# DEBT MATURITY AND CONSERVATISM

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# Debt Maturity and Conservatism

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## CERTIFICATE OF ORIGINALITY

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# Debt maturity and conservatism


## Abstract

In this thesis, I investigate the empirical relation between a firm's short-term debt and conservatism in financial reporting. As both are costly mechanisms to resolve the agency problem between the shareholders and the debtholders, I expect that they act as substitutes if managers choose them in a cost-effective way. I find a negative association between the change in short-term debt and in conservatism, which is consistent with the expectation. The result is robust to alternative measures of short-term debt and accounting conservatism. I further examine the individual and joint effect of short-term debt and conservatism on the firm's cost of debt. I find that the increase of short-term debt or of conservatism is associated with the decrease of the firm's cost of debt. More importantly, I find that short-term debt and accounting conservatism act as substitutes in reducing the firm's cost of debt. The results are robust after controlling for cross-sectional correlations, heteroscedasticity and autocorrelations.

Overall, these results suggest that short-term debt and conservatism both act as

monitoring mechanisms to resolve agency problem in terms of lower cost of debt and firms tend to substitute these two mechanisms in a rational cost-effective way.

**Keywords: Short-term debt, Conservatism, Cost of Debt, Agency problem**

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# Chapter 1 Introduction

## 1.1 Motivations and objectives

Accounting conservatism imposes stronger verification requirements for the recognition of gains than for losses and produces earnings that reflect bad news in a more timely fashion than good news (Basu, 1997; Watts, 2003)[1]. Conservatism in accounting has been the norm in financial reporting for many centuries and its economic consequences have been studied in the past decades (Watts, 2003; Waymire and Basu, 2008). Conservatism has been criticized to be a poor method of treating the existence of uncertainty in the firm's valuation and income (Hendriksen and Van Breda, 1992) and to be negatively associated with its earnings quality (Penman and Zhang, 2002). The economic demands for conservatism in financial reports are still in debate.

[1] Accounting conservatism is manifested in two ways: unconditional conservatism and conditional conservatism (Ball and Shivakumar, 2005; Beaver and Ryan, 2005). Examples of unconditional conservatism include immediate expensing of the costs of intangibles, accelerated depreciation of property, plant equipment, and historical cost accounting for positive net present value projects; examples of conditional conservatism include lower of cost or market accounting for inventory and impairment accounting for fixed assets (Beaver and Ryan, 2005). In this paper, I will focus on conditional conservatism.

Previous literature shows that accounting conservatism improves firm value by reducing the information asymmetry between the shareholders and the managers, and mitigating the agency problem originated from the conflict of interest between the managers and the shareholders (Watts, 2003; LaFond and Roychowdhury, 2008; LaFond and Watts, 2008). However, managers tend to manage gains and losses due to the information asymmetry between the firm and the outsiders / the investors (Cheng et al. 2010). Watts (2003), LaFond and Roychowdhury (2008), and LaFond and Watts (2008) argue that conservatism provides more credible information, mitigates the information asymmetry between the managers and the outsiders, and reduce the moral hazard and the agency costs.

Several papers examine the association between the degree of conservatism in financial reports and the extent of the agency problem that arises from debt financing (Leftwich, 1983; El-Gazzar and Pastena, 1990; Ahmed et al., 2002). Leftwich (1983) and El-Gazzar and Pastena (1990) find that the modifications to Generally Accepted Accounting Principles (GAAP) in private lending agreements tend to be more conservative relative to GAAP. Specifically, goodwill and other

intangibles are excluded by typical modifications in defining the borrower's net worth value. Ahmed et al. (2002) argue that firms with high leverage experience greater agency problems between the bondholders and the shareholders and such firms tend to use more conservative accounting to mitigate the conflicts and to reduce their cost of debt. Similarly, Zhang (2008) finds that conservatism in financial reporting benefits the borrowers ex ante through lower initial interest rates. These findings suggest that accounting conservatism plays a role in mitigating the agency conflict associated with debt financing.

Previous research investigating the importance of debt in accounting conservatism has not examined how accounting conservatism varies with the firm's debt maturity structure. The latter can also affect the extent of agency conflicts between the bondholders and the shareholders. A large number of theoretical and empirical studies suggest that short-term debt plays a significant role in mitigating the agency conflicts between the firms and the lenders. Easterbrook (1984) and Stulz (2000) point out that the monitoring is less of a problem if the firm is constantly in the market for new capital and faced with more frequent loan renewal. Rajan and Winton (1995) argue that short-term debtholders can

effectively monitor managers' behavior with minimum effort. Datta et al. (2005) reason that the agency conflict can be mitigated by short-term debt since the managers are subject to more frequent monitoring by underwriters, investors and rating agencies. More recently, Gul et al. (2009) find a negative relation between short-term debt and accruals-based earnings management in investment-grade firms, suggesting that monitoring firms with low liquidity risk by short-term debtholders is associated with lower earnings management.

Based on the above arguments, the interests of the bondholders are likely to be better protected in firms with a higher percentage of short-term debt and this might lead to less demand for conservatism in financial reports and vice versa. If accounting conservatism and short-maturity debt are substitutes of each other, I expect that firms with a higher percentage of short-maturity debt will have lower demands for conservatism in their financial reports.

Alternatively, a negative association between accounting conservatism and short-term debt can exist through the link of managerial opportunistic choice to reduce liquidation costs. Liquidation is the process of turning a business' real

assets into cash to pay off its debt. The costs of liquidation normally include advertising for the sale of the assets, insurance to cover the sale, a direct fee to the liquidator and the costs for disbursing assets to purchasers. Several papers argue that short-term debt is associated with more flotation costs, higher liquidity risk and higher costs of refinancing, compared to long-term debt (Child et al., 2005; Datta et al., 2005). Firms with higher liquidity risk tend to face a higher risk of costly liquidation (Diamond, 1991; Datta et al., 2005). Since conservatism in financial reports accelerates the recognition of losses, it increases the firm's risk of liquidation and the subsequent liquidation costs. Hence, the firms with more short-term debts which are associated with higher liquidation costs are less likely to report conservative accounting by increasing liquidation risk. Regardless of which theoretical link, I hypothesize that there is a negative relation between accounting conservatism and short-term debt, which is the first research question of this thesis.

To further shed light on the link through which a firm's short-term debt is negatively associated with accounting conservatism, I study the interactive relation of the two monitoring mechanisms in reducing the firm's cost of debt. On

one hand, both mechanisms by theory are associated with benefits by resolving the agency conflict between lenders and borrowers, but both are also associated with costs. Specifically, short-term debt generates the flotation costs (such as investment bank fees and legal fees), the cost of managerial time on frequent debt issuance and the costs of liquidation (Datta et al., 2005). Hence, when confronted with debt maturity choices, the firms balance the costs of short-term debt and the gains achieved (Diamond, 1991). Similarly, conservatism is associated with information inefficiency (Guay and Verrechia, 2006), higher costs of covenant violations and negative stock returns (Zhang, 2008). If the managers choose between the two mechanisms in a cost-effective way, I expect that they individually reduce the firm's cost of debt but interactively increase the cost of debt. On the other hand, the managers tend to opportunistically manage earnings to avoid the costly renegotiation of short-term debt violation as suggested in Gupta et al. (2008)[2]. If the managers choose between the two mechanisms opportunistically, we expect no interactive effects on the firm's cost of debt.

In addition, I also examine the individual effect of short-term debt and that of

[2] However, Gul et al. (2009) find a negative relation between short-term debt and accruals-based earnings management for a sample of investment-grade firms, indicating that there are benefits for accounting quality from lenders' external monitoring.

accounting conservatism on a firm's cost of debt. Since prior studies argue that both short-term debt and conservatism in financial reporting help to mitigate the agency costs between the firm and its debtholders, I expect that short-term debt and accounting conservatism are able to benefit the firms by lowering the cost of debt (Stulz, 1990; Datta et al., 2005; Ahmed et al., 2002; Zhang, 2008). However, several papers argue that short-term debt is associated with more costs such as liquidation cost, flotation costs and other costs associated with frequent debt issuance (Diamond, 1991, 1993; Sharpe, 1991; Datta et al., 2005). Since prior literature does not provide empirical evidence about the relation between a firm's cost of debt and its short-term debt, it is an empirical question whether short-term debt lowers the cost of debt.

In summary, this thesis answers two research questions. First, is there a negative relation between accounting conservatism and short-term debt? Second, are short-term debt and accounting conservatism substitutes in reducing the firm's cost of debt? Addressing both questions helps us understand how managers choose between the two costly mechanisms that are intended to resolve or reduce the agency conflicts between the shareholders and the debtholders, and whether

such choice is made in a cost-effective way or made opportunistically.

## 1.2 Research methods and main findings

### 1.2.1 Measure of short-term debt

Following prior literature (Barclay and Smith, 1995; Datta et al., 2005), I employ the percentage of the firm's total debt that has a maturity of less than three years as the proxy for short-term debt. As a robustness check, I also define short-term debt as the ratio of debt in current liabilities to total debt.

### 1.2.2 Measures of conservatism

Following Khan and Watts (2009), I adopt a firm-specific measure of accounting conservatism. In addition, following Callen et al. (2009), I employ an alternative proxy for conservatism as a robustness check. Emphasized by Khan and Watts (2009), empirical research on conservatism requires a metric that can characterize both cross-sectional and time-series variation in accounting conservatism. Basu's (1997) measure is regarded as the most prominent measure of conservatism (Ryan, 2006). However, the Basu (1997) model can only be estimated in a cross-sectional

way or in a time-series way for an individual firm. Khan and Watts (2009) point out that many factors that affect a firm's amount of conservatism are likely to be both time and firm specific. They thus suggest and develop a cross-sectional firm-level measure of conservatism to capture both effects. I use their measure as the primary proxy of conservatism in this thesis.

I acknowledge that the validity of my conclusions depends crucially on the extent to which a firm's financial reporting conservatism is correctly measured. In order to mitigate the measurement error, I use the ratio of unexpected current earnings to total earnings news, described in Appendix II, as an alternative firm-specific conservatism measure which is suggested by Callen et al. (2009).

### 1.2.3 Main findings

As discussed earlier, two hypotheses are specified. First, it is hypothesized that there is a negative relation between short-term debt and conservatism in financial reporting. Second, it is hypothesized that there are substitutive effects between short-term debt and accounting conservatism on the reduction of the cost of debt.

Using a sample of 8,625 firm-year observations from 1992 to 2005[3] in the US market, I find a significant negative relation between the change of accounting conservatism and the change of short-term debt, which supports the first hypothesis. The results are robust to the alternative measures of short-term debt and accounting conservatism.

Based on the sample of 7,099 firm-year observations for the period from 1993 to 2005[4], the regression results show that the change of a firm's cost of debt is negatively associated with the change of short-term debt and that the change of a firm's cost of debt is negatively associated with the change of accounting conservatism.

Further, I find while the change of each mechanism individually is negatively associated with the change of cost of debt, the interaction between the two is positively associated with the change of cost of debt. In addition, the association between the change of cost of debt and the change of short-term debt /

[3] My sample starts with 1992 because managerial ownership data is collected from *ExecuComp* database which starts at 1992 and the sample ends with 2005 because the computation of the accrual quality measure requires one-year-ahead data from *Compustat*, of which the industrial file stops at 2006.

[4] This study employs a change specification of the cost of debt model to examine the effects of short-term debt and conservatism on a firm's cost of debt, and thus, the period ends with 2005.

conservatism is significantly negative only for the sub-sample of below-median change of conservatism / short-term debt. Taken together, both of the evidence shows that there are substitutive effects between short-term debt and accounting conservatism on reducing the cost of debt, which supports the interpretation of the rational cost-effective choice of two alternative mechanisms.

## 1.3 Contributions

My study contributes to the literature in the following ways. Firstly, the results shed light on the managers' choice of two alternative mechanisms to reduce agency costs. Gupta et al. (2008) examine whether short-term debt induces borrowers to delay the recognition of bad news through earnings management and they find that short-term debt is associated with less conservative accounting. However, my study differs from theirs in three aspects. (1) I view conservative reporting as a mechanism to reduce or resolve the agency conflict between the shareholders and the debtholders, while they view conservative reporting as the opposite of aggressive earnings management. (2) Gupta et al. (2008) is an international study while this is US study. (3) I provide evidence consistent with a cost-effective choice of managers between the two costly mechanisms. Although

the two mechanisms individually reduce the firm's cost of debt, they jointly increase the cost of debt. However, Gupta et al. (2008) infer that the choice of short term debt and conservatism is the result of managerial opportunism. Thus, this study advances the literature "about how firms select among various mechanisms available to them, as well as how the various mechanisms interact and serve as complements and/or substitutes for each other" (Armstrong et al. 2009, p63).

Secondly, although prior studies argue that short-term debt can play a role in mitigating the agency problems between firms and lenders, there is no direct evidence on how lenders price in the firm's reduction of its agency problem. This study provides direct evidence of such. This study also finds empirical evidence that the cost of debt is negatively associated with the amount of accounting conservatism, which complements earlier studies.

Thirdly, my study also contributes to the literature on the consequences of accounting conservatism. My results support the view that accounting conservatism helps to resolve agency conflicts, which in turn affects the

management’s choice on debt maturity structure.

The remainder of the thesis is structured as follows. Chapter 2 reviews the related literature. Chapter 3 develops the two hypotheses and specifies the regression models. Chapter 4 reports the regression results and sensitivity tests. Chapter 5 concludes the thesis.

# Chapter 2 Literature Review

## 2.1 Capital structure theories and empirical evidences

### 2.1.1 Modigliani-Miller theorem

The classical Modigliani and Miller (1958) theorem on capital structure states that a firm's value is irrelevant with the firm's capital structure in an efficient market without taxes, bankruptcy costs and asymmetric information. The Modigliani-Miller theorem forms the basis for modern corporate finance theory and initializes the capital structure research.

The irrelevance theorem of Modigliani and Miller (1958), which assumes perfect capital markets, provokes a series of follow-up studies that relax one or several of its assumptions. For example, market imperfections include taxes, transaction costs, bankruptcy costs, agency conflicts, adverse selection, the lack of separability between financing and operations, time varying financial market opportunities, and investor clientele effects among others (see Harris and Raviv's (1991) classic survey of the theory development based on these ingredients).

Frank and Goyal (2007) note that, although it is hard to empirically test Modigliani-Miller irrelevance proposition [5], the theorem influenced the development of much of the theory of corporate finance up to the 1980s. In fact, most empirical and theoretical studies take the Modigliani-Miller theorem as a starting point / benchmark and relax one or more assumptions. Two main lines of inquiries follow: the trade-off theory and the pecking order theory.

### 2.1.2 Trade-off theory

The original version of the trade-off theory attempts to investigate alternate assumptions of the Modigliani-Miller theorem. Modigliani and Miller (1963) extend their model to include corporate income tax in the original irrelevance proposition. They argue that a firm should be financed all by debt since debt benefits the firm by shielding its earnings from tax. This argument is based on the assumption that there are no offsetting costs of debt such as bankruptcy. However, this is unlikely the case in reality. Kraus and Litzenberger (1973) show that the optimal leverage reflects a trade-off between the tax benefits of debt and the deadweight costs of bankruptcy. Bradley et al. (1984) find that the debt ratio is

[5] Fama and French (1998) and Kemsley and Nissim (2002) provide discussions.

inversely related to the costs of financial distress which includes bankruptcy costs and agency costs of debt. Myers (1984) argues that a firm that follows the trade-off theory will set a target leverage and gradually move towards the target.

Based on prior studies, Frank and Goyal (2007) classify the trade-off theory into two types. The first type is static trade-off theory, in which a firm's capital structure is determined by a single period trade-off between the tax benefits of debt and the deadweight costs of bankruptcy. The second is dynamic trade-off theory, in which a firm sets a target leverage and gradually adopts policy to move towards the target over time. Scholars of dynamic trade-off theories consider multi-period effects / trade-offs of taxation and bankruptcy costs. The first dynamic model to consider the trade-off between taxation and bankruptcy cost are Kane et al. (1984) and Brennan and Schwartz (1984). They both analyze continuous time models with uncertainty, taxes, and bankruptcy costs. Following these, a number of scholars have worked on dynamic trade-off theories[6] and their work has fundamentally altered the understanding of mean reversion, the role of profits and the role of retained earnings (see Frank and Goyal, 2007).

[6] See Fischer et al. (1989), Mello and Parsons (1992), Mauer and Triantis (1994), Goldstein et al. (2001), Baker and Wurgler (2002), Welch (2004), Titman and Tsyplakov (2004), Hennessy and Whited (2005), Leary and Roberts (2005), Lewellen and Lewellen (2006), and Strebulaev (2007).

### 2.1.3 Pecking order

The pecking order theory is developed from Myers (1984) and Myers and Majluf's (1984) adverse selection model. Pecking order occurs when information asymmetry exists between the firm and the investors. Investors charge a higher cost for new equity offering. As Myers and Majluf (1984) noticed, when external equity is too expensive, the firm will forgo positive net present value projects. Hence, internal financing will be preferred because such financing would avoid high equity costs due to information asymmetry problems. If external financing is required, firms first issue debts as they are the safest type of security. A firm is said to follow a pecking order if financing by retained earnings is preferred to debt and debt is preferred to equity. However, a number of scholars have worked on the choice of financing between debt and equity and provide mixed conclusions[7].

Alternatively, it is argued that the pecking order theory roots in agency theory, which is prominently developed by Jensen and Meckling (1976). With respect to

[7] See Eckbo et al. (1990), Dybvig and Zender (1991), Eckbo and Masulis (1992),Viswanath (1993), Ravid and Spiegel (1997), Cadsby et al. (1998), Eckbo and Norli (2004), Halov and Heider (2005).

the agency theory argument[8], external financing demands project details from managers, therefore, exposing managers to outside investor monitoring. Hence, managers prefer internal financing to external financing. Myers (2003) also points out that the agency cost of equity could result in a pecking order.

## 2.2 Debt monitoring

### 2.2.1 Agency problem between stockholders and bondholders

A number of studies have questioned the validity of Modigliani and Miller (1958) theorem's assumption of market perfection. One line of research among these studies focuses on information asymmetry and agency costs (see Jensen and Meckling, 1976; Myers, 1977; Myers and Majluf, 1984; Jensen, 1986).

Jensen and Meckling (1976) define an agency relation as a contract under which the principals delegate the decision-making authority to the agents and engage the agents to perform service on the behalf of the principals. However, it is likely that the agents will not always act in the best benefits of the principals due to a

[8] The agency conflict here refers to the relation between managers and outside investors. This paper focuses on the agency conflict between shareholders and bondholders which will be discussed in next section.

misalignment of investors' interests with those of principals. Agency costs are defined as the sum of the enforcement costs and opportunity loss. Jensen and Meckling (1976) argue that agency costs provide justification to question the assumption of the Modigliani-Miller theorem that the probability distribution of the cash flows is independent of the capital structure.

Jensen and Meckling (1976) emphasize two conflicts: the first is between the shareholders and the managers; the second is between the shareholders and the bondholders. They show that firms acting in the interest of the shareholders may accept negative net present value projects if the shareholders' average payment is increased. Smith and Warner (1979) suggest four major resources of conflict between the firm's stockholders and the bondholders. First, if bonds are priced with the assumption that the firm will maintain its current dividend policy, the value of the bondholders will be reduced by unexpected divided increases which are financed either by reductions in investments or by the sale of debt (see Kalay, 1982). Second, if bonds are priced with the assumption that the firm will not issue additional debt of the same or higher priority, the value of the bondholders will be reduced by an unexpected debt issuance. Third, if a firm exchanges lower-risk

assets for higher-risk investments, the value of the bondholders will be transferred to the shareholders because the bondholders suffer from a higher default risk with fixed interest, and the shareholders benefit from potential high returns (Jensen and Meckling, 1976; Green, 1984). Fourth, with outstanding risky debt, the shareholders cannot benefit from highly profitable investment decisions since the benefits go primarily to the bondholders. Hence, some positive negative present value (NPV) projects may be foregone and this underinvestment problem will lower the firm's value (Myers, 1977).

Since Jensen and Meckling (1976), the empirical evidence of the stockholder and the bondholder conflict has been well documented in the literature. For example, as summarized by Klock et al. (2005), the conflict between the stockholder and the bondholder is significant in spin-offs (Parrino, 1997; Maxwell and Rao, 2003), investment decisions (Parrino and Weisbach, 1999), and repurchases (Maxwell and Stephens, 2003). Using comprehensive bond data, Maxwell and Rao (2003) find consistent evidence with the wealth expropriation hypothesis that there is a wealth transfer from the bondholders to the stockholders in spin-off firms. Maxwell and Stephens (2003) find abnormal stock returns to be positive around

the announcement of repurchase programs and find evidence which supports the wealth redistribution hypothesis. They argue that the loss to the bondholders is a function of the repurchase size and the risk of the debt.

Prior literature has identified that the ability of lenders to intervene in corporate decisions engenders a monitoring role for debt (Jensen and Meckling, 1976; Jensen, 1986; Harris and Raviv, 1991; Hart, 2001). Hence, the potential conflicts of interest between the shareholders and the bondholders create a high demand for effective debt monitoring to minimize agency costs[9].

### 2.2.2 The role of debt in monitoring

Jensen and Meckling (1976) point out that, in an agency relationship as a contract, it is likely that the agent will not always act in the best interests of the principal. The principal can limit this agency problem by establishing appropriate incentives for the agent and by incurring monitoring costs design to limit the agent's aberrant

[9] This study focuses on the agency conflicts between shareholders and bondholders. It is acknowledged that agency relation between managers and shareholders may affect the conflict between shareholders and bondholders since senior managers make important investment and product market decisions on behalf of the stockholders (see Brander and Poitevin, 1992). However, Grossman and Hart (1982) point out that by issuing debt, managers bond themselves to act in the interests of shareholders since "management (the agent) deliberately changes its incentive in such a way as to bring them in line with those of shareholders (the principal) – because of the resulting effect on market value" (Grossman and Hart, 1982, p.109).

activities. In addition the principal will pay the agent to expend resources (bonding costs) to guarantee that the agents will not take any actions to harm the benefit of the principal. Jensen and Meckling also show that the agency costs associated with debt contain the monitoring expenditures by the lenders and the bonding expenditures by the borrowers. In my thesis, I will only focus on monitoring costs associated with the lenders. In other words, we examine the two monitoring mechanisms and how the two interact with each other in mitigating the agency problem between borrowers and lenders.

The literature shows that debt can play a significant role in mitigating agency conflicts between the shareholders and the bondholders. For example, Jensen and Meckling (1976) argue that by the inclusion of various covenants in indenture provisions, the bondholders are able to limit the managerial behavior that reduces the value of the bondholders. Provisions can be used to impose constraints on the management's decisions on dividends payout, future debt issues, and the maintenance of working capital among others, to protect the bondholders from the expropriation by the shareholders. Jensen (1986) suggests that debt issuance reduces agency costs by decreasing the cash flow available for spending at the

discretion of the managers and effectively bond the managers to pay out future cash flows as interests. Stulz (1990) concludes that financing policy reduces the agency costs of managerial discretion and specifically notes that debt issuance reduces the overinvestment costs, that is, the cost associated with the manager investing too much in some circumstances. Harris and Raviv (1990) argue that debt serves as a disciplining mechanism to managers since default allows creditors the option to force the firm into liquidation. Zanzout (1997), Gul and Tsui (1998), and Gul (2001) all provide empirical evidence that debt can act as a monitoring device and mitigate the agency problems. Smith and Warner (1979) analyze the role of bond covenants in the control of the stockholder-bondholder conflict and argue that bond contracts are structured to maximize the value of the firm.

In addition, a large number of studies examine the contracting incentives associated with the choice of provisions in bond contracts. Jensen and Smith (2000) provide a comprehensive review of studies on bond contract provisions including debt maturity, convertible debt, secured debt, dividend policy, intra-bondholder conflict, bonding covenants and corporate accounting policy.

*Debt maturity* is an important issue related to the choice of provisions in bond contracts. As documented by Myers (1977), debt maturity can resolve the agency conflict. Myers identifies the agency conflict between the shareholders and the bondholders in firms with outstanding risky debt as a situation in which some positive net present value projects are foregone. However, he suggests that firms can mitigate this agency conflict by matching the effective maturities of assets and liabilities. Consistent with the Myers (1977) proposition, Mayers and Smith (1981) observe the incentive to match the maturities of assets and liabilities in the insurance companies. Barnea et al. (1980) demonstrate that the maturity structure of debt serves a role in resolving agency problems associated with foregone growth opportunities[10]. In addition, short-term debt is an effective mechanism to monitor managements (see Easterbrook, 1984 and Datta et al., 2000). Easterbrook (1984) argues that the monitoring problem is less serious if the firm is constantly in the market for new capital. Rajan and Winton (1995) argue that short-term debt enables lenders the flexibility to effectively monitor management with minimum effort. Stulz (2000) argues that short-term debt is an extremely powerful tool to monitor management since it is associated with frequent renewals. Datta et al.

[10] This mechanism is the focus of this study and I will discuss it further in next sub-section.

(2005) argue that short-term debt has the additional benefit of mitigating agency conflicts by subjecting managers to more frequent monitoring by underwriters, investors and rating agencies in the event of new debt issuance.

*Convertible debt* grants the bondholder the option to exchange the bond for the firm's common stock. Green (1984) states that the convertible bond helps to mitigate the risk-shifting (or asset-substitution) problem arising from debt financing. That is, in a highly leveraged firm, the shareholders have the incentive to take riskier projects since the losses of bad outcomes will fall mainly on the bondholders, with a wealth transfer from the bondholders to the shareholders. By the use of convertible bonds, firms allow the bondholders to participate in the upside potential for future cash flows, thereby mitigating the risk-shifting problem. Consistent with this statement, several studies provide evidence that firms with a greater propensity to shift risk onto the shareholders have higher demands to issue convertible bonds (Mikkelson, 1981; Lewis et al, 1998, 1999; Krishnaswami and Yaman, 2004; Gomez and Phillips, 2005).

*Secured debt* is defined as the pricing of debt with a security provision which

entitles the creditors priority over the proceeds of the assets sale in the event of liquidation (see Stulz and Johnson, 1983). Smith and Warner (1979) point out that secured debt resolve the asset-substitution problem and lower the administrative and enforcement costs. Stulz and Johnson (1983) also suggest that secured debt lowers the agency costs by controlling the underinvestment problem.

*Dividend restriction* can be specified in the debt covenants and can control the agency problem of dividend payout as discussed in Jensen and Smith (2000). The authors argue that the standard bond covenant specifies the maximum allowable dividend payment to protect the interests of bondholders.

*Intra-bondholder conflict* arises when firms have multiple classes of debt claims, which differ in coupon, maturity, and priority. Warner (1977) shows that in the event of liquidation, the junior claimholders receive higher value claims than the amount implied by the priority. Smith and Warner (1979) and Ho and Singer (1982) document that bond covenants tend to restrict the new debt issuance, no matter the debt is of the same, higher, or lower priority, in order to control the agency problem of refinancing.

*Bonding covenants and corporate accounting policy* help to mitigate agency conflict because various bonding and financial activities can be specified and restricted in the bond covenants, including the requirements for the provision of audited financial statements and the use of specified accounting techniques among others. The issues related to bonding covenants and corporate accounting policies have been widely examined in the literature (see Deakin, 1979, Dhaliwal, 1980, and Bowen et al., 1981).

### 2.2.3 Short-term debt in reducing agency conflict between bondholders and shareholders

The monitoring role of debt arises as the information disclosed during contract renewal enables lenders to affect the project's continuation by influencing the terms of borrowing (Harris and Raviv, 1990). Particularly, as short-term debt is associated with more frequent renewals, it plays an effective role in mitigating the agency costs arising from managerial rent extraction, such as empire building and private benefit seeking (Stulz, 1990; Hart and Moore, 1995). Prior literature has

documented that short-term debt plays a significant role in mitigating agency conflicts (Myers, 1977; Barnea, et al., 1980; Barclay and Smith, 1995; Rajan and Winton, 1995; Guedes and Opler, 1996; Stulz, 2000; Datta et al., 2005).

Some papers examine the role of short-term debt as a mechanism to resolve the underinvestment problem. Myers (1977) suggests that the underinvestment problem arises when firms with outstanding risky debt may make suboptimal investment decisions if their investment opportunity set includes a growth option. Short-term debt can mitigate underinvestment incentives because it matures before the growth options are exercised and the managers would be less concerned about the benefits that are accrued to the bondholders. Thus firms can mitigate this agency conflict by effectively matching the maturities of assets with those of liabilities. Barnea et al. (1980) and Ho and Singer (1984) provide consistent evidence that firms whose assets include a large proportion of growth options tend to use short-term debt. More recently, Johnson (2003) and Billett et al. (2007) examine the impact of growth opportunities upon the joint choice of leverage and debt maturity and they find that high growth firms are more likely to adopt short-term debt in order to control the agency problems caused by the

outstanding risky debt.

### 2.2.4 The determinants of short-term debt

A number of researchers have examined the determinants of the debt maturity choice (Titman and Wessels, 1988; Mitchell, 1991; Barclay and Smith, 1995; Stohs and Mauer, 1996, and Guedes and Opler, 1996). Guedes and Opler (1996) summarize the determinants of the corporate debt maturity structure, including agency costs, liquidity risk and screening, tax benefit and asymmetric information.

*Agency costs:* The agency cost of debt may influence the choice of the corporate debt maturity. Smith and Warner (1979) argue that smaller firms face the potential agency conflicts between the bondholders and the stockholders, including risk shifting and claim dilution. Titman and Wessels (1988) find that smaller firms have a higher proportion of short-term debt to minimize the flotation costs of issuing long-term debt. Barclay and Smith (1995) argue that the small firms that prefer bank debt to private debt with the lower flotation costs are more likely to use short-term debt.

*Liquidity risk and screening:* Diamond (1991) develops a model that analyzes the association of liquidity risk with short-term debt. Firms with high levels of short-term debt carry the risk of debt default and are being forced into inefficient liquidation when they are unable to refinance the debt. Froot et al. (1993) argue that short-term debt is associated with the loss of project rents if the project has to be refinanced at a higher interest rate due to the credit market imperfections. Sharpe (1991) and Titman (1992) also note that liquidity risk provides firms with incentives to borrow long-term debt upon arrival of bad news around the refinancing period might result in a higher default premium on new debt.

However, firms with high liquidity risks maybe not are able to borrow long-term debt because the low quality firms could be screened out of the long-term debt market (Stiglitz and Weiss, 1981; Diamond, 1991). Diamond (1991) notes that firms with very low credit quality and a high probability of inability to secure long-term debts have no choice but to finance with short-term debt. Firms with intermediate credit ratings tend to issue long-term public debt since they face a higher liquidity risk and firms with very high credit ratings are active issuers of

short-term debt such as commercial papers. Empirically, credit quality is proxied by a dummy variable for whether a firm's issues are of investment grade (S&P rating of BBB or higher). Rizzi (1994) finds that firms with speculative grade ratings have often been unable to issue long-term debt, which is consistent with the argument that firms with low credit debt have no choice but to issue short-term debt.

*Tax benefit:* A number of theoretical studies examine the tax implications of the debt maturity choice. Kane et al. (1985) suggest that the optimal debt maturity involves a trade-off between the tax-advantage of debt and bankruptcy and debt-issue flotation costs. Mauer and Lewellen (1987), Emery et al. (1988), and Brick and Palmon (1992) emphasize the tax-timing option on long-term debt contracts and argue that long-term debt is more attractive when interest rates are volatile and the firm expects a stream of taxable earnings. Brick and Ravid (1985) also provide a tax-based model for an optimal debt maturity structure and demonstrate that firm value increases in the amount of long-term debt with the increase in term structure.

*Asymmetric information:* The studies of the maturity decisions when borrowers have private information about their credit quality have been explored in a series of articles (see Flannery, 1986; Robbins and Schatzberg, 1986; Kale and Noe, 1990, and Diamond, 1993). Guedes and Opler (1996) show that in a separating equilibrium, investors are able to infer the private information held by borrowers about their credit qualities from the corporate debt maturity choice. Flannery (1986) shows that a firm's choice about its debt maturity structure can signal insider information about the firm's credit quality when insiders are systematically better informed than outside investors. He argues that firms with large potential information asymmetries are more likely to borrow short-term debt since the larger information costs are associated with long-term debt.

Guedes and Opler (1996) argue that in an adverse selection model, in which private information is not revealed, maturity is chosen to minimize the effects of private information on financing costs. Firms with favorable private information are less likely to issue long-term debt since they expect to borrow more cheaply in the future. Lucas and McDonald (1990) argue that before firms release good news, they usually will not issue securities if they expect that there is an increase in

share price; but they will issue securities before bad news is released. Mitchell (1991) documents that a firm is more likely to issue short-term debt if it is not traded on the New York Exchange, if it has a higher retention ratio and if its capital structure contains convertible debt. This is consistent with the hypothesis that firms with a higher degree of information asymmetry depend on short-term debt to minimize adverse selection costs.

### 2.2.5 The costs of short-term debt

Short-term debt has the potential to enhance firm monitoring to reduce the agency cost between the shareholders and the bondholders, and a number of studies have documented the costs associated with short-term debt. Flannery (1986) and Diamond (1991) both provide intuitive models, in which firms with long-term projects choose different debt maturities to reduce their financing or liquidity risks. Diamond (1991) shows that the debt maturity choice is a trade-off between the gains achieved from private information about future credit rating and the costs of liquidity risk. Liquidity risk arises from the borrower's loss of control rents when lenders are unwilling to refinance with bad news. Diamond (1991, 1993) and Sharpe (1991) argue that short-term debt creates a risk of suboptimal liquidation

because lenders ignore the full value of control rents. Johnson (2003) suggests that firms will trade-off the cost of underinvestment problems against the cost of liquidation risk when choosing the short-maturity debt.

Datta et al. (2005) point out that “borrowing short-term, as opposed to long-term, generates higher costs in the form of flotation costs (such as investment bank fees and legal fees), the cost of managerial time spent on more frequent debt issuances, and the potential costs of illiquidity as the short-term debt comes due” (p2336). Similarly, Childs et al. (2005) points out that the benefit of short-term debt on a reduction of agency costs is offset by the costs of rolling over short-term debt, which include the cost of refinancing and liquidity risk.

Hence, although short-term debt serves as an effective mechanism to mitigate the agency conflict between the shareholder and the bondholders, firms are likely to find a substitute for short-term debt in mitigating these conflicts. Billett et al. (2007) argue that short-term debt and debt covenants are substitutes, which is consistent with the suggestions that firms with high levels of leverage use debt covenants, rather than short-term debt, to manage agency costs (see Barclay and

Smith, 1995).

## 2.3 Conservatism

### 2.3.1 Conservatism in accounting

Researchers have introduced a variety of definitions of conservative accounting. Ball and Shivakumar, (2005) and Beaver and Ryan (2005) refer to two types of accounting conservatism: unconditional conservatism and conditional conservatism. Examples of unconditional conservatism include the immediate expensing of the costs of intangibles, accelerated depreciation of property, plant equipment, and the historical cost accounting for positive net present value projects; examples of conditional conservatism include the lower of cost or market accounting for inventory, the recognition of contingency losses, asset write down, and the recognition of losses in exchange (Beaver and Ryan, 2005; Cheng, et al., 2010). In this paper, I focus on conditional conservatism, which imposes stronger verification requirements for the recognition of gains than for losses and produces earnings that reflect bad news timelier than good news.

Guay and Verreccia (2006) identified three key characteristics of conservative accounting: (1) conservative accounting induces a downward bias in the reported net assets or earnings; (2) conservative accounting contains more timely information about losses than about gains; (3) conservative accounting imposts greater costs on managers who tend to manipulate net assets / earnings upward.

As mentioned in Watts (2003), the extreme form of conservatism is the traditional conservatism adage: “anticipate no profit, but anticipate all losses” (Bliss, 1924 as cited in Watts, 2003, p. 208). The Financial Accounting Standards Board (FASB) criticizes conservatism for not representing the neutrality of information. However, conservatism has survived in accounting for many centuries (Basu, 1997) and the degree of conservatism has increased recently (Givoly and Hayn, 2000).

### 2.3.2 The demand for conservatism in accounting

Accounting literature has attempted to rationalize or explain the demand of conservatism in financial reports. Some papers focus on the role of conservatism in reducing the contracting costs between the firms’ shareholders and other contracting parties, or the costs associated with litigation, tax or accounting

regulation (Watts, 2003). Some studies also examine conservatism as the outcome of an optimal contract design in a principle-agent or stewardship setting (Antle and Lambert, 1988; Kwon et al., 2001; Chen et al., 2007). Watts (2003) summarizes four alternative explanations for conservatism as follows.

*Contracting explanation*: Jensen and Meckling (1976) and Watts (1977) propose that financial reporting is able to mitigate agency conflicts and it is argued that conservatism benefits the users of a firm's accounting reports. One explanation is that conservatism is an effective mechanism to reduce the costs of contracting with various parties who have asymmetric information or have asymmetric payoffs. Watts (2003) shows that accounting conservatism arises from debt contracts, executive compensation contracts, and other contracts like employment contracts[11]. Furthermore, Watts (2003) points out that the contracting explanation of conservatism is a primary demand for conservatism. Conservatism constrains the managerial opportunistic payments to themselves and could increase the firm value shared among all parties to the firm (Watts, 1993). Consistent with the theoretical argument, Ahmed et al. (2002) find that conservatism serves as an efficient contracting mechanism to mitigate dividend policy conflicts between the

[11] This paper focuses on debt contract and will discuss it in detail in next sub-section.

shareholders and the bondholders and they find that the cost of debt is lower when firms have higher levels of conservatism. Zhang (2008) also finds that conservatism benefits the borrowers *ex ante* through lower cost of debt.

*Shareholder litigation*: Litigation can also affect the manager's opportunistic reporting behavior. Beaver (1993) and Watts (1993) show that litigation under the Securities Acts encourages conservatism because the firms that overstate earnings and net assets are more likely to be faced with litigation costs than firms understating them. Stockholder lawsuits based on earnings disclosures are brought under SEC[12] Rule 10b-5, which makes it unlawful for anyone "to make any untrue statement of a material fact or to omit to sate a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading." (Skinner, 1994, p40) Hence, conservatism is able to reduce the expected litigation costs of firms by providing understated earnings and net assets.

*Taxation*: The tax hypothesis is that firms have an incentive to report conservatively to minimize the present value of their tax burden. Watts (2003)

[12] SEC is abbreviation of the United States Securities and Exchange Commission.

suggests that conservatism benefits the firms' tax policies since the asymmetric recognition of losses and gains enable the profitable firms to reduce the present value of taxes and consequently increase firms' value.

*Accounting regulation*: There is an asymmetry in regulator's costs as the standard setters and the regulators are more likely to be criticized if firms overstate earnings and net assets than if firms understate earnings and net assets. Watts (1977) suggests that the losses from overstated assets / income are more likely to be observed and used in the political process than are the gains due to undervalued assets / income. This provides the incentives for regulators and standard setters to demand conservatism in financial reporting.

There are other factors related to the demands for accounting conservatism. The first factor is the agency problem and information asymmetry. Kwon (2005) argues that there are two sources of agency costs under moral hazard: the first is the distortions in incentive contracts; and the second is the implementation of suboptimal decisions. Watts (2003) mainly discusses the first agency cost and Kwon (2005) suggests that conservative accounting is useful for reducing the

second agency cost under moral hazard. Furthermore, there is another agency problem – adverse selection problem between the shareholders and the bondholders. Kothari et al. (2009) document that managers' reluctance to disclose bad news can be viewed as an adverse selection agency problem. Guay and Verrecchia (2007) argue that the commitment to disclose more timely information about losses versus gains allows the bondholders to monitor management more efficiently and reduces adverse selection costs.

LaFond and Watts (2008) emphasize the information role of conservatism. Accounting conservatism is a governance mechanism that reduces managers' incentives and abilities to manipulate or overstate accounting numbers and so reduces information asymmetry, increasing the firm and equity values. In the same vein, it is expected that firms with a lower degree of information asymmetry are associated with a lower demand for accounting conservatism. Hui et al. (2009) find a negative association between accounting conservatism and the frequency, specificity and timeliness of management forecasts, suggesting that accounting conservatism serves as a substitute for management forecasts by reducing information asymmetry in the market.

The second factor is corporate governance. LaFond and Roychowdhury (2008) argue that greater managerial ownership generates greater alignment of the interests of the shareholders and the managers and they find that conservatism declines with managerial ownership, suggesting that accounting conservatism and equity incentives are substitutes in mitigating the conflict between the shareholders and the managers. However, Lara et al. (2009) find that the strong governance firms show significantly higher levels of conditional accounting conservatism, indicating that governance and conservatism are complements.

### 2.3.3 Conservatism and debt contracting

The debt contracting explanation for accounting conservatism is important due to the inherent nature of the debt contract. Specially, the lenders in the firm's debt contracts have an asymmetric payoff with respect to net assets. That is, when the loan is at maturity, the debtholders are not entitled for any additional compensation if the firm's net assets are above the face value of the debt. In contrast, if the firm's net assets are lower than the promised payments to the debtholders, they receive less than the contracted sum due to the limited liability

of the firm's managers. Hence, debtholders are concerned about the lower bounds of the earnings and the net asset distributions.

An early paper of Gilman (1939) proposes that the demand for conservatism in financial reporting originates partly from the debt markets. The comprehensive survey by Holthausen and Watts (2001) shows that debt contracting is the most likely demand for accounting conservatism. Similarly, Ball et al. (2008) find that the demand for conservatism in financial reporting is attributed to the debt markets. In addition, Ahmed et al. (2002) point out that the debt contracts incorporate conservatism in at least two ways. Firstly, the bondholders can demand conservative accounting. Secondly, the managers might commit to use conservative accounting consistently for the managers' reputation. Milgrom and Roberts (1992) suggest that reputational concerns may induce managers' willingness to commit to engage in *ex post* opportunistic accounting choices.

However, the argument has been challenged in at least two ways. First, Leuz (2001) and Guay and Verrechia (2006) point out that the costs and benefits are not clear for the delay of recognition of economics gains relative to losses (in debt

contracting process). Second, Schipper (2005) argue that lenders could protect themselves by writing conservative contracts without requiring conservatism in financial reporting. Guay and Verrechia (2006) suggest that firms can replicate the effect of accounting conservatism in debt contracts by modifying the restrictiveness of the debt covenants without changing the property of the accounting measure. Debt contracts serve as monitors of the borrower's ability to pay by imposing lower bound measures on net assets. Debt contracts can trigger technical default and allow the loan to be called. They also restrict the managerial actions that reduce the value of net assets such as dividends and acquisitions (Smith and Warner, 1979; Beneish and Press, 1993). Watts (2003) notes that in debt contracts, conservatism reduces the likelihood that the managers will take risky projects, overstate earnings and net assets and transfer wealth to the shareholders at the expense of the debtholders.

Empirically, Begley and Freedman (2004) point out that during the last three decades, the use of debt covenants has declined as the financial reporting has become more conservative. Begley and Chamberlain (2005) also find that the use of accounting-based debt covenants is negatively associated with conservatism. In

contrast, Beatty et al. (2008) and Nikolaev (2007) find that debt covenant restrictiveness is positively associated with accounting conservatism, and that accounting conservatism and debt covenant tightness are complements rather than substitutes. Although the results are mixed, Betty et al. (2008) find some evidence that conservative financial reporting and conservative debt covenants adjustments are used simultaneously to address the agency conflict between the firms and the lenders. Guay (2008) contributes the results to the lenders' demand for information and the fact that accounting conservatism is able to elicit timely information about bad news from managers.

### 2.3.4 The benefits and the costs of accounting conservatism

Previous literature proposes that accounting conservatism helps increase the firm value by reducing information asymmetry and mitigating agency costs (Watts, 2003; LaFond and Roychowdhury, 2008). Guay and Verrecchia (2007) summarize that conservative financial reporting has five potential benefits to increase the firm value by providing accounting numbers that (1) reduce information asymmetry and ensure the investors receive more information about the firm value; (2) are more efficient to facilitate corporate governance; (3) are more efficient to

facilitate the incentives of managers; (4) are more efficient for debt contracting; and (5) reduce the litigation costs, tax payments and political costs.

Conservatism has several other economic benefits. A stream of literature documents the potential benefits of conservatism or timely loss recognition. For example, Bushman et al. (2006) find that timely loss recognition leads to the timely termination of negative present value projects. Wittenberg-Moerman (2005) documents that the bid-ask spread in the secondary loan market is negatively associated with the level of timely loss recognition, suggesting that there is a negative relation between conservatism and the degree of information asymmetry. Ahmed and Duellman (2009) show that conservative firms are associated with more future profitability and lower possibility of investment failures. In addition, Ahmed et al. (2002) document that conservatism is positively associated with debt ratings, suggesting that conservatism will reduce the cost of debt for borrowers. They argue that conservatism in financial reporting restricts the managers' behavior in excessive dividend payment; hence the bondholders are likely to require a lower rate of return in exchange for a reduced risk of dividend payments. Similarly, Zhang (2008) employs interest rate as a proxy for the cost of debt and

finds that conservatism benefits borrowers *ex ante* through a lower cost of debt. He suggests that lenders are likely to require a lower rate of return to compensate for the mitigated risk since accounting conservatism provides lenders a timely signal of default risk.

However, some costs are associated with accounting conservatism. Hence, it is an empirical question whether accounting conservatism yields any real economic benefit to firms (Devine, 1963; Sterling, 1973). Hendriksen and Van Breda (1992) argue that conservatism is a poor method of treating the existence of uncertainty in valuation and income. Penman and Zhang (2002) suggest that accounting conservatism is negatively associated with earnings quality by creating accounting reserves for earnings management in the future. Guay and Verrechia (2006) discuss the costs of conservatism and suggest that conservatism is associated with information inefficiency. Gigler et al. (2008) and Li (2009) develop theoretical models to describe the role of accounting conservatism in debt contracts and argue that accounting conservatism is negatively associated with the efficiency of debt contracts when the covenants are not renegotiable. This is in direct contrast with the suggestion of Watts (2003).

Zhang (2008) summarizes three types of costs of conservatism. Firstly, firms with higher levels of accounting conservatism are more likely to violate the debt covenants, so the subsequent costs associated with covenant violations are likely to be economically significant. Beneish and Press (1993) suggest that default and renegotiation costs reflected in stock prices represent about 1.4 percent of the equity's market value, suggesting that the relevant costs are significant. Secondly, conservatism in financial reports recognizes economics losses more timely than gains, resulting in understatement of net assets. Hence, conservative earnings are more likely to result in a loss or a decrease in earnings. Prior literature finds that the market is likely to punish those firms with losses or decreases in earnings (Barth et al., 1999; Bartov et al., 2002). Thus, conservatism in financial reporting is likely to be followed by negative stock returns. Thirdly, if managers' compensations are sensitive to accounting choices, conservatism in financial reporting will impose costs on managers. Hence, the cross sectional variation in the level of accounting conservatism is attributed to the managers' trade-off between the benefits and costs of conservatism.

# Chapter 3 Research Design

## 3.1 Hypothesis development

### 3.1.1 Hypothesis 1: The relation between short-term debt and conservatism in financial reports

Due to the asymmetric payoff, debtholders are concerned about the lower bounds of the earnings and the net asset distributions. As a result, debt contracting is a primary explanation for accounting conservatism (Watts, 2003). Some studies examine the importance of debt in accounting conservatism (Leftwich, 1983; El-Gazzar and Pastena, 1990; Ahmed et al., 2002) but the studies on the relation between debt maturity and conservatism are scarce.

As discussed in Chapter 2, the literature shows that accounting conservatism (Holthausen and Watts, 2001; Watts, 2003; Leftwich, 1983; El-Gazzar and Pastena, 1990; Ahmed et al., 2002) and short-term debt (Barclay and Smith, 1995; Guedes and Opler, 1996; Stulz, 2000; Datta et al. 2005) can both serve as monitoring mechanisms to mitigate the agency conflicts between the shareholders and the bondholders. However, both mechanisms are associated with costs (Flannery,

1986; Diamond, 1991; Johnson, 2003; Datta et al., 2005; Penman and Zhang, 2002; Guay and Verrechia, 2006; Zhang, 2008). Hence, it is likely that firms only choose one of the two mechanisms. Specifically, the interests of the bondholders are likely to be protected in firms with more short-term debt and this may lead to less demand for accounting conservatism and vice versa.

Alternatively, a negative relation between accounting conservatism and short-term debt can be expected through the firms' managerial opportunistic choice to reduce liquidation costs. Prior literature argues that short-term debt is associated with a higher liquidity risk and a higher liquidation costs (Diamond, 1991; Child et al., 2005; Datta et al., 2005). However, firms with conservative reporting accelerate the recognition of bad news, and therefore increasing the liquidation risk. Hence, firms with more short-term debt which are associated with higher liquidation costs are less likely to report conservative accounting. It is likely that managers in these firms have incentives to opportunistically delay the recognition of bad news. Gupta et al. (2008) provide consistent evidence and they find that firms with more short-term debt have incentives to delay the recognition of bad news through earnings management. Hence, it is also expected that there is a negative relation

between accounting conservatism and short-term debt.

Based on these arguments on the relation between accounting conservatism and short-term debt, I test the following hypothesis:

H1: *There is a negative relation between short-term debt and conservatism in financial reports.*

### 3.1.2 Hypothesis 2: The substitutive effects on cost of debt

Short-term debt and accounting conservatism can both serve as a costly monitoring mechanism to mitigate the agency problem between the shareholders and the debtholders. Firms with a given level of agency problem will trade-off the costs and the benefits of adopting conservative accounting and short-term debt to resolve agency conflicts. Few studies have examined how firms select among the various monitoring mechanisms available to them, as well as how the various mechanisms interact and serve as complements and / or substitutes for each other.

For example, LaFond and Watts (2008) document a positive relation between information asymmetry and conservative financial reporting. Their study suggests

that firms can employ more conservative reporting to reduce information asymmetry. Cai et al. (2009) find that information asymmetry is negatively associated with executive equity incentives, suggesting that information asymmetry may be reduced by equity incentives. LaFond and Roychowdhury (2008) document that conservative reporting and CEO equity incentives are substitutive monitoring mechanisms. They show that firms adopt indirect monitoring via equity incentives when firms cannot employ more conservative reporting. Collectively, these results show that both conservatism and equity incentives may be employed to reduce information asymmetry and firms will trade-off the costs and the benefits between these two mechanisms.

However, as suggested by Gupta et al. (2008), short-term debt could create incentives for borrowers to delay the recognition of bad news through earnings management. Given that bad news triggers lender enforcement in the presence of short-term debt, this lender enforcement may encourage borrowers to circumvent it by managing earnings to defer the arrival of bad news. Hence, managers tend to opportunistically manage earnings to avoid the costly renegotiation of short-term debt violation.

Based on the above arguments, the expected negative relation between short-term debt and accounting conservatism is consistent with either of the following two interpretations. First, since short-term debt and accounting conservatism are costly mechanisms to resolve agency problem, firms tend to substitute them in a cost-effective manner. Second, managers may tend to opportunistically reduce the amount of accounting conservatism to avoid the costly renegotiation of short-term debt violation.

To disentangle the two possible causes, this paper tests whether short-term debt and accounting conservatism act as substitutes in reducing the firms' cost of debt. On one hand, if managers choose between short-term debt and accounting conservatism by trading-off the costs and the benefits, we expect that the two mechanisms individually reduce the firm's cost of debt but interactively increase the cost of debt. On the other hand, if managers opportunistically choose between short-term debt and accounting conservatism, we expect that there is no interactive effect between the two mechanisms on the firm's cost of debt. Hence, we test the following hypothesis (null hypothesis):

H2: *A firm's cost of debt is not associated with the interactive effect between short-term debt and accounting conservatism.*

## 3.2 Methodologies and models

### 3.2.1 Variable measurements

*Debt maturity*

*COMPUSTAT* reports the amount of debt payable in years one through five from the firm's fiscal year end (*Compustat* #34 for debt in current liabilities; *Compustat* #91 for debt maturing in second year; *Compustat* #92 for debt maturing in third year; *Compustat* #93 for debt maturing in fourth year and *Compustat* #94 for debt maturing in fifth year).

Following prior literature (Barclay and Smith, 1995; Datta et al. 2005), I define a firm's short-term debt ( *Short* ) as the percentage of the firm's total debt that has a maturity of less than three years. The firm's total debt is long-term debt (*Compustat* #9) plus debt in current liabilities (*Compustat* #34).

*Conservatism*

The measure of accounting conservatism (*Conservatism*) used in this study is C_score (*CS*) developed by Khan and Watts (2009) and described in Appendix I. The C-score is based on Basu (1997) model modified to allow coefficients to vary across firms and over time:

$$X_{i,t} = \beta_{1,t} + \beta_{2,t}D_{i,t} + \beta_{3,i,t}R_{i,t} + \beta_{4,i,t}D_{i,t}R_{i,t} + e_{i,t} \quad (1)$$

where

$X_{i,t}$ = earnings per share for firm $i$ in fiscal year $t$;

$R_{i,t}$ = return on firm $i$ from nine months before fiscal year end $t$ to three months after fiscal year end $t$;

$D_{i,t}$ = 1 if $R_{i,t}$ <0, =0 otherwise.

Watts (2003) suggests that there are four main explanations of the demand for conservatism in financial reporting: contracts, litigation, taxation and regulation. Khan and Watts (2009) argue that these four factors vary with the firm's investment opportunity set as proxied by a set of firm characteristics: market-to-book ratio, size and leverage. They specify that both the timeliness of good news and the incremental timeliness of bad news are linear functions of the firm specific characteristics defined as following:

$$GS \equiv \beta_{3,i,t} = \mu_{1,t} + \mu_{2,t} Size_{i,t} + \mu_{3,t} M/B_{i,t} + \mu_{4,t} Lev_{i,t}$$

$$CS \equiv \beta_{4,i,t} = \lambda_{1,t} + \lambda_{2,t} Size_{i,t} + \lambda_{3,t} M/B_{i,t} + \lambda_{4,t} Lev_{i,t} \quad (2)$$

where

$GS$ = G_score which is the firm-year measure of good news timeliness;

$CS$ = C_score which is the firm-year measure of conservatism;

$\beta_{3,i,t}, \beta_{4,i,t}$ = coefficients estimate from the estimation of equation (1);

$Size_{i,t}$ = the nature log of market value of equity;

$M/B_{i,t}$ = the market-to-book ratio;

$Lev_{i,t}$ = leverage computed as long-term and short-term debt scaled by market value of equity.

Equation (2) is inserted into regression equation (1), resulting in equation (3). This equation is estimated using annual cross-sectional regressions and the estimates of coefficients $\lambda_1$ to $\lambda_4$ are derived from the regressions of equation (3). Then, the estimated coefficients are used to calculate the $CS$ using equation (2) to measure firm-year conservatism.

$$X_{i,t} = \beta_{1,t} + \beta_2 D_{i,t} + R_{i,t}(\mu_1 + \mu_2 Size_{i,t} + \mu_3 M/B_{i,t} + \mu_4 Lev_{i,t}) + D_{i,t} R_{i,t}(\lambda_1 + \lambda_2 Size_{i,t} + \lambda_3 M/B_{i,t} + \lambda_4 Lev_{i,t}) + \varepsilon_{i,t} \quad (3)$$

*Cost of Debt*

My second hypothesis is to examine the substitutive effects between short-term debt and conservatism in reducing the firm's cost of debt ($COD$), calculated as the ratio of firm $i$'s interest expense in year $t$ (*Compustat* #15) to the average interest-bearing debt outstanding during years $t$ and $t-1$ (*Compustat* #9 plus *Compustat* #34).

## 3.2.2 Sample selection

I start by extracting the data from the intersection of the annual *COMPUSTAT* and the monthly *CRSP* for the years 1992 through 2006. This sample is used to calculate the conservatism measure in the main test and another conservatism measure in the robustness check. I also require the data to be available in the *ExecuComp* database for managerial ownership data. All other financial data are from the *COMPUSTAT* and the *CRSP* database. The main sample of this paper begins with 1992 due to the data limitations on the *ExecuComp* database and ends with 2006.

In addition, I remove (1) the firm-years in the financial industry (SIC 6000-6999); (2) the firm-years with negative total assets or book value of equity; (3) the firm-years with debt maturity less than 0 or more than 1; (4) the firm-years with market value of equity less than $10 million; (5) the firm-years with price per share less than $1; (6) the firm-years in the top and bottom 1/2 percent of earnings, returns, size, market-to-book ratio, leverage and return on equity; (7) the firm-years with missing data for any of the variables used in the estimation process. The main sample consists of 9,836[13] firm-year observations. Panel A of Table 1 shows the yearly distribution of the sample firms from 1992 to 2005. Panel B of Table 1 shows the distribution of the sample firms for the 48 industries as suggested in Fama and French (1997).

**[Insert Table 1 here]**

### 3.2.3 Model specifications

*Empirical model for H1*

I adopt the following model to examine the effects of conservatism in financial reporting on the firm's debt maturity choice to issue short-term debt. I choose the

[13] As the change specification is employed to test hypothesis H1, the sample size drops to 8,625 firm-year observations.

change model to control for possible endogeneity problem. All variables except the dummy variables are calculated as the difference between the values in the end of year $t$ minus the values in the end of year $t-1$.

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M / B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^{\ 2} + \alpha_8 \Delta Term_{i,t} + \alpha_9 Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t} \quad (4)$$

where

$OWN_{i,t}$ = the direct stock owned by the top five executives divided by the shares outstanding at the fiscal year end;

$AssetMaturity_{i,t}$ = (gross property, plant and equipment (*Compustat* #7) / total assets (*Compustat* #6))*(gross property, plant and equipment / depreciation expense (*Compustat* #14)) + (current assets (*Compustat* #4) / total assets) * (currents assets / cost of goods sold (*Compustat* #41));

$LNFV_{i,t}$ = the log value of market value of total assets, computed as (share price (*Compustat* #199) * outstanding shares (*Compustat* #54) + book value of total assets (*Compustat*

#6) – book value of equity (*Compustat* #60);

$LNFV_{i,t}^{2}$ = the square of $LNFV_{i,t}$;

$Term_{i,t}$ = measured as the month-end yield on 10-year government bonds – the month-end yield on 6-month government bonds;

$Regulation_{i,t}$ = 1 if the firm is regulated and 0 otherwise, defined as in Barclay and Smith (1995);

$Aearnings_{i,t}$ = (earnings in year $t+1$ (*Compustat* #20) – earnings in year $t$) / (share price * outstanding shares in year $t$);

$AssetRtnStd_{i,t}$ = the stock return standard deviation during the fiscal year * (market value of equity / market value of assets);

$Rating_{i,t}$ = 1 for rated firms and 0 for nonrated firms.

Other variables are as previously defined.

In this model, the coefficient $\alpha_1$ measures the effect of the change of conservatism on the change of short-term debt. I expect that this coefficient to be negative, suggesting that the firms with higher conservatism are less likely to issue short-term debt.

Following Datta et al. (2005), this paper includes managerial stock ownership ($OWN$) as a control variable and I expect a positive coefficient for $OWN$ since managers with a higher stock ownership are expected to choose a larger proportion of short-term debt for more frequent monitoring (Datta et al. 2005). I also control for the effect of firm leverage ($LEV$) and expect a negative relation between short-term debt and leverage, as predicted by Smith and Watts (1992) and Barclay and Smith (1995). Based on the prediction of Myers (1977). I expect a positive coefficient for the $M/B$ ratio since firms are likely to use short-term debt to minimize their underinvestment problems. I control for asset maturity ($AssetMaturity$) by using the measure adopted in Stohs and Mauer (1996) and Johnson (2003). Following Barclay et al. (2003) and Johnson (2003), I use firm value ($LNFV$) and its square ($LNFV^2$) to control for the effects of credit quality on debt maturity. As predicted as Diamond (1991), I expect a negative coefficient for firm value since larger firms have a higher credit quality and more likely to obtain long-term debt. A positive coefficient is expected for the square term to reflect the possible nonlinear relation as suggested by Diamond (1991). Based on the tax hypothesis proposed by Barclay and Smith (1995), I expect that there is a

negative coefficient for the term structure (*Term*) which I adopt from Datta et al. (2005). Following Barclay and Smith (1995) and Datta et al. (2005), I use a regulation dummy[14] (*Regulation*) as another control variable. I expect a negative coefficient, suggesting that the regulated firms are expected to have more long-debt debt in comparison to the unregulated firms. I also include abnormal earnings (*Aearnings*) as a control variable and expect a positive relation between short-term debt since higher quality firms are expected to subject themselves to more frequent monitoring associated with short-term debt than lower quality firms (Flannery, 1986). Another control variable is asset return standard deviation (*AssetRenStd*) and it is expected to have a positive coefficient since firms with greater volatility may be associated with greater credit risk and be less likely to borrow from long-term debt market (Datta et al., 2005). Rating dummy (*Rating*) is coded as 1 for rated firms and 0 for nonrated firms (Datta et al., 2005). It is expected that the coefficient for *Rating* is negative since the rated firms tend to have higher credit quality and are more likely to borrow long-term debt.

*Empirical model for H2*

[14] Following Barclay and Smith (1995), I classify regulated industries as railroads (SIC code 4011), trucking (4210 and 4213), airlines (4512), telecommunications (4812 and 4813), and gas and electric utilities (4900 to 4939).

To examine whether short-term debt and conservatism act as substitutes in reducing firm's cost of debt as suggested in hypothesis H2, I estimate the following model:

$$\Delta COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{it} + \lambda_2 \Delta Conservatism_{it} + \lambda_3 \Delta Short_{it} * \Delta Conservatism_{it}$$

$$\lambda_4 \Delta LEV_{it} + \lambda_5 \Delta SIZE_{it} + \lambda_6 \Delta ROA_{it} + \lambda_7 \Delta IntCov_{it} + \lambda_8 \Delta \sigma(NIBE)_{it} + \lambda_9 \Delta AQ_{it} + \xi_{it} \quad (5)$$

where

$ROA_{it}$ = the return on assets of firm $i$ in year $t$, calculated as the ratio of net income (*Compustat* #172) to average total assets;

$IntCov_{it}$ = the firm $i$'s ratio of operating income (*Compustat* #13) to interest expense in year $t$;

$\sigma(NIBE)_{it}$ = the standard deviation of firm $i$'s net income before extraordinary items ( *NIBE* ), scaled by average assets, over the rolling prior five years. I require that at least five observations to calculate the standard deviation;

$AQ_{it}$ = accrual quality computed based on the residuals of total current accruals estimated by the following model:

$$TCA_{it} = \chi_{0i} + \chi_{1j} CFO_{it-1} + \chi_{2j} CFO_{it} + \chi_{3j} CFO_{it+1} + \chi_{4j} \Delta Sales_{it} + \chi_{5j} PPE_{it} + \nu_{it} \quad (6)$$

I estimate Equation (6) for each of the 48 Fama and French (1997) industry groups with at least 20 firms in year $t$. The subscript $i$ denotes a firm and $j$ denotes the industry. For each cross-sectional annual regression, the firm $i$ is assumed to be in the particular industry $j$. $TCA_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STDEBT_{it})$ where $\Delta CA_{it} =$ change in the current assets of firm $i$ between year $t-1$ and year $t$ (*Compustat* #4), $\Delta Cash_{it} =$ change in the cash balance of firm $i$ between year $t-1$ and year $t$ (*Compustat* #1), $\Delta Cl_{it} =$ change in current liabilities of firm $i$ between year $t-1$ and year $t$ (*Compustat* #5) and $\Delta STDEBT_{it} =$ change in the short-term debt included in the current liabilities of firm $i$ between year $t-1$ and year $t$ (*Compustat* #34). $CFO_{it} = NIBE_{it} - TACC_{it} =$ Operating cash flow of firm $i$ in year $t$, $NIBE_{it} =$ Net income before extraordinary items of the firm $i$ in fiscal year end $t$ (*Compustat* #18), $TACC_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STDEBT_{it}) - DEPN_{it} =$ Total accruals of firm $i$ in year $t$ and $DEPN_{it} =$ Depreciation and amortization expense of firm $i$ in year $t$ (*Compustat* #14). $\Delta Sales_{it} =$ Change in the revenues of firm $i$ between year $t-1$ and

year $t$ (*Compustat* #12) and $PPE_{it}$ = Gross value of PPE of firm $i$ in year $t$ (*Compustat* #7). All variables are scaled by average assets. Annual cross-sectional estimation of equation (6) yields firm- and year-specific residuals of total current accruals, which form the basis for the accrual quality metric: $AQ_{it} = \sigma(v_i)_t$ is the standard deviation of firm $i$'s residuals, $v_{it}$, calculated over years $t-4$ through year $t$.

Other variables are as previously defined.

I use the change specification of this model to control for possible endogeneity problem. All variables are calculated as the difference between the values in the end of year $t$ minus the values in the end of year $t-1$. Prior literature documents that short-term debt helps to resolve the agency conflicts between the shareholders and the bondholders and is associated with a lower agency cost of monitoring (Easterbrook, 1984; Datta et al. 2000). However, several papers show that short-term debt is associated with more costs, such as liquidation cost, flotation costs, and other costs associated with frequent debt issuance (Diamond 1991, 1993; Sharpe, 1991; Datta et al. 2005). Hence, there is no expectation on the coefficient $\lambda_1$.

The coefficient $\lambda_2$ is expected to be negative, indicating that an increase in the conservatism of financial reports helps to reduce the firm's cost of debt, as documented by Ahmed et al. (2002) and Zhang (2008). Most importantly, if there is a substitutive effects between short-term debt and accounting conservatism in reducing the firm's cost of debt, the coefficient $\lambda_3$ should be positive. This implies that the *COD* -reducing-effects of short-term debt / accounting conservatism are mitigated by accounting conservatism / short-term debt.

In addition, following Kaplan and Urwitz (1979) and Palepu et al. (2000), this model includes control variables as firm size ( *SIZE* ), financial leverage ( *LEV* ), return on asset ( *ROA* ), interest coverage ( *IntCov* ), and earnings volatility ( $\sigma(NIBE)$ ). As predicted by Francis et al. (2005), a firm's cost of debt is positively associated with financial leverage and earnings volatility and is negatively associated with firm size, return on asset and interest coverage. I also include accrual quality ( *AQ* ) in the model and expect the coefficient to be positive, suggesting that firms with a higher reporting quality (lower *AQ* ) are associated with lower cost of debt.

Alternatively, I adopt another model to test Hypothesis H2, which assumes that short-term debt and accounting conservatism act as substitutes in reducing the firm's cost of debt. In order to test the substitutive effects, I firstly examine the effects of short-term debt / accounting conservatism on a firm's cost of debt independently. Then after partitioning the whole sample into a below- and an above-median accounting conservatism / short-term debt sub-samples, I again examine the effects of the change in short-term debt / accounting conservatism on the change of a firm's cost of debt. The cost of debt models which examine the effects of the change in short-term debt and accounting conservatism on the change of the firm's cost of debt, respectively, are as follows:

$$\begin{aligned}
&\Delta COD_{it} = \kappa_0 + \kappa_1 \Delta Short_{it} + \kappa_2 \Delta LEV_{it} + \kappa_3 \Delta SIZE_{it} + \kappa_4 \Delta ROA_{it} + \kappa_5 \Delta IntCov_{it} \\
&+ \kappa_6 \Delta\sigma(NIBE)_{it} + \kappa_7 \Delta AQ_{it} + \vartheta_{it} \\
&\Delta COD_{it} = \rho_0 + \rho_1 \Delta Conservatism_{it} + \rho_2 \Delta LEV_{it} + \rho_3 \Delta SIZE_{it} + \rho_4 \Delta ROA_{it} \\
&+ \rho_5 \Delta IntCov_{it} + \rho_6 \Delta\sigma(NIBE)_{it} + \rho_7 \Delta AQ_{it} + \zeta_{it}
\end{aligned} \tag{7}$$

Based on the previous arguments, there is no expectation for the coefficient $\kappa_1$. The coefficient $\rho_1$ is expected to be negative (Easterbrook, 1984; Datta et al.

2000; Ahmed et al. 2002; Zhang, 2008). If there are substitutive effects between short-term debt and accounting conservatism in reducing the firms' cost of debt, the *COD*-reducing-effects of short-term debt / accounting conservatism should be less pronounced in the above-median sub-sample of accounting conservatism / short-term debt.

# Chapter 4 Empirical results

## 4.1 Descriptive statistics

Panel A of Table 2 reports the descriptive statistics for the full sample, and Panel B shows variables definitions and data sources. The percentage of debt that matures in less than three years in our sample has a mean of 0.368 and a median of 0.308, which is comparable to Datta et al. (2005) in that the percentage of debt that matures in more than three years has a mean and median of 0.609 and 0.679. The conservatism measure *Conservatism* has a mean and median of 0.074 and 0.063, respectively in my sample, comparable to the mean and median of the C_score of 0.093 and 0.082, respectively in Khan and Watts (2009). The mean *COD* is 0.076 (median=0.073), which is comparable to the magnitude reported in Francis et al. (2005) (mean=0.099 and median=0.092).

**[Insert Table 2 here]**

The explanatory variables are grouped into common explanatory variables, explanatory variables for the short-term debt equation, for the conservatism

equation, and for the cost of debt equation. The average firm $SIZE$ is 7.078 (median is 6.999). The average leverage of my sample firm is 0.266 (median=0.271) and the average $M/B$ is 2.618 (median=2.105). The mean of stock ownership by the top 5 executives is 0.037 (median=0.007), which is consistent with LaFond and Roychowdhury (2008), both in magnitude and in skewness (mean=0.045 and median=0.009).

Turning to the explanatory variables for the short-term equation, the asset maturity has a mean of 12.338 (median=8.617), which is similar to the magnitude and skewness shown in Datta et al. (2005). Eleven percent of the sample firms are regulated firms and 56.8 percent of the firms are rated firms. The term structure of the sample is averaged at 1.5 percent (median=0.013), comparable to that reported in Datta et al. (2005). In addition, the average abnormal earnings of the full sample is 0.446 (median=0.720) and the average asset return standard deviation is 0.062 (median=0.051).

There are four explanatory variables for the conservatism equation. About 20.3 percent of the firms are in litigious industries and 12.5 percent of the firms

reported losses. The total accruals have an average of -0.040 and the standard deviation of the monthly stock returns in the previous three years has an average of 0.107, which are both consistent with Callen et al. (2009).

With respect to the explanatory variables for the cost of debt equation, return on asset has mean of 0.045 (median=0.047); interest coverage is averaged at 14.719 (median=7.208); the volatility of net income before extraordinary items has a mean of 0.032 (median=0.023); and accruals quality shows a mean of 0.053 (median=0.034), which are comparable to Francis et al. (2005), with the exception that the mean *ROA* is higher but with a similar median value.

Panel A of Table 3 shows the Pearson correlations of the variables used to analyze the model of short-term debt. There is no significant correlation between the short-term debt and the conservatism measure. Short-term debt is significantly and positively correlated with managerial ownership, market to book ratio, and asset return standard deviation, and negatively correlated with leverage, asset maturity, firm value, regulation dummy, and rating dummy, consistent with Datta et al. (2005). The correlation between short-term debt and term structure, or

abnormal earnings is not significant.

**[Insert Table 3 here]**

Panel B of Table 3 reports the correlation matrix for variables used in the conservatism equation. It is shown that conservatism is negatively correlated with firm size, market to book ratio, and total accruals and is positively correlated with firm leverage, loss firms, and standard deviation of stock return, which are largely consistent with the findings of the prior literature (LaFond and Roychowdhury, 2008; Callen et al., 2009), except those between conservatism and managerial ownership or litigious industries.

Panel C of Table 3 shows the Pearson correlation for the variables used in the cost of debt model. It is shown that the cost of debt is significantly and negatively correlated with conservatism, firm size, firm leverage, and return on asset and is positively correlated with the standard deviation of net income before extraordinary items. These are consistent with previous studies on the relation between cost of debt and conservatism (Ahmed et al. 2002) and on the relation between cost of debt and some firm specific variables (Francis et al. 2005). The

correlation between cost of debt and interest coverage is negative but not significant. The correlation between cost of debt and $AQ$ is negative, which is in contrast with Francis et al. (2005).

## 4.2 Regression results

### 4.2.1 Regression results for H1

Table 4 reports the results of estimating equation (4). The coefficient for $\Delta Conservatism$ is significant and negative (coefficient=-0.195, *t-stat*=-3.81) in the short-term debt models. The results are consistent with my expectation which suggests that the change of conservatism in financial reporting directly influence the change of short-term debt after controlling for the other determinants of debt maturity.

**[Insert Table 4 here]**

The coefficients for $\Delta LNFV^2$ (coefficient=0.012, *t-stat*=4.81) and $\Delta AssetRtnStd$ (coefficient=0.278, *t-stat*=3.82) are significant and positive, which is consistent with the findings of previous studies such as Myers (1977), Barclay

et al., (2003), and Datta et al., (2005), Besides, the results show that the coefficients for $\Delta LEV$ (coefficient=0.126, *t-stat*=-4.70) and $\Delta LNFV$ (coefficient=-0.232, *t-stat*=-6.10) are significant and negative, consistent with the prior literature (for example, Smith and Watts, 1992; Johnson, 2003). The exception is *Regulation* , with the coefficient of which (coefficient=0.012, *t-stat*=1.78) is significantly positive which is not as predicted in Barclay and Smith (1995) or Datta et al. (2005). The results indicate that the change of firm leverage, firm value and asset return standard deviation directly influence the change of short-term debt.

### 4.2.2 Regression results for H2

*The effects of interaction between short-term debt and conservatism on cost of debt*

To examine whether short-term debt and conservatism serve as substitutes in reducing a firm's cost of debt in a cost-effective way, I test equation (5). If on one hand, the documented negative relation between short-term debt and conservatism is a result of the managerial cost-effective choice among the two costly monitoring mechanisms, I expect a positive relation between the change of cost of

debt and the interaction term of the change of short-term debt and the change of conservatism. If on the other hand, the negative association between short-term debt and accounting conservatism is driven by the managerial opportunistic choice in order to avoid the costly renegotiation of short-term debt violation. There should be no substitutive effects on a firm's cost of debt between the two. Table 5 reports the results of estimating equation (5).

**[Insert Table 5 here]**

The regression results of table 5 show that $\Delta COD$ is significantly and negatively associated with $\Delta Short$ (Coefficient=-0.003, *t-stat=-3.05*), indicating that an increase in short-term debt reduces the agency cost of debt, as predicted by Easterbrook (1984), Datta et al. (2000), Stulz (2000), and others. Besides, the regression results show that $\Delta COD$ is significantly and negatively associated with $\Delta Conservatism$ (Coefficient=-0.019, *t-stat*=-3.40), indicating that conservatism serves as an effective monitoring mechanism and an increase in conservatism benefits the lenders by lowering the cost of debt. The results are consistent with previous studies such as Ahmed et al. (2002) and Zhang (2008). More importantly, the coefficient for the interaction term between short-term debt

and conservatism is significant and positive (coefficient=0.031, *t-stat*=1.97). The results suggest that there are substitutive effects between short-term debt and conservatism in reducing the firm's cost of debt.

In addition, $\Delta COD$ is negatively associated with $\Delta LEV$ (Coefficient=-0.031, *t-stat*=-8.85) and $\Delta IntCov$ (Coefficient=-0.001, *t-stat*=-12.44) and is positively associated with $\Delta\sigma(NIBE)$ (Coefficient=0.043, *t-stat*=3.04), consistent with the prior literature. The coefficient estimates for $\Delta SIZE$, $\Delta ROA$ and $\Delta AQ$ have the predicted sign, but they are not significant at any conventional level. Theses results indicate that the increase of firm leverage, the increase of the interest coverage and the decrease of the earnings volatility help to decrease the firm's cost of debt.

*Partition in below- and above-conservatism / short-term debt analysis*

I also adopt another approach to examine whether short-term debt and conservatism serves as substitute in reducing a firm's cost of debt. First, I examine the effects of short-term debt on a firm's cost of debt and partition the sample into a below- and an above- median conservatism sub-samples. The regression results

are shown in Table 6. Second, I examine the effects of conservatism on the firm's cost of debt and portion the sample into a below- and an above-median short-term debt sub-samples and the regression results are presented in Table 7.

**[Insert Table 6 and Table 7 here]**

In Table 6, the regression results in the below-median conservatism sub-sample show that $\Delta COD$ is negatively associated with $\Delta Short$ (coefficient=-0.026, *t-stat*=-3.12), which is consistent with the argument that short-term debt helps to monitor agency conflicts and to lower the firm's cost of debt. However, I find that the coefficient of $\Delta Short$ is not significantly different from zero (coefficient=-0.012, *t-stat*=-1.51) when the regression model is conducted in above-median conservatism sub-sample. Of the control variables, $\Delta LEV$ have significant coefficients for the below-median conservatism sub-sample (coefficient=-0.022, *t-stat*=-4.56) and for the above-median conservatism sub-sample (coefficient=-0.043, *t-stat*=-8.00). The coefficients for $\Delta IntCov$ are significant in both sub-samples (coefficient=-0.001, *t-stat*=-8.41; coefficient=-0.001, *t-stat*=-9.35, respectively). $\Delta\sigma(NIBE)$ only has significant coefficient in the above-median conservatism sub-sample (coefficient=0.068,

*t-stat*=3.54).

Similarly, Table 7 shows $\Delta COD$ is negatively associated with $\Delta Conservatism$ (coefficient=-0.005, *t-stat*=-3.55) in the sub-sample of below-median short-term debt. In contrast, in the above-median short-term debt sub-sample, there is no significant relation between $\Delta COD$ and $\Delta Conservatism$ (coefficient=-0.001, *t-stat*=-0.78). $\Delta LEV$ have significant coefficients for the below-median short-term sub-sample (coefficient=-0.041, *t-stat*=-7.91) and for the above-median short-term sub-sample (coefficient=-0.024, *t-stat*=-4.97). The coefficient for $\Delta SIZE$ is significantly positive (coefficient=0.004, *t-stat*=2.95) in the below-median short-term sub-sample and significantly negative (coefficient=-0.005, *t-stat*=-3.58) in the above-median short-term sub-sample. The coefficients for $\Delta IntCov$ are significant in both sub-samples (coefficient=-0.001, *t-stat*=-9.08; coefficient=-0.001, *t-stat*=-8.45, respectively). $\Delta\sigma(NIBE)$ only has significant coefficient in the below-median short-term sub-sample (coefficient=0.075, *t-stat*=3.46).

Taken together, these results indicate that short-term debt and conservatism in

financial reporting serve as substitutes in reducing a firm's cost of debt. The documented negative relation between short-term debt and conservatism is more likely to be a result of the firm's choice of the two costly monitoring mechanisms to reduce its agency conflict between shareholders and debtholders, rather than as the result of the opportunistic reduction in conservatism to avoid the costly renegotiation of possible short-term debt violation as suggested by Gupta et al., (2008).

### 4.2.3 Additional test

In this paper, I expect a negative relation between short-term debt and accounting conservatism. Empirical evidence shows that firms with a higher degree of accounting conservatism are less likely to issue more short-term debt. Alternatively, it is expected that the firms with more short-term debt are less likely to adopt a conservative accounting policy. The following model examines how the change of short-term debt will affect the change in the degree of conservatism.

$$\Delta Conservatism_{i,t} = \beta_0 + \beta_1 \Delta Short_{i,t} + \beta_2 \Delta OWN_{i,t} + \beta_3 \Delta LEV_{i,t} + \beta_4 \Delta M / B_{i,t} + \beta_5 \Delta SIZE_{i,t} + \beta_6 LIT_{i,t} + \beta_7 \Delta TACC_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 \Delta StdRet_{i,t} + \varepsilon_{i,t} \quad (8)$$

where

$LIT_{i,t}$ = 1 if a firm is in a litigious industry and 0 otherwise (Litigious industry is defined as in Francis et al. (1994): firms with four-digit industry codes of 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374);

$TACC_{i,t}$ = total accruals of firm $i$ at fiscal year end $t$;

$LOSS_{i,t}$ = 1 if the firm reports a negative income before extraordinary items and 0 otherwise;

$StdRet_{i,t}$ = standard deviation of the firm's monthly stock returns in the previous three years.

Other variables are previously defined.

The coefficient $\beta_1$ measures the effect of the change of short-term debt on the change of accounting conservatism. I expect that the coefficient $\beta_1$ to be negative in support of the hypothesis that firms with more short-term debt are less likely to adopt a more conservative accounting policy. Following LaFond and Roychowdhury (2008), this model includes the managerial stock ownership ($OWN$) to control for the relation between the firm's managerial ownership and the asymmetric timeliness of earnings. It is expected to be negative since higher

managerial ownership is associated with less severe agency problems, which in turn decreases the demand for conservatism. As predicted by LaFond and Roychowdhury (2008), I include the $M/B$ variable in the model to control for the effects of the firm's investment opportunity set on conservatism. The coefficient is expected to be negative. I also control for the firm's leverage ($LEV$) on the debtholders' demands for conservatism and expect the coefficient to be positive (LaFond and Roychowdhury, 2008). Firm size ($SIZE$) is included in the model as it is likely that the size of the firm is negatively associated with asymmetric timeliness (Givoly et al., 2007; LaFond and Watts, 2008). As suggested by Basu (1997) and Watts (2003), greater litigation risk provides managers higher incentives to recognize bad news early than good news, so I include a litigation dummy variable ($LIT$) coded 1 for the firms in the litigious industry and 0 otherwise[15]. Following Callen et al. (2009), the other control variables include total accruals ($TACC$), the incidence of losses ($LOSS$), and stock return volatility ($StdRet$). Watts (2003) argue that conservatism is positively correlated with the asymmetric information in equity contracts, measured by return volatility by Callen et al., (2009). A positive relation is expected between

[15] Francis et al. (1994) identify litigious industry as SIC codes of 2833-2836, 3570-3577, 7370-7374, 3600-3674, and 5200-5961.

conservatism and stock return volatility. Callen et al. (2009) also argue that firms that have high incidence of losses are likely to be more conservative. Therefore, I expect the coefficient for $LOSS$ to be positive. In addition, Ball and Shivakumar (2006) and Givoly et al., (2007) argue that conservatism is manifested primarily in negative accruals, hence, it is expected that conservatism should be negatively associated with the firm's total accruals.

Table 8 reports the estimates for equation (8). The regression results show that the coefficient for $\Delta Short$ is significant and negative (Coefficient=-0.006, *t-stat*=-2.41) in the model of accounting conservatism, which supports my hypothesis that an increase in short-term debt leads to less conservative reporting after controlling for other variables that may influence the firm's conservatism policy.

**[Insert Table 8 here]**

The coefficient for $\Delta SIZE$ (coefficient=-0.002, *t-stat*=-1.60) is marginally significant and negative, which is consistent with LaFond and Roychowdhury (2008) and Callen et al. (2009). In addition, as predicted in Callen et al., (2009),

the coefficients for *LOSS* (coefficient=0.010, *t-stat*=8.02) and $\Delta StdRet$ (coefficient=0.201, *t-stat*=9.46) are significantly positive. These regression results indicate that the change of conservatism in financial reporting is affected by the change of firm size, whether the firms report loss and the volatility of the stock returns.

## 4.3 Sensitivity checks

### 4.3.1 Sensitivity check for the first hypothesis

*Alternative measure for firm specific conservatism*

To mitigate the measure error problem for firm specific conservatism, this study employs alternative conservatism measure, named conservatism ratio ( *CR* ), which is developed by Callen et al., (2009). The details and derivation of the conservatism ratio are discussed in the Appendix. I estimate equation (4) by replacing *Conservatism* with *CR* to re-examine the relation between short-term debt and conservatism. The results are presented in Table 9.

**[Insert Table 9 here]**

The regression results in Table 9 show that there is a negative but not significant

relation between the change of short-term debt and the change of conservatism ratio (coefficient=-0.021, *t-stat*=-1.42). I also find that the coefficients of the control variables, such as firm leverage (coefficient=-0.224, *t-stat*=-4.89), firm size (coefficient=-0.285, *t-stat*=-5.89) and its square value (coefficient=0.015, *t-stat*=4.89), and asset return standard deviation (coefficient=0.501, *t-stat*=5.14), are generally significant with the predicted signs.

*The effect of short-term debt on Basu (1997) model*

In this paper, I mainly focus on the firm-specific conservatism measures. In addition, I also include a short-term debt in the Basu (1997) model to examine whether short-term debt will delay the recognition of bad news but not of good news. Such a result will imply that short-term debt reduces conservatism. The regression model is developed as the following equation and the results are shown in Table 10.

$$X_{i,t} = \theta_1 + \theta_2 D_{i,t} + \theta_3 R_{i,t} + \theta_4 Short_{i,t} + \theta_5 D_{i,t} R_{i,t} + \theta_6 D_{i,t} Short_{i,t} + \theta_7 R_{i,t} Short_{i,t} + \theta_8 D_{i,t} R_{i,t} Short_{i,t} + \upsilon_{i,t} \quad (9)$$

where all variables are as previously defined.

**[Insert Table 10 here]**

The results of Table 10 show that the coefficient of *DRShort* is significant and negative (coefficient=-0.043, *t-stat*=-2.08), which suggests that short-term debt has a negative effect on the timeliness of recognizing bad news. This is consistent with my main findings. In addition, the coefficients estimate of the variables *R* (coefficient=0.072, *t-stat*=10.56) and *DR* (coefficient=0.261, *t-stat*=19.79) are positive and significant, which are consistent with those reported in Basu (1997).

*Alternative measure for short-term debt*

The choice of three years in my analysis to measure short-term debt is arbitrary (Barclay and Smith, 1995). Following Gupta et al. (2008), I repeat the analysis using the ratio of debt in current liabilities to total debt ($STD/TD$) as the proxy for the short-term debt variable to check the robustness of my results. The regression models are the same as equation (4). The results are shown in Table 11.

**[Insert Table 11 here]**

Table 11 shows that $\Delta STD/TD$ is significantly and negatively affected by $\Delta Conservatism$ after controlling for other determinants (coefficient=-0.079,

*t-stat*=-2.42). The control variables, the change of firm leverage (coefficient=0.108, *t-stat*=-6.32), firm value (coefficient=-0.079, *t-stat*=-3.24) and its square (coefficient=0.004, *t-stat*=2.58), and asset return standard deviation (coefficient=0.140, *t-stat*=3.01) are all significant with the predicted signs. These results provide further evidence to support my main findings.

*Control for outliers and non-linearities*

To control for outliers and non-linearities, I use a decile rank of the change of all variables (excluding dummies) to re-examine my analysis regarding the relation between short-term debt and conservatism. I re-estimate equation (4)[16] by replacing all raw values of the variables with the corresponding decile rank for the particular year. The results are shown as Table 12.

**[Insert Table 12 here]**

The regression results of Table 12 show that the change of short-term debt is significantly and negatively associated with the change of conservatism (coefficient=-0.029, *t-stat*=-1.83) which supports my findings about the effect of

[16] The variable $\Delta LNFV^2$ is excluded from the decile ranking model since the model includes the rank of $\Delta LNFV$.

conservatism on short-term debt. The control variables, firm leverage (coefficient=-0.058, *t-stat*=-5.26), firm value (coefficient=-0.048, t-stat=-4.02) and rating dummy (coefficient=-0.121, *t-stat*=-1.89) are significant with the predicted sign. However, the regulation dummy variable (coefficient=0.223, *t-stat*=2.28) is not consistent with those results reported previously.

*Inclusion of credit risk variables*

Debt maturity decision is known to be a nonlinear function of credit quality (Diamond, 1991). On one hand, high-credit quality firms prefer short-term debt for lower borrowing costs. On the other hand, low-credit quality firms are not able to borrow long-term debt although they prefer to long-term debt since the borrowing cost can be locked in by long-term debt. These high credit risk firms are forced to borrow short-term debt. To control for the credit risk variables, I include interest coverage ratio and current ratio[17] in equation (4) and the results are shown as Table 13.

**[Insert Table 13 here]**

[17] Interest coverage ratio is computed as earnings before interest expense and tax expense divided by interest expense. Current ratio is computed as current assets divided by current liabilities.

Table 13 shows that the coefficient of the change of conservatism is significantly negative (coefficient=-0.206, *t-stat*=-4.03), which is consistent with my findings about the relation between short term debt and conservatism.

*Inclusion of credit rating score*

In order to control the effect of credit quality rather than the presence of credit rating, I include the numerically converted credit rating score[18] in equation (4) and re-estimate the regression. The results are shown in Table 14.

**[Insert Table 14 here]**

The results of Table 14 show that the change of short term debt is negatively associated with the change of conservatism (coefficient=-0.076, *t-stat*=-2.15), suggesting that my finding about the negative relation between short-term debt and conservatism remains unchanged.

*Simultaneous equation model*

Given that both short term debt and conservatism are influenced by a firm decision, the endogeneity issue is likely to arise. To address this problem, I use

[18] The credit rating score is described in Appendix III.

simultaneous equation model with two-stage least squares (2SLS) design. In the first stage, I estimate regressions of short-term debt/conservatism on different sets of relatively well know variables (which can be used as instruments). In the second stage, I re-estimate equation (4)/ equation (8) using the predicted value of short term debt /conservatism from the first stage estimation. The results are shown in Table 15 and Table 16.

**[Insert Table 15 and Table 16 here]**

The results of Table 15 show that the change of short-term debt is negatively associated with the change of predicted value of conservatism (coefficient=-0.407, *t-stat*=-3.05). Table 16 shows that the change of conservatism is negatively associated with the change of predicted value of short-term debt (coefficient=-0.059, *t-stat*=-4.94). These results suggest that after controlling the simultaneous determination problem, the negative relation between short-term debt and conservatism still holds.

### 4.3.2 Sensitivity check for the second hypothesis

*Fama-MacBeth regressions*

To control for cross-sectional correlations, I assess the significance of the 13 annual regression results using the time-series standard errors of the estimated coefficients. The Fama-MacBeth regression results are shown as Table 17 and they are qualitatively similar to those reported in Table 5. Overall, the results support the argument that there are substitutive effects between short-term debt and conservatism in reducing the firm's cost of debt.

**[Insert Table 17 here]**

*Control for heteroscedasticity and autocorrelation*

My estimation procedure uses the pooled time-series and cross-sectional regressions to the extent that there are autocorrelation problems. The estimates are not efficient and may be inconsistent. To control for these problems, I assess the statistical inference using the Newey-West (1987) standard errors with three lags[19]. The results are shown in Table 18 and they are similar in all respects to the main results.

**[Insert Table 18 here]**

The regression results of Table 18 generally support my previous findings except

[19] Following Newey-West (1987), three lags best match our sample size.

that the coefficient for the interaction between short-term debt and conservatism is not significant for the two-tailed tests (coefficient=0.031, *t-stat*=1.30)[20].

*Causality tests of cost of debt model*

In this paper, I argue that the increase of short-term debt / conservatism benefits borrowers by lowering the cost of debt, so I expect that the short-term debt / conservatism change will lead to changes in the firm's cost of debt. To conduct this test I incorporate the change in the short-term debt / conservatism at different time intervals, *t-1*, *t*, and *t+1* into equation (7) as follows:

$$COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{i(t+x)} + \lambda_2 Short_{i(t+x-1)} + \lambda_3 LEV_{it} + \lambda_4 SIZE_{it} + \lambda_5 ROA_{it} +$$

$$\lambda_6 IntCov_{it} + \lambda_7 \sigma(NIBE)_{it} + \lambda_8 AQ_{it} + \xi_{it}$$

$$COD_{it} = \lambda_0 + \lambda_1 \Delta Conservatism_{i(t+x)} + \lambda_2 Conservatism_{i(t+x-1)} + \lambda_3 LEV_{it} + \lambda_4 SIZE_{it} + \quad (10)$$

$$\lambda_5 ROA_{it} + \lambda_6 IntCov_{it} + \lambda_7 \sigma(NIBE)_{it} + \lambda_8 AQ_{it} + \xi_{it}$$

where $\Delta Short_{i(t+x)}$ and $\Delta Conservatism_{i(t+x)}$ equal the change in the short-term debt / conservatism over the period from the year *t+x-1* to year *t+x*, where x equals one of the following: -1, 0, 1. All other variables are as previously defined. Table 19 presents the results. For the sake of brevity, I only tabulate the estimation

[20] However, the coefficient is significant at the 10% for the one-tailed test.

results for main variables.

**[Insert Table 19 here]**

Panel A of Table 19 reports the estimation results of the effects of short-term debt on the firm's cost of debt. The coefficient on $\Delta Short_{it}$ is significant and negative when x=-1 and x=0 (coefficient=-0.005, *t-stat*=-3.84 and coefficient=-0.004, *t-stat*=-2.84, respectively), suggesting that both the previous year and contemporaneous increases in the level of short-term debt are associated with a decreased cost of debt. The coefficient on $\Delta Short_{it}$ is not significant when x=+1 (coefficient=-0.001, *t-stat*=-1.08), indicating that there is no relation between the future change of short-term debt and the change of conservatism. Overall the results support the notion that the increase of the short-term debt leads to the decrease of the cost of debt, but not vice versa.

Panel B of Table 19 presents of the estimation results of the effects of the change of conservatism on the change of cost of debt. When x=-1, the coefficient on $\Delta Conservatism_{i(t-1)}$ is significant and negative (coefficient=-0.027, *t-stat*=-4.74), indicating that increases in conservatism in the previous year are associated with a

decrease in the cost of debt in the contemporaneous year. Similarly, when x=0, the coefficient on $\Delta Conservatism_{it}$ is significantly negative (coefficient=-0.015, *t-stat*=-2.79), suggesting that a contemporaneous increase in the degree of conservatism is associated with a contemporaneous decrease in the cost of debt. When x=+1, the coefficient on $\Delta Conservatism_{i(t+1)}$ is positive (coefficient=0.005, *t-stat*=1.07) which suggests that there is no relation between the future change of conservatism and the change in the cost of debt. In all, these results show that an increase in conservatism leads to a decrease in the cost of debt, but not vice versa.

*Alternative measure of cost of debt*

To address the measurement error problem of cost of debt, I use the numerically converted credit rating score as another proxy for cost of debt and re-examine the equation (5). I use the level-based regression instead of change regression because credit rating scores for most of firms remain unchanged from year to year. Since credit rating score is discrete dependent variable, I use an ordered logistic model to re-estimate the substitutive effect of short-term debt and conservatism on firms' cost of debt. The regression results are shown as Table 20.

**[Insert Table 20 here]**

The regression results from Table 20 show that firms' credit rating is negatively associated with short-term debt (coefficient=-0.480, *t-stat*=-8.73) and the firms' credit rating is positively associated with the interaction term between short-term debt and conservatism (coefficient=6.082, *t-stat*=12.16). However, the regression results show that firms' credit rating is not related to conservatism although the coefficient is negative (coefficient=-0.027, t-stat=-0.64). Overall, the results show that the findings about the substitutive effect between short-term debt and conservatism on firms' cost of debt become weak if cost of debt is proxied by credit rating[21].

### 4.3.3 Sensitivity check for both hypotheses

*Levels-based regression with fixed effect model*

The changes regression employed is powerful to address potential problems associated with correlated omitted variables and to alleviate possible endogeneity issues to some extent. To address these problems, I also use the levels-based regression with fixed effect to re-examine hypothesis H1 and hypothesis H2. Table 21 shows the regression results for H1 and Table 22 shows the regression

[21] The possible reason is that firms with credit rating are those with public debt financing, which excluding the effect in firms with private bank loan only.

results for H2.

**[Insert Table 21 and Table 22 here]**

The regression results from Table 21 show that my findings about the relation between short-term debt and conservatism remain unchanged with fixed effect model (coefficient=-0.366, *t-stat*=-5.21). However, Table 22 shows that there is no relation between the joint effect of short-term debt and conservatism on firms' cost of debt (coefficient of interaction term=0.003, *t-stat*=0.70).

*Levels-based regression with lagged test variable*

Similarly, I also use the levels-based regression with lagged test variable to re-examine hypothesis H1 as shown in Table 23 and hypothesis H2 as shown in Table 24.

**[Insert Table 23 and Table 24 here]**

The results of Table 23 show that short-term debt is negatively associated with conservatism (coefficient=-0.415, *t-stat*=-6.19), suggesting that this result is qualitatively similar to my findings. However, based on Table 24, there is no significant relation between the joint effect of short-term debt and conservatism

on firms' cost of debt (coefficient=0.022, *t-stat*=0.82), suggesting that levels-based regression with lagged value of cost of debt provides weaker results compared to changes-based regression.

*Partition analysis for regression of short-term debt*

The hypothesis on the relation between short-term debt and accounting conservatism depends on the level of conflicts of interest between shareholders and debtholders. Hence, the hypothesized relation is likely to be more pronounced in situation when agency problem is more severe. I partition the whole sample into two sub-samples based on the credit rating score. The conflicts of interest between shareholders and debtholders are likely to be more severe in the below-median credit rating score (higher credit risk) sub-sample than those in the above-median credit rating score (lower credit risk) sub-sample. The partition analysis for regression of short-term debt is shown in Table 25.

**[Insert Table 25 here]**

The results from Table 25 show that the relation between the change of short-term debt and the change of conservatism is significantly negative (coefficient=-0.292,

*t-stat*=-3.50) in below-median credit rating score sub-sample. However, there is no relation (coefficient=0.193, *t-stat*=0.21) between the change of short-term debt and the change of conservatism in above-median credit rating score sub-sample. The results show that the negative relation between short-term debt and conservatism only exists in higher credit risk firms, which is consistent with my expectation.

*Partition analysis for regression of cost of debt*

I also run partition analysis for regression model of cost of debt and re-examine the substitutive effect between short-term debt and conservatism on firms' cost of debt in the two sub-samples. The regression results are shown in Table 26.

**[Insert Table 26 here]**

The results of Table 26 show that in high credit risk firms, the change of firms' cost of debt is negatively associated (insignificant) with the change of short-term debt (coefficient=-0.003, *t-stat*=-1.53), negatively associated (insignificant) with the change of conservatism (coefficient=-0.012, *t-stat*=-1.46), and positively associated with the interaction term between the change of short-term debt and the

change of conservatism (coefficient=0.073, *t-stat*=3.02). However, in low credit risk firms, the change of cost of debt is negatively associated with the change of short-term debt (coefficient=-0.006, *t-stat*=-3.59), negatively associated with the change of conservatism (coefficient=-0.021, *t-stat*=-2.53), but not related with the interaction term between the change of short-term debt and the change of conservatism (coefficient=-0.028, *t-stat*=-1.16). To sum up, the substitutive effect between short-term debt and conservatism on firms' cost of debt only exists in those firms with high credit risk, which is consistent with my expectation.

# Chapter 5 Conclusions

## 5.1 Summary

In this study, I examine the relation between the firm's short-term debt and conservatism. As the two monitoring mechanisms to resolve the agency conflicts between the borrowers and the lenders, short-term debt and conservatism play a significant role in reducing the firm's agency cost of debt. However, little has been studied about how firms trade-off among different monitoring mechanisms to resolve agency problem and how these mechanisms interact and serve as complements and / or substitutes for each other. In order to advance this literature, this study attempts to examine the relation between two monitoring mechanisms, short-term debt and conservatism, and also examine the interactive effects of the two mechanisms on a firm's cost of debt.

I propose that the interests of bondholders are better protected in firms with higher levels of short-term debt, which results in a lower demand for conservatism in their financial reports. This is consistent with the interpretation that managers make a cost-effective choice between the two agency-problem-reduction

mechanisms. The findings show that there is a significantly negative relation between the change of short-term debt and the change of conservatism in financial reports. The negative relation is robust for alternative measures of short-term debt and firm-specific conservatism. However, firms with more short-term debt tend to suffer from high liquidation risk and are unlikely to choose conservative accounting. This is consistent with another interpretation that managers tend to opportunistically manage earnings to delay the recognition of bad news in the presence of short-term debt.

To detangle the two explanations, I further show that there are substitutive effects between short-term debt and conservatism in reducing a firm's cost of debt. This suggests that managers choose among the two costly monitoring mechanisms in a cost-effective way. In conclusion, this study sheds light on: (1) the firm's choice of two monitoring mechanisms to reduce the agency conflict between shareholders and debtholders; (2) the negative relation between short-term debt and conservatism, as suggested by Gupta et al., (2008), is more likely a result of the firm's rational cost-effective choice rather than an opportunistic choice made by managers; (3) the effects of short-term debt / conservatism on cost of debt,

which complements earlier studies.

## 5.2 Limitations and future research

This study is subject to some limitations. First, I acknowledge that there is no generally accepted firm-year measure for conservatism in financial reports, and thus my measures of conservatism might be subject to measurement errors. The C-score suggested by Khan and Watts (2009) is a function of the firm specific characteristics: firm size, market to book ratio and firm leverage. Hence, the empirical results estimated based on the C-score are potentially driven by these firm-specific characteristics. To address this problem, I use the conservatism ratio suggested by Callent et al., (2009) as an alternative measure of accounting conservatism. Consistent results suggest that my findings based on the C-score are unlikely to be driven by the measurement errors of the conservatism measures. I also estimate the pooled Basu (1997) model to test hypothesis H1. Consistent results from the Basu model further validate my findings with the other two firm-year measures of conservatism.

Second, this study focuses on the role of short-term debt and accounting

conservatism on the agency conflicts between the bondholders and the shareholders and assumes that the interests of the managers and the shareholders are aligned. However, short-term debt can effectively monitor managers. Hence it is likely to reduce the free cash flow available to managers and force the managers to focus on value maximization. Additionally, conservatism can reduce the extent of information asymmetry by increasing the speed with which negative information is revealed in the earnings numbers (LaFond and Watts, 2008). Hence, conservatism can play a role in the conflicts between the managers and the shareholders. One possible future research is to examine the interactive effects of the two in the equity capital. I leave these issues for further research.

# Appendix I: C_Score (*Conservatism*)

Khan and Watts (2009) estimate a firm-year measure of accounting conservatism based on Basu (1997) model modified to allow coefficients to vary across firms and over time:

$$X_{i,t} = \beta_{1,t} + \beta_{2,t}D_{i,t} + \beta_{3,i,t}R_{i,t} + \beta_{4,i,t}D_{i,t}R_{i,t} + e_{i,t} \quad (11)$$

where

$X_{i,t}$ = earnings per share for firm $i$ in fiscal year $t$;

$R_{i,t}$ = return on firm $i$ from nine months before fiscal year end $t$ to three months after fiscal year end $t$;

$D_{i,t}$ = 1 if $R_{i,t}$ <0, =0 otherwise.

Based on equation (11), Khan and Watts (2009) point out that the firm-year good news timeliness measure is $\beta_{3,i,t}$, and that the measure of incremental timeliness for bad news over good news (firm-year conservatism) is $\beta_{4,i,t}$.

Watts (2003) suggests that there are four main explanations of the demand for conservatism in financial reporting: contracts, litigation, taxation and regulation.

Khan and Watts (2009) argue that these four factors vary with the firm's investment opportunity set as proxied by a set of firm characteristics: size, market-to-book ratio, and leverage. They specify that both the timeliness of good news and the incremental timeliness of bad news are linear functions of the firm specific characteristics defined as following:

$$GS \equiv \beta_{3,i,t} = \mu_{1,t} + \mu_{2,t} Size_{i,t} + \mu_{3,t} M/B_{i,t} + \mu_{4,t} Lev_{i,t}$$
$$CS \equiv \beta_{4,i,t} = \lambda_{1,t} + \lambda_{2,t} Size_{i,t} + \lambda_{3,t} M/B_{i,t} + \lambda_{4,t} Lev_{i,t} \quad (12)$$

where

$GS$ = G_score which is the firm-year measure of good news timeliness;

$CS$ = C_score which is the firm-year measure of conservatism;

$\beta_{3,i,t}, \beta_{4,i,t}$ = coefficients estimate from the estimation of equation (11);

$Size_{i,t}$ = the nature log of market value of equity;

$M/B_{i,t}$ = the market-to-book ratio;

$Lev_{i,t}$ = leverage computed as long-term and short-term debt scaled by market value of equity.

Equation (12) is inserted into regression equation (11), resulting in equation (13). This equation is estimated using annual cross-sectional regressions and the

estimates of coefficients $\lambda_1$ to $\lambda_4$ are derived from the regressions of equation (13).

$$X_{i,t} = \beta_{1,t} + \beta_2 D_{i,t} + R_{i,t}(\mu_1 + \mu_2 Size_{i,t} + \mu_3 M/B_{i,t} + \mu_4 Lev_{i,t}) + D_{i,t}R_{i,t}(\lambda_1 + \lambda_2 Size_{i,t} + \lambda_3 M/B_{i,t} + \lambda_4 Lev_{i,t}) + \varepsilon_{i,t} \quad (13)$$

Then, the estimated coefficients are used to calculate the C_Score using equation (12) to measure firm-year conservatism. Khan and Watts (2009) show that C_Score varies across firms through cross-sectional variation in the firm-year characteristics such as firm size, market-to-book ratio and leverage and that C_Score varies over time through intertemporal variation in intercept and the firm-year characteristics. Higher C_Score represents higher degree of accounting conservatism.

# Appendix II: Conservatism ratio ($CR$)

Callen et al. (2009) develop a firm-year level conservatism based on a log-linear vector autoregressive (VAR) model. The VAR model can be described as a system of equations with three state variables: log stock return, log of one plus return on equity and the log book-to-market ratio:

$$r_t = \alpha_1 r_{t-1} + \alpha_2 roe_{t-1} + \alpha_3 bm_{t-1} + \eta_{1,t} \quad (14)$$

$$roe_t = \beta_1 r_{t-1} + \beta_2 roe_{t-1} + \beta_3 bm_{t-1} + \eta_{2,t} \quad (15)$$

$$bm_t = \delta_1 r_{t-1} + \delta_2 roe_{t-1} + \delta_3 bm_{t-1} + \eta_{3,t} \quad (16)$$

where

$r_t$ = log equity return (cum dividend) in excess of the risk free rate in period t. Annual returns are computed over a period starting 9 months before and ending 3 months after the fiscal year-end. The risk-free rate is the annualized 3-month Treasure bill rate;

$roe_t$ = log of one plus return on equity in period t. Return on equity computed as income before extraordinary items (*Compustat* #18) scaled by the beginning of the period stockholders' equity (*Compustat* #60);

$bm_t$ = log of book-to-market ratio.

Callen et al. (2009) estimate the above equations separately by industry using weighted least squares with one pooled regression per state variable. And they argue that earnings news may be computed as:

$$Ne_t = \Delta Et\sum_{j=0}^{\infty}\rho^j(roe_{t+j} - i_t) = Et\sum_{j=0}^{\infty}\rho^j(roe_{t+j} - i_t) - Et-1\sum_{j=0}^{\infty}(\rho^j(roe_{t+j} - i_t)$$
$$= e2^{'}(I - \rho A)^{-1}\eta_{i,t} \quad (17)$$

where

$\eta_{i,t}$ = residual value from estimation of equation ($i$);

$Ne_t$ = earnings news;

$e2$ = (0,1,0);

$I$ = unit matrix;

$\rho$ = a constant discount rate term, assumed to equal 0.967 following Vuolteenaho (2002), Callen and Segal (2004), Callen et al. (2005) and Callen et al. (2006);

$A$ = matrix of the coefficient estimates from equation (14) to (16).

Callen et al. (2009) define conservatism ratio as the ratio of unexpected current

earnings to total earnings news as the following:

$$CR_t = \eta_{2,t} / Ne_t \quad (18)$$

where

$CR_t$ = Conservatism ratio;

$\eta_{2,t}$ = earnings surprise calculated from equation (15).

This conservatism ratio captures how much of the total earnings shock is incorporated into current period unexpected earnings and larger $CR$ represents higher level of conservatism.

# Appendix III: Numerically converted credit rating score

| Credit Rating | Numerically converted credit rating score |
|---|---|
| AAA | 1 |
| AA+ | 2 |
| AA | 3 |
| AA- | 4 |
| A+ | 5 |
| A | 6 |
| A- | 7 |
| BBB+ | 8 |
| BBB | 9 |
| BBB- | 10 |
| BB+ | 11 |
| BB | 12 |
| BB- | 13 |
| B+ | 14 |

| | |
|---|---|
| B | 15 |
| B- | 16 |
| CCC+ | 17 |
| CCC | 18 |
| CCC- | 19 |
| CC | 20 |
| C | 21 |
| D | 22 |

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**Table 1 Sample description**

Panel A: Yearly distribution of sample firms

| Year | No. of observation |
|---|---|
| 1992 | 601.00 |
| 1993 | 743.00 |
| 1994 | 751.00 |
| 1995 | 820.00 |
| 1996 | 812.00 |
| 1997 | 731.00 |
| 1998 | 750.00 |
| 1999 | 708.00 |
| 2000 | 636.00 |
| 2001 | 682.00 |
| 2002 | 671.00 |
| 2003 | 618.00 |
| 2004 | 668.00 |
| 2005 | 645.00 |
| | 9836 |

Panel B: Distribution of sample firms for Fama and French (1997) 48 industries

| Industry | No. of observations |
|---|---|
| Agriculture | 39 |
| Food products | 264 |
| Candy and soda | 34 |
| Alcoholic beverages | 31 |
| Tobacco products | 3 |
| Recreational products | 68 |
| Entertainment | 137 |
| Printing and publishing | 170 |
| Consumer goods | 184 |
| Apparel | 193 |
| Healthcare | 222 |
| Medical equipment | 219 |
| Pharmaceutical products | 300 |
| Chemicals | 411 |
| Rubber and plastic products | 73 |
| Textiles | 111 |

| | |
|---|---|
| Construction materials | 259 |
| Construction | 77 |
| Steel works, etc | 321 |
| Fabricated products | 44 |
| Electrical equipment | 484 |
| Miscellaneous | 143 |
| Automobiles and trucks | 49 |
| Aircraft | 205 |
| Shipbuilding, railroad eq | 95 |
| Guns | 30 |
| Precious metals | 27 |
| Nonmetallic mining | 42 |
| Coal | 45 |
| Petroleum and natural gas | 16 |
| Utilities | 488 |
| Telecommunications | 1240 |
| Personal services | 185 |
| Business services | 96 |

| | |
|---|---|
| Computers | 561 |
| Electronic equipment | 263 |
| Measuring and control equip | 492 |
| Business supplies | 205 |
| Shipping containers | 299 |
| Transportation | 70 |
| Wholesale | 408 |
| Retail | 443 |
| Restaurants, hotel, motel | 790 |
| Banking | 0 |
| Insurance | 0 |
| Real estate | 0 |
| Trading | 0 |
| | 9836 |

**Table 2 Descriptive statistics over the period 1992-2005**

Panel A: Descriptive statistics

| Variable | Mean | Median | Standard Deviation | Lower Quartile1 | Upper Quartile |
|---|---|---|---|---|---|
| Dependent variables: | | | | | |
| *Short* | 0.368 | 0.308 | 0.275 | 0.152 | 0.529 |
| *Conservatism* | 0.074 | 0.063 | 0.068 | 0.019 | 0.112 |
| $COD_{it}$ | 0.076 | 0.073 | 0.024 | 0.062 | 0.086 |
| Common explanatory variables: | | | | | |
| $SIZE_{it}$ | 7.078 | 6.999 | 1.372 | 6.076 | 8.038 |
| $LEV_{it}$ | 0.266 | 0.271 | 0.143 | 0.161 | 0.364 |
| $M/B_{it}$ | 2.618 | 2.105 | 2.109 | 1.517 | 3.175 |

| | | | | | |
|---|---|---|---|---|---|
| $OWN_{it}$ | 0.037 | 0.007 | 0.072 | 0.003 | 0.031 |
| Variables for short-term debt equation: | | | | | |
| $AssetMaturity_{it}$ | 12.338 | 8.617 | 10.926 | 4.407 | 16.994 |
| $LNFV_{it}$ | 7.747 | 7.670 | 1.368 | 6.729 | 8.721 |
| $LNFV_{it}^{2}$ | 61.901 | 58.829 | 21.605 | 45.292 | 76.059 |
| $Term_{it}$ | 0.015 | 0.013 | 0.012 | 0.004 | 0.027 |
| $Regulation_{it}$ | 0.110 | 0 | 0.312 | 0 | 0 |
| $Aearnings_{it}$ | 0.446 | 0.720 | 9.660 | -1.147 | 2.459 |
| $AssetRtnStd_{it}$ | 0.062 | 0.051 | 0.043 | 0.034 | 0.078 |
| $Rating_{it}$ | 0.568 | 1 | 0.495 | 0 | 1 |
| Variables for conservatism equation: | | | | | |
| $LIT_{it}$ | 0.203 | 0 | 0.420 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| $TACC_{it}$ | -0.040 | -0.042 | 0.065 | -0.073 | -0.012 |
| $LOSS_{it}$ | 0.125 | 0 | 0.331 | 0 | 0 |
| $StdRet_{it}$ | 0.107 | 0.096 | 0.049 | 0.072 | 0.129 |
| Variables for cost of debt equation: | | | | | |
| $ROA_{it}$ | 0.045 | 0.047 | 0.059 | 0.023 | 0.077 |
| $IntCov_{it}$ | 14.719 | 7.208 | 29.223 | 4.402 | 13.555 |
| $\sigma(NIBE)_{it}$ | 0.032 | 0.023 | 0.031 | 0.012 | 0.040 |
| $AQ_{it}$ | 0.053 | 0.034 | 0.071 | 0.019 | 0.057 |

Panel B: Variable definitions and data sources

Dependent variables

*Short* = the percentage of the firm's total debt that has a maturity of less than three years. The firm's total debt is long-term debt (*Compustat* #9)

plus debt in current liabilities (*Compustat* #34).

$Conservatism$ = C_score ($CS$) suggested by Khan and Watts (2009).

$COD_{it}$ = the ratio of firm $i$'s interest expense in year $t$ (*Compustat* #15) to average interest-bearing debt outstanding during years $t$ and $t-1$ (*Compustat* #9 plus *Compustat* #34).

Common explanatory variables:

$SIZE_{it}$ = the nature log of market value of equity;

$LEV_{it}$ = leverage computed as long-term and short-term debt scaled by market value of equity.

$M/B_{it}$ = the market-to-book ratio;

$OWN_{it}$ = the direct stock owned by the top five executives divided by shares outstanding at the fiscal year end;

Variables for short-term debt equation:

$AssetMaturity_{it}$ = (gross property, plant and equipment (*Compustat* #7) / total assets (*Compustat* #6))*(gross property, plant and equipment / depreciation expense (*Compustat* #14)) + (current assets (*Compustat* #4) / total assets) * (currents assets / cost of goods sold (*Compustat* #41));

$LNFV_{it}$ = log value of market value of total assets, computed as (share price (*Compustat* #199) * outstanding shares (*Compustat* #54) + book value of

total assets (*Compustat* #6) – book value of equity (*Compustat* #60);

$LNFV_{it}^{2}$ = the square of $LNFV_{i,t}$;

$Term_{it}$ = measured as the month-end yield on 10-year government bonds – the month-end yield on 6-month government bonds;

$Regulation_{it}$ = 1 if the firm is regulated and 0 otherwise, defined as in Barclay and Smith (1995);

$Aearnings_{it}$ = (earnings in year $t+1$ (*Compustat* #20) – earnings in year $t$) / (share price * outstanding shares in year $t$);

$AssetRtnStd_{it}$ = stock return standard deviation during the fiscal year * (market value of equity / market value of assets);

$Rating_{it}$ = 1 for rated firms and 0 for nonrated firms.

Variables for conservatism equation:

$LIT_{it}$ = 1 if a firm is in a litigious industry and 0 otherwise (Litigious industry is defined in Francis et al. (1994): firms with four-digit industry codes of 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374);

$TACC_{it}$ = total accruals of firm $i$ at fiscal year end $t$;

$LOSS_{it}$ = 1 if the firm reports negative income before extraordinary items and 0 otherwise;

$StdRet_{it}$ = standard deviation of monthly stock returns in the previous three years.

Variables for cost of debt equation:

$ROA_{it}$ = return on assets of firm $i$ in year $t$, calculated as the ratio of net income (*Compustat* #172) to average total assets;

$IntCov_{it}$ = the firm $i$'s ratio of operating income (*Compustat* #13) to interest expense in year $t$;

$\sigma(NIBE)_{it}$ = the standard deviation of firm $i$'s net income before extraordinary items ($NIBE$), scaled by average assets, over the rolling prior five years. I require that at least five observations to calculate the standard deviation;

$AQ_{it}$ = accrual quality computed based on the following model: $TCA_{it} = \chi_{0i} + \chi_{1j} CFO_{it-1} + \chi_{2j} CFO_{it} + \chi_{3j} CFO_{it+1} + \chi_{4j} \Delta Sales_{it} + \chi_{5j} PPE_{it} + \nu_{it}$

I estimate this equation for each of Fama and French's (1997)'s 48 industry groups with at least 20 firms in year $t$. The subscript $i$ denotes a firm and $j$ denotes the industry. For each cross-sectional annual regression, the firm $i$ is assumed to be in the particular industry $j$. $TCA_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STDEBT_{it})$ where $\Delta CA_{it} =$ change in current assets of firm $i$ between year $t-1$ and year $t$ (*Compustat* #4), $\Delta Cash_{it} =$ change in cash balance of firm $i$ between year $t-1$ and year $t$ (*Compustat* #1), $\Delta Cl_{it} =$ change in current liabilities of firm $i$ between year $t-1$ and year $t$ (*Compustat* #5) and $\Delta STDEBT_{it} =$ change in short-term debt included in current liabilities of firm $i$ between year $t-1$ and year $t$ (*Compustat* #34). $CFO_{it} = NIBE_{it} - TACC_{it} =$ Operating

cash flow of firm $i$ in year $t$, $NIBE_{it}$ = Net income before extraordinary items of the firm $i$ in fiscal year end $t$ (*Compustat* #18), $TACC_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STDEBT_{it}) - DEPN_{it}$ = Total accruals of firm $i$ in year $t$ and $DEPN_{it}$ = Depreciation and amortization expense of firm $i$ in year $t$ (*Compustat* #14). $\Delta Sales_{it}$ = Change in revenues of firm $i$ between year $t-1$ and year $t$ (*Compustat* #12) and $PPE_{it}$ = Gross value of PPE of firm $i$ in year $t$ (*Compustat* #7). All variables are scaled by average assets. Annual cross-sectional estimation of the equation yields firm- and year-specific residuals, which form the basis for the accrual quality metric: $AQ_{it} = \sigma(\nu_i)_t$ is the standard deviation of firm $i$'s residuals, $\nu_{it}$, calculated over years $t-4$ through year $t$.

**Table 3 Correlation matrix over the period 1992-2005**

Panel A: Correlation matrix for short-term debt equation

| Variable | *Short* | *Conservatism* | *LEV* | *M / B* | *OWN* | *Asset Maturity* | *LNFV* | *LNFV*$^2$ | *Term* | *Regulation* | *Aearnings* | *Asset RtnStd* | *Rating* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Short* | 1 | | | | | | | | | | | | |
| *Conservatism* | 0.014 | 1 | | | | | | | | | | | |
| *LEV* | -0.272*** | 0.167*** | 1 | | | | | | | | | | |
| *M / B* | 0.025** | -0.034*** | -0.035*** | 1 | | | | | | | | | |
| *OWN* | 0.089*** | 0.073*** | -0.071*** | -0.006 | 1 | | | | | | | | |
| *AssetMaturity* | -0.187*** | -0.006 | 0.274*** | -0.022** | -0.137*** | 1 | | | | | | | |
| *LNFV* | -0.182*** | -0.502*** | 0.185*** | 0.033*** | -0.219*** | 0.179*** | 1 | | | | | | |
| *LNFV*$^2$ | -0.167*** | -0.499*** | 0.178*** | 0.032*** | -0.216*** | 0.174*** | 0.994*** | 1 | | | | | |
| *Term* | 0.008 | 0.195*** | -0.005 | -0.016* | -0.012 | -0.004 | -0.002 | -0.001 | 1 | | | | |
| *Regulation* | -0.117*** | 0.045*** | 0.284*** | -0.023** | -0.148*** | 0.585*** | 0.181*** | 0.179*** | -0.024** | 1 | | | |
| *Aearnings* | -0.001 | 0.003 | -0.020** | -0.007 | -0.002 | 0.005 | -0.133 | -0.011 | 0.042*** | -0.004 | 1 | | |
| *AssetRtnStd* | 0.217*** | 0.045*** | -0.375*** | 0.010 | 0.135*** | -0.344*** | -0.292*** | -0.283*** | -0.078*** | -0.318*** | 0.025** | 1 | |
| *Rating* | -0.177*** | -0.197*** | 0.226*** | 0.010 | -0.143*** | 0.155*** | 0.505*** | 0.494*** | -0.002 | 0.149*** | 0.014 | -0.257*** | 1 |

Panel B: Correlation matrix for conservatism equation

| Variable | *Conservatism* | *SIZE* | *LEV* | *M / B* | *OWN* | *LIT* | *TACC* | *LOSS* | *StdRet* |
|---|---|---|---|---|---|---|---|---|---|
| *Conservatism* | 1 | | | | | | | | |
| *SIZE* | -0.540*** | 1 | | | | | | | |
| *LEV* | 0.167*** | 0.033*** | 1 | | | | | | |
| *M / B* | -0.034*** | 0.057*** | -0.035*** | 1 | | | | | |
| *OWN* | 0.074*** | -0.201*** | -0.071*** | -0.006 | 1 | | | | |
| *LIT* | -0.026*** | 0.027*** | -0.050*** | 0.007 | -0.003 | 1 | | | |
| *TACC* | -0.017* | -0.073*** | -0.078*** | 0.039*** | 0.055*** | -0.018* | 1 | | |
| *LOSS* | 0.166*** | -0.103*** | 0.027*** | -0.010 | -0.032*** | -0.002 | -0.145*** | 1 | |
| *StdRet* | 0.321*** | -0.284*** | -0.125*** | -0.017* | 0.124*** | 0.048*** | -0.019** | 0.311*** | 1 |

Panel C: Correlation matrix for cost of debt equation

| Variable | *COD* | *Short* | *Conservatism* | *SIZE* | *LEV* | *ROA* | *IntCov* | $\sigma(NIBE)$ | *AQ* |
|---|---|---|---|---|---|---|---|---|---|
| *COD* | 1 | | | | | | | | |
| *Short* | 0.009 | 1 | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Conservatism* | -0.038*** | 0.013 | 1 | | | | | | |
| *SIZE* | -0.110*** | -0.206*** | -0.395*** | 1 | | | | | |
| *LEV* | -0.091*** | -0.413*** | 0.213*** | 0.219*** | 1 | | | | |
| *ROA* | -0.036*** | 0.106*** | -0.278*** | -0.074*** | -0.299*** | 1 | | | |
| *IntCov* | -0.001 | 0.178*** | -0.104*** | -0.175*** | -0.436*** | 0.329*** | 1 | | |
| $\sigma(NIBE)$ | 0.088*** | 0.063*** | 0.081*** | -0.220*** | -0.095*** | -0.250*** | 0.048*** | 1 | |
| *AQ* | -0.018* | 0.076*** | 0.129*** | -0.106*** | -0.139*** | -0.066*** | 0.053*** | 0.225*** | 1 |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 4 Regression model of short-term debt**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M/B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^{\ 2} + \alpha_8 \Delta Term_{i,t} + \alpha_9 Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

Dependent Variable: $\Delta Short$

| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
|---|---|---|---|
| *Intercept* | ? | 0.007 | 0.74 |
| $\Delta Conservatism$ | - | -0.195 | -3.81*** |
| $\Delta OWN$ | + | -0.069 | -0.96 |
| $\Delta LEV$ | - | -0.126 | -4.70*** |
| $\Delta MB$ | + | 0.000 | 0.24 |
| $\Delta AssetMaturity$ | - | 0.000 | 0.79 |
| $\Delta LNFV$ | - | -0.232 | -6.10*** |
| $\Delta LNFV^2$ | + | 0.012 | 4.81*** |
| $\Delta Term$ | - | 0.128 | 0.46 |
| *Regulation* | - | 0.012 | 1.78* |
| $\Delta Aearnings$ | + | 0.008 | 0.52 |
| $\Delta AssetRtnStd$ | + | 0.278 | 3.82*** |
| *Rating* | - | -0.006 | -1.25 |
| Year dummies | | Included | |
| N | | 8,625 | |
| Adj. $R^2$ | | 0.021 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 5 The effects of short-term debt, conservatism and their interaction on firm's cost of debt**

$$\Delta COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{it} + \lambda_2 \Delta Conservatism_{it} + \lambda_3 \Delta Short_{it} * \Delta Conservatism_{it}$$
$$\lambda_4 \Delta LEV_{it} + \lambda_5 \Delta SIZE_{it} + \lambda_6 \Delta ROA_{it} + \lambda_7 \Delta IntCov_{it} + \lambda_8 \Delta\sigma(NIBE)_{it} + \lambda_9 \Delta AQ_{it} + \xi_{it}$$

| | | The effect of short-term debt | | The effect of conservatism | | The effect of short-term debt and conservatism | |
|---|---|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat* | OLS Estimate | *t-stat* |
| Intercept | ? | 0.003 | 3.15*** | 0.003 | 3.93*** | 0.003 | 3.84*** |
| $\Delta Short$ | - | -0.003 | -3.05*** | | | -0.003 | -3.02*** |
| $\Delta Conservatism$ | - | | | -0.019 | -3.40*** | -0.019 | -3.32*** |
| $\Delta Short * \Delta Conservatism$ | ? | | | | | 0.031 | 1.97** |
| $\Delta LEV$ | ? | -0.034 | -9.57*** | -0.028 | -8.47*** | -0.031 | -8.85*** |
| $\Delta SIZE$ | - | -0.001 | -0.76 | -0.001 | -0.83 | -0.001 | -0.91 |
| $\Delta ROA$ | - | 0.001 | 0.32 | 0.001 | 0.09 | -0.001 | -0.06 |
| $\Delta IntCov$ | - | -0.001 | -12.27*** | -0.001 | -12.34*** | -0.001 | -12.44*** |
| $\Delta\sigma(NIBE)$ | + | 0.042 | 2.98*** | 0.042 | 2.98*** | 0.043 | 3.04*** |
| $\Delta AQ$ | + | 0.003 | 0.47 | 0.003 | 0.57 | 0.003 | 0.50 |
| Year dummies | | Included | | Included | | Included | |
| N | | 7099 | | 7099 | | 7099 | |
| Adj. $R^2$ | | 0.062 | | 0.063 | | 0.064 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 6 The effects of short-term debt on firm's cost of debt partitioning into below- and above-median conservatism samples**

$$\Delta COD_{it} = \kappa_0 + \kappa_1 \Delta Short_{it} + \kappa_2 \Delta LEV_{it} + \kappa_3 \Delta SIZE_{it} + \kappa_4 \Delta ROA_{it} + \kappa_5 \Delta IntCov_{it} + \kappa_6 \Delta \sigma(NIBE)_{it} + \kappa_7 \Delta AQ_{it} + \vartheta_{it}$$

| | | Below-median conservatism | | Above-median conservatism | |
|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat* |
| Intercept | ? | 0.005 | 4.34*** | 0.001 | 0.80 |
| $\Delta Short$ | - | -0.026 | -3.12*** | -0.012 | -1.51 |
| $\Delta LEV$ | ? | -0.022 | -4.56*** | -0.042 | -8.00*** |
| $\Delta SIZE$ | - | -0.002 | -1.54 | 0.001 | 0.11 |
| $\Delta ROA$ | - | 0.001 | 0.01 | 0.001 | 0.03 |
| $\Delta IntCov$ | - | -0.001 | -8.41*** | -0.001 | -9.35*** |
| $\Delta\sigma(NIBE)$ | + | 0.017 | 0.84 | 0.068 | 3.54*** |
| $\Delta AQ$ | + | 0.012 | 1.55 | -0.008 | -0.99 |
| Year dummies | | Included | | Included | |
| N | | 3557 | | 3541 | |
| Adj. $R^2$ | | 0.058 | | 0.070 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 7 The effects of conservatism on firm's cost of debt partitioning into below- and above-median short-term debt samples**

$$\Delta COD_{it} = \rho_0 + \rho_1 \Delta Conservatism_{it} + \rho_2 \Delta LEV_{it} + \rho_3 \Delta SIZE_{it} + \rho_4 \Delta ROA_{it} + \rho_5 \Delta IntCov_{it} + \rho_6 \Delta \sigma(NIBE)_{it} + \rho_7 \Delta AQ_{it} + \zeta_{it}$$

| | | Below-median short-term debt | | Above-median short-term debt | |
|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat* |
| Intercept | ? | 0.003 | 2.08** | 0.002 | 1.98** |
| $\Delta Conservatism$ | - | -0.005 | -3.55*** | -0.001 | -0.78 |
| $\Delta LEV$ | ? | -0.041 | -7.91*** | -0.024 | -4.97*** |
| $\Delta SIZE$ | - | 0.004 | 2.95*** | -0.005 | -3.58*** |
| $\Delta ROA$ | - | 0.006 | 1.01 | -0.006 | -0.90 |
| $\Delta IntCov$ | - | -0.001 | -9.08*** | -0.001 | -8.45*** |
| $\Delta\sigma(NIBE)$ | + | 0.075 | 3.46*** | 0.013 | 0.66 |
| $\Delta AQ$ | + | 0.002 | 0.21 | 0.006 | 0.72 |
| Year dummies | | Included | | Included | |
| N | | 3532 | | 3566 | |
| Adj. $R^2$ | | 0.074 | | 0.058 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 8 Regression model of conservatism**

$$\Delta Conservatism_{i,t} = \beta_0 + \beta_1 \Delta Short_{i,t} + \beta_2 \Delta OWN_{i,t} + \beta_3 \Delta LEV_{i,t} + \beta_4 \Delta M / B_{i,t} + \beta_5 \Delta SIZE_{i,t} + \beta_6 LIT_{i,t} + \beta_7 \Delta TACC_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 \Delta StdRet_{i,t} + \varepsilon_{i,t}$$

| Dependent Variable: $\Delta Conservatism$ | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.042 | 23.72*** |
| $\Delta Short$ | - | -0.006 | -2.41** |
| $\Delta OWN$ | - | -0.003 | -0.14 |
| $\Delta LEV$ | + | 0.007 | 1.12 |
| $\Delta MB$ | - | 0.000 | 0.79 |
| $\Delta SIZE$ | - | -0.002 | -1.60 |
| *LIT* | + | 0.000 | 0.06 |
| $\Delta TACC$ | - | 0.001 | 0.18 |
| *LOSS* | + | 0.010 | 8.02*** |
| $\Delta StdRet$ | + | 0.201 | 9.46*** |
| Year dummies | | Included | |
| N | | 8,625 | |
| Adj. $R^2$ | | 0.524 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 9 Regression model of short-term debt with alternative measure for conservatism (*CR*)**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta CR_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M / B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^{\ 2} + \alpha_8 \Delta Term_{i,t} + \alpha_9 Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

Dependent Variable: $\Delta Short$

| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
|---|---|---|---|
| *Intercept* | ? | 0.007 | 1.38 |
| $\Delta CR$ | - | -0.021 | -1.42 |
| $\Delta OWN$ | + | 0.054 | 0.53 |
| $\Delta LEV$ | - | -0.224 | -4.89*** |
| $\Delta MB$ | + | -0.001 | -0.54 |
| $\Delta AssetMaturity$ | - | 0.001 | 0.87 |
| $\Delta LNFV$ | - | -0.285 | -5.89*** |
| $\Delta LNFV^2$ | + | 0.015 | 4.89*** |
| $\Delta Term$ | - | 0.007 | 0.03 |
| *Regulation* | - | 0.012 | 1.13 |
| $\Delta Aearnings$ | + | 0.010 | 1.36 |
| $\Delta AssetRtnStd$ | + | 0.501 | 5.14*** |
| *Rating* | - | -0.005 | -0.80 |
| Year dummies | | Included | |
| N | | 7,308 | |
| Adj. $R^2$ | | 0.013 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 10 The effect of short-term debt on conservatism measured by Basu (1997)'s model over the period 1973-2007**

$$X_{i,t} = \theta_1 + \theta_2 D_{i,t} + \theta_3 R_{i,t} + \theta_4 Short_{i,t} + \theta_5 D_{i,t} R_{i,t} + \theta_6 D_{i,t} Short_{i,t} + \theta_7 R_{i,t} Short_{i,t} + \theta_8 D_{i,t} R_{i,t} Short_{i,t} + \upsilon_{i,t}$$

| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
|---|---|---|---|
| Intercept | + | 0.170 | 59.31*** |
| *D* | ? | -0.006 | -1.25 |
| *R* | + | 0.072 | 10.56*** |
| *Short* | ? | -0.076 | -14.39*** |
| *DR* | + | 0.261 | 19.79*** |
| *DShort* | ? | -0.018 | -2.28** |
| *RShort* | ? | -0.015 | -1.29 |
| *DRShort* | - | -0.043 | -2.08** |
| N | | 79,779 | |
| Adj. $R^2$ | | 0.124 | |

Variables

| | | |
|---|---|---|
| $X_{i,t}$ | = | earnings per share for firm $i$ in fiscal year $t$; |
| $R_{i,t}$ | = | return on firm $i$ from 9 months before fiscal year end $t$ to three months after fiscal year end $t$; |
| $D_{i,t}$ | = | 1 if $R_{i,t}$ <0, =0 otherwise. |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 11 Regression model of short-term debt with alternative measure of short-term debt ( $STD/TD$ )**

$$\Delta STD/TD_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M/B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^{\ 2} + \alpha_8 \Delta Term_{i,t} + \alpha_9 Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

| Dependent Variable: | $\Delta STD/TD$ | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.013 | 2.09** |
| $\Delta Conservatism$ | - | -0.079 | -2.42** |
| $\Delta OWN$ | + | -0.106 | -2.28** |
| $\Delta LEV$ | - | -0.108 | -6.32*** |
| $\Delta MB$ | + | 0.000 | 0.30 |
| $\Delta AssetMaturity$ | - | -0.001 | -1.59 |
| $\Delta LNFV$ | - | -0.079 | -3.24*** |
| $\Delta LNFV^2$ | + | 0.004 | 2.58** |
| $\Delta Term$ | - | 0.236 | 1.32 |
| *Regulation* | - | 0.006 | 1.38 |
| $\Delta Aearnings$ | + | 0.010 | 1.09 |
| $\Delta AssetRtnStd$ | + | 0.140 | 3.01*** |
| *Rating* | - | -0.004 | -1.43 |
| Year dummies | | Included | |
| N | | 8,625 | |
| Adj. $R^2$ | | 0.013 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 12 Regression model of short-term debt using decile rank of all variables (except dummy variables)**

$$Rank\_\Delta Short_{i,t} = \alpha_0 + \alpha_1 Rank\_\Delta Conservatism_{i,t} + \alpha_2 Rank\_\Delta OWN_{i,t} + \alpha_3 Rank\_\Delta LEV_{i,t} + \alpha_4 Rank\_\Delta M/B_{i,t} + \alpha_5 Rank\_\Delta AssetMaturity_{i,t} + \alpha_6 Rank\_\Delta LNFV_{i,t} + \alpha_7 Rank\_\Delta Term_{i,t} + \alpha_8 Regulation_{i,t} + \alpha_9 Rank\_\Delta Aearnings_{i,t} + \alpha_{10} Rank\_\Delta AssetRtnStd_{i,t} + \alpha_{11} Rating_{i,t} + e_{i,t}$$

Dependent Variable: *Rank _ ΔShort*

| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
|---|---|---|---|
| *Intercept* | ? | 4.984 | 22.57*** |
| *Rank _ ΔConservatism* | - | -0.029 | -1.83* |
| *Rank _ ΔOWN* | + | -0.009 | -0.84 |
| *Rank _ ΔLEV* | - | -0.058 | -5.26*** |
| *Rank _ ΔMB* | + | 0.005 | 0.45 |
| *Rank _ ΔAssetMaturity* | - | 0.012 | 1.12 |
| *Rank _ ΔLNFV* | - | -0.048 | -4.02*** |
| *Rank _ ΔTerm* | - | -0.001 | -0.04 |
| *Regulation* | - | 0.223 | 2.28** |
| *Rank _ ΔAearnings* | + | -0.008 | -0.72 |
| *Rank _ ΔAssetRtnStd* | + | 0.018 | 1.60 |
| *Rating* | - | -0.121 | -1.89* |
| Year dummies | | Included | |
| N | | 8,625 | |
| Adj. $R^2$ | | 0.015 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 13 Regression model of short-term debt including credit risk variables**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M/B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^2 + \alpha_8 \Delta Term_{i,t} + \alpha_9 \Delta Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + \alpha_{13} \Delta CurrentRatio_{i,t} + \alpha_{14} \Delta IntCoverRatio_{i,t} + e_{i,t}$$

| Dependent Variable: $\Delta Short$ | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.003 | 0.28 |
| $\Delta Conservatism$ | - | -0.206*** | -4.03 |
| $\Delta OWN$ | + | -0.084 | -1.16 |
| $\Delta LEV$ | - | -0.147*** | -5.49 |
| $\Delta MB$ | + | 0.001 | 0.91 |
| $\Delta AssetMaturity$ | - | -0.001 | -0.35 |
| $\Delta LNFV$ | - | -0.249*** | -6.49 |
| $\Delta LNFV^2$ | + | 0.013*** | 5.18 |
| $\Delta Term$ | - | -0.019 | -0.07 |
| *Regulation* | - | 0.012* | 1.88 |
| $\Delta Aearnings$ | + | 0.010 | 0.68 |
| $\Delta AssetRtnStd$ | + | 0.330*** | 4.46 |
| *Rating* | - | -0.004 | -0.99 |
| $\Delta CurrentRatio$ | - | -0.042*** | -4.68 |
| $\Delta IntCoverRatio$ | - | -0.001 | -0.68 |
| Year dummies | | Included | |
| N | | 8,445 | |
| Adj. $R^2$ | | 0.045 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 14 Regression model of short-term debt including credit rating score**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M/B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^2 + \alpha_8 \Delta Term_{i,t} + \alpha_9 \Delta \mathrm{Re}\, gulation_{i,t} \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} \Delta CreditRating_{i,t} + e_{i,t}$$

| Dependent Variable: $\Delta Short$ | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | -0.009 | -0.80 |
| $\Delta Conservatism$ | - | -0.076** | -2.15 |
| $\Delta OWN$ | + | -0.047 | -0.46 |
| $\Delta LEV$ | - | -0.110*** | -4.65 |
| $\Delta MB$ | + | 0.001 | 0.35 |
| $\Delta AssetMaturity$ | - | -0.001 | -0.52 |
| $\Delta LNFV$ | - | -0.265*** | -4.11 |
| $\Delta LNFV^2$ | + | 0.015*** | 3.87 |
| $\Delta Term$ | - | -0.130 | -0.40 |
| *Regulation* | - | 0.008 | 1.12 |
| $\Delta Aearnings$ | + | 0.024 | 1.42 |
| $\Delta AssetRtnStd$ | + | 0.019 | 0.18 |
| $\Delta CreditRating$ | + | 0.008 | 0.95 |
| Year dummies | | Included | |
| N | | 5,171 | |
| Adj. $R^2$ | | 0.025 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 15 Regression model of short-term debt using simultaneous equation model**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservati\ sm^{*}_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M / B_{i,t} + \alpha_5 \Delta AssetMatur\ ity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV^{2}_{i,t} + \alpha_8 \Delta Term_{i,t} + \alpha_9 \Delta \mathrm{Re}\ gulation_{i,t} \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnSt\ d_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

| Dependent Variable: *Short* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| Intercept | ? | 1.465*** | 17.99 |
| *Conservatism** | - | -0.407*** | -3.05 |
| *OWN* | + | 0.114*** | 3.06 |
| *LEV* | - | -0.323*** | -12.56 |
| *MB* | + | 0.001** | 2.20 |
| *AssetMaturity* | - | -0.003*** | -9.23 |
| *LNFV* | - | -0.231*** | -11.98 |
| $LNFV^2$ | + | 0.013*** | 11.01 |
| *TERM* | - | 0.739 | 0.89 |
| *REGULATION* | - | -0.055 | -0.62 |
| *AEARNINGS* | + | -0.018 | -0.94 |
| *AssetRtnStd* | + | 0.500*** | 7.19 |
| *Rating* | - | -0.027*** | -4.36 |
| *Year dummies* | | Included | |
| N | | 9,998 | |
| Adj. $R^2$ | | 0.124 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 16 Regression model of conservatism using simultaneous equation model**

$$\Delta Conservati\ sm_{i,t} = \beta_0 + \beta_1 \Delta Short^{*}_{i,t} + \beta_2 \Delta OWN_{i,t} + \beta_3 \Delta LEV_{i,t} + \beta_4 \Delta M / B_{i,t} + \beta_5 \Delta SIZE_{i,t} + \beta_6 LIT_{i,t} + \beta_7 \Delta TACC_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 \Delta Std\ \mathrm{Re}\, t_{i,t} + \varepsilon_{i,t}$$

| Dependent Variable: *Conservatism* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.215*** | 27.56 |
| *Short** | - | -0.059*** | -4.94 |
| *OWN* | - | -0.022*** | -2.66 |
| *LEV* | + | 0.068*** | 9.72 |
| *MB* | - | 0.001 | 1.36 |
| *SIZE* | - | -0.025*** | -23.34 |
| *LIT* | + | -0.006 | -0.85 |
| *TACC* | - | -0.021** | -2.47 |
| *LOSS* | + | 0.008*** | 4.51 |
| *StdRet* | + | 0.297*** | 21.95 |
| Year dummies | | Included | |
| N | | 9,998 | |
| Adj. $R^2$ | | 0.355 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 17 Fama-Macbeth regression results on the effects of short-term debt, conservatism and their interaction on firm's cost of debt**

$$\Delta COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{it} + \lambda_2 \Delta Conservatism_{it} + \lambda_3 \Delta Short_{it} * \Delta Conservatism_{it}$$
$$\lambda_4 \Delta LEV_{it} + \lambda_5 \Delta SIZE_{it} + \lambda_6 \Delta ROA_{it} + \lambda_7 \Delta IntCov_{it} + \lambda_8 \Delta\sigma(NIBE)_{it} + \lambda_9 \Delta AQ_{it} + \xi_{it}$$

| | | The effect of short-term debt | | The effect of conservatism | | The effect of short-term debt and conservatism | |
|---|---|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat* | OLS Estimate | *t-stat* |
| Intercept | ? | -0.002 | -2.099** | -0.002 | -1.802* | -0.002 | -1.847* |
| $\Delta Short$ | - | -0.004 | -2.511*** | | | -0.005 | -2.535*** |
| $\Delta Conservatism$ | - | | | -0.011 | -2.756*** | -0.010 | -2.831*** |
| $\Delta Short * \Delta Conservatism$ | ? | | | | | 0.034 | 1.850* |
| $\Delta LEV$ | ? | -0.041 | -5.871*** | -0.036 | -5.845*** | -0.040 | -5.644*** |
| $\Delta SIZE$ | - | 0.001 | 0.307 | 0.001 | 0.511 | 0.001 | 0.456 |
| $\Delta ROA$ | - | 0.003 | 0.383 | 0.002 | 0.352 | 0.001 | 0.205 |
| $\Delta IntCov$ | - | -0.001 | -4.757*** | -0.001 | -4.740*** | -0.001 | -4.851*** |
| $\Delta\sigma(NIBE)$ | + | 0.037 | 1.499 | 0.038 | 1.514 | 0.041 | 1.573 |
| $\Delta AQ$ | + | 0.003 | 0.162 | 0.005 | 0.262 | 0.001 | 0.077 |
| Year dummies | | Included | | Included | | Included | |
| N | | 7099 | | 7099 | | 7099 | |
| Adj. $R^2$ | | 0.073 | | 0.075 | | 0.080 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 18 Regression results with Newey-West standard errors on the effects of short-term debt, conservatism and their interaction on firm's cost of debt**

$$\Delta COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{it} + \lambda_2 \Delta Conservatism_{it} + \lambda_3 \Delta Short_{it} * \Delta Conservatism_{it}$$
$$\lambda_4 \Delta LEV_{it} + \lambda_5 \Delta SIZE_{it} + \lambda_6 \Delta ROA_{it} + \lambda_7 \Delta IntCov_{it} + \lambda_8 \Delta \sigma(NIBE)_{it} + \lambda_9 \Delta AQ_{it} + \xi_{it}$$

| | | The effect of short-term debt | | The effect of conservatism | | The effect of short-term debt and conservatism | |
|---|---|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat* | OLS Estimate | *t-stat* |
| Intercept | ? | 0.003 | 2.90*** | 0.003 | 3.43*** | 0.003 | 3.37*** |
| $\Delta Short$ | - | -0.003 | -2.35*** | | | -0.003 | -2.36*** |
| $\Delta Conservatism$ | - | | | -0.019 | -2.84*** | -0.019 | -2.74*** |
| $\Delta Short * \Delta Conservatism$ | ? | | | | | 0.031 | 1.30 |
| $\Delta LEV$ | ? | -0.034 | -6.50*** | -0.028 | -5.69*** | -0.031 | -6.03*** |
| $\Delta SIZE$ | - | -0.001 | -0.42 | -0.001 | -0.47 | -0.001 | -0.51 |
| $\Delta ROA$ | - | 0.001 | 0.24 | 0.001 | 0.07 | -0.001 | -0.04 |
| $\Delta IntCov$ | - | -0.001 | -4.18*** | -0.001 | -4.25*** | -0.001 | -4.29*** |
| $\Delta \sigma(NIBE)$ | + | 0.042 | 2.08*** | 0.042 | 2.09** | 0.043 | 2.13*** |
| $\Delta AQ$ | + | 0.003 | 0.32 | 0.003 | 0.39 | 0.003 | 0.34 |
| Year dummies | | Included | | Included | | Included | |
| N | | 7099 | | 7099 | | 7099 | |
| Adj. $R^2$ | | 0.062 | | 0.063 | | 0.064 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 19 Changes in short-term debt/conservatism analysis controlling for beginning of change period short-term debt/conservatism**

$$COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{i(t+x)} + \lambda_2 Short_{i(t+x-1)} + \lambda_3 LEV_{it} + \lambda_4 SIZE_{it} + \lambda_5 ROA_{it} + \lambda_6 IntCov_{it} + \lambda_7 \sigma(NIBE)_{it} + \lambda_8 AQ_{it} + \xi_{it}$$

$$COD_{it} = \lambda_0 + \lambda_1 \Delta Conservatism_{i(t+x)} + \lambda_2 Conservatism_{i(t+x-1)} + \lambda_3 LEV_{it} + \lambda_4 SIZE_{it} + \lambda_5 ROA_{it} + \lambda_6 IntCov_{it} + \lambda_7 \sigma(NIBE)_{it} + \lambda_8 AQ_{it} + \xi_{it}$$

Panel A: Changes in short-term debt analysis controlling for beginning of change period short-term debt

| Change Period | X=-1 | | X=0 | | X=+1 | |
|---|---|---|---|---|---|---|
| | Coefficient | *t-stat* | Coefficient | *t-stat* | Coefficient | *t-stat* |
| Intercept | 0.096 | 41.18*** | 0.098 | 45.77*** | 0.097 | 45.93*** |
| $\Delta Short_{i(t+x)}$ | -0.005 | -3.84*** | -0.004 | -2.84*** | -0.001 | -1.08 |
| $Short_{i(t+x-1)}$ | -0.006 | -4.30*** | -0.007 | -5.28*** | -0.006 | -4.70 |
| Control Variables | | | | | | |

Panel B: Changes in conservatism analysis controlling for beginning of change period conservatism

| Change Period | X=-1 | | X=0 | | X=+1 | |
|---|---|---|---|---|---|---|
| | Coefficient | *t-stat* | Coefficient | *t-stat* | Coefficient | *t-stat* |
| Intercept | 0.106 | 42.39*** | 0.105 | 45.18*** | 0.102 | 45.13*** |
| $\Delta Conservatism_{i(t+x)}$ | -0.027 | -4.74*** | -0.015 | -2.79*** | 0.005 | 1.07 |
| $Conservatism_{i(t+x-1)}$ | -0.062 | -10.70*** | -0.051 | -9.18*** | -0.041 | -7.54*** |
| Control Variables | | | | | | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 20 The effects of short-term debt, conservatism and their interaction on firm's credit rating**

$$CreditRating_{i,t} = \lambda_0 + \lambda_1 Short_{i,t} + \lambda_2 Conservatism_{i,t} + \lambda_3 Short_{i,t} * Conservatism_{i,t} + \lambda_4 LEV_{i,t} + \lambda_5 SIZE_{i,t} + \lambda_6 ROA_{i,t} + \lambda_7 IntCov_{i,t} + \lambda_8 \sigma(NIBE)_{i,t} + \lambda_9 AQ_{i,t} + \xi_{i,t}$$

| Dependent Variable: *CreditRating* | | | |
|---|---|---|---|
| Variables | Predicted Sign | Ordered Logit Estimate | *t-stat.* |
| *Intercept* | ? | 5.468*** | 49.46 |
| *Short* | - | -0.480*** | -8.73 |
| *Conservatism* | - | -0.027 | -0.64 |
| *Short*Conservatism* | ? | 6.082*** | 12.16 |
| *LEV* | ? | 2.121*** | 20.26 |
| *SIZE* | - | -0.216*** | -20.32 |
| *ROA* | - | -2.488*** | -11.48 |
| *IntCov* | - | -0.007*** | -5.72 |
| *Std(NIBE)* | + | 8.327*** | 21.54 |
| *AQ* | + | 1.194*** | 7.04 |
| Year dummies | | Included | |
| N | | 5,324 | |
| Adj. $R^2$ | | 0.450 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 21 Regression of short-term debt with firm fixed effect**

$$Short_{i,t} = \alpha_0 + \alpha_1 Conservatism_{i,t} + \alpha_2 OWN_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 M/B_{i,t} + \alpha_5 AssetMaturity_{i,t} + \alpha_6 LNFV_{i,t} + \alpha_7 LNFV_{i,t}^2 + \alpha_8 Term_{i,t} + \alpha_9 \text{Re}\,gulation_{i,t} \alpha_{10} Aearnings_{i,t} + \alpha_{11} AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

| Dependent Variable: *Short* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| Intercept | ? | 1.442*** | 5.78 |
| *Conservatism* | - | -0.366*** | -5.21 |
| *OWN* | + | 0.009 | 0.12 |
| *LEV* | - | -0.229*** | -7.71 |
| *MB* | + | -0.002 | -0.96 |
| *AssetMaturity* | - | 0.001 | 0.42 |
| *LNFV* | - | -0.294*** | -9.20 |
| $LNFV^2$ | + | 0.015*** | 7.61 |
| *TERM* | - | -0.237 | -0.61 |
| *REGULATION* | - | 0.055 | 0.18 |
| *AEARNINGS* | + | -0.019 | -0.77 |
| *AssetRtnStd* | + | 0.181* | 1.77 |
| *Rating* | - | 0.168 | 0.56 |
| *Firm dummies* | | Included | |
| *Year dummies* | | Included | |
| N | | 9,998 | |
| Adj. $R^2$ | | 0.497 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 22 Regression of cost of debt with firm fixed effect**

$$COD_{i,t} = \lambda_0 + \lambda_1 Short_{i,t} + \lambda_2 Conservatism_{i,t} + \lambda_3 Short_{i,t} * Conservatism_{i,t} + \lambda_4 LEV_{i,t} + \lambda_5 SIZE_{i,t} + \lambda_6 ROA_{i,t} + \lambda_7 IntCov_{i,t} + \lambda_8 \sigma(NIBE)_{i,t} + \lambda_9 AQ_{i,t} + \xi_{i,t}$$

| Dependent Variable: *COD* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.077*** | 4.23 |
| *Short* | - | -0.004*** | -3.16 |
| *Conservatism* | - | -0.021 | -1.52 |
| *Short*Conservatism* | ? | 0.003 | 0.70 |
| *LEV* | ? | -0.036*** | -10.63 |
| *SIZE* | - | -0.002*** | -2.65 |
| *ROA* | - | -0.002 | -0.43 |
| *IntCov* | - | -0.001*** | -6.33 |
| *Std(NIBE)* | + | 0.063*** | 5.39 |
| *AQ* | + | 0.002 | 0.44 |
| Firm dummies | | Included | |
| Year dummies | | Included | |
| N | | 8,556 | |
| Adj. $R^2$ | | 0.586 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 23 Regression of short-term debt with lagged value of short-term debt**

$$Short_{i,t} = \alpha_0 + \alpha_1 Conservatism_{i,t} + \alpha_2 Lag(Short_{i,t}) + \alpha_3 OWN_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 M/B_{i,t} + \alpha_6 AssetMaturity_{i,t} + \alpha_7 LNFV_{i,t} + \alpha_8 LNFV_{i,t}^2 + \alpha_9 Term_{i,t} + \alpha_{10} \text{Re}\, gulation_{i,t} \alpha_{11} Aearnings_{i,t} + \alpha_{12} AssetRtnStd_{i,t} + \alpha_{13} Rating_{i,t} + e_{i,t}$$

| Dependent Variable: *Short* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| Intercept | ? | 0.899*** | 11.26 |
| *Conservatism* | - | -0.415*** | -6.19 |
| *Lag(Short)* | ? | 0.508*** | 53.72 |
| *OWN* | + | 0.001 | 0.05 |
| *LEV* | - | -0.144*** | -6.81 |
| *MB* | + | 0.002* | 1.76 |
| *AssetMaturity* | - | -0.002*** | -4.21 |
| *LNFV* | - | -0.143*** | -7.63 |
| $LNFV^2$ | + | 0.007*** | 6.55 |
| *TERM* | - | 0.185 | 0.34 |
| *REGULATION* | - | 0.038 | 1.01 |
| *AEARNINGS* | + | -0.018 | -0.72 |
| *AssetRtnStd* | + | 0.017 | 0.22 |
| *Rating* | - | -0.017*** | -2.89 |
| *Year dummies* | | Included | |
| N | | 8,625 | |
| Adj. $R^2$ | | 0.346 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 24 Regression of cost of debt with lagged value of cost of debt**

$$COD_{i,t} = \lambda_0 + \lambda_1 Short_{i,t} + \lambda_2 Conservatism_{i,t} + \lambda_3 Short_{i,t} * Conservatism_{i,t} + \lambda_4 Lag(COD_{i,t}) + \lambda_5 LEV_{i,t} + \lambda_6 SIZE_{i,t} + \lambda_7 ROA_{i,t} + \lambda_8 IntCov_{i,t} + \lambda_9 \sigma(NIBE)_{i,t} + \lambda_{10} AQ_{i,t} + \xi_{i,t}$$

| Dependent Variable: *COD* | | | |
|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.032*** | 12.73 |
| *Short* | - | -0.001 | -1.06 |
| *Conservatism* | - | -0.028 | -1.25 |
| *Short*Conservatism* | ? | 0.022 | 0.82 |
| *Lag(COD)* | ? | 0.596*** | 63.31 |
| *LEV* | ? | -0.162*** | -7.34 |
| *SIZE* | - | -0.001 | -0.67 |
| *ROA* | - | -0.016*** | -3.50 |
| *IntCov* | - | -0.001*** | -2.58 |
| *Std(NIBE)* | + | 0.021*** | 2.66 |
| *AQ* | + | 0.007** | 2.28 |
| Year dummies | | Included | |
| N | | 7,099 | |
| Adj. $R^2$ | | 0.442 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 25 Partition analysis for regression of short-term debt**

$$\Delta Short_{i,t} = \alpha_0 + \alpha_1 \Delta Conservatism_{i,t} + \alpha_2 \Delta OWN_{i,t} + \alpha_3 \Delta LEV_{i,t} + \alpha_4 \Delta M / B_{i,t} + \alpha_5 \Delta AssetMaturity_{i,t} + \alpha_6 \Delta LNFV_{i,t} + \alpha_7 \Delta LNFV_{i,t}^{2} + \alpha_8 \Delta Term_{i,t} + \alpha_9 Regulation_{i,t} + \alpha_{10} \Delta Aearnings_{i,t} + \alpha_{11} \Delta AssetRtnStd_{i,t} + \alpha_{12} Rating_{i,t} + e_{i,t}$$

Dependent Variable: Δ*Short*

| | | High credit risk firms | | Low credit risk firms | |
|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat.* |
| *Intercept* | ? | 0.022 | 1.20 | -0.211 | -1.48 |
| Δ*Conservatism* | ? | -0.292*** | -3.50 | 0.193 | 0.21 |
| Δ*OWN* | + | 0.041 | 0.34 | -0.211 | -1.48 |
| Δ*LEV* | - | -0.048 | -1.09 | -0.277*** | -5.09 |
| Δ*MB* | + | -0.001 | -0.54 | 0.001 | 0.34 |
| Δ*AssetMaturity* | - | -0.001 | -0.08 | 0.001 | 1.22 |
| Δ*LNFV* | - | -0.437*** | -5.32 | -0.034 | -0.27 |

| | | | | | |
|---|---|---|---|---|---|
| $\Delta LNFV^2$ | + | 0.024*** | 4.54 | 0.004 | 0.50 |
| $\Delta Term$ | - | 0.702 | 1.48 | -0.342 | -0.74 |
| *Regulation* | - | 0.012 | 0.88 | 0.007 | 0.90 |
| $\Delta Aearnings$ | + | 0.034* | 1.73 | -0.009 | -0.24 |
| $\Delta AssetRtnStd$ | + | 0.263* | 1.84 | -0.448** | -2.84 |
| *Rating* | - | -0.005 | -0.56 | 0.001 | 0.05 |
| Year dummies | | Included | | Included | |
| N | | 2,583 | | 2,829 | |
| Adj. $R^2$ | | 0.0343 | | 0.041 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.

**Table 26 Partition analysis for regression of cost of debt**

$$\Delta COD_{it} = \lambda_0 + \lambda_1 \Delta Short_{it} + \lambda_2 \Delta Conservatism_{it} + \lambda_3 \Delta Short_{it} * \Delta Conservatism_{it}$$
$$\lambda_4 \Delta LEV_{it} + \lambda_5 \Delta SIZE_{it} + \lambda_6 \Delta ROA_{it} + \lambda_7 \Delta IntCov_{it} + \lambda_8 \Delta \sigma(NIBE)_{it} + \lambda_9 \Delta AQ_{it} + \xi_{it}$$

Dependent Variable: *COD*

| | | High credit risk firms | | Low credit risk firms | |
|---|---|---|---|---|---|
| Variables | Predicted Sign | OLS Estimate | *t-stat.* | OLS Estimate | *t-stat.* |
| Intercept | ? | 0.002 | 1.61 | 0.003*** | 2.84 |
| Δ*Short* | - | -0.003 | -1.53 | -0.006*** | -3.59 |
| Δ*Conservatism* | - | -0.012 | -1.46 | -0.021** | -2.53 |
| Δ*Short** Δ*Conservatism* | ? | 0.073*** | 3.02 | -0.028 | -1.16 |
| Δ*LEV* | ? | -0.017*** | -3.18 | -0.026*** | -4.36 |
| Δ*SIZE* | - | 0.001 | 0.84 | -0.003** | -2.07 |
| Δ*ROA* | - | 0.003 | 0.40 | 0.001 | 0.12 |

| | | | | | |
|---|---|---|---|---|---|
| $\Delta IntCov$ | - | -0.001*** | -6.12 | -0.001*** | -2.45 |
| $\Delta\sigma(NIBE)$ | + | 0.020 | 0.93 | 0.052** | 2.02 |
| $\Delta AQ$ | + | -0.001 | -0.08 | 0.017 | 1.47 |
| Year dummies | | Included | | Included | |
| N | | 2,189 | | 2,417 | |
| Adj. $R^2$ | | 0.061 | | 0.073 | |

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, for the two-tailed tests.