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CEO COMPENSATION AND LOAN CONTRACTING

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ABSTRACT

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The agency theory literature implies the pay-performance based managerial compensation can relieve the agency problem between shareholders and managers. As the interests of shareholders and managers are aligned, managers have incentive to invest in best projects and hence to improve firms' performance. While the use of equity compensation to managers may reduce the agency cost between managers and shareholders, its impact on agency cost of debts is ambiguous. On the one hand, a large portion of equity compensation discourages risk-averse managers to invest in risky investment and hence reduce the credit risk. On the other hand, while the equity compensation brings the interests of managers in alignment to shareholder it may encourage managers to take opportunistic corporate strategies and to exploit the wealth of creditors. As a result, creditors may response to the CEO compensation package by imposing different covenant restrictions according to their perception of the credit risk.

Supported with empirical evidence, this research finds that loan agreement contains more restrictive covenants if the firm's CEO has a higher portion of option compensation to the total compensation, but contains less restrictive covenants if the firm's CEO has a higher portion of stock compensation to the total compensation. It implies that creditors view that the increase in the use of option compensation would increase the credit risk of the firm, while the increase in the use of stock compensation would decrease the credit risk. This research also investigates the relation between the CEO option compensation and some specific financial covenants. The finding shows that the use of liquidity covenant and minimum net worth covenant is positively related to the CEO option compensation.

DECLARATION

I declare that this is an original work based primarily on my own research, and I warrant that all citations of previous research, published or unpublished, have been duly acknowledged.

(Ma Yiu Chung)

Date

CERTIFICATE OF APPROVAL OF THESIS

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Chapter 1 Introduction

The structure of CEO compensation has changed dramatically in the recent decades. The median level of CEO compensation in the 50 largest US firms has been increase from \$1.8 million in 1980s to \$9.2 million in 2000s, increased by more than 300% in 3 decades (Frydman and Jenter, 2010). There are four main components in the CEO compensation: salary, bonus, stocks, and options. The components of CEO compensation are no longer dominated by salary and bonus but by equity compensation nowadays. In the 1980s salary and bonus takes up 74% of the total compensation while options and stock takes up 19% and 7% respectively. In 2000s salary and bonus takes up only 40% of the total compensation, while the option and stock take up 36% and 23% representatively.

The dramatic changes could be explained by the tax policies which lower the cost of option compensation (Hall and Murphy 2003). Another reason is that equity compensation is considered to be one of the most efficient performance-based pay methods. The agency theory (Jensen and Meckling (1976)) suggests that the interest of shareholder and manager are not the same. The goal of shareholder is to maximize the firm's value, while the goal of manager is to maximize his payoff. If the firm's performance is not related to the manager's paid, it is hard to expect the manager would do their job well. Equity compensation is one of the performance-based compensation that aims at reducing the agency cost of equity. By linking the CEO payout with firms' share price, CEOs have high incentive to improve firm performance and hence the good performance can be reflected from the increasing share price. Equity compensation is more popular nowadays among other performance-based (like bonus

and profit sharing) as share price is believed to be an unbiased indicator to reflect the firm value in long run (Kim, Li and Zhang, 2011). Several researches suggest that the use of equity compensation has associated with better firm's performance. Mehran (1995) finds that firm's performance is positively related to the use of equity compensation.

While the use of equity compensation can reduce the agency cost between managers and shareholders, the impact to agency cost of debts is ambiguous. As the payoffs of managers are now related to the share price, it affects their risk taking behavior. Stulz (1984) and Smith and Stulz (1985) suggest that managers are generally risk averse. A large portion of equity compensation exposes the managers into a high level of firm specific risk. As managers receive most of their pay in the form of restricted stock and option, they cannot diversify the firm specific risk like the shareholder (investors). To reduce such risk, they tend to reduce investment in risky projects (even if they have positive NPV) and adopt less risky corporate strategies and hence reduce the credit risk of firm. On the other hand, Jensen and Meckling (1976) and Brander and Poitevin (1992) argue that equity compensation align the interest between shareholders and managers, the nature of manager become closer to shareholder, and the manager undergo opportunism and take more risky corporate strategies. Creditor would view this as an increase in credit risk and hence increase the agency cost of debts.

I argue that studying the equity compensation alone cannot understand the puzzle, instead we should study the whole compensation package in a deeper sense as equity compensation contains two very different elements inside: the stock compensation and

the option compensation. Although their values are closely related to the stock price, the loss of option is limited when the stock price drops below the option exercise price. This distinctive nature provides very different incentive to CEO.

I employ three measurements of CEO equity compensation: The equity incentive ratio, the ratio of annual equity compensation to total compensation, and the equity holdings to proxy for the incentive from equity compensation. I use the number of covenants as a proxy to measure the credit risk. Supported by empirical evidence, I show that loan agreement contains more restrictive covenants if the firm's CEO has a higher option incentive, a larger portion of option compensation to the total compensation, and more option holdings. This implies that creditors view the increase in option compensation would increase the credit risk of the firm.

Previous studies suggest that option compensation induce certain CEO manipulation, which increases firm's credit risk. Efendi, Srivastava and Swanson (2007) find that only the CEO option compensation but not the stock compensation induces manager to misstate financial statement. Kim, Li and Zhang (2011) find that only the CEO option incentive is positively related to future stock price crash but not the stock compensation. My finding is consistent with these findings, which suggests that only CEO option compensation increases firms' credit risk.

My another finding shows that loan agreement contains less restrictive covenants if the firm's CEO has a larger portion of stock compensation to the total compensation and more stock holdings. It means the creditors view the increase in stock compensation to

total compensation would decrease the firm's credit risk. This finding is consistent with the previous studies by Smith and Stulz (1985) that risk averse managers receiving large stock compensation tend to reduce the variance of the firm's return and hence reduce the credit risk.

This research contributes to the literature by investigating the compensation structure and the debt contract. Previous researches on CEO compensation structure mainly focus on the impacts to firms' performance and management, while this study investigates the relation between CEO compensation and private debt contract. By looking at the number of covenants imposed by banks, this research investigates how the equity compensation affects creditors' evaluation on the loan risk. It implies that the CEO compensation structure not only affects the firm's internal control but also the external one.

Another contribution of my research is most of the previous research on loan contracting studies the public debt, while this research studies the private debt. There are a number of reasons supporting the importance of studying private debt agreement. Firstly there are around 80% of public firms maintain private debt agreement while only 15% – 20% firms have private public debts (Sufi, 2009). The other reason is due to the credit quality. Denis and Mihov (2003) suggest that the firms with highest credit quality tend to use public debt while firms with medium quality tend to use private debts. As most of the previous research on loan contract focus on public debts, their works tend

to focus on firms' with highest credit quality. My research on private debt attempts to fill the gap that to study the firms with medium credit quality.

The remaining structure of the thesis is as follow: Chapter 2 provides the literature review. Chapter 3 develops the hypotheses. Chapter 4 describes the data and variables. Chapter 5 presents the empirical result. Chapter 6 gives the conclusion and future works on this topic.

Chapter 2 Literature Review

This chapter provides the literature review on the topics of principal agency problem, managerial compensation and agency cost of debts. Supported by the literature, I will analyze how the equity compensation and loan agreement are connected in the later part of this chapter.

2.1 Principal Agency Problem

Principal agency problem is a widely studied topic in financial economics literature as it affects different aspects in corporate governance like capital structure, earning management, merger and acquisition decision. Jensen and Meckling (1976) define the agency relationship as a contractual relationship between two parties, the principal and the agent. The principal grants the agent authority to perform service/duties on behalf of the principal. As both parties are utility maximizers, it is unlikely that the agent would always act in the best interest to the principal if their interests are not allied. The cost incurred is defined as agency cost. The occurrence of agency cost is mainly due to the divergence of interests between the two parties. The principal can lower the agency cost by implanting appropriate incentive mechanism and hence align their interest and motivate the agent to act in the best of the principal.

One of the typical agency relationships in corporate finance is the shareholder (Principal) and the manager (Agent). The shareholder employs the manager to manage the firm.

While the interest of the shareholder is to maximize the firms' value (and hence their wealth), the manager's goal is to maximize his own utility (compensation, reputation and managerial power). Without proper incentive the managers might not act in best of the shareholders. For example, the managers may over-extend themselves in acquisition for empire-buildings, or they don't have incentive to search for profitable projects as they cannot share any gains from these investment. The potential loss from over or under investment is costly to the shareholders.

2.2 Managerial Compensation and Firm Performance

Previous research and founding suggests that equity-based compensation can reduce the agency cost between the shareholder and the manager. By using equity compensation, the interest between shareholders and managers are aligned as part of the firm's equity are now belonging to the manager, which means the payoff to the manager depends on the firm's value. To maximize his/her payoff, manger now has strong incentive to search and invest in projects with positive NPV so that the firm's value can be increased and hence his equity portion.

Previous empirical researches on CEO compensation mainly focus on the impacts to firms' performance. Jensen and Murphy (1990) focus on the relation between CEO compensation structure and Stockholders' wealth. Base on the framework of agency conflict between shareholders (Principal) and CEO (Agent), they suggest that proper compensation policy is needed to align their interest so the CEO has incentive to improve firm's performance. By using a sample of 10,400 CEO-years of data from 1974

to 1986, they investigate the pay-performance sensitivity (which is defined as the dollar change in the CEO's wealth associated with a dollar change in the shareholders' wealth) of different performance based compensation such as bonus, salary revision and stock option. Although their findings show that equity-based compensation gives the largest pay-performance sensitivity which coincides with the literature, the overall sensitivity is very low (on average CEO wealth changes by \$3.25 for every \$1000 change in shareholder's wealth). They suggest the risk averseness of CEO, non-pecuniary rewards to CEO and unobservable measures of performance are possible reasons attribute to low pay-performance sensitivity. Mehran (1995) focus on both the impact of both executive compensation structure and ownership structure to firm performance. He suggests that it is the structure rather than the level of compensation motivates CEO to improve firm's performance. By using a sample of 153 manufacturing firms from 1979 to 1980, he investigates the relations between CEO compensation, CEO ownership and firm performance. His result shows that firm's performance (using Tobin's Q and Return on asset as proxies) is positively related to the percentage of CEO's equity-based compensation and ownership. His findings support the Agency theory that equity compensation is associated with better firm performance.

2.3 Equity compensation and manipulation

Although the above studies provide strong empirical evidence to show that the use of equity compensation has positive impacts to firm performance, there are also findings suggest that equity compensation induce managers to engage in certain fraud and risky

behavior, includes earning management, hiding firms' bad news, manipulate firms' financial reports, etc. One of the examples is Enron Scandal. Enron Corporation was one of the largest energy companies worldwide with a market capitalization of \$60 billion in 2000. During 1990s, the company enjoyed rapid growth and its stock price has increased by more than 300% within 10 years. However it was discovered later that the executives have manipulated the financial reports through the accounting loopholes, hiding billions of debts and overstated the ever-growing revenue, eventually caused this huge corporation to go bankruptcy. The loss to the shareholders and the society is extraordinary huge. It was suggested the design of executive compensation caused such consequence. By using excessive amount of equity compensation, the executives were highly incentivized. To maximize their payoff, they tried to support the high stock price by any means (includes over-exaggerating the revenue growth, invest in risky projects, hiding the bad news which would hinder the stock price). These value-destroying actions harmed the firm value in long run and eventually lead to the firm became insolvent. The Enron Scandal caught the attentions of researchers to investigate the implications of the use of equity compensation and the results are not one-sided.

Bergstresser and Philippon (2006) investigate the relationship between CEO incentive and firms' earning management. They construct the variable CEO_Incentive as a proxy to measure the power of equity-based incentive by calculating the sensitivity of CEO wealth to the firm's share price (change of CEO compensation from 1% change in stock price). The higher the CEO_Incentive implies the more powerful the equity-based compensation is, hence provide more incentive for CEO to take action improve firms'

stock return. CEO may take a number of actions to achieve this goal, one way is to improve firms' performance, the other way is to manipulate earnings' report and boost up the stock price in short run. By using the accruals as a proxy to measure earning manipulation, their finding shows that CEO incentive induces CEO to manipulate firms' earning report, which implies high CEO incentive may harm both shareholders and creditors as manipulated report adversely affect firms' value, and even causing bankruptcy. Jiang, Petroni and Wang (2010) extend the work and compare whether it is CEO's or CFO's incentive is more influential towards earning management.

Benmelech, Kandel and Veronesi (2010) suggest that due to information asymmetry, the use of stock-based compensation not only induce their effort to improve firm's performance, but also motivate them to hide the firms' bad news about future growth options. On the other hand, Armstrong, Jagolinzer and Larcker (2010) finding shows that the occurrence of accounting irregularities and CEO equity incentive are negatively related. The rationale behind is the equity incentive align the interest of managers and shareholder and motivate managers to avoid taking value-destroying actions.

2.4 Option Compensation

In the recent decades option has become increasingly important and takes up a more significant portion of CEO compensation. In 1970s option only took up 11% of the total CEO compensation while in 2000s it took up 37% of the total CEO compensation in the 50 largest firms in US (Frydman and Jenter, 2010). The rapid increases trend in option compensation catches the attentions of the scholars and more studies have been done

to investigate the impact of option compensation. The nature of option compensation is like a contract which grants the right to the employees to buy the firm's stock at a certain price (exercise price). These options are usually non-tradable and cannot be exercised immediately. The employees lose the option if they leave the firm before vesting. Similar to stock compensation, option compensation provide incentive for employees to improve firm performance as it links the employees' wealth to firms' value. Also option compensation is a deferred compensation which may help firms to retain their employees and reduce the searching cost. But there are some factors which makes option different from stock. The value of option is highly depending on the evaluation on firms' prospect. As different employees have different evaluation, firm using option compensation can attract those optimistic, highly motivated and entrepreneurial employees.

There are researches have been done on the "effectiveness" (by means of inducing employees' effort) of option compensation, but the conclusion is controversial in the literature. Oyer and Schaefer (2006) suggest that option is inefficient mean to provide incentive to employees. As option compensation is highly risky to undiversified employees (who are risk-averse), the option would worth much less to the employees than to a diversified investor. Also a large portion of the option compensation would become the risk-premium to compensate for the addition risk imposed to the employees, which makes option less effective to induce employees' efforts. Hall and Murphy (2000) suggest that option compensation can provide strong incentive. As option value is more sensitive to the stock price, for the same dollar of stock

compensation and option compensation, option compensation can provide more incentive to employees.

Apart from effectiveness, the impact of option to corporate strategies also catches the attention of the scholars. Dittmann and Maug (2007) argue that under optimal structure of executive pay, option should never be granted, the corresponding incentive should be provided through restricted stock granted. The implication behind is option does award to invest highly risky projects (even if these projects have negative NPV), which induce manager to take too much risk. By using Tobin's Q as proxy of firm value, Habib and Ljungqvist (2005) find that the value of firm and the CEO stock holding is positively related, but negatively related to the CEO option holding. They argue that option compensation cannot provide CEO enough incentive to maximize the value of firm. Efendi, Srivastava and Swanson (2007) use the ratio of bonus, option grants and restricted stock to salary as the proxy of CEO compensation structure. Supported by empirical data, their finding shows that the ratio of option grants to salary and firm's misstatement on financial report is positively related. Their result implies that option motivate CEO to take inappropriate action supporting the share price. Kim, Li and Zhang (2011) investigate the relation between equity compensation and stock price crash risk. By using the incentive ratios (stock incentive and option incentive) as proxy to measure equity incentive, their finding suggest that option incentive is positively related to future stock price crash risk, but the relation between stock incentive and future stock price crash is not significant.

2.5 Agency Cost of Debt

Apart from the agency problem between shareholders and managers mentioned in the first part of the literature, there exists another type of agency problem between the creditor (Principal) and the shareholder (Agent). As the pay-off of debt is determined by the preset interest rate while the pay-off to equity is determined by the value of firm, there exists a conflict of interest. For example, firm may invest in risky project to increase firm value, which increase the default risk and harm the interest of creditor. Jensen and Meckling (1976) suggest that under a highly leveraged financial structure, the risk of investment can be shifted to the creditor. As a result owner has incentive to engage in investment with high payoffs even if they have negative NPV. If the investment success, the owner captures most of the profit, on the other hand if it fails, it is the creditor who bears most of the loss. The shareholders may also transfer the wealth from the creditors to shareholders through asset substitution (for example, large dividend payout). These opportunistic incentive associated with debts generates the agency cost of debts. Stockholder may also adapt a high dividend yield policy which liquidate the firm asset and transfer the wealth to shareholder. These actions are considered as asset substitution, which transfer the wealth from creditor to shareholder and hence harm the interest of creditor.

This thesis extends the literature by investigating how the use of equity compensation affects the agency cost of debts. Previous researches of equity compensation focus on the firms' performance and firm risk, which only concern about the conflict of interest

between shareholder and manager, without considering the impacts to the creditors. Moreover this research separately investigates of stock compensation and option compensation, which attempts to solve the puzzle of how the equity compensation would affect manager risk taking behavior.

To conclude, the literature suggests the alienation of interest is the main cause of the agency problem between shareholders and managers. Equity compensation is one of the ways to reduce the agency cost of equity. By allying the interests between the two parties, equity compensation provides incentive for manager to improve firm performance. However due to the nature maybe “too strong” which motivate the managers to engage in highly risky activities or even in fraud, which destroy firm value and harm the interest of both shareholder and creditor in the end. In the next chapter I will develop the hypotheses and demonstrate the impacts of equity compensation on loan agreement.

Chapter 3 Hypothesis

In the last chapter I reviewed the literature on the agency theory and equity compensation, provided the background of how equity compensation and the agency cost of debt are related. Based on these foundations I will develop the hypotheses on equity compensation and loan covenants.

This thesis investigates whether the equity compensation would affect the creditors' evaluation on firm's credit risk. As mentioned before the use of equity compensation can affect manager's risk taking behavior, it also affects the agency cost of debt. If the manager takes more risky corporate strategies, it increases the default risk of firm, which is harmful to the creditors. In order to prevent firm undergoes risky strategies, the creditor may impose certain covenants to restrict the firm from engage in certain activities so that the default risk could be reduced. This means creditors would impose more restrictive covenants in the debt contract if they perceive the firm's credit risk is increased.

Although stock compensation and option compensation are both considered as equity compensation and are aimed to induce CEO effort by tightening the CEO pay off with share price, their natures are not the same. Begley and Feltham (1999) suggest that option compensation has a distinctive difference. Option value does vary with the stock price when the strike price is above the stock price, but once the stock price is below the

strike price, further drop in stock price does not affect the option value. This distinctive nature of option encourages manager to take some highly risky investment with high payoff when it succeeds, even if it has negative NPV. This is because the manager can fully benefit from the gains, but only suffers from its losses. Due to this distinctive nature, the impacts of stock compensation and option compensation to the credit risk are not the same.

I hypothesize the creditor hold the views that the use option compensation would increase the firm's credit risk and hence induce the creditor to impose more restrictive covenants as option compensation induce CEO risk taking behavior. On the other hand the use of stock compensation decreases firm's credit risk and hence induces the creditor to impose less restrictive covenants as CEO cannot diversify their portfolio which induce them to take less risk. This thesis uses 3 measurements separately for the option compensation and stock compensation. For the option compensation, they are "annual option compensation ratio", "option holdings" and "option incentive"; for stock compensation, they are "annual stock compensation ratio", "stock holdings" and "stock incentive". From these variables I develop the follow hypotheses:

H1a. Bank views CEO's annual option compensation would increase the firm's credit risk:

CEO option compensation ratio and the number of covenants are positively related

H1b. Bank views CEO's accumulated option holding would increase the firm's credit risk:

CEO option holding and the number of covenants are positively related

H1c. Bank views the CEO option incentive to CEO wealth increases the firm's credit risk:

CEO option sensitivity to CEO wealth and the number of covenants are positively related

H2a. Bank views CEO's annual stock compensation would decrease the firm's credit risk:

CEO stock compensation ratio and the number of covenants are negatively related

H2b. Bank views CEO's accumulated stock holding would decrease the firm's credit risk:

CEO stock holding and the number of covenants are negatively related

H2c. Bank views the CEO option incentive to CEO wealth increases the firm's credit risk:

CEO stock sensitivity to CEO wealth and the number of covenants are positively related

I also investigate the relation between the number of loan covenants and the 2 common measures of CEO equity incentive in the literature: CEO delta and CEO vega. CEO delta measures the sensitivity of CEO's equity wealth, including both stock and option compensation to the change of stock price.

CEO delta measure depends on the value of both stock compensation and option compensation. As I hypothesize before the impacts of stock compensation and option compensation to creditor's evaluation on firm risk are in opposite direction, I hypothesize that CEO delta does not have a clear impact to creditor's evaluation on the firm's credit risk.

H3. *Bank views the CEO delta has no impacts to the firm's credit risk: CEO stock delta and the number of covenants are not related*

CEO vega measures the sensitivity of CEO's option holdings to the stock price volatility. The convexity of CEO wealth to stock price encourages CEO to take more risky investment. Coles, Daniel and Naveen (2006) finding shows that the higher CEO vega induce risky investment policies. Support with the literature, I hypothesize that the creditor hold the view that the higher the sensitivity of CEO's option holdings to the stock price volatility induce more firm risk.

H3. Bank views the CEO vega has a positive impacts to the firm's credit risk: CEO vega and the number of covenants are positively related.

I use the number of financial covenants instead of interest rate as proxy to measure the bank's evaluation on firm risk. Stiglitz and Weiss (1981) suggest that interest rate has two impacts on loan risk: The adverse selection effect and the adverse incentive effect. The adverse selection aspect perceives interest rate as a screening device to identify the quality of borrowers. For those borrowers who willing to pay are the most risky borrower. They are willing to accept a high interest rate simply because their probability of repaying is low. The adverse incentive aspect perceives interest rate as an incentive mechanism which a higher interest rate tends to induce borrower to take more risk. The rationale behind is an increase in interest rate lowers the expected return of project with high probability to pay back the debts by larger portion than the project with low probability to pay back the debts. Both effects would increase the risk of debts, as a

result the interest rate could not be a good measurement to proxy for the creditors' evaluation on loan risk.

Covenant is a common tool in debt contract to protect the creditor from being exploited by the shareholder. By limiting borrower from engaging certain activities, covenant prevents the transfer of wealth from lenders to the shareholder. These limitations based on firms' leverage, profitability, working capital, cash flow, capital expenditure and dividend policy. For example, the debt to equity ratio covenant limits the ownership structure of the firm; the minimum earnings before interest, taxation, depreciation and amortization (EBITDA) covenant require the firm to maintain certain profitability. If any covenants are violated, the borrower is considered to be "technically default" and the creditor has the right to accelerate the loan.

Summarized by Chava and Roberts (2008), there are two rationales support the use of covenants: prevent the value reduction and defining the control right. The first rationale is based on the agency theory which suggests manager may have incentive to reduce firm value for the sake of self-interest (for example, empire-building). These actions benefit the manager at the expenses of creditor and shareholder. Covenants like capital expenditure restriction and limitation of new debt insurance are designed to address such problem and hence prevent the value reduction induced by manager's self-interest. The second rationale suggests that covenant serves as a state-contingent control mechanism. Poor performance may lead to violation of covenant. By the threat of calling back the loans, creditor may negotiate for more favor terms (like higher interest

rate) or impose other restrictive covenants. Under this situation part of the control right is transferred to the creditor from the manager. To prevent such consequence, manager has incentive to improve firm's performance in order to retain the control right (so as to protect the associated benefit). This mechanism rewards proper management and punish poor management which induce manager's effort and hence add value to the firm. The above characters justify the use of covenant could reduce the credit risk faced by creditors, which implies the use of covenant serves as a proper measure of the creditors' evaluation on loan risk.

In this chapter, I build up the hypotheses that option compensation and loan covenants are positively related, on the other hand stock compensation and loan covenant are negatively related. In the next chapter, I'll describe the data and variables which I have employed to examine the results.

Chapter 4 Data and Variables

In the last chapter I developed the hypotheses on the relation between equity compensation and the number of financial covenants contained in loan agreement. In this chapter, I will describe the variables and the data sources.

4.1 Data Sources

The primary data source of the loan's information is from DealScan, which includes Loan size, maturity, loan purpose, etc. For the firm's information, the data is from CompuStat, which includes asset size, profit, liabilities, etc. For the CEO's compensations, the data is from ExeceComp which includes annual compensation, option holdings, stock holdings, option exercise price, option maturity, etc.

For the loan covenants data, the primary source is from Nini, Smith and Sufi (2009).

They suggest that although DealScan provides information on the debt covenant, there is many missing report. In order to obtain a more comprehensive covenant data set, they develop another method. They collect the covenant data by using text-searching programs to scan through the 10-K, 10-Q and 8-K filling in Electronic Data Gathering, Analysis, and Retrieval System (EDGAR). EDGAR contains the information that firms are required by law to file forms with U.S. Securities and Exchange Commission (SEC). Information like loan contract agreement is included in the database. They collect the covenant data from 1996 – 2005. They scan all the filing in EDGAR with the following

keywords in capital letters “credit agreement”, “loan agreement”, “loan and security agreement”, “revolving credit”, “financing and security agreement:”, “financing and security agreement”, “credit and guarantee agreement:”, and “credit and guarantee agreement”. If any of these keywords are found, the text-searching program would extract the paragraph within 20 lines into the document. I follow their method and further extend the data to 2006. I also check all the missing loan information from the 8-K file. I use the date, borrowers’ CIKA and firms’ name to identify each loan contract and match with other loans’ information in DealScan.

The sample of the loan deals contains the private loan agreements in US with the period from 1996 to 2006. All the loan agreements without corresponding firms’ information and CEO compensation’s information are excluded from the sample. The final sample includes 1512 loan agreements from 791 firms.

Table 1 shows the summary statistics of the loan agreements in my sample. For the loan size, the mean is 567 million and then median is 300 million. For the maturity, the mean is 42.7 months and the median is 48 months. For the interest spread, the mean is 116.6 basis points and the mean is 87.5 basis points. Among the sample, 77.6% of them have performance pricing, which means their terms and conditions (like spread rate) could be modified depends on firm’s financial performance (like leverage). 35% of the loan agreement in the sample are secured and back by collateral.

For the loan covenants, I follow Nini, Smith and Sufi (2009) and classified 7 types of financial covenants: Coverage ratio covenant (includes interest coverage, fixed charge

coverage and debt service coverage covenants), Debt to cash flow covenant (includes debt to cash flow and debt to senior cash flow covenants), Net worth covenant (includes minimum net worth and minimum tangible net worth covenants), Debt to balance sheet covenants (includes debt to capitalization and debt to net worth covenants), Liquidity covenant (includes minimum working capital, current ratio and quick ratio covenants), minimum cash flow covenant (includes minimum EBITDA and minimum cash flow covenants) and Capital expenditure restriction covenants. On average the loan deal in my sample contains 2.22 types of financial covenants and the median is 2. Among the 7 types of financial covenants, Coverage covenant is the most common type of covenant, 64% of the sample loan deal contains this type of covenant. The second common type of covenants is Coverage ratio covenant, 51.9% of the loan deal in my sample contain this type of covenant. The least common type of covenant is Minimum cash flow covenant and Liquidity covenant, among the sample only 5.4% and 8.9% of the loan deal contains these types of covenant respectively.

Table 2 shows the summary statistics of firm and CEO compensation. The average asset size of the firm (borrower) is 4,890 million dollars and the median is 1,600 million dollars. For the CEO compensation, the mean of annual total compensation is 4,847,493 dollars and the median is 2,563,169 dollars. On average the annual option compensation takes up 33% of the annual total compensation; annual stock compensation takes up 8% of the annual total compensation. The median of stock holding and option holding are 5,634,107 dollars and 2,903,512 dollars respectively.

4.2 Dependent Variable

My research studies the relation between debt contract and CEO compensation. Unlike previous studies which most of them focus on public debt agreement, I focus on private debt agreement. Denis and Mihov (2003) suggest that credit quality does affect the choice of debts. Those firms with highest credit quality tend to use public debts, while firms with medium credit quality tend to borrow from bank. Studying public debts alone might omit those firms with medium credit quality. My research fills the gap of the literature by studying private debt contract so that the behavior of those firms with medium credit quality can be investigated. Due to concentrated ownership of the debt, banks are allowed to process more information like the accounting information, financial information and even management decision of the borrower (Fama, 1985). So the terms and conditions included in the private debt agreement can better reflect the financial situation of the borrower. Private debt agreement is suggested to be the largest source of financing for corporation (Sufi, 2009). These reasons justify the importance to study private debt agreement.

FinCov_Num : The financial covenant index measure the degree of restrictiveness of the loan contracts to the firm's management. Following Bradley and Roberts (2004) assumption that the more number of covenants means greater the restrictions to the firm, I construct a financial covenant index by counting the number of financial covenants included in the private debt contract. Nini, Smith and Sufi (2009) defines 7 types of financial covenants, they are Coverage ratio covenants, Debt to cash flow ratio

covenants, Net worth covenants, Debt to balance sheet covenants, liquidity covenants, Minimum cash flow covenants and Capital expenditure restriction covenants. I follow their definitions and construct a financial covenant index with range of 0 to 7. Although there is potential limitation of the covenant index as it implicitly assumes that all types of covenant have the same weight in the index, the approach is transparent and it accounts the impacts of all types of financial covenants.

4.3 Independent Variable – equity compensation

Follow the literature I employ 5 measurements to measure the relative equity incentives. These measurements are the sensitivity of CEO's wealth (include stock and option compensation) to the change of stock price (delta), the sensitivity of CEO wealth to the stock price volatility (vega), ratio of equity compensation in current year, accumulated equity holdings and the CEO incentive.

CEO delta: measures the dollar change in the value of the option or restricted stock grants, share holdings, and any restricted stock and option holdings for a 1 % change in the stock price.

CEO vega: measures the dollar change in the value of the CEO's option grants and any option holdings for a 0.01 change in the annualized standard deviation of stock returns.

Ratio of equity compensation in current year: For the proxies to measure CEO compensation structure, I follow Mehran (1995) and employ 2 measures:

Option Ratio: the percentage of current year total compensation in grants of new options. This variable measures the relative size of option compensation in the current year. The option valuation is based on the Black-Scholes formula.

Stock Ratio: the percentage of current year total compensation in grants of new stock. This variable measures the relative size of stock compensation in the current year.

Accumulated equity holdings: For the proxies to measure CEO stock holding and option holding. I follow Efendi, Srivastava and Swanson (2007) and employ 2 measures:

Option holding/Cash pay: the ratio of accumulated option holdings to the current year salary of CEO. This variable measures the relative size of option holding to the non-equity compensation.

Stock holding/Cash pay: the ratio of accumulated stock holdings to the current year salary of CEO. This variable measures the relative size of option holding to the non-equity compensation.

CEO incentive: For the proxies to measure the strength of CEO incentive from stock and option, I follow Bergstresser and Philippon (2006) and Kim, Li and Zhang (2010) and employ 2 measures:

Option Incentive: $\text{ONEPCT_OPT} / (\text{ONEPCT_OPT} + \text{Salary} + \text{Bonus})$,

(where $\text{ONEPCT_OPT} = 0.01 * \text{Share Price} * \text{option delta} * \text{no. of options hold by CEO}$)

The ONEPCT_OPT is the dollar change in CEO option holdings resulting from 1% change in firm's stock price. Option Incentive is the incentive ratio measure the relative strength of incentive from option holdings to CEO.

Stock Incentive: $\text{ONEPCT_STK} / (\text{ONEPCT_STK} + \text{Salary} + \text{Bonus}),$

(where $\text{ONEPCT_STK} = 0.01 * \text{Share Price} * \text{no. of shares hold by CEO}$)

The ONEPCT_STK is the dollar change in CEO stock holdings resulting from 1% change in firm's stock price. Similar to Option Incentive, Stock Incentive is the incentive ratio measure the relative strength of incentive from stock holdings to CEO.

4.4 Control Variables – Firm Characteristics

The evaluation of credit risk and borrowing cost are highly depending on firms' characters, so I have put a number of firm specific control variables in the model.

Log Asset (The Logarithm of a firm's total assets): Firm size is important in loan cost evaluation as larger firms usually come with better reputation, hence they can negotiate with better terms (for example, less restrictive covenants and lower spread) . Larger firms also associate with less information asymmetry. (Graham, Li, Qiu (2008))

Profitability (The ratio of profit to total assets): Following Graham, Li, Qiu (2008), it is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to total asset. This variable controls for the ability of firms to make profit. Firms with higher

profitability are expected to have lower default risk as they are less likely to issue additional debt.

Asset Tangibility (The ratio of tangibility assets to total assets): Follow Graham, Li, Qiu (2008), it is the ratio of net property, plant and equipment to total assets. This variable measures the quality of loans' collateral. As banks have the right to takeover firms' asset (collateral) in the event of default, more tangible assets should lower the borrowing cost and hence less restrictive covenant would be imposed.

Market to Book Ratio (The ratio of market value of asset to the book value of assets): Follow Graham, Li, Qiu (2008), I calculate this ratio by dividing the sum of market value of equity and book value of debt by total assets. This variable is a proxy to control for firms' growing opportunities. Firms with high growth opportunities mean they are expected to have more future cash flows. As a result their borrowing cost is lower. However growing firms are also more vulnerable to financial distress, so their credit risk could be higher.

Leverage (The ratio of long term debts to total assets): This variable measure the financial status of firms. Firms with higher leverage are expected to have higher default risk, which increase the borrowing cost.

S&P Ratings: The rating from S&P reflects the firm quality and credit risk. The higher the credit rating means the better credit quality, which is expected to associate with lower loan spread and less restrictions (covenants) in borrowing. I have created 8 dummies

variable (with AAA =1, AA = 2, A=3, BBB=4, BB=5, B=6, CCC=7, CC or below = 8) to control for the credit rating.

Industry Control: Dummy variables have been used to control for unobserved industry characteristics.

4.5 Control Variables – Loan Characteristic

Apart from controlling the firm's characteristics, various loan factors are also controlled. These control variables include:

ln(Deal amount): the Natural Logarithm of the loan amount, which control the economy of scale in the bank's lending (Graham, Li and Qiu (2008)).

ln(maturity): the Natural Logarithm of the loan maturity in months, which controls the liquidity premium required by the bank (Graham, Li and Qiu (2008)).

Performance pricing: a dummy memory equal to 1 if the loan agreement contains performance pricing (i.e. the loan spread is tied to firm financial performance) and otherwise 0.

Loan Purpose: Dummy variables have been used to control for different loan purposes.

Loan Type: Dummy variables have been used to control for different loan types.

4.6 Other control variables

Credit Spread: the difference between AAA corporate bond yield and BAA corporate bond yield. The higher the difference means a higher risk premium is required. This

variable serves as a proxy to control for macroeconomic conditions. (Graham, Li and Qiu (2008))

This chapter provides the data sources, describes the summary statistics of the data and shows the computation of several key variables of this research. The next chapter will present the model and regression results.

Chapter 5 Regression analysis

The last chapter described the computation of the three measurements of CEO compensation: equity incentive, annual equity compensation ratio and accumulated equity holdings. In this chapter, I will present the regression results and examine the effects of CEO equity compensation on the usage of financial covenants in loan agreement.

5.1 Main regressions

Poisson regression is used to examine the relation between CEO equity compensation and number of covenants:

$$Y_{i,t} = \alpha + \beta_1(\text{CEO Compensation Variables})_{i,t-1} + \beta_2(\text{Firm Control Variables})_{i,t-1} + \beta_3(\text{Loan Control Variables})_{i,t} + \beta_4(\text{Other Control Variables})_{i,t-1} + \mu_{i,t}$$

where Y is the number of financial covenant

Probit regression is used to examine the relation between CEO equity incentive and the probability to include coverage covenants and debt to cash flow covenants.

$$\Pr(Y_{j,t=1}) = F(\alpha + \beta_1(\text{CEO Compensation Variables})_{j,t-1} + \beta_2(\text{Firm Control Variables})_{j,t} + \beta_3(\text{Loan Control Variables})_{j,t} + \beta_4(\text{Other Control Variables})_{j,t-1})$$

where $Y_{j,t=1}$ is 1 if covenant j exists and 0 otherwise

Table 3 to Table 5 present the result of the relation between CEO equity compensation and financial covenants. Different columns represent the regression results with different control variables, which include loan purpose, loan type, industry and S&P rating. The coefficients of the key variables Option Ratio, Option holding/Cash pay and Option Incentive have changes after controlling for S&P rating in column 4 and column 5, which confines with the previous study of Nini, Smith and Sufi (2009) that loan covenants are sensitive to the S&P ratings.

Table 3 presents the result of the relation between CEO incentive and the number of financial covenants. The dependent variable is the number of financial covenants. The more covenants implies a higher credit risk to the perception of bank. The key variables here are the Option Incentive and Stock Incentive. The Incentive variables hypothesize the impact of 1% increase in stock price to the CEO wealth, which capture the relative incentive provided by the stock compensation and option compensation. Follow the framework of Chava, Kumar and Warga (2009) and Graham, Li and Qiu (2008) I also include the Loan characteristic variables (loan amount, maturity, loan purpose, loan type and performance dummy), Firm characteristic variables (Firm size, profitability, tangibility, leverage, market to book ratio) and credit rating) and Macroeconomic control variables (credit spread) into the regression. The result shows that number of financial covenant is positively related to Option Incentive. The increases in the number of financial covenant range from 13.9% to 29.4% if the option incentive increases from 0 to 1. By adding more control variables the coefficient is reduced, but it remains statistically significant. This finding shows that the loan agreement contains more

restrictive financial covenants when firm's CEO payoff is more sensitive to option. As mentioned before the loss from option is limited, the high option sensitivity to CEO payoff implies that CEO has a higher incentive to support a higher stock price by means of taking risky corporate strategy in order to maximize the payoff. These action induced by the option incentive would increase the credit risk of firm perceived by bank. To protect its interest, the bank imposes more financial covenants to prevent CEO engaging in certain risky strategy. On the other hand the relation between Stock Incentive and number of financial covenant is insignificant. The asset size of firm is negatively and significantly related to the number of financial covenants, which is consistence with Graham, Li, Qiu (2008) suggest that firms with larger size could negotiate with better terms, as they usually comes with a better reputation and with less information asymmetry. Previous findings (Chen, Roll and Ross (1986) and Graham, Li, Qiu (2008)) suggest that the credit spread reflects the macroeconomic condition. A high credit spread means the creditor demands for a higher risk premium, which implies the credit risk is higher. My finding shows that credit spread is positively and significantly related to number of financial covenants, which is consistence with the literature.

Apart from the number of financial covenant, I also investigate the relation between CEO equity incentive and the probability of the loan agreement containing the 2 most common types of covenants – the coverage covenant and the debt to cash flow covenant.

Table 4 presents the result of the relation between CEO option incentive and the probability of the inclusion of coverage covenant. Following Nini, Smith and Sufi (2009), the coverage covenant includes the fixed charge coverage, interest coverage and debt service coverage covenants. These covenants require the firm to meet a minimum level of revenue over the fixed charges, interest expenses and debt service expenses. In general, the largest component of fixed charge to the firm is the interest payment to debt. The aim of coverage covenant is to ensure the firm has the ability to meet its debt obligation. A low revenue or high interest payment would cause the violation of the coverage covenant. In order to avoid violation of the covenant, the firm has to increase the firm revenue. It can also reduce the interest payment by improving the creditability or decreasing the debt level. The coverage covenant is effective to reduce the firm credit risk from CEO opportunisms. As the covenant requires firm to have sufficient revenue to support the interest payment, it discourages CEO's empire building behavior (i.e. non-profitable acquisition).

The key variables here are the Option Incentive and Stock Incentive. The Option Incentive has a positive and significant effect to the use of coverage ratio covenant. The increases in probability range from 27.3% to 40.3% if the option incentive increased from 0 to 1. The result shows that when CEO's wealth is more sensitive to option, the high probability for the bank to include coverage covenant into the loan agreement, which implies the bank views the option incentive of CEO would increase the credit risk of the firm. On the other hand the relation between Stock Incentive and probability of the use of coverage covenant is insignificant.

Table 5 presents the result of the relation between CEO option incentive and the probability of the inclusion of the debt to cash flow covenants. The debt to cash flow covenant includes the total debt to cash flow covenant and senior debt to cash flow covenants. It requires the firm to have a ratio of total debt to revenue not to exceed certain level. The nature of debt to cash flow covenant and coverage covenant are similar that they both target on the ability of firm to meet the debt obligation. The use of debt to cash flow covenant can reduce the credit risk of firm by restricting the firm's borrowings. It ensures the firm's borrowing is supported by sufficient revenue. The results show that the key variable option incentive has a positive and significant effect to the use of debt to cash flow covenant. The increases in probability range from 32% to 49.1% if the option incentive increased from 0 to 1. On the other hand, the Stock Incentive has a negative and significant effect to the use of debt to cash flow covenant. The decreases in probability range from 9.5% to 11.9%. The results suggest that to the perception of bank, if the CEO's wealth is more sensitive to option compensation, the credit risk of firm increases. On the other hand the credit risk of firm is lower to bank if the CEO's wealth is more sensitive to stock compensation. These findings are consistence with my hypotheses that the use of option compensation increases credit risk of firm, while the stock compensation decreases credit risk of firm.

Table 6 shows the result of the relation between CEO annual compensation and the number of financial covenants. The key variables are the Option Ratio (ratio of annual option compensation to total compensation) and Stock Ratio (ratio of annual stock compensation to total compensation). The ratio of annual option compensation ratio

has a significant and positive effect on the number of covenant. The increases in number of covenant range from 7.1% to 9.5% if the option compensation ratio increased from 0% to 100%. This finding shows that when CEO's annual compensation contains more option, the bank imposes more financial covenants in the loan agreement. It is consistent with my hypothesis that the bank views CEO option compensation would increase firm's credit risk. The results suggest that to the perception of bank, if the CEO's wealth is more sensitive to option compensation, the credit risk of firm increases.

The ratio of annual stock compensation ratio, on the other hand, has a significant and negative effect on the number of covenant. The decreases in number of covenant range from 25.6% to 27.4% if the stock compensation ratio increased from 0% to 100%. The results suggest that the use of stock compensation and the number of financial covenants are negatively related, which means bank views CEO equity compensation would decrease firm's credit risk. This finding is consistency with my hypothesis that the bank views CEO stock compensation would decrease firm's credit risk.

Table 7 shows the result of the relation between CEO equity holdings and the number of financial covenants. The key variables here are the Option holding/Cash pay (accumulated option holding over cash compensation in current year) and Stock holding/Cash pay (the accumulated stock holding over cash compensation in current year). The number of financial covenant is positively related to the CEO Option holding, but negatively related to CEO stock holding. Although both coefficients are small, they

are statistically significant, which provides evidence showing that bank views the CEO option holding increases the credit risk of firm and the CEO stock holding decreases the credit risk of firm.

Table 8 shows the result of the relation between CEO delta, CEO vega and the number of financial covenants. The key variables here are CEO delta and CEO vega. The result shows that CEO delta and the number of financial covenant are negatively related, but the relation is not statistically significant. The result is consistence with my hypothesis that delta does not have a clear relation with banks' evaluation on firm's credit risk. As the impacts from stock compensation and option compensation are in opposite direction, delta cannot be a good variable to measure how banks evaluate the firms' credit risk associate with CEO compensation. On the other hand for CEO vega, the result shows that it has a significant and positive impact to the number of financial covenants. It provides evidence showing that bank views the higher CEO vega increases the credit risk of firm and the CEO stock holding decreases the credit risk of firm. It is consistence with the literature and my hypothesis that a high CEO vega induce risky investment policies, which increases the firms' credit risk.

To conclude, the empirical evidence shows that the use of covenants is positively related to the option compensation in terms of all measurements: the annual option compensation ratio, the accumulated option holdings and the option incentive. The results suggest that the bank views the use of CEO option compensation increases the firm's credit risk. On the other hand I also find that the use of covenants is negatively

related to the annual stock compensation ratio and accumulated stock holdings, which provide evidence to show that bank view the use of CEO stock compensation decreases the firm's credit risk.

5.2 Subsample analysis: Credit Spread

Chen, Roll and Ross (1986) and Graham, Li and Qiu (2008) suggest credit spread is a good proxy to measure the macroeconomics conditions. The credit spread measures the differences between the AAA corporate yield and BAA corporate bond yield. The differences could be explained by, among other things, the firm-specific risk, business climate, interest rate, market volatility.. These factors reflect the situation of macro-economy. Collin-Dufresne, Goldstein and Martin (2001) argue that the credit spread is lower during expansion and higher during recession. It is because the investors would demand for a higher risk premium during economic downturn to compensate for the increased default risk. Chen (2010) suggests that the expected growth rate of firm is lower during recession. Also the expected cash flow of firm is lower and more volatile.

Moreover the uncertainty of economic prospect during recession raises investors' marginal utilities and hence they would demand for a higher risk premium on securities. These factors as a result increase the credit risk of firm during recession period.

Bushman, Dai and Wang (2010) argue if the systematic risk (especially during recession) is high, it is harder for the board to truly interpret the CEO talent in relation to firm performance as the volatility of firm performance is driven by factors beyond CEO controls. Base on the above studies, I hypothesize that the impact from option incentive

is higher at the period with high credit spread. As the high credit spread increases the firm performance volatility and hence CEO can hide their inappropriate behavior easier.

Table 8 shows the subsample analysis on credit risk. The whole sample is divided into 2 groups: the group with the credit spread higher or equal to the median and the group with the credit spread lower than the median. The key variables here are Option Incentive, Option ratio and Option holdings/cash. The results show that CEO incentive and Option ratio are significantly and positively related to the number of financial covenants only in the high credit spread group. While for option holdings/cash, it is significant and positively related to the number of covenants for both groups. The above regressions results are consistent with the previous studies which suggest that debt holder view the increase in credit spread increases the firm's credit risk.

5.3 Subsample analysis: leverage

Previous literature suggests the use of debt can alleviate the managerial agency problem by reducing the free cash flow controlled by managers. Grossman and Hart (1982) suggest the use of short-term "hard" debt (refer to senior debt and non-postponable debt) reduces the free cash flow by forcing the managers to repay the debts promptly. Hart and Moore (1995) argue the use of long-term debt can impose certain constraints to manager's future investments. As firm with high debt level (or highly leveraged) would be more difficult to further raise capital. Supported with empirical data, Chava, Kumar and Warga (2009) find that holding the default risk

constant, the managerial agency cost from managerial entrenchment is lowered for highly leverage firm.

From the above work, I hypothesize that holding default risk constant, the impact from option incentive to credit risk would be lower for the highly leveraged firm. The high level of debt decrease the free cash flow controlled by CEO, also the threat of bankrupt has a discipline effect to hinder CEO from taking risky corporate strategy.

Table 10 shows the subsample analysis on firm's leverage. Similar to the subsample analysis on credit spread, I divide the whole sample into 2 groups: the group with the firm leverage higher than or equal to the median and the group with the firm leverage lower than the median. The key variables here are still Option incentive, Option ratio and Option holdings/cash. The results show that CEO incentive and Option ratio are significantly and positively related to the number of financial covenants only in the low leverage group. While for option holdings/cash, it is significant and positively related to the number of covenants for both groups. The results are consistent with the literature that debt has a discipline role to reduce managerial agency risk.

5.4 Subsample analysis: Market-to-Book-Ratio

Previous studies suggest the firms' growth opportunities have certain implications on firm's risk. As there is conflict of interest between creditor and shareholder, firms with more growth opportunities are more likely to have risk-shifting behavior (Eisdorfer, 2008). It implies that CEO has a higher tendency to invest in riskier project. I use market-to-book ratio as proxy of growth opportunity and hypothesize that the impact from

option incentive to credit risk would be higher for the firm with more growth opportunities.

Table 11 shows the subsample analysis on firm's market-to-book-ratio. The sample is divided into two groups: the group with the firm's market-to-book-ratio higher than or equal to the median and the group with the firm's market-to-book-ratio lower than the median. The key variables are Option incentive, Option ratio and Option holdings/cash. The results show that both Option Incentive, Option ratio and Option holdings/cash are significantly and positively related to the number of financial covenants only in the high market-to-book-ratio group. The above results are consistent with the previous studies that growth opportunities induce more firms' credit risk and affect banks' evaluation on firm risk.

5.5 Robustness Test: Instrumental Variables

To encounter the potential endogeneity problem which the expectations on the future loan contract may affect the current CEO compensation package, I employ the certain Instrumental Variables:

Instrumental Variables for Option Incentive ratio: Average option holding of other firms in the same industry

Instrumental Variables for Stock Incentive ratio: Average stock holding of other firms in the same industry

Instrumental Variables for Option ratio: Average Option ratio of other firms in the same industry

Instrumental Variables for Stock ratio: Average stock ratio of other firms in the same industry

Instrumental Variables for Option Holding / Cash Pay: Average Option Holding / Cash Pay of other firms in the same industry

Instrumental Variables for Stock Holding / Cash Pay: Average Stock Holding / Cash Pay of other firms in the same industry

Table 12 presents the OLS regression result with the instrumental variables. It shows that all the option incentive variables (the Option Incentive ratio, Option ratio and Option Holding / Cash Pay) remain significantly and positively related to the number of financial covenants. However for the stock incentive variables, only the Stock Holding / Cash Pay remains significantly and positively related to the number of financial covenants. The result provides strong evidence that CEO option incentive would increase the banks' evaluation on firms' credit risk.

Chapter 6 Conclusion

This thesis examines the relation between CEO equity compensation and loan covenants.

By using a novel set of loan characteristics, I find that both the CEO option incentive, annual option granted ratio and the accumulated option holding are positively and significantly related to the number of financial covenants included in the loan agreement. The finding suggests that the creditor views the use of equity compensation increase the credit risk of a firm, and the use of financial covenants reflected the level of credit risk. The findings consistent with the literature that the use of option compensation induce risk taking behavior (Efendi, Srivastava and Swanson (2007), Kim, Li and Zhang (2011)), On the other hand, I also find that the CEO annual stock granted ratio and the accumulated stock holding are negatively and significantly related to the number of financial covenants included in the loan agreement, which suggested that creditor views the use of stock compensation alleviate the credit risk of firm. This finding is consistent with Armstrong, Jagolinzer and Larcker (2010) which suggest that CEO with large shareholding is discouraged to take value destroying action.

This thesis also investigates how the credit spread and leverage affect the credit risk evaluation by creditor. By using the subsample analysis and divide the whole sample into two groups with high credit spread and low credit spread, I find that the CEO option incentive and annual option granted ratio are both positively and significantly related to the number of financial covenants only in the group with high credit spread. This finding is consistent with previous studies (Chen (2010)), which argue that under high

systematic risk, it is harder to notice the information content of CEO performance, so CEO has more incentive to engage in risky corporate strategy and hence increase credit risk of firm. Similar subsample analysis has also been use to investigate the impact from leverage. The finding shows that CEO option incentive and annual option granted ratio are both positively and significantly related to the number of financial covenants only in the group with low leverage. This finding is consistent with Chava, Kumar and Warga (2009), which suggest a highly leveraged firm structure would alleviate the managerial agency cost.

Previous empirical studies on CEO compensation focus on it impacts to firm performance and corporate strategy but fail to address how the CEO compensation structure affects the firms' debt finance. By linking the CEO compensation structure and the financial covenants included in the loan agreement, it shows that creditor perceive option compensation would increase the credit risk and stock compensation would decrease the credit risk. By separately investigate the two components: option compensation and stock compensation, this thesis shed some light to the puzzle of whether equity compensation would have a positive or negative impact to the agency cost of debt. The use of option induce CEO risk taking behavior due to its nature that the loss is "limited" and hence it increases credit risk; the use of stock compensation tight CEO's wealth with share price. As CEOs are risk averse, they would take less risky corporate strategy if they have large share holdings, which decrease the credit risk.

My finding suggests the creditor would react accordingly to the CEO compensation structure, which implies that the CEO compensation does not only affect the internal control, but also the external control. The literatures on CEO compensation focus on how it would affect internal control. For example, Weisbach (2007) summarizes the optimal CEO compensation contract depends on how well it can align manager and shareholder interest and hence improve firm performance. Oyer and Schaefer (2006) focus on the cost of compensation, and suggest that the use of option is an expensive way to compensate CEO as it worth much less to risk-averse CEO. Hall and Murphy (2000) argue that option is cheap. As for the same dollar of compensation, option can provide the most incentive to CEO than other types of compensation. Dittmann and Maug (2007) argue that the optimal compensation should not include options, but only low fixed salary and high portion of stock compensation. The rationale behind is option compensation induce excessive risk-taking behavior. The incentive to improve firm performance should be alternatively provided by stock compensation. The above studies ignore the fact that CEO compensation structure would also affect the outside parties' perception to the firm. My research examines the relation between compensation and loan contract, and suggests that CEO compensation structure would affect the cost of finance. These factors should also be included in determining the optimal structure of CEO pay.

Appendix

The calculation of option delta is based on the Black-Scholes option-pricing model:

$$Z = \frac{\ln\left[\frac{S}{X}\right] + T\left[r - d + \frac{\sigma^2}{2}\right]}{\sigma\sqrt{T}}$$

$$\text{Delta} = e^{-dT}N(Z)$$

N = Cumulative probability function for the normal distribution

S = Fiscal year end share price (prccf from Compustat)

X = Exercise price of the option (expric from Compustat for new granted option)

σ = expected stock return volatility over the life of option (bs_volatility from Compustat)

d = the expected dividend yield over the life of option (bs_yield from Compustat)

r = the risk free rate (from US Department of Treasury)

T = remaining time to maturity of the option (exdate from Compustat for new granted option)

In order to calculate the delta of the option portfolio, it is necessary to rebuild the CEO's option portfolio. I follow Guay (1999) and Core and Guay (2002) approach and divide the CEO option into 3 parts: "Option granted in the current year", "Unexercisable option granted in previous years" and "Exercisable option granted in the previous years" and calculate the option delta of the 3 types of option respectively. Since ExecuComp only provides the data of the option exercise price and remaining time to maturity for the

Option granted in the current year, it is necessary to estimate the option exercise price and remaining time to maturity for the “Unexercisable option granted in previous years” and “Exercisable option granted in the previous years”.

For the option exercise price, I follow Core and Guay (2002) and use the realize value (the value of immediate exercising the option) divided by the number of option to estimate the option exercise price. For the remaining time to maturity, I follow Brockman, Martin and Unlu (2010), assumes that the maturity of “Unexercisable option granted in previous years” is 1 year less than “Option granted in the current year”. For “Exercisable option granted in the previous years”, the maturity is assumed to be 3 years less than “Unexercisable option granted in previous years”. For those year with no new option granted, the maturity is assumed to be 9 years for “Unexercisable option granted in previous years” and 6 years for “Exercisable option granted in the previous years”. As the “Number of option granted in current year” is included in the “Number of unexercisable option” and “Number of exercisable option” in the ExecuComp database, in order to calculate the “Number of unexercisable option granted in previous years” and “Exercisable option granted in previous years”, it is necessary to deduct the “Number of option granted in current year” from the “Number of unexercisable option” and “Number of exercisable option”(as newly granted option are assumed to be unexercisable). If the “Number of option granted in current year” is larger than the “Number of unexercisable option”, the residual would be deducted from the “Number of exercisable option” in order to calculate the “Number of exercisable option granted in previous years”.

The computation of Delta in STATA

Delta for New granted Option:

```
gen new_z = (ln(prccf/expric) + exdate*(risk_free - bs_yield + bs_volatility/2))/
```

```
(bs_volatility* exdate^0.5)
```

```
gen normal_z = N(new_z)
```

```
gen new_delta = exp(-bs_yield *exdate)* normal_Z
```

Delta for Unexercisable previous granted option:

```
gen unex_mat = exdate - 1
```

```
gen unex_expric = (opt_unex_unexer_est_val - (prccf - expric)*(option_awards_num))/
```

```
opt_unex_unexer_num
```

```
gen unex_z = (ln(prccf/unex_expric) + unex_mat*(risk_free - bs_yield + bs_volatility/2))/
```

```
(bs_volatility* unex_mat^0.5)
```

```
gen normal_unex_z = N(unex_z)
```

```
gen unex_delta = exp(-bs_yield *unex_mat)* normal_unex_z
```

Delta for Exercisable previous granted option:

```
gen ex_mat = exdate - 4
```

```
for (prccf - expric)*(option_awards_num) > opt_unex_unexer_est_val:
```

```

gen ex_expric = (opt_unex_exer_est_val - ((prccf - expric)*(option_awards_num) -
opt_unex_unexer_est_val ))/ opt_unex_exer_num - prccf

for (prccf - expric)*(option_awards_num) < opt_unex_unexer_est_val:
gen ex_expric = (opt_unex_exer_est_val - opt_unex_unexer_est_val)/
opt_unex_exer_num - prccf

gen ex_z = (ln(prccf/ex_expric) + ex_mat*(risk_free - bs_yield + bs_volatility/2))/
(bs_volatility* ex_mat^0.5)

gen normal_ex_z = N(ex_z)

gen ex_delta = exp(-bs_yield *ex_mat)* normal_ex_z

```

Table A (Definition of variables)

Variable name	Variable definitions (name in CompuStat)
<i><u>Firm characteristics</u></i>	
Ln(Asset)	Natural log of Total Asset = log(AT)
Leverage	(Long term debt + debt in current liabilities)/total assets = (DLTT + DLC)/AT
Market to book ratio	(Common Shares Outstanding* Share Price at close + Total Asset - Common Equity) / Total Asset = (CSHO* PRCC_F + AT - CEQ) / TA
Profitability	EBITDA/Total Asset = EBITDA/TA
Tangibility	Property, Plant and Equipment (Net) / Total Asset = PPENT/TA
Control for S&P rating	Dummy variables for S&P credit rating, with AAA=1, AA=2 A=3, BBB=4, BB=5, B=6, CCC=7, CC or below=8
Control for industry	Dummy variables control for different industries
<i><u>CEO Equity Compensation</u></i>	
Option Incentive	ONEPCT_OPT / (ONEPCT_OPT + Salary + Bonus), (where ONEPCT_OPT = 0.01*Share Price*option delta*no. of options hold by CEO)
Stock Incentive	ONEPCT_STK / (ONEPCT_STK + Salary + Bonus), (where ONEPCT_STK = 0.01*Share Price*no. of shares hold by CEO)
Option Ratio	Black-Scholes value of the option grant/Total Compensation = option_awards_blk_value/tdc1
Stock Ratio	Value of Restricted stock granted/Total Compensation = rstkgmnt/tdc1
Option holding/Cash pay	Unexercisable option estimated value + Exercisable option estimated value = opt_unex_exer_est_val + opt_unex_unexer_est_val
Stock holding/Cash pay	Share owned exclude option * share price at close = shrown_excl_opts * prccf
<i><u>Loan characteristics</u></i>	
Ln(Deal amount)	Natural log of the loan deal amount (in millions)

Ln(Maturity)	Natural log of the loan maturity (in months)
Performance dummy	Dummy variable equal to 1 if the loan contains performance pricing
Control for loan purpose	Dummy variables for loan purpose
Control for loan type	Dummy variables for loan type

Control for Macro factors

Credit Spread	The difference between AAA corporate bond and BAA corporate bond yield
---------------	--

Table 1
Summary Statistics of Loan Characteristics.

Variable	N	mean	Std. Dev.	p25	p50	p75
<i>Loan Deal Characteristics</i>						
Deal amount (million)	1512	567	997	150	300	635
Maturity (months)	1512	42.704	21.565	24	48	60
Performance pricing {0,1}	1512	0.776	0.417	1	1	1
Secured {0,1}	1512	0.35	0.477	0	0	1
<i>Covenant Characteristics</i>						
No. of financial covenants	1512	2.223	1.141	1	2	3
Coverage ratio covenant	1512	0.64	0.48	0	1	1
Debt to cash flow covenant	1512	0.519	0.5	0	1	1
Debt to balance sheet covenant	1512	0.333	0.472	0	0	1
Net worth covenant	1512	0.392	0.488	0	0	1
Liquidity covenant	1512	0.089	0.285	0	0	0
Minimum cash flow covenant	1512	0.054	0.227	0	0	0
Capital expenditure restriction	1512	0.196	0.397	0	0	0

Table 2
Summary Statistics of Firm, CEO's compensation and Credit Spread.

Variable	N	mean	sd	p25	p50	p75
<i>Firm characteristics</i>						
Asset size (million)	1512	4890	11700	660	1600	4100
Leverage	1512	0.266	0.166	0.151	0.268	0.366
Profitability	1512	-0.355	6.347	0.000	0.079	0.150
Tangibility	1512	0.279	0.271	0.050	0.182	0.445
Market-to-Book-Ratio	1512	1.870	1.670	1.196	1.497	2.065
<i>CEO compensation (thousand)</i>						
Option Holdings	1512	13051.17	41400.41	330.228	2903.512	10529.88
Stock Holdings	1458	68164.88	499654.5	1569.087	5634.107	19271.23
Option award	1512	2270.571	5369.717	0.000	724.157	2036.648
Stock award	1512	568.343	2003.030	0.000	0.000	216.113
Salary	1512	696.694	341.757	450.319	650.000	878.814
Bonus	1512	836.691	1636.405	150.000	469.000	976.957
Total Compensation	1512	4847.493	7434.464	1341.275	2563.169	5184.623
<i>CEO Incentive measure</i>						
Option incentive	1511	0.124	0.125	0.040	0.089	0.167
Stock Incentive	1512	0.122	0.199	0.013	0.039	0.127
Option Ratio	1512	0.330	0.276	0.000	0.317	0.535
Stock Ratio	1512	0.079	0.155	0.000	0.000	0.099
Option holding/Cash Pay	1506	9.256997	65.16628	.3831589	2.47714	7.51783
Stock holding/Cash Pay	1455	2886653	65200000	1.493629	4.31851	15.1043
CEO delta (thousand)	1512	5211.222	937.024	90.42453	203.1887	561.017
CEO vega (thousand)	1512	180.6963	47.22329	.0000641	.4112174	32.80749
<i>Other Control</i>						
Credit Spread	1512	0.867	0.196	0.600	0.830	0.890

Table 3**Incentive Ratio and Number of Financial Covenants.**

This table presents the coefficient from the unbalanced cross sectional poisson regression. It examines the effects of CEO equity incentive ratio on the number of financial covenants contain in loan agreement. The sample contains 1512 private credit agreements from the Securities and Exchange Commission (SEC)'s EDGAR electronic filing system from 1996 to 2006. The dependent variable is the number of financial covenants. The key variables are Option Incentive, which is defined as $\text{ONEPCT_OPT} / (\text{ONEPCT_OPT} + \text{Salary} + \text{Bonus})$, where $\text{ONEPCT_OPT} = 0.01 * \text{Share Price} * \text{option delta} * \text{no. of options hold by CEO}$ and Stock Incentive, which is defined as $\text{ONEPCT_STK} / (\text{ONEPCT_STK} + \text{Salary} + \text{Bonus})$, where $\text{ONEPCT_STK} = 0.01 * \text{Share Price} * \text{no. of shares hold by CEO}$. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) FinCov_Num	(2) FinCov_Num	(3) FinCov_Num	(4) FinCov_Num	(5) FinCov_Num
Option Incentive	0.283** (0.113)	0.257** (0.101)	0.260** (0.112)	0.153** (0.0687)	0.135** (0.0669)
Stock Incentive	0.0651 (0.145)	0.0415 (0.144)	0.0459 (0.153)	0.0585 (0.120)	0.0219 (0.128)
Ln(Deal amount)	0.0218* (0.0120)	0.0258** (0.0124)	0.0228** (0.00929)	0.0219 (0.0174)	0.0303* (0.0163)
Ln(Maturity)	0.0703*** (0.0215)	-0.0268 (0.0366)	0.0679*** (0.0233)	0.0174 (0.0225)	-0.0402 (0.0349)
Performance dummy	0.0171 (0.0225)	0.0401* (0.0216)	0.0176 (0.0220)	0.0419** (0.0206)	0.0448** (0.0215)
Profitability	-0.000694 (0.00123)	-0.00129* (0.000770)	-0.000787 (0.00131)	-0.00141 (0.00120)	-0.00160 (0.000991)
Tangibility	0.0392 (0.0385)	0.0265 (0.0348)	0.0544 (0.0349)	0.0118 (0.0416)	0.0217 (0.0390)
Ln(Asset)	-0.187*** (0.00916)	-0.156*** (0.00854)	-0.181*** (0.0106)	-0.132*** (0.0113)	-0.120*** (0.00905)
Leverage	0.0421 (0.109)	-0.00209 (0.0952)	0.0618 (0.120)	-0.119 (0.0965)	-0.130 (0.0907)
Market to book ratio	-0.0502 (0.0509)	-0.0441 (0.0423)	-0.0493 (0.0499)	-0.0229 (0.0236)	-0.0223 (0.0206)
Spread difference	0.128 (0.0817)	0.219*** (0.0711)	0.120 (0.0769)	0.0926 (0.0806)	0.160** (0.0733)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.0376	0.0448	0.0392	0.0570	0.0612
Observations	1,511	1,511	1,511	1,511	1,511

Table 4

Incentive Ratio and Coverage Covenant.

This table presents the coefficient from the unbalanced cross sectional probit regression. It examines the effects of CEO equity incentive ratio on the probability of having the coverage covenant in loan agreement. The sample contains 1512 private credit agreements from the Securities and Exchange Commission (SEC)'s EDGAR electronic filing system from 1996 to 2006. The dependent variable is the number of financial covenants. The key variables are Option Incentive, which is defined as $ONEPCT_OPT / (ONEPCT_OPT + Salary + Bonus)$, where $ONEPCT_OPT = 0.01 * Share\ Price * option\ delta * no.\ of\ options\ hold\ by\ CEO$ and Stock Incentive, which is defined as $ONEPCT_STK / (ONEPCT_STK + Salary + Bonus)$, where $ONEPCT_STK = 0.01 * Share\ Price * no.\ of\ shares\ hold\ by\ CEO$. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) d_cover	(2) d_cover	(3) d_cover	(4) d_cover	(5) d_cover
Option Incentive	0.410*** (0.117)	0.403*** (0.119)	0.379*** (0.128)	0.315*** (0.106)	0.282** (0.116)
Stock Incentive	-0.0409 (0.119)	-0.0299 (0.127)	-0.0637 (0.129)	-0.0516 (0.123)	-0.0586 (0.139)
Ln(Deal amount)	0.0689*** (0.0213)	0.0668*** (0.0186)	0.0704*** (0.0222)	0.0684*** (0.0211)	0.0689*** (0.0204)
Ln(Maturity)	0.0797*** (0.0225)	0.0859* (0.0445)	0.0834*** (0.0228)	0.0529** (0.0265)	0.0853** (0.0414)
Performance dummy	0.0372 (0.0314)	0.0458 (0.0395)	0.0293 (0.0307)	0.0433 (0.0280)	0.0349 (0.0338)
Profitability	-0.00405 (0.00592)	-0.00412 (0.00445)	-0.00466 (0.00670)	-0.00797 (0.00773)	-0.00940 (0.00707)
Tangibility	-0.0111 (0.0662)	-0.00825 (0.0687)	0.00888 (0.0587)	-0.0283 (0.0720)	0.00318 (0.0698)
Ln(Asset)	-0.146*** (0.0219)	-0.139*** (0.0220)	-0.144*** (0.0248)	-0.116*** (0.0229)	-0.120*** (0.0255)
Leverage	0.0414 (0.0478)	0.0481 (0.0534)	0.104** (0.0415)	-0.0616 (0.0712)	-0.00169 (0.0543)
Market to book ratio	-0.0461** (0.0222)	-0.0436** (0.0202)	-0.0480** (0.0195)	-0.0180 (0.0119)	-0.0188 (0.0120)
Spread difference	0.215*** (0.0442)	0.216*** (0.0490)	0.201*** (0.0338)	0.202*** (0.0482)	0.164*** (0.0465)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.0923	0.1017	0.1134	0.1358	0.1641
Observations	1,511	1,511	1,511	1,511	1,511

Table 5**Incentive Ratio and Debt to Cash Flow Covenant.**

This table presents the coefficient from the unbalanced cross sectional probit regression. It examines the effects of CEO equity incentive ratio on the probability of having the debt to cash flow covenant in loan agreement. The sample contains 1512 private credit agreements from the Securities and Exchange Commission (SEC)'s EDGAR electronic filing system from 1996 to 2006. The dependent variable is the number of financial covenants. The key variables are Option Incentive, which is defined as $ONEPCT_OPT / (ONEPCT_OPT + Salary + Bonus)$, where $ONEPCT_OPT = 0.01 * Share\ Price * option\ delta * no.\ of\ options\ hold\ by\ CEO$ and Stock Incentive, which is defined as $ONEPCT_STK / (ONEPCT_STK + Salary + Bonus)$, where $ONEPCT_STK = 0.01 * Share\ Price * no.\ of\ shares\ hold\ by\ CEO$. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) d_dcf	(2) d_dcf	(3) d_dcf	(4) d_dcf	(5) d_dcf
Option Incentive	0.506*** (0.121)	0.490*** (0.163)	0.418*** (0.0805)	0.438** (0.178)	0.339** (0.137)
Stock Incentive	-0.0717* (0.0413)	-0.0392 (0.0303)	-0.119 (0.0723)	-0.0954*** (0.0333)	-0.0950*** (0.0365)
Ln(Deal amount)	0.109*** (0.0182)	0.102*** (0.0168)	0.120*** (0.0135)	0.132*** (0.0155)	0.140*** (0.0149)
Ln(Maturity)	0.0692*** (0.0183)	0.00117 (0.0178)	0.0805*** (0.0169)	0.0264* (0.0150)	-0.00684 (0.0189)
Performance dummy	0.0335 (0.0462)	0.0537 (0.0409)	0.0291 (0.0520)	0.0602 (0.0403)	0.0608 (0.0384)
Profitability	0.000212 (0.00186)	-0.000676 (0.00194)	0.000354 (0.00190)	-0.000732 (0.00170)	-0.00118 (0.00201)
Tangibility	0.0627 (0.0665)	0.0568 (0.0642)	0.0559 (0.0791)	0.0295 (0.0787)	0.0206 (0.0874)
Ln(Asset)	-0.180*** (0.0300)	-0.154*** (0.0315)	-0.180*** (0.0378)	-0.132*** (0.0304)	-0.124*** (0.0414)
Leverage	-0.0986 (0.103)	-0.0916 (0.130)	-0.00861 (0.0731)	-0.195* (0.116)	-0.0978 (0.117)
Market to book ratio	-0.0211 (0.0214)	-0.0163 (0.0121)	-0.0250 (0.0211)	-0.00306 (0.00858)	-0.00505 (0.00710)
Spread difference	0.341*** (0.0819)	0.319*** (0.0929)	0.322*** (0.0735)	0.329*** (0.0821)	0.251*** (0.0857)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.1016	0.1327	0.1353	0.1642	0.2144
Observations	1,511	1,511	1,511	1,511	1,511

Table 6

Annual Compensation Ratio and Number of Covenants.

This table presents the coefficient from the unbalanced cross sectional poisson regression. It examines the effects of CEO equity incentive ratio on the number of financial covenants contain in loan agreement. The sample contains 1512 private credit agreements from the Securities and Exchange Commission (SEC)'s EDGAR electronic filing system from 1996 to 2006. The dependent variable is the number of financial covenants. The key variables are Option Ratio (the percentage of current year total compensation in grants of new options) and Stock Ratio (the percentage of current year total compensation in grants of new stock). The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) FinCov_Num	(2) FinCov_Num	(3) FinCov_Num	(4) FinCov_Num	(5) FinCov_Num
Option Ratio	0.0954*** (0.0370)	0.0919*** (0.0312)	0.0933** (0.0380)	0.0813*** (0.0246)	0.0709*** (0.0234)
Stock Ratio	-0.274*** (0.0975)	-0.269*** (0.0847)	-0.277*** (0.0966)	-0.259** (0.117)	-0.256** (0.108)
Ln(Deal amount)	0.0242* (0.0124)	0.0303** (0.0122)	0.0260*** (0.00981)	0.0237 (0.0163)	0.0344** (0.0142)
Ln(Maturity)	0.0749*** (0.0223)	-0.0271 (0.0392)	0.0716*** (0.0244)	0.0205 (0.0238)	-0.0412 (0.0370)
Performance dummy	0.0202 (0.0218)	0.0444** (0.0211)	0.0217 (0.0215)	0.0443** (0.0193)	0.0486** (0.0203)
Profitability	-0.000915 (0.00121)	-0.00152** (0.000742)	-0.00102 (0.00128)	-0.00157 (0.00120)	-0.00179* (0.000996)
Tangibility	0.0356 (0.0384)	0.0231 (0.0345)	0.0505 (0.0339)	0.00777 (0.0413)	0.0181 (0.0380)
Ln(Asset)	-0.178*** (0.0108)	-0.149*** (0.00987)	-0.174*** (0.0132)	-0.125*** (0.0114)	-0.117*** (0.00973)
Leverage	0.0370 (0.100)	-0.00222 (0.0885)	0.0584 (0.115)	-0.119 (0.0853)	-0.128 (0.0840)
Market to book ratio	-0.0427 (0.0452)	-0.0380 (0.0379)	-0.0432 (0.0441)	-0.0204 (0.0226)	-0.0207 (0.0198)
Spread difference	0.129 (0.0800)	0.212*** (0.0652)	0.122 (0.0764)	0.0896 (0.0807)	0.152** (0.0718)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.0385	0.0459	0.0403	0.0582	0.0623
Observations	1,512	1,512	1,512	1,512	1,512

Table 7**Equity Holdings and Number of Covenants.**

This table presents the coefficient from the unbalanced cross sectional poisson regression. It examines the effects of CEO equity incentive ratio on the number of financial covenants contain in loan agreement. The sample contains 1512 private credit agreements from the Securities and Exchange Commission (SEC)'s EDGAR electronic filing system from 1996 to 2006. The dependent variable is the number of financial covenants. The key variables are Option holding/Cash pay (the ratio of accumulated option holdings to the current year cash pay of CEO) and Stock holding/Cash pay (the ratio of accumulated stock holdings to the current year cash pay of CEO). The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) FinCov_Num	(2) FinCov_Num	(3) FinCov_Num	(4) FinCov_Num	(5) FinCov_Num
Option holding/Cash pay	0.00239*** (0.000340)	0.00214*** (0.000249)	0.00239*** (0.000291)	0.00149*** (0.000145)	0.00139*** (0.000131)
Stock holding/Cash pay	-7.10e-10*** (0)	-7.23e-10*** (0)	-6.78e-10*** (0)	-7.36e-10*** (0)	-7.23e-10*** (0)
Ln(Deal amount)	0.0429*** (0.0136)	0.0466*** (0.0154)	0.0437*** (0.0121)	0.0361** (0.0182)	0.0446*** (0.0169)
Ln(Maturity)	0.0587*** (0.0217)	-0.0464 (0.0330)	0.0566** (0.0229)	0.00906 (0.0214)	-0.0546* (0.0330)
Performance dummy	0.126* (0.0753)	0.208*** (0.0644)	0.116* (0.0697)	0.0879 (0.0766)	0.153** (0.0669)
Profitability	0.0276 (0.0253)	0.0491** (0.0228)	0.0279 (0.0249)	0.0502** (0.0205)	0.0517** (0.0205)
Tangibility	-0.000692 (0.00115)	-0.00124* (0.000680)	-0.000771 (0.00122)	-0.00138 (0.00113)	-0.00155 (0.000950)
Ln(Asset)	0.0486 (0.0380)	0.0432 (0.0352)	0.0650* (0.0347)	0.0221 (0.0402)	0.0381 (0.0390)
Leverage	-0.204*** (0.00745)	-0.172*** (0.0120)	-0.198*** (0.00686)	-0.145*** (0.0136)	-0.135*** (0.0136)
Market to book ratio	-0.0405 (0.0817)	-0.0879 (0.0742)	-0.0159 (0.103)	-0.182** (0.0789)	-0.196** (0.0839)
Spread difference	-0.111*** (0.0166)	-0.102*** (0.0123)	-0.112*** (0.0148)	-0.0678*** (0.00780)	-0.0668*** (0.00750)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.0418	0.0490	0.0435	0.0595	0.0638
Observations	1,455	1,455	1,455	1,455	1,455

Table 8

CEO delta, CEO vega and Number of Covenants.

This table presents the coefficient from the unbalanced cross sectional poisson regression. It examines the effects of CEO equity incentive ratio on the number of financial covenants contain in loan agreement. The dependent variable is the number of financial covenants. The key variables are CEO delta (the dollar change in the value of the option and stock holdings for a 1 % change in the stock price) and CEO vega (the dollar change in the value of the CEO's option holdings for a 0.01 change in the standard deviation of stock returns). The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) fin_num7	(2) fin_num7	(3) fin_num7	(4) fin_num7	(5) fin_num7
CEO delta	-1.25e-05 (1.23e-05)	-1.27e-05 (1.09e-05)	-1.45e-05 (1.32e-05)	-7.35e-06 (1.07e-05)	-9.67e-06 (1.06e-05)
CEO vega	0.000389*** (7.98e-05)	0.000355*** (5.79e-05)	0.000345*** (0.000103)	0.000170** (6.74e-05)	0.000148** (7.27e-05)
Ln(Deal amount)	0.0222 (0.0148)	0.0252* (0.0132)	0.0241* (0.0124)	0.0227 (0.0176)	0.0305** (0.0146)
Ln(Maturity)	0.0748*** (0.0240)	-0.0235 (0.0380)	0.0724*** (0.0259)	0.0232 (0.0251)	-0.0366 (0.0366)
Performance dummy	0.0128 (0.0216)	0.0359* (0.0215)	0.0136 (0.0217)	0.0365* (0.0193)	0.0399* (0.0208)
Profitability	-0.000753 (0.00122)	-0.00126* (0.000754)	-0.000865 (0.00130)	-0.00143 (0.00120)	-0.00158 (0.000987)
Tangibility	0.0355 (0.0358)	0.0228 (0.0317)	0.0521 (0.0317)	0.00999 (0.0390)	0.0204 (0.0359)
Ln(Asset)	-0.176*** (0.0149)	-0.145*** (0.0117)	-0.171*** (0.0186)	-0.125*** (0.00946)	-0.113*** (0.00884)
Leverage	0.0350 (0.0957)	-0.00993 (0.0858)	0.0493 (0.107)	-0.117 (0.0816)	-0.135* (0.0797)
Market to book ratio	-0.0357 (0.0485)	-0.0313 (0.0405)	-0.0348 (0.0474)	-0.0149 (0.0234)	-0.0148 (0.0207)
Spread difference	0.126 (0.0814)	0.225*** (0.0688)	0.119 (0.0771)	0.0935 (0.0798)	0.169** (0.0716)
Loan purpose	No	Yes	No	No	Yes
Loan type	No	Yes	No	No	Yes
Industry	No	No	Yes	No	Yes
S&P rating	No	No	No	Yes	Yes
Pseudo R2	0.0369	0.0441	0.0385	0.0552	0.0596
Observations	1,506	1,506	1,506	1,506	1,506

Table 9

Subsample Analysis: Credit Spread.

This table presents the coefficient from the unbalanced cross sectional probit regression. It examines the results of subsample analysis of the impact of equity compensation on number of financial covenants contain in loan agreement. The key variables are Option Incentive, which is defined as $ONEPCT_OPT / (ONEPCT_OPT + Salary + Bonus)$, where $ONEPCT_OPT = 0.01 * Share\ Price * option\ delta * no.\ of\ options\ hold\ by\ CEO$, Stock Incentive, which is defined as $ONEPCT_STK / (ONEPCT_STK + Salary + Bonus)$, where $ONEPCT_STK = 0.01 * Share\ Price * no.\ of\ shares\ hold\ by\ CEO$, Option Ratio (the percentage of current year total compensation in grants of new options), Stock Ratio (the percentage of current year total compensation in grants of new stock), Option holding/Cash pay (the ratio of accumulated option holdings to the current year cash pay of CEO) and Stock holding/Cash pay (the ratio of accumulated stock holdings to the current year cash pay of CEO). The subsample of high credit spread includes observations with credit spread above median and the subsample of low credit spread includes observations with credit spread below median. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	Credit Spread		Credit Spread		Credit Spread	
	(High)	(Low)	(High)	(Low)	(High)	(Low)
	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num
Option Incentive	0.229** (0.108)	0.105 (0.0804)				
Stock Incentive	-0.0757 (0.135)	0.117 (0.104)				
Option Ratio			0.1000*** (0.0244)	0.0221 (0.0434)		
Stock Ratio			-0.139** (0.0671)	-0.415* (0.213)		
Option holding/Cash pay					0.00247** (0.00119)	0.000829*** (0.000318)
Stock holding/Cash pay					-1.05e-09*** (0)	-3.53e-10*** (0)
Ln(Deal amount)	0.0751*** (0.0184)	-0.0224 (0.0319)	0.0778*** (0.0191)	-0.0173 (0.0286)	0.0709*** (0.0162)	-0.00799 (0.0327)
Ln(Maturity)	-0.0847** (0.0367)	0.0626 (0.0502)	-0.0859** (0.0361)	0.0579 (0.0514)	-0.0887** (0.0362)	0.0405 (0.0543)
Performance dummy	0.0181 (0.0206)	0.0505 (0.0497)	0.0236 (0.0224)	0.0550 (0.0483)	0.0194 (0.0212)	0.0557 (0.0486)
Profitability	-0.00434* (0.00251)	-0.00149* (0.000859)	-0.00386 (0.00304)	-0.00175* (0.000935)	-0.00441 (0.00274)	-0.00132* (0.000776)
Tangibility	0.0224 (0.0712)	-0.0398 (0.0260)	0.0216 (0.0755)	-0.0460* (0.0257)	0.0250 (0.0731)	-0.0194 (0.0274)
Ln(Asset)	-0.147*** (0.0145)	-0.101*** (0.0228)	-0.146*** (0.0137)	-0.0946*** (0.0224)	-0.147*** (0.0144)	-0.107*** (0.0273)
Leverage	-0.0810 (0.134)	-0.286*** (0.0352)	-0.0880 (0.141)	-0.287*** (0.0375)	-0.0911 (0.141)	-0.368*** (0.0579)
Market to book ratio	-0.0780***	-0.00986	-0.0760***	-0.00585	-0.0852***	-0.0411**

Spread difference	(0.00618) 0.352***	(0.00683) 0.196	(0.00557) 0.329***	(0.00427) 0.265	(0.00846) 0.344***	(0.0169) 0.245
Loan purpose	(0.112) Yes	(0.304) Yes	(0.109) Yes	(0.332) Yes	(0.111) Yes	(0.310) Yes
Loan type	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
S&P rating	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.0581	0.0818	0.0584	0.0830	0.0602	0.0822
Observations	918	593	919	593	891	564

Table 10

Subsample Analysis: leverage.

This table presents the coefficient from the unbalanced cross sectional probit regression. It examines the results of subsample analysis of the impact of equity compensation on number of financial covenants contain in loan agreement. The subsample of high leverage includes observations with credit spread above median and the subsample of low leverage includes observations with credit spread below median. The key variables are Option Incentive, which is defined as $\text{ONEPCT_OPT} / (\text{ONEPCT_OPT} + \text{Salary} + \text{Bonus})$, where $\text{ONEPCT_OPT} = 0.01 * \text{Share Price} * \text{option delta} * \text{no. of options hold by CEO}$, Stock Incentive, which is defined as $\text{ONEPCT_STK} / (\text{ONEPCT_STK} + \text{Salary} + \text{Bonus})$, where $\text{ONEPCT_STK} = 0.01 * \text{Share Price} * \text{no. of shares hold by CEO}$, Option Ratio (the percentage of current year total compensation in grants of new options), Stock Ratio (the percentage of current year total compensation in grants of new stock), Option holding/Cash pay (the ratio of accumulated option holdings to the current year cash pay of CEO) and Stock holding/Cash pay (the ratio of accumulated stock holdings to the current year cash pay of CEO). The subsample of high credit spread includes observations with credit spread above median and the subsample of low credit spread includes observations with credit spread below median. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	Leverage		Leverage		Leverage	
	(High) FinCov_Num	(Low) FinCov_Num	(High) FinCov_Num	(Low) FinCov_Num	(High) FinCov_Num	(Low) FinCov_Num
Option Incentive	0.0777 (0.161)	0.317*** (0.0668)				
Stock Incentive	0.0364 (0.138)	0.0336 (0.119)				
Option Ratio			0.0492 (0.0345)	0.119*** (0.0348)		
Stock Ratio			-0.382** (0.150)	-0.162 (0.118)		
Option holding/Cash pay					0.00366*** (0.00122)	0.00123*** (0.000175)
Stock holding/Cash pay					-7.05e-10*** (0)	-5.62e-05 (0.000128)
Ln(Deal amount)	0.0428** (0.0192)	0.00212 (0.0172)	0.0457*** (0.0170)	0.00895 (0.0176)	0.0469*** (0.0163)	0.0248 (0.0172)
Ln(Maturity)	0.00223 (0.0430)	-0.0728* (0.0375)	-0.000149 (0.0428)	-0.0700 (0.0428)	-0.00508 (0.0435)	-0.0825** (0.0358)
Performance dummy	-0.0130 (0.0290)	0.112*** (0.0267)	-0.00982 (0.0302)	0.113*** (0.0284)	-0.00175 (0.0320)	0.112*** (0.0280)
Profitability	-0.000344* (0.000180)	-0.00574 (0.00404)	-0.000753*** (0.000153)	-0.00559 (0.00452)	-0.000414** (0.000180)	-0.00532 (0.00378)
Tangibility	-0.0427 (0.0778)	0.0696 (0.0734)	-0.0474 (0.0709)	0.0701 (0.0836)	-0.0355 (0.0769)	0.0934 (0.0748)
Ln(Asset)	-0.0996*** (0.0283)	-0.137*** (0.0185)	-0.0947*** (0.0246)	-0.132*** (0.0221)	-0.110*** (0.0283)	-0.147*** (0.0178)
Leverage	-0.119 (0.125)	0.177 (0.325)	-0.118 (0.122)	0.202 (0.328)	-0.106 (0.119)	-0.0452 (0.354)

Market to book ratio	-0.0632*** (0.0222)	-0.0176 (0.0144)	-0.0610** (0.0242)	-0.0117 (0.0129)	-0.0902*** (0.0248)	-0.0556*** (0.00793)
Spread difference	0.233*** (0.0871)	0.0912 (0.0732)	0.227** (0.0956)	0.0896 (0.0706)	0.231*** (0.0837)	0.0792 (0.0736)
loan purpose	Yes	Yes	Yes	Yes	Yes	Yes
loan type	Yes	Yes	Yes	Yes	Yes	Yes
industry	Yes	Yes	Yes	Yes	Yes	Yes
S&P rating	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.0582	0.0738	0.0603	0.0741	0.0599	0.0758
Observations	756	755	756	756	732	723

Table 11

Subsample Analysis: Market to book ratio.

This table presents the coefficient from the unbalanced cross sectional probit regression. It examines the results of subsample analysis of the impact of equity compensation on number of financial covenants contain in loan agreement. The key variables are Option Incentive, which is defined as $ONEPCT_OPT / (ONEPCT_OPT + Salary + Bonus)$, where $ONEPCT_OPT = 0.01 * Share\ Price * option\ delta * no.\ of\ options\ hold\ by\ CEO$, Stock Incentive, which is defined as $ONEPCT_STK / (ONEPCT_STK + Salary + Bonus)$, where $ONEPCT_STK = 0.01 * Share\ Price * no.\ of\ shares\ hold\ by\ CEO$, Option Ratio (the percentage of current year total compensation in grants of new options), Stock Ratio (the percentage of current year total compensation in grants of new stock), Option holding/Cash pay (the ratio of accumulated option holdings to the current year cash pay of CEO) and Stock holding/Cash pay (the ratio of accumulated stock holdings to the current year cash pay of CEO). The subsample of high market to book ratio includes observations with market to book ratio above median and the subsample of low market to book ratio includes observations with market to book ratio below median. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	Market to book ratio		Market to book ratio		Market to book ratio	
	(High)	(Low)	(High)	(Low)	(High)	(Low)
	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num	FinCov_Num
Option Incentive	0.367*** (0.0858)	-0.0410 (0.200)				
Stock Incentive	0.0431 (0.164)	0.0418 (0.0990)				
Option Ratio			0.150*** (0.0242)	-0.00848 (0.0578)		
Stock Ratio			-0.249*** (0.0844)	-0.274** (0.132)		
Option holding/Cash pay					0.000973*** (0.000319)	-0.00123 (0.00247)
Stock holding/Cash pay					-6.54e-05 (0.000142)	-3.27e-10*** (0)
Ln(Deal amount)	0.0190 (0.0296)	0.0384*** (0.0127)	0.0228 (0.0287)	0.0426*** (0.0117)	0.0333 (0.0330)	0.0435*** (0.0140)
Ln(Maturity)	-0.0411 (0.0559)	-0.0203 (0.0537)	-0.0485 (0.0602)	-0.0160 (0.0527)	-0.0525 (0.0522)	-0.0377 (0.0620)
Performance dummy	0.0629** (0.0289)	0.0223 (0.0367)	0.0652*** (0.0222)	0.0246 (0.0376)	0.0643** (0.0264)	0.0354 (0.0431)
Profitability	0.00273 (0.00223)	-0.00107 (0.00106)	0.00341 (0.00307)	-0.00125 (0.00100)	0.00170 (0.00266)	-0.00110 (0.00104)
Tangibility	0.0548 (0.0459)	-0.00985 (0.0535)	0.0526 (0.0520)	-0.0114 (0.0470)	0.0611 (0.0491)	0.0109 (0.0583)

Ln(Asset)	-0.140*** (0.0123)	-0.123*** (0.0146)	-0.123*** (0.0115)	-0.123*** (0.0137)	-0.132*** (0.0189)	-0.127*** (0.0125)
Leverage	-0.238 (0.150)	-0.165*** (0.0478)	-0.232* (0.138)	-0.174*** (0.0461)	-0.295* (0.161)	-0.162*** (0.0467)
Market to book ratio	-0.0159* (0.00922)	-0.116 (0.114)	-0.00967 (0.00765)	-0.109 (0.116)	-0.0417*** (0.0110)	-0.122 (0.120)
Spread difference	-0.0304 (0.0628)	0.188* (0.101)	-0.0261 (0.0644)	0.189* (0.104)	0.0220 (0.0589)	0.169 (0.105)
Loan purpose	Yes	Yes	Yes	Yes	Yes	Yes
Loan type	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
S&P rating	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.0741	0.0608	0.0749	0.0620	0.0767	0.0611
Observations	755	756	756	756	733	725

Table 12**Robustness Test: Instrumental Variables.**

This table presents the coefficient from the unbalanced cross sectional OLS regression with the Instrumental Variables. It examines the effects of CEO equity incentive ratio on the number of financial covenants contain in loan agreement. Instrumental Variables for Option Incentive ratio is the average option holding of other firms in the same industry; Instrumental Variables for Stock Incentive ratio is the average stock holding of other firms in the same industry; Instrumental Variables for Option ratio is the average Option ratio of other firms in the same industry; Instrumental Variables for Stock ratio is the average stock ratio of other firms in the same industry; Instrumental Variables for Option Holding / Cash Pay is the average Option Holding / Cash Pay of other firms in the same industry; Instrumental Variables for Stock Holding / Cash Pay is the average Stock Holding / Cash Pay of other firms in the same industry. The *, ** and *** indicate the statistical significance at 10%, 5% and 1% levels. Robust standard errors are clustered in industry level.

VARIABLES	(1) fin_num7	(2) fin_num7	(3) fin_num7
Option Incentive	1.446** (0.627)		
Stock Incentive	-0.630 (0.438)		
Option Ratio		0.309** (0.123)	
Stock Ratio		-0.465 (0.310)	
Option holding/Cash pay			0.00272*** (0.000215)
Stock holding/Cash pay			-6.79e-10*** (0)
Ln(Deal amount)	0.0650*** (0.0227)	0.0665** (0.0280)	0.0876** (0.0354)
Ln(Maturity)	-0.133* (0.0741)	-0.0947 (0.0796)	-0.126 (0.0797)
Performance dummy	0.358*** (0.136)	0.324** (0.140)	0.346* (0.143)
Profitability	0.103*** (0.0295)	0.100*** (0.0370)	0.105** (0.0427)
Tangibility	-0.00331 (0.00250)	-0.00385 (0.00265)	-0.00330 (0.00282)
Ln(Asset)	0.0843 (0.0728)	0.0378 (0.0763)	0.0835 (0.0833)
Leverage	-0.277*** (0.0199)	-0.251*** (0.0123)	-0.278*** (0.0256)
Market to book ratio	-0.308* (0.151)	-0.298* (0.148)	-0.436* (0.161)

	(0.171)	(0.164)	(0.183)
Spread difference	-0.0649**	-0.0469	-0.132***
	(0.0330)	(0.0316)	(0.0124)
Loan purpose	0.121	0.139	-0.596
	(0.0786)	(0.0918)	(0.555)
Loan type	0.477	0.185	0.358
	(0.439)	(0.329)	(0.528)
Industry	-0.203***	-0.183***	0.0930
	(0.0474)	(0.0460)	(0)
S&P rating	-0.0428	-0.00233	0.575
	(0.129)	(0.127)	(0.329)
Observations	1,457	1,512	1,455
R-squared	0.287	0.313	0.316

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