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Working Paper

The benefits of conservative accounting to shareholders: Evidence from the financial crisis

Bank of Finland Research Discussion Papers, No. 8/2013

Provided in Cooperation with:
Bank of Finland, Helsinki

Suggested Citation: Francis, Bill; Hasan, Iftekhar; Wu, Qiang (2013) : The benefits of conservative accounting to shareholders: Evidence from the financial crisis, Bank of Finland Research Discussion Papers, No. 8/2013, ISBN 978-952-6699-09-7, Bank of Finland, Helsinki, https://nbn-resolving.de/urn:nbn:fi:bof-20140807161

This Version is available at:
https://hdl.handle.net/10419/212248

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The benefits of conservative accounting to shareholders: Evidence from the financial crisis

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The Benefits of Conservative Accounting to Shareholders: Evidence from the Financial Crisis

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Forthcoming in Accounting Horizons

The Benefits of Conservative Accounting to Shareholders: Evidence from the Financial Crisis

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Abstract

Using the recent financial crisis as a natural quasi-experiment, we test whether and to what extent conservative accounting affects shareholder value. We find that there is significantly positive and economically meaningful relation between conservatism and firm stock performance during the current crisis. The result holds for alternative measures of conservatism and is validated in a series of robustness checks. We further find that the relation between conservatism and firm value is more pronounced for firms with weaker corporate governance or higher information asymmetry. Overall, our paper complements LaFond and Watts (2008) by providing empirical evidence to their argument that conservatism is an efficient governance mechanism to mitigate information risk and control for agency problems, and that shareholders benefit from it.

JEL Classification: M41; M48; G01
Keywords: Accounting conservatism, Shareholder value, Financial crisis

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The authors would like to thank Zining Li, Gary Biddle, Mary Ma, Ashok Robin, Hao Zhang, Stan Hao, Paul Griffin (co-editor), an anonymous referee, workshop participants at Rensselaer Polytechnic Institute, Rochester Institute of Technology, Fordham University and 2010 American Accounting Association Annual Meeting for their helpful comments.

1. Introduction

This study investigates whether conservative accounting affects shareholder value. Specifically, we use the recent financial crisis as a natural quasi-experiment to examine whether, and to what extent, conservative accounting affects firm performance in the equity market. Positive accounting theory suggests that financial reporting conservatism is an efficient contracting and governance mechanism to mitigate information asymmetries and address agency problems, and it benefits users of the firm's accounting reports (e.g., Watts 2003a; Lafond and Roychowdhury 2008; Lafond and Watts 2008). Extant studies provide empirical evidence on the economic benefits of conservatism to debtholders (e.g., Ahmed et al. 2002; Beatty et al. 2008; Wittenberg-Moerman 2008; Zhang 2008). However, there is little convincing evidence on the benefits of conservatism to shareholders.[1] Given the fact that shareholders are the major stakeholders of corporations and the scarcity of empirical evidence on the issue, examining the impact of accounting conservatism on shareholder value is important in its own right.

Understanding the economic consequences of conservatism on shareholder value could also help in resolving the ongoing debate about the benefits and costs of accounting conservatism. On one hand, Watts (2003a), Lafond and Watts (2008), Lafond and Roychowdhury (2008) and others point out that under information asymmetry, executives have the incentive to overstate the value of net assets and earnings so as to maximize their personal benefits due to the separation between ownership and control of the firm, even in the absence of formal accounting-based contracts. Accounting conservatism mitigates this managerial opportunism by requiring a higher degree of verification to recognize good news as gains than to recognize bad news as losses (Basu 1997; Watts 2003a). As such, Lafond and Watts (2008) contend that "conservative financial reporting is a governance mechanism that reduces the managers' ability to manipulate and overstate financial performance and increases the firm's cash flows and value."

[1] For example, Feltham and Ohlson (1995) argue that conservative accounting does not affect firm value estimated by the residual income valuation model. Penman and Zhang (2002) find that the stock market does not react to the changes in conservative accounting. The effect of conservatism on the cost of equity capital is also mixed (e.g., Francis et al. 2004; Chan et al. 2009; Garcia Lara et al. 2011).

On the other hand, opponents of conservatism argue that because conservatism introduces biases into financial reporting, it increases information asymmetry and leads users of financial reports, including outside investors, to make incorrect inferences presumably. Consequently, conservatism could potentially cause inefficient resource allocations and reduction of firm value (e.g., Penman and Zhang 2002; Lev et al. 2005; Guay and Verrecchia 2006; Gigler et al. 2009). The Financial Accounting Standard Boards (FASB) holds a similar view. In 2010, the FASB removed conservatism from their conceptual framework, and they argue that conservatism could produce information asymmetries and "describing prudence or conservatism as a qualitative characteristic or a desirable response to uncertainty would conflict with the quality of neutrality." (FASB 2010)

To the extent that the governance view of conservatism is correct (e.g., Watts 2003a; Ahmed and Duellman 2007; Lafond and Watts 2008; Garcia Lara et al. 2009), we expect that firms characterized by more conservative accounting would experience significantly less value losses during the crisis period compared to their less conservative counterparts. This is the case for several reasons. First, Jensen and Meckling (1976), Johnson et al. (2000), Mitton (2002) and others, state that a systematic crisis causes more companies to fall into a situation of financial distress and firms in financial distress would be exposed to higher information asymmetries and more agency problems. In this situation, managers are more likely to engage in aggressive earnings manipulations using private information for their private benefits (e.g., Baek et al. 2004; Kim and Yi 2006). Greater earnings manipulations impose increased information and agency risks on outside shareholders resulting in more negative returns during crisis periods (Mitton 2002; Easley and O'Hara 2004). The asymmetric verification requirements inherent in conservative accounting limit managerial earnings-manipulations thereby providing more reliable and transparent accounting information to outside investors (Watts 2003a). Thus, as an efficient disciplining mechanism, conservatism lessens agency and information risks thereby mitigating firm value losses during crisis periods.

Second, when the economy is good, because investment opportunities are plentiful, investors are likely to pay less attention to the quality of accounting information (Mitton 2002). However, a crisis could force investors to recognize the weakness in the

quality of accounting information that existed all along. This recognition could lead to a "flight to quality" syndrome (e.g., Goh et al. 2009). That is, panicked investors either withdraw from the stock market entirely, or move their money to what they perceive as high-quality firms. Because conservatism fulfills an important role in providing high-quality information for investors (Ball et al. 2000; Watts 2003a, b; Ball and Shivakumar 2005), if a firm consistently reports more conservative accounting numbers, it signals to outside investors that the quality of its information is higher. Thus, we expect firms with more conservative accounting practices ensue less declines in stock prices during the crisis.

Third, the effect of conservatism on firms' financing, investments and other real activities could also help prevent firm value losses during the crisis period. For example, prior studies find that conservatism reduces cost of debt financing (Ahmed et al. 2002; Zhang 2008); increases investment efficiency (e.g., Francis and Martin 2010; Garcia Lara et al. 2010; Ahmed and Duellman 2011); enhances the value of cash holdings (Li 2010; Louis et al. 2012); and control various firm risks such as, bankruptcy risk (Biddle et al. 2011a), downside risk of operating cash flows (Biddle et al. 2011b), and stock price crash risk (Kim and Zhang 2010). Because excessive risk-taking behavior has been cited as the major cause of the financial crisis (Diamond and Rajan 2009), and that firms are generally credit constrained and usually lack investment opportunities during crisis periods (Ivashina and Scharfstein 2010; Campello et al. 2010), the impact of conservatism on these real activities could become especially important in reducing the loss of firm value during these periods.

There is anecdotal evidence that supports our conjecture. For example, a related article in *Forbes* (April 5, 2010) lists the 100 Most Trustworthy Companies in the U.S.[2] The assessments are conducted by an independent financial analytics company called Audit Integrity, which looks beyond the raw data on companies' income statements and balance sheets to assess the true quality of corporate accounting. Audit Integrity finds that the 100 Most Trustworthy Companies have consistently demonstrated conservative and transparent accounting practices and that they do not play games with revenue and expense recognition or with asset valuation. Coster (2010) says that conservative

[2] Helen Coster, "The 100 Most Trustworthy Companies," *Forbes*, April 5, 2010.

housekeeping practices "leave companies better prepared to handle an economic downturn, especially one as severe as right now," and there is a direct correlation between its assessments and the likelihood of negative events such as poor stock price performance, class-action litigation, and bankruptcy filings.

We empirically examine the relation between conservatism and firm value changes during the crisis period defined to be from October 1, 2007 to March 31, 2009.[3] Our primary measure of conservatism is Khan and Watts's (2009) C-score, which is based on Basu's (1997) timeliness measure of conservatism. By incorporating firm-specific characteristics, such as size, market to book, and leverage into Basu's model, the C-score captures both the time series and the cross-sectional variations in measuring individual firms' conditional conservatism (Khan and Watts, 2009). Consistent with the extant literature, we measure firm value changes using the buy-and-hold abnormal returns during the crisis period.

Using a sample of 6,326 U.S. public companies we find consistent with our expectations a significantly positive relationship between accounting conservatism and buy-and-hold abnormal returns during the crisis period. These results hold after controlling for the Fama-French risk factors, other measures of risks such as beta, cash holding, tangibility and debt rating, and industry effects. In addition to Khan and Watts's (2009) C-score, we also use other measures of conservatism, such as Basu (1997) model, skewness of earnings, non-operating accruals, and bias component of the market to book ratio, to capture both conditional and unconditional conservatism, and our results hold for all these measures.

We further test the robustness of our results by using different definitions of the crisis period, an accounting measure of firm performance, a different proxy for firm-specific risk, and a reduced sample excluding financial companies. We also address several potential econometric issues in our data, such as endogeneity, measurement error, non-linearity, outliers, and omitted variable bias (i.e., corporate governance effect, prior firm performance effect, and accrual quality effect). Our results are robust to all these tests. Overall, the findings in our paper indicate that firms with a higher degree of

[3] We also experiment with different starting and ending dates and our results remain essentially unchanged.

conservative accounting prior to the crisis experience significantly less losses in the stock market compared to firms with a lower degree of conservative accounting.

Furthermore, we find that the identified relation between conservatism and stock returns is conditional on governance or information environments of firms. Specifically, we find that the impact of conservatism on stock performance is more pronounced for firms with weaker corporate governance, higher bid-ask spreads or lower analyst forecast accuracy, indicating that conservatism is more important for protecting shareholder value when firms have poorer corporate governance or have higher information risk. The findings provide supportive evidence of the governance and information roles of accounting conservatism on firm value.

Finally, we examine how conservatism affects various real activities during the crisis period. We find that on average, more conservative firms enjoy lower cost of bank loans, reduce cash holding, capital expenditure and R&D expenditure less, increase debt issuance more, and increase discretional accruals and default risk less compared to less conservative firms. The results are consistent with prior studies and provide possible real activity channels through which conservatism affects firm value during the crisis period.

This paper contributes to the literature in several ways. First, it furthers our understanding of the economic consequences of conservatism. Prior studies on the benefits of conservatism mainly focus on the debt market. In this paper, we show that conservatism also has desirable consequences in the equity market because it enhances value for shareholders. This extension provides supportive empirical evidence of LaFond and Watts (2008) argument that conservatism accounting increases firm value. In addition, in our research design we use the recent financial crisis, which is an exogenous shock to most individual firms, as a natural experiment to test the relationship between accounting conservatism prior to the current crisis and shareholder value changes during the current crisis. As such, we can more clearly isolate the valuation effect of accounting conservatism, and to a large extent mitigate the potential endogeneity concern in prior studies examining the role of conservatism. [4]

[4]A recent study by Watts and Zuo (2011), WZ, also examines the impact of accounting conservatism on firm value during the current financial crisis. Our paper differs from WZ in several ways. First, we use five commonly used measures to capture both conditional and unconditional conservatism, while WZ mainly uses Basu (1997) model to measure conservatism. Second, we provide empirical evidence to show that

Second, our paper is also related to the literature on the relation between the governance role of financial accounting information and economic performance. Bushman and Smith (2001) and Sloan (2001) argue that many financial accounting principles cannot be understood unless we interpret them from a corporate governance perspective, and they call for more future research on how various properties of financial accounting information affect firm performance. Prior studies demonstrate that various accounting-based and/or market-based measures of accounting quality are important in determining firm value and/or cost of capital (e.g., Sloan 1996; Botosan 1997; Mitton 2002; Bhattacharya et al. 2003; Baek et al. 2004; Francis et al. 2004; Francis et al. 2005). Our study contributes to the understanding of how the conservative accounting principle, which to some are thought of as the most important principle of valuation in accounting (Sterling 1970), impacts firm value during crisis periods in general, and in particular in the recent crisis.

Finally, our results also have implications for regulators and accounting standard-setters. Some academic scholars argue that regulators and standard setters do not fully understand the reasons for and consequences of conservatism. For instance, Watts (2003a) states that the "elimination of conservatism will change managerial behavior and impose significant costs on investors and the economy in general." Although the debate on whether conservatism should continuously be regarded as a pervasive precept of financial accounting is beyond the scope of our paper, given the empirical findings in our paper, as well as the benefits of conservatism to debt holders documented in prior studies, we suggest that regulators and standard setters should fully consider the economic implications of conservatism before making regulation changes.

The remainder of the paper is structured as follows. Section 2 reviews the related literature and proposes our hypothesis. Section 3 contains the sample description,

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accounting conservatism affects firm value through its governance and information roles, while WZ does not. Third, we examine a series of real activities, including borrowing capacity, borrowing cost, cash holding, capital expenditure, R&D expenditure and firm risk, as possible real activity channels that conservatism affects firm value, while WZ only examine borrowing capacity and capital expenditure. Finally, methodologically, we provide a series of robustness checks and sensitivity analyses dealing with various empirical issues, such as endogeneity, measurement error, non-linearity, outliers, and omitted variable bias, while WZ does not.

describes the variables used in our analysis, and presents summary statistics. The results of multivariate tests are reported in Section 4. The final section provides conclusions.

2. Related literature and hypothesis development

Conservatism has long been an important convention in financial reporting. Although the concept of conservatism has been criticized by capital market regulators and standard setters, such as the FASB, empirical studies find that accounting practice has become more conservative in the last 30 years, especially after the series of accounting scandals at the beginning of the twenty-first century and the passage of the Sarbanes–Oxley Act (SOX) (Givoly and Hayn 2000; Zhou and Lobo 2006). The increasing practice of conservative accounting implies that there must be some benefits of conservatism that are overlooked by the regulators and standard-setters (Watts 2003a).

In the glossary of *Statement of Concept No. 2* of the Financial Accounting Standard Board (FASB), conservatism is defined as "possible error in measurement [that] should be in the direction of understatement rather than overstatement of net income and net assets" (FASB 1980). Watts (2003a) defines conservatism as "the differential verifiability required for recognition of profits versus losses." Basu (1997) interprets conservatism as "the accountant's tendency to require a higher degree of verification to recognize good news as gains than to recognize bad news as losses." Collectively, the differential verifiability required for the recognition of good news versus bad news is the cornerstone of accounting conservatism. An important implication of this asymmetric verification is that it leads to a persistent understatement of net asset values and generates earnings that reflect bad news in a timelier fashion than good news (Basu 1997; Watts 2003a).

Recent studies try to examine the effect of conservatism on firm value through its governance and information role. For example, LaFond and Watts (2008) argue that information asymmetry between insiders and outside equity holders generates conservatism. Accounting conservatism reduces the manager's incentives and ability to manipulate accounting numbers, reduces the subsequent agency costs, and increases firm and equity values, even in the absence of formal financial contracts. They refer to conservative financial reporting as an efficient governance mechanism to control for

agency problems. Their argument is consistent with the opinion of Bushman and Smith (2001) and Sloan (2001) who emphasize the governance role of accounting information in controlling agency problems. While LaFond and Watts (2008) provide empirical evidence consistent with their argument, their analysis does not focus on the economic consequences or benefits of conservatism in the equity market. This paper aims to complement the line of research that examines the governance and information role of conservatism by examining the firm-level relation between conservatism and firm value.

If conservatism plays an important role in mitigating information asymmetries and addressing agency problems between managers and outside shareholders, we expect that conservative accounting impact shareholder value significantly during the crisis period. First, agency problems, such as manipulation and expropriation by managers, become more severe during the crisis period because the expected return on investment falls (Johnson et al. 2000; Mitton 2002). In this situation, managers are more likely to manipulate accounting numbers in opportunistic ways using private information for their private benefits. Kim and Yi (2006) find direct evidence that firms are more likely to engage in aggressive earnings management during the crisis period. Thus, during the crisis period, greater earnings manipulation risk imposed increased risk on shareholders, which could lead to more negative returns and subsequent firm value losses. As an efficient governance mechanism, the asymmetric verification requirements under conservatism becomes significantly important to control the aggravating agency risk and information risk, and consequently mitigate the negative event impact on firm value during the crisis period. We refer this as a “flight-from-risk” effect.

Second, when the economy is good, investors may pay less attention to the quality of earnings because investment opportunities are plentiful (Mitton, 2002). However, a crisis could force investors to recognize the weakness in earnings quality that existed all along. This recognition could lead to a flight to quality, thereby depressing stock prices (Francis et al. 2012). For example, empirical work provides evidence that under crisis conditions, the use of Level 2 and especially Level 3 fair value accounting involves manipulation by managers and induces excessive and artificial volatility that does not reflect the true value of the underlying assets, and investors tend to revise downward the valuation of such kinds of assets (e.g., Allen and Carletti 2008; Plantin et al. 2008; Goh et

al. 2009).[5] If a firm consistently reports conservative accounting numbers, it signals outside investors that the firm has reliable and high-quality accounting information. Thus, we expect firms with more conservative accounting practices ensue less declines in stock prices during the crisis. We refer this as a "flight-to-quality" effect.

Finally, although the above discussion focuses on how conservatism prevents firm value losses during the crisis through its information and governance role, conservatism could also affect firm value via its impact on financing, investments and other real activities. For example, the timelier recognition of losses than gains can enable shareholders and board of directors to promptly identify unprofitable projects and force managers to discontinue them. This prevents the bad performance of bad projects from accumulating and reduces the probability of asset price declines (e.g., Bleck and Liu 2007; Francis and Martin 2010; Garcia Lara et al. 2010; Ahmed and Duellman 2011). Ahmed et al. (2002) and Zhang (2008) show that conservatism lowers the cost of debt, which makes external financing easier. Li (2010) find that conservatism increases cash flows from financing, and enhances future cash flow from operations. Louis et al. (2012) find that conservatism mitigates agency problems associated with higher cash holdings such as cash wastage in operations and investment. Ahmed and Duellman (2011) find that firms with more conservative accounting have higher future cash flows and gross margins and lower likelihood and magnitude of special items charges than firms with less conservative accounting.

More recent studies also find that conservatism reduces various risks of firms. For example, Biddle et al. (2011b) claim that conservatism is a risk management tool, and find a negative relation between conservatism and the downside risk of operating cash flows. Biddle et al. (2011a) find a negative relation between conservatism and contemporaneous and subsequent bankruptcy risk of the firms. Kim and Zhang (2010) find that conservatism reduces stock price crash risk.

[5] For example, Lehman Brothers implemented Statement of Financial Accounting Standards (SFAS) No. 157 (Fair Value Measurements) and SFAS No. 159 (Option for Fair Value Measurement) in the first quarter of its 2007 fiscal year. After the onset of the crisis, around 75% of its fair value assets were measured based on Level 2 or Level 3 inputs. By the end of May 2008, this proportion had increased to about 82%, suggesting that managers intended to overstate assets and deliberately shifted them into Level 2 and Level 3 to hide the increasing losses.

Diamond and Rajan (2009), among others, have cited firms' excessive risk-taking behavior as one of the major causes of the current financial crisis. Ivashina and Scharfstein (2010), Campello et al. (2010),and others contend that during crisis periods firms are generally financially constrained and lack investment opportunities. As such, the various roles of conservatism such as risk mitigation, financing availability, investment efficiency, and cash enhancement provide real-activity channels through which conservatism could prevent firm value losses during the crisis. We refer this as a "real-activity" effect.

Collectively, we hypothesize that:

H*: During the crisis period, firms with more conservative accounting practice prior to the crisis experience significantly smaller firm value losses than firms with less conservative accounting practice prior to the crisis.*

3. Sample selection, variable descriptions, and summary statistics

3.1. Sample selection

We collect monthly stock data from the Center for Research in Security Prices (CRSP). Because there is no general agreement on the beginning and ending of the financial crisis, we plot the movement of the S&P 1,500 composite stock index from January 2007 to December 2009 as a means of identifying the duration of the crisis. We find that there is a continuous decline from October 2007 through March 2009, where it bottomed out and then experienced an upturn. Given this evidence, we choose October 2007 as the beginning point and March 2009 as the ending point. We think this measurement period is long enough to reflect the impact of the external shock on firm value. However, as several other papers use different time periods, we experiment with several starting and ending points. The results are robust to the different specifications.

We draw accounting and other firm-specific data from the Compustat database. Annual stock returns are calculated by cumulating monthly returns starting from the

fourth month after the firm's fiscal year end (Basu 1997). After merging the CRSP and Compustat databases, the final sample is comprised of 6,326 public companies.[6]

3.2. Variable descriptions

3.2.1 Measures of firm value during the current crisis

Because we are interested in firms' relative performance during the financial crisis period, Following Johnson et al. (2000), Beltratti and Stulz (2009), and Fahlenbrach and Stulz (2011), we use buy-and-hold abnormal returns (BHAR) over the crisis period (from October 2007 to March 2009) as the primary measure of firm performance.[7] We compute BHAR as follows:

$$\begin{aligned} BHAR(crisis) &= (1+R_{i,Oct2007})(1+R_{i,Nov2007})(1+R_{i,Dec2007})\cdots(1+R_{i,Mar2009}) \\ &- (1+R_{m,Oct2007})(1+R_{m,Nov2007})(1+R_{m,Dec2007})\cdots(1+R_{m,Mar2009}) \end{aligned} \tag{1}$$

where $R_{i,t}$ is the monthly return of firm i at time t; and $R_{m,t}$ is the value-weighted market return at time t.[8] For robustness checks, we also construct BHAR using different beginning dates and different ending dates.

3.2.1 Measures of accounting conservatism

At present, there is no single generally accepted measure of conservatism in the accounting literature. Recently, Khan and Watts (2009) proposed a new measure for conservatism, *C-score*, that is based on Basu's (1997) measure of the asymmetric timeliness method. By adding firm-specific characteristics – size, market to book, and leverage – to the annual cross-sectional Basu (1997) regression, the *C-score* is able to take into account both firm- and year-variation in conservatism.

The basic Basu (1997) cross-sectional regression is specified as

$$X_i = \beta_1 + \beta_2 D_i + \beta_3 R_i + \beta_4 D_i R_i + \varepsilon_i \tag{2}$$

where *i* indicates the firm, X is earnings, R is returns, and D is a dummy variable that equals one if R is less than 0, and 0 otherwise. So β_3 is the good news timeliness

[6] Following Ball et al. (2000), Khan and Watts (2009), and others, we delete outliers in the top and bottom 1% of earnings, returns, size, market to book ratio and leverage.
[7] We also use cumulative stock returns as an alternative measure of firm performance, and the results of all empirical tests hold.
[8] The results are similar when we use equal-weighted market return as the benchmark.

measure and β_4 is the incremental timeliness for bad news over good news, or conservatism.

Khan and Watts (2009) control for the time series variation and the cross-sectional variation by adding firm-year characteristics (size, M/B, and leverage) to the annual cross-sectional Basu (1997) regression model. Then firm-year specific coefficients β_3 (timeliness of good news) and β_4 (conservatism) can be expressed by linear functions of firm-year characteristics that are correlated with the timeliness of good news and conservatism:

$$G-score = \beta_3 = \mu_1 + \mu_2 Size_i + \mu_3 M/B_i + \mu_4 Leverage_i \tag{3}$$

$$C-score = \beta_4 = \lambda_1 + \lambda_2 Size_i + \lambda_3 M/B_i + \lambda_4 Leverage_i \tag{4}$$

where *Size* is the natural log of the market value, *M/B* is the market-to-book ratio, and *Leverage* is the debt-to-equity ratio. Replacing β_3 and β_4 in Eq. (2) by Eqs. (3) and (4), respectively, yields the following empirical regression model:

$$\begin{aligned} X_i = {} & \beta_1 + \beta_2 D_i + R_i(\mu_1 + \mu_2 Size_i + \mu_3 M/B_i + \mu_4 Leverage_i) \\ & + D_i R_i(\lambda_1 + \lambda_2 Size_i + \lambda_3 M/B_i + \lambda_4 Leverage_i) \\ & + (\delta_1 Size_i + \delta_2 M/B_i + \delta_3 Leverage_i + \delta_4 D_i Size_i + \delta_5 D_i M/B_i + \delta_6 D_i Leverage_i) + \varepsilon_i \end{aligned} \tag{5}$$

As our main question is how conservatism accounting affects firm value during the crisis period, to mitigate the endogeneity concern, we measure conservatism at the end of 2006. Thus, we first run regression Eq. (5) for year 2006, and then estimate the firm-year measure of conservatism, *C-score,* as the sum of the products of the estimated parameters and the firm-year values of the instruments as shown in Eq. (4). The larger the C-Score, the greater is the degree of conservatism.

Khan and Watts (2009) conduct a series of tests on the properties of this conservatism measure and conclude that the *C-score* captures the time series and the cross-sectional variations in conservatism very well. Since our research question is more related to the asymmetric timeliness of earnings (news-dependent, conditional conservatism), and our research analyses are on the individual firm level, the *C-score* measure fits our purpose well.

As we control for firm size and leverage in our main regression tests, and we also incorporate firm size and leverage in the calculation of *C-score,* to mitigate the

multicollinearity concern we construct a second conservatism measure *Coeff_Basu*, which is based on the firm-specific Basu (1997) model. Following Zhang (2008), we first run Basu (1997) model for each firm from 1980 to 2006.[9]

$$X_{i,t} = \beta_{1i} + \beta_{2i} D_{i,t} + \beta_{3i} R_{i,t} + \beta_{4t} D_{i,t} R_{i,t} + \varepsilon_i \quad (6)$$

where i indicates the firm, t indicates year, X is earnings, R is returns, and D is a dummy variable that equals one if R is less than 0, and 0 otherwise. In this regression, the sensitivity of earnings to good news is captured by β_{3i}, and the sensitivity of earnings to bad news is captured by $\beta_{3i} + \beta_{4t}$. Thus the sensitivity of earnings to bad news relative to the sensitivity of earnings to good news is given by *Coeff_Basu* = $(\beta_{3i} + \beta_{4t}) / \beta_{3i}$. The higher *Coeff_Basu* is, the more conservative the firm is.

Our third measure of conservatism, *Skewness_Earnings*, is the time-series skewness of earnings. Similar to Zhang (2008), to control for the variation in firm performance, we deflate it by the skewness of cash flows. We also multiply it by -1 to make the results easy to interpret. Higher *Skewness_Earnings* indicates higher conservatism. This measure is based on Givoly and Hayn (2000) who argue that accounting conservatism requires an immediate and complete recognition of negative news and a delayed and gradual recognition of positive events, leading to a negatively skewed earnings distribution. We calculate *Skewness_Earnings* from 1980 till 2006.

Recent studies argue that conditional and unconditional conservatism could play different roles in contracting, valuation and in reducing information asymmetries (e.g., Beaver and Ryan 2005), as a robustness check, we use two alternative measures to capture unconditional conservatism. Our fourth measure of conservatism, *Accrual*, equals the non-operating accruals deflated by lagged assets and multiplied by -1. Higher *Accrual* indicates greater unconditional conservatism. This measure is based on Givoly and Hayn (2000) and is widely used in the accounting literature (e.g., Ahmed and Duellman 2007; Beatty et al. 2008; Zhang 2008). The basic idea is that conservative accounting tends to accelerate the recognition of losses and defer the recognition of gains, which leads to persistently negative accruals.

[9] Firms with less than five consecutive years of observations are excluded.

Our final measure of conservatism is the bias component of the market to book ratio. This measure is introduced by Beaver and Ryan (2000) and decomposes the market to book ratio into a recognition lag component and a bias component, with the latter interpreted as unconditional accounting conservatism. Following Beaver and Ryan (2000), we regress the market to book ratio on contemporary and lagged stock returns (up to six years) using the following fixed effect regression:

$$M/B_{i,t} = \alpha_t + \alpha_i + \sum_{j=0}^{6} \beta_j R_{t-j,i} + \varepsilon_{t,i} . \qquad (7)$$

Where α_i is unconditional conservatism measure which captures firm specific persistent bias component of the market to book ratio. [10]

3.2.2 Control variables

To capture the incremental effect of conservatism on firm stock performance, it is important to control for risk factors that could impact firm performance. Frist, we use buy-and-hold abnormal returns instead of raw returns to capture excess returns. Second, following prior studies, such as Mitton (2002), Lemmon and Lins (2003) and others, we control for several risk factors that might affect firm stock performance. The first is *Size*, measured by the logarithm of market value of equity.[11] Large firms generally are less likely to rely on debt financing and have less information asymmetries. We expect that large firms are less vulnerable to external shocks. The second is *Leverage*, measured as the ratio of total liabilities (long-term plus short-term debt) to the market value of equity. Because highly leveraged firms would have more difficulties obtaining external funding during a crisis, we expect such firms to experience a larger decline in market value during the crisis. The third is the market to book ratio. We expect firms with higher market to book ratios to perform better during the crisis period because they have growth options that would help in preserving their equity value.[12] The fourth risk control variable, *Beta*, is calculated by regressing a firm's monthly stock return five years before the crisis on

[10] We also calculate *Coeff_Basu*, *Skewness_earnings* and *Biased M/B* based on the 12 years' time window, and our results hold.
[11] The results are very similar when we use the total assets of the firm.
[12] We do not include market to book when we use C-score as the dependent variable, as C-score is a linear function of size, leverage and market to book. There is a serious multicollinearity issue when we include market to book in the regressions.

the corresponding NYSE/AMEX/NASDAQ Value-Weighted Index from CRSP. We require at least 12 months of return data prior to October 2007 to compute Beta. Risky firms generally have a high default risk and are more vulnerable to an external shock. Therefore, we would expect a negative relation between Beta and firm performance during the crisis. The fifth variable is *Cash holdings*, which is the cash and short-term investment divided by total assets. Firms with more internal sources of financing should suffer less during a crisis. Thus, we expect a positive relation between cash holdings and firm performance during a crisis. The sixth control is *Sales growth*, which is the three year average of annual growth rates in total sales. We expect a negative relation between sales growth and firm performance, as high sales growth firms might suffer more from opportunity losses during a crisis period. The last control is *Tangibility*, which is the net property, plant and equipment divided by total assets. Firms with more tangible assets can use them as collateral to seek external funding during a crisis. Thus, we expect that tangibility positively affects firm performance during the crisis.

To avoid spurious correlations between these variables and firm performance during the crisis, we measure them at the end of the firm's 2006 fiscal year. Finally, as different industries have different level of exposures to the financial crisis, we estimate our regressions using indicator variables for a firm's primary two-digit SIC code to control for industry differences. We also used the three-digit SIC code and the Fama-French industry classifications, and the results are qualitatively unchanged.

3.3 Summary statistics

Table 1 provides summary statistics for firm stock performance, conservatism, and other firm-specific variables. As expected, Table 1 shows that firms performed poorly during the crisis, with cumulative stock returns approaching negative 47%, on average. The average BHAR is -0.058.

[Insert Table 1 here]

With regard to our main conservatism measure, *C-score*, we find that the mean value is 0.209 and the median value is 0.188. Our results are higher than those of Khan

and Watts (2009) (mean=0.105 and median=0.097). One possible reason is that Khan and Watts measure *C-score* from 1963 to 2005, while our *C-score* is only for 2006. Givoly and Hayn (2000) find that conservatism in financial reporting has increased continuously over the past several decades. When we examine five-year averages of the *C-score*, we find that the value is much closer to that of Khan and Watts (2009). In terms of other conservatism measures, their values and distributions are similar to other studies such as Zhang (2008).

[Insert Table 2 here]

Table 2 shows Spearman pair-wise correlations between main variables used in our analysis. As expected, we find that both cumulative stock returns and BHAR during the crisis period are significantly positively correlated with *C-score* and other conservatism measures. We also find that *C-score* is positively correlated with the other four measures of conservatism, although some of the correlation values are not very high. Furthermore, we find that the stock returns are also highly correlated with several key firm variables, suggesting that we should further test the relation between conservatism and firm value in a multivariate environment.

To further assess the relationship between firm value and *C-score*, we sort firms on their *C-score* and place them in deciles based on their *C-score*s. Examining the patterns of *C-score* deciles allows non-parametric tests of unconditional predictions and circumvents issues of potential non-linear relationships (e.g., Khan and Watts 2009).

[Insert Table 3 here]

Table 3 reports the means and medians of cumulative stock returns, BHAR and stock return volatilities during the crisis for the *C-score* deciles. It shows that, in general, the means of both the cumulative stock returns and BHARs increase monotonically with *C-score*. The mean difference between cumulative stock returns for the high and low *C-score* is significantly positive at 0.061. The monotonic relation is also significant for the medians of cumulative stock returns and *C-score* deciles. The Wilcoxon Ranksum test of

median difference between High and Low *C-score* deciles is 0.142 which is significant at the 1% level. The results suggest that there is a monotonic and positive relation between conservatism and firm value during the crisis. We find the same pattern when we use BHAR as the measure of firm stock performance.

Table 3 also provides evidence on the distributions of stock return volatilities by *C-score* deciles. Consistent with our expectation, we find a very strong monotonically negative relation between conservatism and stock return volatilities, for both the mean and median values of stock return volatilities.

In summary, Table 2 and Table 3 results suggest that conservatism affects firm value positively and that the relation is monotonic. In addition, conservative accounting also had an economically important impact on firms' stock return volatilities during the crisis. In the next section, we go to multivariate analysis and further investigate how conservatism affects firm value in a multivariate environment.

4. Multivariate analysis

To further assess the impact of conservatism on firm value during the crisis, we estimate the following multivariate regression model:

$$\begin{aligned} Crisis_Period_Return = {} & \alpha + \beta_1(Conservatism) + \beta_2(Size) + \beta_3(Leverage) + \beta_4(Beta) + \beta_5(Cashholding) + \beta_6(Salesgrowth) \\ & + \beta_7(Tangibility) + \beta_8(Market/book) + \beta_9(Industry_Dummies) + \varepsilon \end{aligned} \quad (8)$$

where the variables are as previously described.

4.1 Accounting conservatism and firm value during the crisis: Baseline regressions

We first test how accounting conservatism as measured by *C-score* affects stock returns during the crisis. The results of our regressions are shown in Table 4.

[Insert Table 4 here]

We first use cumulative stock returns as the dependent variable to test how conservatism affects returns. We report the results in Column 1. We also include variables to control for risk and industry effects. The coefficient on *C-score* is 0.038 and

is significant at the 1% level. This result indicates that if a firm changes its accounting conservatism from a 25th percentile level to a 75th percentile level, its stock returns increase by about 0.022, an effect which is economically meaningful.[13]

With regard to firm control variables, consistent with our expectations, we find that smaller firms, those holding less-cash holding and those that are highly leveraged suffer significantly more during the crisis. We also find that *Beta* is negatively related to firm stock performance. The results are consistent with our expectations and prior studies, such as those by Mitton (2002) and Lemmon and Lins (2003).

As Fahlenbrach and Stulz (2011) point out that *BHAR* is a better measure to explain cross-sectional variation in firm performance, we further use *BHAR* as the dependent variable to capture excess returns. The results are in Column 2 of Table 4. We find that the coefficient of *C-score* is 0.064 and is significant at the 1% level. The result indicates that more conservative firms are associated with higher abnormal returns during the crisis period.

Stock return volatility is an important measure of the risk of stock performance. Firms with higher stock volatility should be more risky. In Column 3 of Table 4, we test how conservatism impacts stock return volatility during the crisis. Our dependent variable is the standard deviation of the monthly stock returns during the crisis period. We find that the coefficient of *C-score* is -0.017 and significant at the 1% level, indicating that more conservative firms are associated with lower stock return volatility.

In sum, the positive relation between *C-score* and firm stock returns and the negative relation between *C-score* and stock return volatility during the crisis period support our hypothesis that conservative accounting is an efficient governance mechanism to control for agency risk and mitigate firm value losses during the crisis period. Therefore, firms reporting more conservative numbers before the crisis suffer less during the crisis period than firms reporting more aggressive accounting numbers.

4.2. The economic significance of conservative accounting

[13] Because size and leverage are also included in constructing *C-score*, we test whether multicollinearity problems exist for the regression. The highest variance inflation factor among all regressors is (VIF) 2.75, which is well below the threshold indicator of 10.

Our baseline regression shows that accounting conservatism affects firm stock performance positively during the financial crisis period. In this sub-section, we further discuss the economic significance of our finding. From Column 2 of Table 4, we find that the coefficient on *C-score* is 0.064. The average firm market capitalization at the beginning of the crisis is 3,590 million. Therefore, if *C-score* increases by one standard deviation (about 50 percentage-points) then the implied increase in firm stock valuation is about 114.7 million (114.7=0.064x0.499x3,590). The economic significance of conservatism on shareholder value during the crisis period is fairly meaningful.

We further separate firms into two groups (high-conservatism firms and low-conservatism firms) based on the median value of *C-score*. We construct a dummy variable *High-conservatism*, which equals one if a firm belongs to high-conservatism firms and zero otherwise. We run the same regression as Column 2 of Table 4 but replace *C-score* with *High-conservatism*. We find the coefficient on *High-conservatism* is 0.023 and is significant at the 1% level (For brevity, we do not tabulate the findings). The result indicates that, on average, the market valuation changes during the crisis period for a firm with high conservative accounting are about 82.6 million (82.6=0.023x3,590) higher than that for a firm with low conservative accounting. On the aggregate level, given the mean market capitalization for high-conservatism group is 8,970 million and there are 1,980 firms in the group, the total market valuation changes during the crisis period for high-conservatism group are about 408.5 billion (408,493=0.023x8,970x1,980) higher than that for low-conservatism group. Therefore, on the market level, the aggregate economic benefit of conservatism accounting to shareholders is very significant.

4.3 Alternative measures of accounting conservatism

In Table 4, we measure C-score in the end of the 2006 fiscal year. It is possible that firms report temporarily higher or lower conservatism in a certain year. In order to mitigate the noise in the one-year measure of conservatism, we calculate the three-year average C-score (2004, 2005, and 2006). The method is similar to that of Ahmed and Duellman (2007), who use cumulative accrual to measure conservatism. They argue that cumulating conservatism over a certain time period of a firm mitigates the effects of any

temporary large conservatism. In Column 1 of Table 5, we report the results using the three-year average C-score as the measure of accounting conservatism. We find that the coefficient of the three-year average C-score is 0.028 and is significant at the 5% level. The result confirms the identified positive relation between C-score and stock returns during the crisis period.

One concern is that *C-score* could be a tenuous firm-level measure of conservatism, as it is calculated based on the linear functions of three firm characteristics. To mitigate this concern, we use our second measure of conservatism, *Coeff_Basu*, which is the sensitivity of earnings to bad news relative to the sensitivity of earnings to good news based on firm-specific Basu (1997) model. Another advantage of this measure is that because it is calculated based on 26-years time-series regressions, it can reduce the possible noise in the one-year measure of *C-score*. The results are in Column 2 of Table 5. We also add market to book as an additional risk factor in the regressions.

[Insert Table 5 here]

We find that the coefficient on *Coeff_Basu* is 0.002 and is significant at the 5% level. The result confirms the positive relation between conservatism and firm stock performance. We also find a positive relation between market to book and stock performance. There are two possible explanations. First, market to book ratio is also a proxy for conservatism in the accounting literature (e.g., Beaver and Ryan 2000; Ahmed et al. 2002; Ahmed and Duellman 2007). Second, market to book could also represent the growth options of firms. Both explanations indicate a positive relation between market to book and firm stock performance.

We further use the skewness of earnings over 26 years as the measure of accounting conservatism (Givoly and Hayn (2000)). The result in Column 3 of Table 5 shows a positive and significant relation between *Skewness_Earnings* and *BHAR*. The result further confirms that if a firm consistently reports conservative financial reporting, it suffers less in the stock market during the crisis period.

As *C-score*, *Coeff_Basu* and *Skewness_Earnings* mainly capture conditional conservatism and recent studies argue that conditional and unconditional conservatism

could play different roles in contracting, valuation and in reducing information asymmetries (e.g., Beaver and Ryan 2005), we use two commonly used measures of unconditional conservatism to examine whether unconditional conservatism also impacts firm value during the crisis period. The first one is the Non-operating accrual (*Accrual*) (e.g., Givoly and Hayn 2000; Ahmed and Duellman 2007; Beatty et al. 2008; Zhang 2008). The result is in Column 4 of Table 5. We find that the coefficient of *Accrual* is positive and significant, suggesting that firms reporting more unconditional conservatism before the crisis outperform their counterparts during the crisis period.

Finally, we use bias component of the market to book ratio (*Bias Market/book*) to measure unconditional conservatism. The result is in Column 5 of Table 5. We find that the coefficient of *Bias Market/book* is also positive and significant, further confirming the positive relationship between unconditional conservatism and firm value during the crisis period.

Overall, Table 5 using additional measures of conservatism overcomes some drawbacks in *C-score*, and confirms the positive association between conservatism (both conditional and unconditional) and firm value during the crisis.[14]

4.4 Robustness checks

There is no consensus on the beginning date of the crisis. Beltratti and Stulz (2009) and Fahlenbrach and Stulz (2011) define July 2007 as the beginning of the current crisis. In Column 1 of Table 6, we change the time window of the crisis to begin in July 2007. We find that the coefficient of *C-score* is 0.072 and is still significant at the 1% level, indicating our result is robust to an alternative time span of the current crisis.[15]

[Insert Table 6 here]

Baek et al. (2004) and Beltratti and Stulz (2009) also use accounting profitability as the performance measure in their studies. In Column 2 of Table 6, we provide a robustness check by using cumulative return on assets (ROA) during the crisis period as

[14] The results hold when we use 3-year and 5-year average *Accrual* as measures of conservatism.
[15] We also use December 2007 to June 2009, which is defined by National Bureau of Economic Research' as the alternative crisis period, and the results are qualitatively unchanged.

an alternative measure of firm performance. Similar to Beltratti and Stulz (2009), we define crisis period cumulative ROA as the cumulative quarterly net income from 2007Q3 to 2009Q1 divided by the total assets at the end of 2007Q2. We rerun Model 1 of Table 6 but use *Cumulative ROA* as the performance measure. Again, we find that *C-score* is still significantly and positively related to accounting profitability. However, we should be cautious to interpret the result, as Baek et al. (2004) point out that accounting profitability is not a reliable measure of firm performance because it is subject to earnings management, especially during crisis periods. Thus, we use cash from operation as a cash based measure of firm performance, and our result still hold.

Prior studies (e.g., Mitton 2002; Lemmon and Lins 2003; and Baek et al. 2004) show that several governance mechanisms affect firm value during crisis periods. It is possible that our main result is driven by omitted governance variables. To mitigate this concern, we add two additional control variables in the regression. One is the Bebchuk et al. (2009) E-index which captures overall entrenchment of the management. Bebchuk et al. (2009) find that the six provisions (components of E-index) of the twenty-four governance provisions in IRRC are significantly related with firm value. Another one is the numbers of segments of a firm. Mitton (2002) and Baek et al. (2004) find a negative relation between diversification and firm value.

It is also possible that firm stock performance during the crisis period is affected by prior stock performance; similar to Fahlenbrach and Stulz (2011), we therefore include cumulative stock return in 2006 to control for prior firm stock performance.[16] We also include discretionary accruals estimated using the cross-sectional Jones model, to control for accrual quality. Controlling for these variables significantly reduces our sample size mainly because the governance index is only available for S&P 1,500 companies. We report the results in Column 3 of Table 6. The results show that after controlling for other governance variables, prior firm performance and accrual quality, the impact of C-score on firm value is still significant at the 1% level, indicating that our main result about the relation between conservatism and firm value is not ruled out by other governance effects, prior firm performance and accrual quality.

[16] Our results hold when we use ROA in 2006 to proxy for prior firm performance.

We further consider the potential endogeneity of conservatism. One possibility is that the changes in conservatism during the crisis impact firm value during the crisis, which makes our results difficult to interpret. We mitigate the endogeneity issue in two ways. First, we measure conservatism and firm risk variables at the end of 2006, which is before the beginning of the crisis, while we measure shareholder value as the changes in firm value during the crisis. Thus, concerns about endogeneity should be mitigated.

Second, we trace the conservatism level of each firm in our sample from 2006 to 2008. We also construct reduced samples in which we only include firms that their conservatism levels have not changed over 20%, 30% and 50% (either increase or decrease) since 2006. For all sample firms, the numbers of no-change firms of 20%, 30% and 50% thresholds are 594, 948 and 1435, respectively. We rerun our main model using these reduced samples and our results hold for each of the reduced samples. For illustrative purposes, we report the results in Column 4 of Table 6 using 30% threshold sample. The results show that the coefficient of *C-score* is still positive and significant. The economic magnitude of *C-score* (0.253) is significantly higher than that in full sample regression. This reduced sample test isolates the impact of conservatism changes during the crisis on the identified relationship and further mitigates the endogeneity concerns.

We also conduct several other robustness checks. For brevity, we do not tabulate the results. First, there are two possible problems associated with one of our independent variables - *Beta*. The first one is the measurement error in *Beta* because it is a generated regressor from historical market model. The second one is that it captures firms' systematic risk instead of firm-specific risk premium. To deal with these two issues, we run an errors-in-variables regression to check how the measurement reliability of *Beta* could affect our main results materially. We assume that *Beta* falls to measurement reliability of 0.8 before the results are materially affected. We find the main results hold when *Beta* has a reliability of 0.8, indicating that our findings are not sensitive to the measurement error of *Beta*.

To further isolate the noise in *Beta* measurement and more precisely capture firm specific risk, we use S&P long-term debt rating at the end of 2006 from Compustat to measure firm-specific risk factor. Of the total companies, 1,218 have S&P long-term

debt ratings. We rerun our main model using debt rating as the measure of risk factor. The untabulated results show that conservatism is still positively related to firm value during the crisis after controlling for firm debt ratings.

Second, we investigate whether a few observations with extreme stock returns drive the results. We perform a median regression that estimates the effect of explanatory variables on the median BHAR, conditional on the values of explanatory variables. Accordingly, the untabulated results are similar to those from the average response regression (OLS). Overall, we conclude that our results are not driven by outliers. Third, As sub-prime mortgages in financial institutions are always cited as the origin of the current financial crisis, whether and to what extent it is an exogenous shock to financial companies is unclear.[17] Therefore, we re-test the relation between conservatism and firm value using a reduced sample from which we exclude financial companies. The untabulated results show that after using the reduced sample, the economic magnitude of the coefficient of *C-score* is increased to 0.077 and it keeps significant at the 1% level, indicating that the economic impact of conservatism on shareholder values is more pronounced for non-financial companies than for financial companies.

The current financial crisis is an unexpected shock to investment opportunities that allows us to isolate more clearly the effect of accounting conservatism on shareholder value. Prior to the crisis, we expect that the effect of conservatism on changes in shareholder value should be less evident. When the economy is good, the expected earnings-manipulation risk is relatively lower (Kim and Yi 2006), and investors may pay less attention to the earnings quality when the market is liquid and investment opportunities are plentiful (Mitton 2002).

We investigate this conjecture in Column 5 of Table 6. Note that now the dependent variable is the BHAR over a one-year period preceding the crisis (October 2006 to September 2007).[18] Consistent with our expectation, we find that our key variable, *C-score*, has no significant impact on firm value during the pre-crisis period.

[17] In addition, financial institutions implemented Statement of Financial Accounting Standards (SFAS) No. 157 (Fair Value Measurements) and SFAS No. 159 (Option for Fair Value Measurement) in late 2007, accounting information in these financial institutions may have a different impact on firm value compared with non-financial firms during the crisis period.

[18] The results are similar when we use 18 month pre-crisis period (March 2006 to September 2007).

The result is consistent with Penman and Zhang (2002) and Francis et al. (2004), who find that there is no association between conservatism and equity price. The pre-crisis result also provides further evidence that the results we document during the crisis period are not spurious. [19]

4.5. Subsample tests

In this paper, we argue that conservative financial reporting is a governance mechanism that reduces information asymmetry and mitigates agency costs, and consequently prevents firm value losses during the crisis. If this is the case, we would expect that association between conservatism and firm value is conditional on the governance or information environments of firms. Specifically, if a firm has a good governance environment or is more transparent, the identified relation should be less evident.

[Insert Table 7 here]

Table 7 tests this conjecture. We first construct dummy variable *Good governance*, which equals 1 if a firm's E-index is less than 3 in 2006. We then interact *Good governance* with *C-score*. The result is in Column 1 of Table 7. We find that the coefficient of *C-score*, which captures the effect of conservatism on stock performance for firms with weak governance, is 0.196 and is significant at the 1% level. It is not surprising that the coefficient of *Good governance* is positive and significant, as prior studies show that corporate governance is of first-order importance in determining firm value during crises (e.g., Johnson et al. 2000; Lemmon and Lins 2003; Francis et al. 2012). The interaction term between *Good governance* and *C-score*, which captures the incremental effect of conservatism on stock performance for firms with good governance, is -0.102 and is significant at the 5% level.[20] Hence, the impact of conservatism on firm value is much more pronounced for firms with weak governance environments. Our

[19] The results are all robust when we use different measures of conservatism. Also we find that there is also no significant relation between other conservatism measures and pre-crisis period firm value.

[20] The F-test of the effect of *C-score* on *BHAR* for good governance firms (0.196-0.102=0.094) is not significant at the traditional level.

results could provide a possible explanation for why some firms with weak governance are more conservative in their financial reporting.

To capture the overall information asymmetry of a firm, we first construct a dummy variable called *High bid-ask spread*, which equals 1 if a firm has a higher than the median value of bid-ask spread in 2006. We then interact *High bid-ask spread* with *C-score.* In Column 2 of Table 7, we find that the coefficient of *C-score*, which captures the effect of conservatism on stock performance for firms with lower bid-ask spread, is 0.019 and is significant at the 10% level. The interaction term between *High bid-ask spread* and *C-score*, which captures the incremental effect of conservatism on stock performance for firms with higher bid-ask spread, is 0.033 and is significant at the traditional level.[21] Hence, the impact of conservatism on firm performance is more pronounced for firms with higher information asymmetry.

We further use analysts' forecasts accuracy to capture information asymmetry. We construct a dummy variable called *Low analyst accuracy*, which equals 1 if a firm has a higher than the median value of Analyst forecast dispersion in 2006. Analyst forecast dispersion is the standard deviation of individual analyst forecasts deflated by actual earnings. Consistent with our expectation, we find in Column 3 of Table 7 that the interaction term between *Low analyst accuracy* and *C-score* is positive and significant, further indicating that the relation between conservatism and firm performance is conditional on the information environments of firms.

In sum, Table 7 provides empirical evidence to support our hypothesis that accounting conservatism affects firm value through its governance and information roles. It also indicates a substitution relation between conservatism and other governance mechanisms.

4.6. The effect of conservatism on real activities during the crisis period

In this sub-section, we provide supplemental tests on how conservatism affects real operational activities during the crisis periods. The main purpose is to further

[21] The F-test of the effect of *C-score* on *BHAR* for high bid-ask spread firms (0.019+0.033=0.052) is significantly positive at the 1% level.

investigate possible channels through which conservatism affects firm value during the crisis.

We first separate firms into two subsamples based on the median value of *C-score*. Then we provide univariate tests on the major operational activity changes during the crisis period (from 2007Q3 to 2009Q1) between the more and the less conservative firm samples. The results are in Table 8.

[Insert Table 8 here]

We first compare earnings management behavior between two subsamples. We use cross-sectional modified Jones model (Dechow et al. 1995) as the measure of discretionary accruals. We find that for the less conservative firm sample, the mean value of discretionary accruals increases by 0.046 during the crisis period, while it increases only by 0.009 for the more conservative firm samples. The mean difference is 0.036 and is significant at the 5% level. The results have two implications. First, it provides evidence to show that manipulations of earnings become more severe during the crisis period. Second, it confirms that conservatism plays an important governance role to deter earnings management during the crisis period. The result is also consistent with Baek et al. (2004) and Kim and Yi (2006) that managers are more likely to engage in aggressive earnings manipulations during the crisis periods.

Secondly, we examine firm financing activities during the crisis period. We first compare total debt changes for two subsamples. We find that for the less conservative firm sample, on average, its total debt increases by 18 million, while it increases by 212 million for the more conservative firms. The mean difference of 194 is significant at the 1% level. The result shows that more conservative firms have more access to debt markets compared to less conservative firms.

We further compare cost of bank loans between these two subsamples during the crisis period. We match our sample with Dealscan database. We find that the average bank loan price for more conservative firms is 185 basis points, while it is 239 basis points for less conservative firms. The mean difference of 54 basis points is significant at the 1% level, indicating more conservative firms enjoy much lower cost of debt financing.

The ability to rise funding and to lower cost of debt capital is especially important during the crisis period, as firms are generally financially constrained because of credit crunches of the banking system (e.g., Ivashina and Scharfstein 2010). This provides another possible channel through which conservatism affects firm value during the crisis period. The result is also consistent with the finding by Ahmed et al. (2002), Zhang (2008), and others, which show that conservatism makes external financing easier and cheaper.

Thirdly, we test firm investment activates during the crisis period. We compare total capital expenditure changes for two subsamples. We find that less conservative firms, on average, reduce capital expenditures by 0.002, while more conservative firms increase by 0.002. The mean difference is also statistically different. The result shows that while less conservative firms reduce their investments, more conservative firms increase their investments during the crisis. The investment ability is also important during the crisis, as most firms suffer from underinvestment because of lack of funding and investment opportunities (e.g., Campello et al. 2010). The result is in line with prior studies, such as Francis and Martin (2010) and Garcia Lara et al. (2010) that show that conservatism could mitigate underinvestment problems. We further examine acquisition activities between these two subsamples. However, we do not find significant differences between more and less conservative firms during the crisis period.

Next, we examine research and development (R&D) activity changes during the crisis period. Recent studies show that managers use accrual-based as well as real-based earnings management, such as reductions of R&D expenditures, to avoid reporting losses (e.g., Roychowdhury 2006; Cohen and Zarowin 2010). We expect firms generally reduce R&D expenditures during the crisis period. The result shows that less conservative firms cut R&D expenditures by 0.016, while more conservative firms cut R&D expenditures by 0.007. The mean difference of 0.009 is significant at the 5% level. The result also indicates that more conservative firms are less likely to involve in real earnings management during the crisis period.

We further examine cash holding during the crisis period. We find that less conservative firms reduce cash holding by 0.031, while more conservative firms reduce cash holding by 0.007. The mean difference is also statistically significant at 5% level.

The result is consistent with Li (2010) that find conservatism increases cash flows from financing, and enhances future cash flow from operations.

Finally, as Biddle et al. (2011a) find a negative relation between conservatism and bankruptcy risk of the firms, we examine how default risk changes during the crisis. We use Altman's (1968) Z-score to measure default risk. We find that for less conservative firms, the mean default risk increases by 0.354, while it increases by 0.167 for more conservative firms. The mean difference is also significant at the 5% level. The result is in line with the finding by Biddle et al. (2011a), and provides another possible channel through which conservatism affects firm value during the crisis.

In sum, the results in Table 8 show that conservatism affects financing, investments, cash holding, R&D, default risk of firms during the crisis period. The results are consistent with prior studies and provide possible real activity channels through which conservatism affects firm value.

5. Conclusion

In this paper, using the current financial crisis as a natural experiment, we test whether and to what extent conservative accounting affects shareholder value. We find strong evidence that there is a positive association between conservatism and firm value during the current crisis. The result holds when we use various measures of conservatism (both conditional and unconditional conservatism), and when we conduct a series of robustness checks. Collectively, our results provide supportive evidence to the argument in the accounting literature that conservatism is an efficient governance mechanism that mitigates information risk and control agency problems, and that shareholders benefit from conservative accounting.

It is well established that conservatism is beneficial to debt holders. Our paper provides a direct test of the benefits of conservatism to outside shareholders. Thus, the findings in our paper complement the line of research on the economic consequences of conservatism accounting in the equity market and further our understanding of the benefits of accounting conservatism.

Our paper also provides evidence to support the calling by Watts (2003a) that standard setters should be cautious in eliminating conservatism and moving toward fair value in reporting assets and liabilities. Our paper suggests that standard-setters should fully understand the economic consequences of conservatism, and consider the tradeoff between fair value accounting and conservative accounting when making their decisions.

However, we acknowledge that the results of our paper should be considered in the context of the study's inherent limitations. First, measurement error is a common concern in most conservatism studies. Although we attempt to use different proxies for conservatism, we still cannot totally rule out the measure error problem. Second, given there is no consensus on the time span of the current financial crisis, we try different time windows and our results are all statistically significant. However, the economic significances of our results are sensitive to the different time windows of the crisis. Third, in our paper, we propose several possible explanations for why accounting conservatism affects firm performance during the crisis period. However, we do not know exactly which factor(s) drives the observed relation, or which factor(s) is more important. Further studies could investigate more on how conservatism affects managers' reporting incentives, real corporate activities, and how investors, especially institutional investors, react to the financial crisis differently between more conservative and less conservative firms. A related research question of how managers' reporting behaviors changes after the financial crisis is also worthy to explore.

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Table 1: Summary statistics

This table provides summary statistics for the data employed in our analysis. C-score is calculated based on Khan and Watts (2009). Coeff_Basu is based on Zhang (2008) conservatism measure: ($\beta_{3i} + \beta_{4t}$)/ β_{3i} . β_{3i} and β_{4t} are obtained from firm-specific Basu (1997) model $X_{i,t} = \beta_{1i} + \beta_{2i}D_{i,t} + \beta_{3i}R_{i,t} + \beta_{4t}D_{i,t}R_{i,t} + \varepsilon_i$ from 1980 to 2006. Accrual is non-operating accruals scaled by lagged assets and multiplied by -1. Skewness_Earnings is the skewness of earnings from 1980 till 2006 divided by the skewness of cash flow from operations from 1980 till 2006, multiplied by -1. Bias Market /book is the α_i from following regression model: $M/B_{i,t} = \alpha_t + \alpha_i + \sum_{j=0}^{6} \beta_j R_{t-j,i} + \varepsilon_{t,i}$

Cum. Returns (Crisis) is the cumulative stock returns during the financial crisis (October 2007 to March 2009). BHAR (crisis) is the buy-and-hold abnormal returns during the financial crisis period (October 2007 to March 2009). Return Volatility (Crisis) is the stock return volatility during the financial crisis (October 2007 to March 2009). Market/book is the ratio of market value of equity to book value of equity at the end of the year. Size is the natural log of market value of equity. Leverage is the long term debt plus short term debt scaled by market value of equity. Cash holding is the cash and short investment divided by total assets. Sales growth is the three year average of annual growth rates in total sales. Tangibility is the net property, plant and equipment divided by total assets. Beta is calculated by regressing a firm's monthly stock return five years before the crisis on the corresponding NYSE/AMEX/NASDAQ Value-weighted Index from CRSP. All firm variables are measured at the end of fiscal year 2006.

Variables	N	Mean	Median	Std. Dev.	25 percentile	75 percentile
C-score	5043	0.209	0.188	0.499	-0.109	0.483
Coeff_Basu	4684	0.581	0.098	13.40	-1.026	1.619
Skewness_Earnings	6203	-0.095	0.009	1.337	-1.004	0.837
Accrual	3706	0.008	0.005	0.112	-0.043	0.029
Bias Market/book	4933	-1.366	0.520	6.339	-7.434	2.340
Cum. return (crisis)	5464	-0.472	-0.518	0.361	-0.740	-0.254
BHAR (crisis)	5395	-0.058	-0.069	0.304	-0.303	0.3151
Return volatility (crisis)	5453	0.167	0.141	0.099	0.104	0.202
Market/book	5076	1.967	1.355	2.127	0.933	2.223
Size	6326	6.204	6.181	2.224	4.624	7.625
Leverage	5743	0.208	0.149	0.253	0.014	0.312
Cash holding	5758	0.202	0.102	0.233	0.031	0.292
Sales growth	5758	0.198	0.112	0.344	0.020	0.278
Tangibility	5569	0.212	0.117	0.233	0.028	0.321
Beta	6163	1.107	0.987	0.751	0.582	1.512

Table 2: Spearman correlation table

This table provides Spearman correlations of key variables employed in our analysis. All variables are defined in Table 1. P-values are in parentheses.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Cum. return (crisis)	1													
2	BHAR (crisis)	0.826	1												
		(0.00)													
3	C-score	0.047	0.127	1											
		(0.00)	(0.00)												
4	Coeff_Basu	0.057	0.051	0.009	1										
		(0.00)	(0.00)	(0.95)											
5	Skewness_Earnings	0.060	0.135	0.182	0.028	1									
		(0.00)	(0.00)	(0.00)	(0.05)										
6	Accrual	0.005	0.046	0.001	0.027	0.150	1								
		(0.59)	(0.01)	(0.91)	(0.14)	(0.00)									
7	Bias Market/book	0.038	0.019	0.291	0.009	0.042	0.185	1							
		(0.02)	(0.02)	(0.00)	(0.58)	(0.00)	(0.00)								
8	Market/book	0.072	0.022	0.354	0.007	0.029	0.119	0.564	1						
		(0.00)	(0.15)	(0.00)	(0.64)	(0.03)	(0.00)	(0.00)							
9	Size	0.059	0.175	0.596	0.005	0.271	0.051	-0.133	-0.313	1					
		(0.00)	(0.00)	(0.00)	(0.76)	(0.00)	(0.00)	(0.00)	(0.00)						
10	Leverage	-0.069	-0.052	0.470	0.006	-0.051	0.063	0.016	-0.080	0.172	1				
		(0.00)	(0.00)	(0.00)	(0.70)	(0.00)	(0.00)	(0.31)	(0.00)	(0.00)					
11	Beta	-0.295	-0.394	-0.108	-0.02	-0.166	-0.055	0.044	0.061	-0.162	-0.058	1			
		(0.00)	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)				
12	Cash holding	0.004	-0.108	-0.204	-0.02	-0.105	-0.159	0.262	0.385	-0.410	-0.306	0.357	1		
		(0.73)	(0.00)	(0.00)	(0.20)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			

13	Sales growth	-0.014	-0.022	0.016	0.01	-0.001	-0.037	0.021	0.129	-0.055	-0.004	0.004	0.019	1	
		(0.31)	(0.12)	(0.23)	(0.49)	(0.91)	(0.02)	(0.21)	(0.00)	(0.00)	(0.75)	(0.72)	(0.13)		
14	Tangibility	0.028	0.024	0.162	0.02	0.008	0.048	-0.122	-0.127	0.138	0.211	-0.059	-0.297	0.0019	1
		(0.05)	(0.10)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.89)	

Table 3: Firm stock performance and volatility during the current crisis, by C-score deciles

This table shows means and medians of cumulative stock returns, buy-and-hold abnormal returns, and stock return volatility during the current crisis, sorted by C-score deciles. Conservatism is increasing in the C-score ranks. All variables are defined in Table 1. High-Low is the mean or median difference between the values of the variable for the high and low C-score deciles. Absolute t value for T-test and absolute Z value for Wilcoxon Ranksum Test are reported. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Cum. returns (crisis)		BHAR (crisis)		Return volatility (crisis)	
C-score deciles	Mean	Median	Mean	Median	Mean	Median
1	-0.525	-0.631	-0.173	-0.223	0.211	0.184
2	-0.541	-0.658	-0.163	-0.251	0.207	0.182
3	-0.493	-0.629	-0.105	-0.186	0.198	0.181
4	-0.492	-0.552	-0.076	-0.118	0.189	0.165
5	-0.474	-0.544	-0.070	-0.102	0.178	0.162
6	-0.468	-0.528	-0.064	-0.078	0.176	0.159
7	-0.486	-0.554	-0.045	-0.068	0.171	0.156
8	-0.485	-0.528	-0.054	-0.057	0.167	0.147
9	-0.481	-0.506	-0.043	-0.049	0.153	0.131
10	-0.464	-0.489	-0.037	-0.039	0.145	0.129
High-Low (10)-(1)	0.061**	0.142***	0.136***	0.184***	-0.066***	-0.055***
T/Z-Statistics	[2.07]	[4.87]	[6.47]	[7.71]	[9.44]	[10.18]

Table 4: Conservatism and firm value during the current crisis

This table presents OLS regression results on the effect of accounting conservatism on firm value during the current financial crisis. The dependent variables are the cumulative stock returns, BHAR (crisis) and return volatility during the financial crisis. All variables are defined in Table 1. Heteroskedasticity robust t-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

		(1)	(2)	(3)
	Predict sign	Cum. return (crisis)	BHAR (crisis)	Return volatility (crisis)
C-score	+/-	0.038	0.064	-0.017
		(3.06)***	(5.21)***	(3.34)***
Size	+/-	0.010	0.014	-0.009
		(2.69)***	(4.44)***	(9.71)***
Leverage	-/+	-0.139	-0.157	0.076
		(2.63)***	(3.45)***	(8.14)***
Beta	-/+	-0.132	-0.152	0.033
		(9.44)***	(16.26)***	(8.24)***
Cash holding	+/-	0.116	0.035	0.015
		(2.51)**	(1.17)	(1.24)
Sales growth	-/+	-0.001	-0.001	0.001
		(1.73)*	(2.03)**	(2.07)**
Tangibility	+/-	0.039	0.035	-0.005
		(1.12)	(1.19)	(0.51)
Industry effect		Y	Y	Y
R2		0.12	0.19	0.19
N		3,728	3,690	3,769

Table 5: Conservatism and firm value during the current crisis: Alternative measures of conservatism

This table presents OLS regression results on the effect of accounting conservatism on firm value during the current crisis. The dependent variable is the buy-and-hold abnormal returns during the financial crisis (October 2007 to March 2009). All variables are defined in Table 1. Heteroskedasticity robust t-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

		(1)	(2)	(3)	(4)	(5)
	Predict sign	BHAR (crisis)	BHAR (crisis)	BHAR (crisis)	BHAR (crisis)	BHAR (crisis)
C-score (3 year average)	+	0.028				
		(2.14)**				
Coeff_Basu	+		0.002			
			(2.44)**			
Skewness_Earnings	+			0.012		
				(3.36)***		
Accrual	+				0.068	
					(2.85)***	
Bias Market/book						0.004**
						(1.98)
Size	+	0.026	0.026	0.022	0.022	0.026
		(9.81)***	(9.84)***	(9.09)***	(6.51)***	(10.02)***
Leverage	-	-0.125	-0.131	-0.104	-0.102	-0.229
		(4.98)***	(5.33)***	(2.49)**	(3.19)***	(6.22)***
Beta	-	-0.151	-0.151	-0.145	-0.155	-0.153
		(18.21)***	(17.10)***	(15.28)***	(12.97)***	(15.69)***
Cash holding	+	0.031	0.077	0.020	0.015	0.033
		(1.09)	(2.51)**	(0.68)	(0.35)	(1.03)
Sales growth	-	-0.001	-0.005	-0.001	-0.001	-0.001
		(2.57)**	(1.53)	(3.18)***	(0.53)	(2.40)**
Tangibility	+	0.046	0.001	0.041	0.065	0.054
		(1.53)	(0.01)	(1.39)	(1.48)	(1.71)*
Market/book	+		0.021	0.016	0.019	
			(7.44)***	(4.90)***	(4.89)***	
Industry effect		Y	Y	Y	Y	Y
R2		0.19	0.16	0.20	0.21	0.20
N		3,537	3,066	3,689	1,758	3,236

Table 6: Robustness checks

This table presents robustness checks on the effect of accounting conservatism on firm value before and during the current crisis. BHAR (Crisis1) is the buy-and-hold abnormal returns during the financial crisis (July 2007 to March 2009). BHAR (pre-Crisis) is the buy-and-hold abnormal returns during the pre-financial crisis (October 2006 to September 2007). Crisis period cumulative ROA is defined as the cumulative quarterly net income from 2007Q3 to 2009Q1 divided by the total assets at the end of 2007Q2. E-index is Bebchuk et al. (2009) index of entrenchment of the management. Segments are the total number of segments of a firm. Stock return (2006) is the cumulative stock returns during the 2006. Discretionary accrual is calculated based on cross-sectional Jones model. All other variables are defined in Table 1. Heteroskedasticity robust t-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)	(4)	(5)
	Earlier crisis period starts	Alternative performance measure	Additional control variables	No major changes of C-score firms	Pre-crisis effect
	BHAR (crisis1)	Cumulative ROA	BHAR (crisis)	BHAR (crisis)	BHAR (pre-crisis)
C-score	0.072	2.361	0.208	0.253	0.020
	(3.50)***	(5.42)***	(2.78)***	(3.92)***	(1.07)
Size	0.014	-0.201	0.021	0.012	0.010
	(3.49)***	(2.62)***	(1.64)	(1.02)	(1.86)*
Leverage	-0.205	-2.687	-0.358	-0.359	-0.060
	(3.51)***	(5.24)***	(4.79)***	(4.51)***	(1.18)
Beta	-0.170	0.109	-0.306	-0.139	0.038
	(6.67)***	(0.65)	(14.37)***	(10.64)***	(2.46)**
Cash holding	0.090	-2.055	0.207	-0.016	-0.123
	(1.11)	(2.21)**	(3.04)***	(0.36)	(2.29)**
Sales growth	-0.001	-0.005	-0.006	-0.004	-0.001
	(2.42)**	(1.64)	(2.03)**	(0.41)	(1.20)
Tangibility	0.028	-0.228	-0.031	-0.065	0.179
	(0.82)	(1.26)	(0.68)	(1.29)	(3.13)***
E-index			-0.015		
			(2.33)**		
Segments			-0.007		
			(1.75)*		
Stock return (2006)			0.029		
			(1.10)		
Discretionary accrual			-0.098**		
			(2.28)		
Industry effect	Y	Y	Y	Y	Y
R2	0.11	0.07	0.26	0.16	0.05
N	3,889	3,630	934	918	4,242

Table 7: Conservatism and firm value during the current crisis: Subsample tests

This table presents additional tests on how the relation between accounting conservatism and firm value during the current crisis depends on governance or information environments of firms. The dependent variable is the buy-and-hold abnormal returns during the financial crisis (October 2007 to March 2009). Good governance is a dummy variable which equals 1 if a firm' s E-index score is less than the median value in 2006. High bid-ask spread is a dummy variable which equals 1 if a firm has an average bid ask spread higher than the median value in 2006. Low analyst accuracy is a dummy variable which equals 1 if a firm has a higher than the median value of the Analyst forecast dispersion in 2006. Analyst forecast dispersion is the standard deviation of individual analyst forecasts deflated by actual earnings. All other variables are defined in Table 1. Heteroskedasticity robust t-statistics/z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)
C-score	0.196	0.019	0.041
	(2.84)***	(1.88)*	(2.24)**
Good governance	0.077		
	(3.00)***		
C-score*Good governance	-0.102		
	(2.10)**		
High bid-ask spread		-0.231	
		(18.29)***	
C-score* High bid-ask spread		0.033	
		(1.83)*	
Low analyst accuracy			-0.013
			(2.22)**
C-score* Low analyst accuracy	0.102		0.032
	(2.10)**		(1.65)*
Size	0.018	0.013	0.015
	(1.69)*	(4.06)***	(4.99)***
Leverage	-0.270	-0.117	-0.154
	(4.14)***	(3.15)***	(6.17)***
Beta	-0.205	-0.150	-0.152
	(12.42)***	(17.95)***	(19.17)***
Cash holding	0.143	0.047	0.034
	(2.50)**	(1.74)*	(1.27)
Sales growth	0.031	-0.001	-0.001
	(1.15)	(1.77)*	(1.85)*
Tangibility	0.067	-0.027	0.035
	(1.24)	(1.15)	(1.19)
Industry effect	Y	Y	Y
R2	0.31	0.24	0.19
N	1,187	3,690	3,690

Table 8: Comparison of real activity changes during the current crisis between more and less conservative firms

This table presents univariate tests of firm real activity changes and cost of bank loans during the current crisis period between more and less conservatism firms (based on the median value of C-score). The financial crisis period is defined as from 2007Q3 to 2009Q1. Discretionary accruals are calculated based on modified Jones model. Total debt is total long term debt and short term debt. Interest rate is the all-in-spread-drawn during the crisis period from the DealScan data. All-in-spread is the basis points borrowers pay in excess of the London Interbank Offered Rate (LIBOR) or LIBOR equivalent. Investments is capital expenditures divided by total assets. Acquisitions is acquisitions divided by total assets. Research and development is the research and development expenditures divided by total assets. Cash holding is cash and short investment divided by total assets. Default risk is Altman's (1968) Z-score. The means of the differences between the variables for two sub-samples and t statistics are also reported. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Less conservative firms		More conservative firms		(Less)-(More)	
	Mean	STD	Mean	STD	Diff	T value
Changes in discretionary accruals	0.046	0.155	0.009	0.109	0.037**	2.28
Changes in total debt (Million)	18	78	212	371	-194***	-17.04
Interest rate (Basis points)	239	155	185	150	54***	5.82
Changes in investments	-0.002	0.049	0.002	0.046	-0.004**	-2.08
Changes in acquisitions	-0.005	0.098	-0.003	0.091	-0.002	-0.56
Changes in research and development	-0.016	0.051	-0.007	0.036	-0.009**	-2.06
Changes in cash holdings	-0.031	0.129	-0.007	0.068	-0.024**	-2.12
Changes in default risk	-0.354	2.331	-0.167	0.831	-0.187**	-2.44

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ISBN 978-952-6699-09-7, ISSN 1456-6184, online