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Essays on Reporting Conservatism

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CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written nor material which has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

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ABSTRACT

This dissertation consists of three parts. The first part of the thesis, chapter two, reviews the papers on the definition, determinants, consequences, measures of reporting conservatism. This chapter is useful for chapters three and four, as it not only provides theories for building up the hypotheses that are tested in the later two chapters, but also comments on the models and measures that are employed in chapters three and four.

Next, I investigate the impact of conservatism on investment efficiency. Using various measures to proxy for conservatism and investment efficiency and employing different models to examine the association between conservatism and investment efficiency, I find that the results are sensitive to different testing approaches. The empirical analyses provide no reliable evidence indicating that conservatism improves investment efficiency by deterring the over-investment problem. Endogeneity and measurement errors in the conservatism proxies are two possible reasons that explain the observed results.

Finally, the last part of my thesis explores the influence of CEO retirement on conservatism. I first examine the link between CEO retirement and reporting conservatism and then further investigate CEO compensation's influence on it. I document that firms are more likely to prepare less conservative financial reports prior to the retirement of their CEOs, and further, the result is more pronounced for the CEOs that rely primarily on earnings-based compensation.

Keywords: Conservatism, Investment Efficiency, Horizon Problem

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TABLE OF CONTENTS

LIST OF TABLES

Chapter One

Introduction

This thesis comprises three parts. In the first part, recent papers on conservatism are reviewed. In the second part, the impact of accounting conservatism on investment efficiency is investigated. Finally, the influence of CEO retirement on reporting conservatism is examined.

1.1 A Review on Conditional Conservatism

The first part of this thesis, chapter two, reviews papers on the definition, determinants, consequences, and measurements of conditional conservatism. Chapter two is useful for the later two chapters of my thesis, as it (1) provides theories for building up the hypotheses that are tested in chapters three and four, and (2) comments on the various conservatism models and measures that are used in the later two chapters.

1.2 The Association between Reporting Conservatism and Investment Efficiency

Using samples of 1,339 to 80,022 firm-year observations (sample sizes change accordingly for tests based on different conservatism measures and different models) over twenty-five years, from 1980 to 2005, the second part of this thesis examines the influence of reporting conservatism on investment efficiency. Given that there is no general consensus on which measure best captures firms' reporting conservatism (Ryan 2006; Givoly, Hayn, Natajaran, 2007), I use Basu (1997) model and five individual measures to proxy for accounting conservatism in this study. The five firm-specific measures of conservatism include Khan and Watts (2009) C-score measure, two time-series measures of conservatism based on the Basu (1997) model, and Givoly and Hayn's (2000) accrual and skewness measures. Firm-specific over-investment measure is computed following the method proposed by Verdi (2006), and the over-investment models are constructed following the regression proposed by Biddle, Hilary and Verdi (2009) and the model developed by Durnev, Morck and Yeung (2004).

I am motivated to investigate the association between conservatism and investment efficiency for the following reasons. First, investment decision influences firms' future profitability, which in turn influences the survival prospects of the firms. Thus, given the importance of investment efficiency and the scarcity of studies in this field, how conservatism influences investment efficiency becomes an important issue.

Second, during the recent years, standard setters including FASB argue that conservatism causes biased financial reports, and there undergoes a debate over the elimination of conservatism (e.g., Watts 2003; FASB 2006). Therefore, empirical evidence on the role played by conservatism in monitoring firms' investment decisions not only extends knowledge on conservatism, but also has important implications for the debate over the desirability of conservatism.

Third, while researchers have paid attention to investigate the association between corporate governance mechanisms and financial market characteristics (e.g., Klein 2002; Farber 2005), they have paid relatively little attention to the influence of conservatism, which is viewed as an important corporate governance mechanism (e.g., Ball and Shivakumar 2005) on firms' investment decisions.

There are four related studies that provide initial evidence on the link between conservatism and firms' investment decisions. Through a cross-country analysis, Bushman, Piotroski and Smith (2007) find that firms' investment efficiency varies with the countries' aggregated conservatism level. However, cross-country evidence on the association between conservatism and investment efficiency might be subject to several limitations. First, cross-country test may have measurement problem. As argued by Levine and Zervos (1993), the explanations for some variables vary among countries, and only people that are familiar with the environments of the countries may interpret the meaning of those variables accurately. Therefore, employing single proxies to measure variables across countries may cause measurement errors. Second, cross-country analysis may cause statistical problem. As argued by Harberger (1987), some countries, such as Dominican Republic, Thailand, Zimbabwe, Greece, and Bolivia, may have little in common. While regression analyses require that “the observation are drawn from a distinct population” (Levine and Zervos, 1993, p.426), the variables that are used in the cross-country regressions show substantial heterogeneity across countries. Therefore, putting countries with great heterogeneity in the same regression may cause statistical errors. Moreover, as Bushman et al. (2007) estimate the country-level conservatism measure by estimating Basu (1997) model by country using 12-year pooled data, the conceptual basis upon which they build their research design may be also subject to some limitations. The factors that have significant influence on both conservatism (e.g., Watts 2003; Khan and Watts 2009) and firms’ investment decisions (e.g., Biddle et al. 2009), such as business cycle, regulations, reporting requirements, and legal environments, may change dramatically during the time for some countries. Therefore, it is questionable to interpret the coefficient on country-level conservatism measure as the behavioral relationship that shows how much investment efficiency will change when conservatism level changes. Fourth, given that the country-level analyses conducted by Bushman et al. (2007) do not resolve the causal problem, their results should be explained with cautions. The results might be viewed as the partial relationship between conservatism and investment efficiency, instead of the impact of conservatism on investment efficiency.

Different from Bushman et al. (2007), this study uses firm-level U.S. data to examine the influence of conservatism on investment efficiency. Firm-level analyses alleviate the concerns about the heterogeneity across countries. Furthermore, my study examines the impact of *ex ante* conservatism on *ex post* investment efficiency, which overcomes the reverse causality problem. Moreover, firm-level analysis controls for the influence of characteristic differences across countries, such as reporting requirements, administrative efficiency, and legal environments, on reporting conservatism and investment efficiency. Thus, firm-level analysis allows me to direct test the influence of reporting choices on investment decisions. Finally, firm-level analysis also allows me to investigate whether conservatism plays similar roles across and within countries. Overall, by testing the association between conservatism and investment efficiency using U.S. data, my study complements Bushman et al.'s (2007) cross-country study and contributes to the related literature.

Another paper by Ahmed and Duellman (2007a) examines the relation between conservatism, future profitability, and future special items charge. Higher future profitability and lower future special items charges are viewed as the *ex post* consequences of good investment decisions. They find that firms preparing more conservative financial reports have higher future profitability and lower future special items charge. Viewing acquisition investment profitability as the *ex post* consequence of good acquisition decision, Francis and Martin (2010) show that firms exhibiting greater degrees of conservatism make more profitable acquisition-investments. As both Ahmed and Duellman (2007a) and Francis and Martin (2010) provide evidence on the consequences of investment efficiency, my study complements these two studies by providing direct evidence on the influence of conditional accounting conservatism on over-investment.

Contemporarily, a study by Garcia Lara, Garcia Osma and Penalva (2009a) addresses the issue of the influence of conservatism on investment efficiency. Similar to my study, Garcia Lara et al. (2009a) also examine the association between conditional conservatism and investment, and provide direct evidence that conditional conservatism improves investment efficiency. The basic idea of Garcia Lara et al. (2009a) is similar to my study, and both Garcia Lara et al. (2009a) and my study use the Biddle et al. (2009) as the basic model to investigate the influence of conservatism on investment efficiency. However, as will be discussed in details in chapter three, we use different testing techniques. While Garcia Lara et al. (2009a) use accruals to proxy for conditional conservatism, the first draft of my thesis employs five conservatism measures and the Basu (1997) model to examine the influence of conservatism on investment efficiency. Interestingly, I find results inconsistent with Garcia Lara et al. (2009a). While they find strong and consistent results that conservatism improves investment efficiency, I find mixed evidence on the association between conservatism and investment efficiency. My findings show that the results are sensitive to different conservatism measures. Therefore, I conduct several additional analyses, which will be shown in chapter three, to investigate the possible reasons that cause the differences.

Garcia Lara et al. (2010) later revise their paper using the C-score measure, instead of the accrual measure, to proxy for conservatism. I further include the Durnev et al. (2004) model to provide more comprehensive tests on the association between conservatism and investment efficiency. Similar to the results for the tests based on the Biddle et al. (2009) model, results for the tests based on the Durnev et al. (2004) model are also sensitive to different conservatism measures. Overall, I find no consistent evidence regarding whether conservatism improves investment efficiency by curbing over-investment, which casts doubt on the validity of Garcia Lara et al.'s (2010) conclusion that is reached based on a sole measure of conservatism.

Briefly, mixed evidence is found in my study. On one hand, for the tests based on the Basu (1997) model, I find consistent evidence that conservatism is negatively correlated with future over-investment, which supports the view that conservatism improves firms' investment efficiency. However, the result is not economically significant. For the tests based on the C-Score measure, I find evidence that conservatism is negatively correlated with future over-investment. However, for the test based on Biddle et al. (2009) model, the association between C-Score and future over-investment is not significant when employing the ranked value of C-Score as the proxy for conservatism. On the other hand, using the firm-specific coefficient ratio, which is estimated based on the Basu (1997) model, to proxy for conservatism, I document that conservatism is positively associated with future over-investment by using the Biddle et al. (2009) model, and find no association between conservatism and investment efficiency using the Durnev et al. (2004) model. For the accrual measure of conservatism, which is estimated based on Givoly and Hayn (2000), I find that conservatism is positively related to future over-investment using the Biddle et al. (2009) model but is negatively associated with future over-investment using the Durnev et al. (2004) model. In addition, I find no evidence on the association between future over-investment and other firm-specific conservatism measures. Overall, in the absence of consistent evidence on the relation between conservatism and investment efficiency, no definite conclusion can be drawn. The results are open to two plausible explanations. First, as prior studies suggest that firm-specific measures of conservatism may be subject to measurement errors (e.g., Francis et al. 2004; Givoly, Hayn and Natarajan 2007; Garcia Lara, Garcia Osma and Penalva 2011), the results may be due to measurement errors. Second, endogeneity is a possible reason for the failure to detect the impact of conservatism on investment efficiency. Demsetz and Lehn (1985) show that firms change their ownership structures to maximize firm value. Following Demsetz and Lehn's argument, firms may change their accounting practices, such as conservatism, in response to their environment. For firms with a higher propensity to over-invest, at the demand of stockholders and debtholders, conservatism emerges as a mechanism to restrain those firms from over-investing. To the extent that reporting conservatism effectively prevents the firms from over-investing, the equilibrium outcome is that the association between conservatism and over-investment is not observed. However, such evidence is entirely conformable with the argument that reporting conservatism improves investment efficiency. Moreover, as Bushman et al. (2007) find a positive association between conservatism and investment efficiency by using cross-country analysis, my results may indicate that conservatism operates differently across and within countries.

Overall, the second part of my study contributes to the literature by extending knowledge on the association between reporting quality and investment efficiency (e.g., Biddle and Hilary 2006; Biddle et al. 2009), and specifically, on the impact of conditional conservatism on investment efficiency (e.g., Ahmed and Duellman 2007a; Bushman et al. 2007; Francis and Martin 2010; Garcia Lara et al. 2009a).

1.3 The Association between CEO Retirement and Conservatism

There are two research questions for the third part of this thesis: (1) whether the firms exhibit lower conservatism prior to CEO retirements, (2) and the impact of the compensation plan on the association between conservatism and CEO retirement. Similar to earlier studies (e.g., Basu 1997; Beekes, Pope and Young 2004; Ahmed and Duellman 2007b), this study employs the Basu (1997) model to test these two research questions. The association between CEO retirement and conservatism is examined by employing 15,687 firm-year observations during the sample period of 1994 to 2006, and the impact of the compensation plan on the link between CEO retirement and conservatism is tested by using 15,573 firm-year observations during the same sample period.

I am motivated to conduct this study for three reasons. As discussed in previous studies, managers may have lower incentives to work for shareholders' interests when they plan to leave the firms (e.g., Smith and Watts 1982; Dechow and Sloan 1991). The departing managers are less concerned about firms' long-term benefits. Instead, they focus on boosting up the short-term profits to increase their own wealth. This phenomenon is referred to as the horizon problem. Several prior studies are conducted to examine the influence of the horizon problem on managers' operating and accounting decisions, and mixed evidence is presented by these studies (e.g., Butler and Newman 1989; Dechow and Sloan 1991; Gibbons and Murphy 1992; Cheng 2004). My study revisits this issue by analyzing the impacts of CEO retirement on accounting conservatism.

Compared with the CEOs who are forced to leave the firms, the retiring CEOs are better able to predict when they will leave the firms. Furthermore, as most of the retiring CEOs are no longer in the job market after they get retired, they are less concerned about their reputation in the job market. Thus, the horizon problem may be more pronounced for the retiring CEOs. Most of the previous studies on the horizon problem examine the impact of CEO retirement on firms' operating and accounting choices by employing R&D, advertising fee or accruals to proxy for earnings management or managers' operating decisions (e.g., Dechow and Sloan 1991; Cheng 2004; Kalyta 2009). My work is related to prior studies, as I also focus on the impact of CEO retirements on firms' accounting choices. However, the unique features of conservatism differentiate my research from prior studies. The role conservatism plays is two-folded: (1) conservatism is a mechanism that offsets reporting biases caused by earnings management (Watts

2003), (2) and more importantly, conservatism plays a monitoring role that disciplines managers' opportunistic behaviors. As will be discussed in detail in the later sections, the retiring CEOs might manipulate earnings or engage in opportunistic behaviors to increase their last year's compensation. For example, they might invest in negative NPV projects that generate high profits in the short-run but low profits in the long-run, or are less concerned about firms' future costs of capital, or defer the recognition of bad news to the new CEOs' tenure. All of these activities may influence the CEO retirement firms' accounting conservatism. Thus, investigating how CEO retirement influences firm's conservatism level may provide more comprehensive evidence on the impact of CEO retirement on firms' operating and accounting choices.

Second, prior studies on the influence of the horizon problems on firms' reporting choices have paid relatively less attention to the role compensation plan plays. Compensation can be classified into two components: earnings-based compensation and stock-based compensation (e.g., Duru, Mansi and Reeb 2005). Earnings-based compensation comprises salary and cash bonus, and stock-based compensation includes restricted stock holdings, stock options, and other stock-related compensation. As previous studies show that stock-based compensation plan aligns managerial and shareholders' interests (e.g., Kim and Suh 1993), it is interesting to examine whether the choice of reporting less conservative earnings is more appealing for the retiring CEOs who are compensated mainly based on firms' financial performance, instead of firms' stock price performance.

To my knowledge, there are two related papers that provide direct evidence on the influence of the compensation plan on the association between CEO departure and firms' accounting and operating choices. Dechow and Sloan (1991) demonstrate that the departing CEOs are more likely to cut R&D expenditures in their final year when their compensation is mainly based on firms' financial performance. My study extends Dechow and Sloan's work in four ways. First, I examine the influence of the horizon problem by using the CEO retirement firms, while they investigate all the CEO departures, both the voluntary and involuntary departures are included. However, as discussed previously, the departing CEOs who leave the firms for reasons other than retirement may not be affected by the horizon problem. Thus, my approach may provide more precise evidence on the influence of the horizon problem. Second, they examine the R&D expenditure. However, the later studies provide mixed and inconclusive evidence on the influence of the horizon problem on R&D expenditure (e.g., Murphy and Zimmerman 1993; Cheng 2004). I re-investigate this issue by examining the influence of the horizon problem on reporting conservatism. Third, my sample consists of 15,687 observations over 13 years, from 1994 to 2006. Meanwhile, their tests are based on 517 observations on 57 CEO departure firms for 15 years, from 1974 to 1988. My sample is time-independent of the one employed by Dechow and Sloan (1991). Hence, this study provides an updated test for the horizon problem. Fourth, while Dechow and Sloan (1991) obtain the CEO departure observations from the Forbes annual compensation survey, I use the data from the Execucomp database. As noted by Brookman et al. (2006), the Execucomp data differ from the Forbes annual compensation survey data in several ways: (1) whereas the Forbes compensation survey just covers approximately 700 large firms, the Execucomp database has more observations and includes approximately 2,500 firms; and (2) some variables are defined differently by the two databases. For example, while the Forbes compensation survey uses the value of options exercised to compute total compensation, the Execucomp employs the value of options granted to calculate total compensation. As prior studies show that the research results are sensitive to differences in data sources and variable definitions (e.g., Kern and Morris 1994), my study complements Dechow and Sloan's research by employing the Execucomp data to examine the influence of the horizon problem.

Kalyta (2009) examines the impact of CEO pension plans on retiring CEOs' disclosure choices by employing discretionary accruals to proxy for earnings management. My study differs from Kalyta (2009) in several ways. First, while

Kalyta (2009) examines the horizon problem's impact on firms' earnings management activities, I investigate the horizon problem's influence on conservatism. Second, whereas Kalyta (2009) explores the impact of the CEO post-retirement compensation plans on the horizon problem, my study examines the influence of the CEO pre-retirement compensation plans.

Third, given that CEO is one of the most important actors in the agency conflicts, there are a lot of studies examining issues related to CEOs. While CEO turnover has been extensively examined in the previous literature (e.g., Pourciau 1993; Huson et al. 2001; Farrell and Whidbee 2003), there are just a few papers examining the issue of CEO retirement (e.g., Dechow and Sloan 1991; Kalyta 2009). My paper adds to the stream of the empirical literature on the association between CEO retirement and accounting choices.

My empirical results show the followings. Take the CEO retirement years as year 0. Year -1 is the last year the old CEOs manage the firms for a full year, and year 1 is the first year that the incoming CEOs take their positions for a full year. In the tests examining the cross-sectional differences, the results indicate that compared with non-CEO retirement observations, CEO retirement firms prepare less conservative financial reports in year -1. In the time-series tests, the findings show that CEO retirement firms exhibit less conservatively in year -1 than year

-2 or year 1.

To test the influence of compensation plans on the association between CEO retirement and conservatism, I partition the sample into three subgroups: CEOs rely heavily on earnings-based compensation (High-EBC group), those are compensated based both on stock prices and financial performance (Median-EBC group), and those rely mostly on stock-based compensation (Low-EBC group). My results are shown as follows. First, for the tests that examine the cross-sectional differences, the High- and Median- EBC firms report less conservative earnings before CEO retirements. I employ an F-test to compare the regression coefficients between the High-EBC group and the Median-EBC group. The coefficients on the indicator, which capture the impact of the horizon problem on reporting conservatism, do not differ significantly between the High-EBC group and the Median-EBC group. For the Low-EBC group, there is no difference in conservatism level between the firms with retiring CEOs and those without CEO retirements. Second, for the tests that investigate the time-series differences, the retiring CEOs for the High-EBC firms report less conservative earnings in year -1 than in year -2, and I do not find evidence that the retiring CEOs report less conservatively in year -1 than in year -2 for the Median- and Low- EBC firms. In addition, I find that the retiring CEOs of all the three compensation groups prepare less conservative financial reports than the incoming CEOs. Overall, the results are consistent with the hypothesis that the CEOs who are primarily compensated by earning-based compensation are likely to report less conservative earnings prior to their retirements.

This study contributes to the literature in several ways. First, to my knowledge, this is the first study that links CEO retirement to reporting conservatism. The retiring CEOs' attitudes to firms' short-term benefits and long-term profits are different. As shown previously and will be discussed in detail in the later parts, the retiring CEOs are more myopic than the CEOs who are not expected to leave their positions in the near future. For example, the retiring CEOs may choose to manage earnings to increase firms' short-term profits, invest in the projects that generate high profit in the short-run, and be less concerned about the future costs of capital. Conservatism captures not only the horizon problem's impact on firms' earnings management activities, but also the opportunistic behaviors that have potential influences on firms' future performance. Therefore, my study contributes to the literature by providing more comprehensive evidence on the consequences of the horizon problem.

Second, while the prior studies document mixed and inclusive evidence on the impact of the horizon problems on firms' accounting choices, my paper provides strong and consistent results that CEOs report less conservative accounting numbers prior to their retirements by employing a battery of tests to examine both the cross-sectional differences and the time-series trends.

Third, my study contributes to the literature by extending knowledge on the influence of compensation plans on the association between CEO retirement and conservatism. By partitioning CEOs into different groups according to their compensation plans, I find that earnings-based compensation causes the retiring CEOs to report less conservative earnings.

1.4 The Structure of the Thesis

The remainder of the thesis is divided into four chapters. Chapter 2 reviews the related literature on reporting conservatism. Chapter 3 examines the relationship between conservatism and investment efficiency, and Chapter 4 presents evidence that firms prepare less conservative financial reports prior to CEO retirements.

Chapter Two

Review on Reporting Conservatism

This chapter is structured as follows. Section 2.1 discusses the definitions of conservatism. Section 2.2 reviews the studies on the determinants and consequences of reporting conservatism. Section 2.3 discusses the conservatism measures and models proposed by prior studies.

2.1 Definition of conservatism

Prior literature suggests that there are two types of conservatism. The first type of conservatism is unconditional conservatism (*ex ante* conservatism or balance sheet conservatism). Beaver and Ryan (2005) clearly distinguish unconditional conservatism from conditional conservatism. They define unconditional conservatism as news-independent conservatism, and it leads firms to report lower book value of shareholders' equity than the market value during their lives. Conservatism can also be conditional (*ex post* conservatism or income statement conservatism). As Basu (1997) notes in his study, conditional conservatism is news dependent, and it leads earnings to reflect bad news in a timelier manner than good news. Out of the two types of conservatism, only conditional conservatism contains information on firms' future operation (e.g., Basu 1997; Ball, Kothari and Nikolaev 2009), and is useful in improving contracting efficiency (e.g., Ball, Kothari and Robin 2000; Ball and Shivakumar 2005). Since the rest of this thesis (i.e. chapter three and four) aims to discuss issues related to the contracting demands for and consequences of conditional conservatism, only the studies on the contracting explanation for accounting conservatism will be reviewed in the following sections.

2.2 A Review on the Contracting Explanation of Conservatism

First introduced by Basu (1997), conditional conservatism is extensively discussed, analyzed and examined by mounting studies. These studies enhance our understanding of conditional conservatism. Research on conditional conservatism examines issues spanning the distinctions between conditional and unconditional conservatism (e.g., Beaver and Ryan 2005), the demands for and consequences of conservatism (e.g., Ball and Shivakumar 2005; Zhang 2008), and the conservatism measures (e.g., Basu 1997; Givoly and Hayn 2000; Khan and Watts 2009).

2.2.1 Demands for Conditional Conservatism

Prior studies provide ample evidence on the contracting explanation for conservatism. Ball and Shivakumar (2005) examine conservatism in U.K. companies and show that public firms report more conservative earnings than private firms. In UK, public firms and private firms are subject to equivalent litigation risk, regulations, reporting standards, and taxes. The key distinction between public firms and private firms is that the two types of firms prepare financial reports for different purposes. While public firms prepare financial reports for contracting purposes, e.g. contract with investors, lenders, and managers, private firms prepare financial reports to meet taxation and regulation requirements. Dividend is another factor that private firms may consider when preparing financial reports. Contracting demand requires public firms exhibit greater conditional conservatism than private firms. Ball and Shivakumar (2008) further support this view by providing evidence that IPO firms report more conservative earnings following initial public offerings, given that the contracting demands are higher when the firms go public. The finding of public firms' higher degree of conservatism is replicated in European countries by Burgstahler, Hail and Leuz (2006) and Peek, Cuijpers and Buijink (2009).

Several papers examine the influence of shareholder-manager conflicts on conservatism. For example, LaFond and Roychowdhury (2008) find that reporting conservatism increases when firms' managerial ownership decreases. Managerial ownership indicates the separation of ownership and control rights, and the interests of managers and shareholders are better aligned for the firms with higher managerial ownership (e.g., Ball 2001). They interpret their results to mean that agency conflicts between managers and shareholders increases the demand for reporting conservatism. LaFond and Watts (2008) examine the association between PIN score and conservatism. PIN score was originally developed to measure the information asymmetry between informed and uninformed equity holders (Easley and O'Hara 1992). Presuming managers are better informed than shareholders, LaFond and Watts (2008) use PIN to proxy the information asymmetry between managers and shareholders. Their results show that conservatism is significantly positively associated with the PIN variable. In addition, they document that firms are more conservative following increases in information asymmetry, which further supports the view that the information asymmetry between shareholders and managers posits a requirement for firms to prepare more conservative financial reports.

The impact of the agency conflicts between shareholders and debt holders on conservatism is also examined by several studies. Ahmed et al. (2002) explore the influence of shareholder-bondholder conflicts on conservatism. They find that firms facing more severe shareholder-bondholder conflicts prepare more conservative financial reports. Using an international sample, Ball, Robin and Sadka (2008) provide evidence that conservatism is driven by the contracting demands from debt markets. However, the debt contracting explanation for conservatism is questioned by several recent papers (e.g. Leuz 2001; Schipper 2005; Guay and Verrecchia 2006). For example, Schipper (2005) argues that lenders could choose to write more conservative covenants rather than requiring the borrowers to report biased earnings.

Contracting also explains the cross-country differences in conservatism. As financial reports are more likely to be used for contracting purpose in common-law countries than in code-law countries, Ball, Kothari and Robin (2000) find that firms in common-law countries report more conservative earnings than those in code-law countries. Ball, Robin and Wu (2003) further examine conditional conservatism in four East Asian countries, including Hong Kong, Malaysia, Singapore and Thailand. Those countries have accounting standards similar to common-law countries due to their accounting traditions. However, the unique features of those countries differentiate them from other common law countries. On one hand, the dominance of family owned enterprises, along with the heavy reliance on personal networking and bank loans, reduces the demands for public equity and debt, which in turn lowers the demands for public disclosures. On the other hand, political influences in Malaysia and Thailand, tax policies in Thailand, and the lower litigation risks in those four countries also reduce firms' incentive to prepare high-quality financial reports. Ball et al. (2003) show that firms in those countries are not more conservative than firms in code-law countries. The result lends support to the view that conservatism is determined by managers' reporting incentive rather than reporting standards.

2.2.2 Consequences of Conditional Conservatism

If contracting explains conditional conservatism, then we should observe that firms exhibiting greater conservatism enjoy contracting benefits. While earlier studies provide extensive evidence on the demands for conservatism, just a few studies examine the consequences of conservatism. The evidence on costs of equity is rare. Francis et al. (2004) investigate the association between costs of equity and seven earnings attributes, including accrual quality, persistence, predictability, smoothness, value relevance, timeliness and conservatism. They find the insignificant relation between conservatism and costs of equity and argue that the result shows that conservatism is not a prominent earnings feature in determining firms' costs of capital. However, Garcia Lara et al. (2011) suggest that the conservatism measure employed by Francis et al. (2004) may not efficiently capture reporting conservatism, and argue that the insignificant association between conservatism and costs of equity might be driven by the measurement errors. Through a portfolio method, they provide evidence that conservatism reduces costs of equity.

For the link between conservatism and costs of debt, Ahmed et al. (2002) find that conservatism is significantly positively associated with borrowers' debt ratings, which indicates the important role conservatism plays in reducing firms' costs of debt. Zhang (2008) investigates *ex ante* benefits of reporting conservatism to borrowers and *ex post* benefits of conservatism to lenders. She finds that more conservative firms enjoy lower interest rates and may violate debt covenants sooner. Ball, Bushman and Vasvari (2007) examine the association between accounting conservatism and loan syndicate structure. They find that for the firms that prepare more conservative financial reports, the information asymmetries regarding the firms are reduced. As a result, the minority participants hold a higher percentage of the loan deals. Using observations from the secondary loan market, Wittenberg-Moerman (2008) finds that bid-ask spread increases when information asymmetry increases, and accounting conservatism is negatively associated with bid-ask spread. He interprets this result as suggesting that conservatism reduces the information asymmetry regarding the borrowers, and thus improves loan trade efficiency. In contrast, Gigler, Kanodia, Sapra, and Venugopalan (2009) argue that conservatism reduces debt contracting efficiency by developing an analytical model of the debt covenant.

The influence of conservatism on the contracting between managers and shareholders is also examined. LaFond and Watts (2008) provide marginal evidence on the role played by conservatism in reducing information asymmetry. Hui, Matsunaga, and Morse (2009) find that conservatism is significantly negatively associated with the management forecast frequency, specificity, and timeliness. They interpret their results by the means that conservatism and management forecasts are alternative mechanisms for reducing information asymmetry between managers and outside equity holders. As discussed previously, conservatism also affects firms' investment activities. There are three related papers in this field, including Bushman et al. (2007), Ahmed and Duellman (2007a), and Francis and Martin (2010). These studies provide evidence that conservatism alleviates agency conflicts between managers and shareholders and thus improves firms' investment efficiency.

2.3 Conservatism Measures

Since the notion of "conditional conservatism" is put forward by Basu (1997), a number of conservatism measures are proposed in the literature. In the literature, there is no consensus on which measure best captures firms' reporting conservatism. The various conservatism measures are to be discussed in detail in this section.

2.3.1 Basu (1997) Model

In the conservatism literature, Basu (1997) model is most extensively used to examine timely loss recognition. Under the efficient market assumption, all the information that affects the firm value is reflected in stock returns. Meanwhile, accountants "require a higher degree of verification to recognize good news as gains than to recognize bad news as losses" (Basu 1997, p.7). Thus, Basu (1997) model captures timely loss recognition by testing the piecewise-linear relation between stock returns and earnings.

$$NI = \alpha + \beta_1 DR + \beta_2 RET + \beta_3 DR*RET + \varepsilon,$$

where NI is net income before extraordinary items reported by the end of the year divided by beginning-of-year market value of equity, RET is the twelve-month buy and hold return ending three months after the fiscal year end, and DR is a dummy variable equals to 1 if RET is negative and 0 otherwise. The estimate of β_2 captures the recognition of good news in earnings, and the sum of β_2 and β_3 captures the recognition of bad news. The positive and significant estimate of β_3 captures the asymmetric timeliness of loss recognition.

Basu (1997) model also receives a lot of critiques. Hanna (2003) argues that firms engaging in earnings management activities, such as big bath, are classified as conservative firms in tests based on Basu's (1997) approach. Dietrich, Muller and Riedl (2007) suggest that employing Basu (1997) model to estimate conservatism yields estimation bias, unless restricted conditions are met. They analytically and empirically examine the factors that may cause the estimation bias. Basu (1997) model reverses the returns-earnings equation to examine whether earnings reflect “bad news” in a timelier manner than “good news”. However, as the causality runs from earnings to returns and not vice versa, reversing the structural returns-earnings regression may cause biases in the coefficient estimate. Dietrich et al. (2007) show that the estimated coefficient on returns is biased unless stock returns are solely determined by firms’ earnings numbers, which is rarely met in empirical settings. In addition, they demonstrate that the conservatism measure may also be biased if the reported earnings are asymmetrically distributed, non-earnings information is non-homoskedastically distributed, or good and bad news samples are not separated from the mean of stock returns. However, empirically, neither returns nor earnings are symmetrically distributed. Furthermore, they also provide empirical evidence that the estimation bias may explain the conservatism findings reported by the studies that measure conservatism following Basu (1997) approach. Moreover, they show that different scale variables used in Basu (1997) model may also affect the conservatism findings. Finally, they decompose earnings into accruals and cash flows. As bad news that may affect firms’ future operation is recognized in accruals, conditional accounting conservatism is reflected in accruals, rather than cash flows. However, Dietrich et al. (2009) find that operating cash flows are more conservative than operating accruals. This result further supports the view that Basu (1997) model is subject to measurement errors.

Givoly et al. (2007) point out two limitations of Basu (1997) model. First, disclosure policy and reporting environment, besides conservatism, may also affect information disclosure. Thus, Basu (1997) measure of conservatism could be biased. For example, for the firms that operate in more litigious environment, the firms may be required to disclose bad news more quickly. However, the bad news may not be recognizable under GAAP. As a result, the Basu measure underestimates those firms' conservatism level. Second, as it is impossible to observe conservatism for single shocks empirically, Basu (1997) model fails to provide evidence on the recognition of individual shocks in earnings. For Basu (1997) model, stock returns capture the aggregated impact of the news over a period of time, instead of individual news (Givoly et al. 2007).

2.3.2 Khan and Watts (2009)

The first firm-specific conservatism measure employed in this study is Khan and Watts (2009) C-score measure. Prior studies (e.g., Watts 2003; Qiang 2007) provide four explanations for the existence of conservatism, including contracting, litigation, regulation, and taxes. Khan and Watts (2009) construct C-score measure by employing three firm-specific variables, including market-to-book ratio, size, and leverage, to capture the four conservatism demands.

The market-to-book ratio is included to capture firms' contracting, litigation and regulation demands. The market-to-book ratio is commonly viewed as a proxy for the growth opportunity (e.g., Smith and Watts, 1992; Barclay and Smith, 1995). Since it is difficult to determine future cash flows from growing projects, LaFond and Watts (2008) indicate that information asymmetry between managers and shareholders might be more severe for the firms with higher growth opportunities. Thus, those shareholders may have higher demands for contracting mechanisms that reduce the information asymmetry regarding the firms. For the litigation demands, firms with the higher market-to-book ratio are more likely to have more volatile stock returns. The firms with more volatile stock returns are riskier (e.g., Froot, Perold, and Stein, 1992) and thus are more likely to be sued. For the regulation demands, regulation induces unconditional conservatism (Qiang 2007), which reduces book value of equity. Therefore, the firms under stricter regulation may have higher market-to-book ratio.

Firm size captures firms' contracting, litigation, and tax demands. For the contracting demands, larger firms are more likely to be mature firms with the better information environment. As the investors are better informed under more transparent information environment, the contracting demands for conservatism are lower. For the litigation demands, larger firms are more likely to have "deep pocket" and are therefore attractive targets for litigation. For the tax demands, as suggested by Khan and Watts (2009), larger firms are more likely to defer gains for tax purposes. Thus, the litigation and tax demands are higher for the larger firms.

Leverage captures firms' contracting and litigation demands. For the high leverage firms, bondholders are more concerned about the firms' excess distributions, and the shareholder-bondholder conflicts are more severe. As a result, contracting demand is higher for the firms with higher leverage ratio. Leverage is also a proxy for financial distress. Financial distressed firms are more likely to go bankruptcy, and in turn are more likely to get sued. Thus, litigation demand is higher for the high-leverage firms.

Following the method proposed by Khan and Watts (2009), I estimate the C-score measure for each firm. The computation of the C-score will be shown in detail in chapter three. After Khan and Watts (2009), C-score measure has been widely used as a proxy for conservatism. For example, Frankel and Roychowdhury (2008) use C-score to test the link between conservatism and the persistence of special items. They argue that the conservative firms are more likely to reflect bad news in current earnings, rather than recognize it gradually over the future periods. For those firms, the large losses reported in the special items are likely to be less persistent. In addition, prior studies suggest that conservative firms are more likely to discontinue negative NPV investment early (e.g., Ball and Shivakumar 2005), which may cause large loss recognition via special items. Therefore, the special items that are reported by conservative firms are more transitory. Employing C-score to measure conservatism, Frankel and Roychowdhury (2008) find that higher degree of conditional conservatism is associated with lower persistence of the negative special items. Wittenberg-Moerman (2008) employs C-score to investigate the association between timely loss recognition and the information asymmetry in the secondary loan market. He finds that conditional conservatism is negatively related to bid-ask spread, which indicates that timely loss recognition reduces the information asymmetry regarding the borrowers. Francis and Martin (2010) investigate the relation between conservatism and acquisition profitability. They employ the Basu (1997) model in the main test and the C-score measure of conservatism in the robustness test, and find that conservative firms make more profitable acquisitions. The C-Score measure is also used by Farber, Hsieh, Jung and Yi (2010) to investigate the link between conservatism and labor unions. They find that conservatism is negatively related to the strength of labor union. They interpret their result as showing that labor unions and conservatism are both monitoring mechanism and act as substitutes in reducing agency costs.

One caveat of the C-score measure stems from the estimation procedure. As market-to-book ratio, leverage, and firm size indicate the demands for both conditional and unconditional conservatism, one possible limitation of C-Score measure is that this proxy is a mixed measure which captures both conditional and unconditional conservatism. In addition, as suggested by Garcia Lara et al. (2011), given that the three factors, including market-to-book ratio, leverage, and firm size, also proxy for firm risk, the C-score measure should not be employed in the studies that examine the association between conservatism and firm risk.

2.3.3 Firm-specific Conservatism Measures from Modification of Basu (1997)

The second and third firm-specific conservatism measures, firm-specific Basu coefficient and R-square ratio, are both from Basu (1997).

Since the Basu (1997) model is introduced, numerous key studies have employed this model to measure conditional conservatism (e.g. Ball et al., 2000; Beekes et al., 2004; Ball and Shivakumar 2005). Despite that Basu (1997) model is originally used to capture the cross-sectional differences in conservatism, several recent studies (e.g. Francis et al. 2004, Zhang 2008) modify Basu (1997) method to estimate firm-specific conservatism measures.

My second measure of conservatism is firm-specific Basu coefficient. The Basu coefficient is estimated by running Basu (1997) model at the firm-level, instead of running the model cross-sectionally with pooled data. The third conservatism measure, R-square ratio, is also developed based on the Basu (1997) model. The basic idea of Basu's (1997) approach is to show that bad news, relative to good news, is recognized in earnings in a timelier manner. Thus, for conservative firms, the explanation power of bad news to earnings should be higher than that of good news to earnings. The ratio between R^2(bad news) and R^2(good news) is taken as my third conservatism measure.

The firm-specific conservatism measures based on the Basu (1997) model are also employed by several prior studies. For example, the coefficient measure is used by Ecker, Francis, Kim, Olsson, and Schipper (2006) to proxy for conservatism. They develop a return-based earnings quality measure (the "e-loading"), which is estimated based on the assets pricing model, augmented with accruals quality measure. They show that e-loading is significantly positively correlated with most of the accounting-based earnings quality measures, including accruals quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism. Other representative studies that use the above two measures include Francis et al. (2004) and Zhang (2008), which have been discussed in detail in section 2.2.

Although the coefficient and R-square are commonly used to measure firm-specific conservatism in the literature, these two measures are also criticized by some scholars. Francis et al. (2004) suggest that running the Basu (1997) model in time series may cause measurement errors. Givoly et al. (2007) use the time-series approach to estimate the coefficient on differential timely recognition of bad news (DR*RET) for each firm, and find that more than eighty percent of the firms have insignificant coefficients on the interaction between DR and RET. They attribute this result to the low power test due to the limited observations for each firm. Furthermore, Garcia Lara et al. (2011) argue that the firm-specific conservatism measures based on the Basu (1997) model are biased, as the measures capture firms' accumulated conservatism level over a certain period, rather than firms' accounting conservatism in a particular year. For example, if the firm-specific conservatism measure for year 0 is estimated by using data from year -9 to year 0, and the conservatism policies for the firm change considerably at year 0, the conservatism measure fails to capture firms' conservatism level at year 0.

2.3.4 Givoly and Hayn (2000)

The fourth and fifth firm-specific conservatism measures, accumulated non-operating accruals and earnings skewness, are both from Givoly and Hayn (2000).

My fourth measure of conservatism is accumulated non-operating accruals. Conservative firms may use accruals as a vehicle to slow earnings and assets recognition and quicken expenses and liabilities recognition, which in turn leads to lower earnings and shareholders' equity. Partitioning accruals into operating accruals and non-operating accruals, Givoly and Hayn (2000) suggest that non-operating accruals capture managerial discretion on accounting policy and thus capture conditional conservatism.

The link between non-operating accruals and conditional conservatism is shown as follows. First, operating accruals are those from daily operating activities, and non-operating accruals are those from unusual activities, e.g. assets write-off. Second, GAAP provides extensive guidance on the recognition criteria for most of the operating accrual items, while it gives little guidance on the recognition of the non-operating accrual items. An example is the bad debt provision, a constituent of non-operating accruals. Since both the amount and the timing of irrecoverable accounts receivable are estimated by the management, the financial number reported in the bad debt provision account is subject to management judgment. Therefore, compared with operating accruals that arise from daily operations and are reported under GAAP's ruling, non-operating accruals depend more on management discretion. Thus, non-operating accruals capture conservatism, and Givoly and Hayn (2000) argue that the negative accumulated non-operating accruals are attributable to the increases in conservatism over 23 years, from 1966 to 1998. Furthermore, they also conduct several tests to rule out the alternative explanations, such as enterprise restructuring, merger and acquisition, and inflation, for the existence of negative accumulated non-operating accruals. In my study, the accruals measure is computed as the accumulation of non-operating accruals over a six-year period scaled by total assets.

My fifth measure of conservatism is earnings skewness. As discussed previously, bad news that may affect firms' future operations is reflected in accruals, rather than cash flows. Consistent with this argument, Givoly and Hayn (2000) document that the distribution of earnings is negatively skewed but no such tendency is found for cash flows. Therefore, the skewness of earnings also captures firms' conservatism level. In my study, the earnings skewness measure is calculated as the difference between the skewness of cash flows and that of earnings.

The two accrual-based conservatism measures have been widely used by previous research. For example, Krishnan and Visvanathan (2008) use the accruals measure to examine the impact of compensation committee's financial expertise on reporting conservatism. They classify audit committee members into three groups: financial experts with accounting experience, financial experts without accounting experience (e.g., former CEOs or presidents), and non-financial experts. They find that firms report more conservative earnings when they have higher percentage of accounting financial experts on the audit committee, and the result does not hold for the firms with weak corporate governance. Their results contribute to the literature by indicating the importance of audit committees' accounting financial expertise on improving firms' financial reporting quality. Krishnan (2005) compares the difference in the degree of reporting conservatism between the firms audited by Arthur Andersen and the firms audited by the other Big 6 auditors. In the univariate test, he finds that earnings for the non-Andersen clients are more negatively skewed than those for the Andersen clients, which indicates that the Andersen clients report less conservative earnings than the non-Andersen clients. Chung and Wynn (2008) examine the link between managerial legal liability coverage and reporting conservatism. They find that the managers with higher managerial legal liability coverage, which reduces managerial legal liability, prepare less conservative financial reports. Beatty, Weber and Yu (2008) use several proxies to measure conservatism, including market-to-book ratio, the measure based on the Basu (1997) model, and two accrual-based measures based on Givoly and Hayn (2000), to examine the link between debt contract modification and conservatism. They find that both conservatism and debt contract modification are used to meet lenders' demand for conservatism. The accrual-based measures are also employed by Ahmed et al. (2002), Ahmed and Duellman (2007a), Zhang (2008), Garcia Lara et al. (2009b), and Hui et al. (2009). Those papers have been discussed in detail in section 2.2.

Givoly and Hayn (2000) measures capture managerial discretion on accounting choices, which are affected by both conditional and unconditional conservatism demands, such as taxes, regulation, contracting and litigation. Thus, one possible drawback of Givoly and Hayn (2000) conservatism measures is that the two proxies are mixed measures which capture both conditional and unconditional conservatism.

Chapter Three

The Effect of Conservatism on Investment Efficiency

In this chapter, the impact of conditional conservatism on investment efficiency is examined. Section 3.1 reviews the literature and develops the hypothesis, and section 3.2 describes the research design. Section 3.3 presents the sample selection procedure, and section 3.4 tests the validity of the firm-specific conservatism measures. Section 3.5 reports the results of testing the association between conservatism and investment efficiency. Section 3.6 presents the results of the robustness tests. Section 3.7 describes the supplementary tests, which are employed to re-examine Garcia Lara et al.'s (2009a) results. Finally, section 3.8 concludes this chapter.

3.1 Literature Review and Research Question

3.1.1 Agency Problem and Investment Efficiency

Efficient investment means that managers invest in positive NPV projects and reject or discontinue negative NPV projects. As future incomes (losses) are generated by positive (negative) NPVs, investment efficiency plays an important role in determining firms' future profitability (Ahmed and Duellman 2007a), future market value (McConnell and Muscarella 1985), and even corporates' survival (Klammer, Koch and Wilner 1991). Therefore, the issues on how to improve investment efficiency and which kind of mechanism would improve investment efficiency are practically important. Before answering these questions, first we should answer the following question: if efficient investment brings about so many benefits, then why so many managers choose to invest inefficiently?

Agency problem is a key factor that results in inefficient investment. The emergence of modern firms causes the separation of ownership and control rights (Berle and Means 1932). The financiers provide funds for companies' operations and expect to get return from the investment. The managers have two choices after they receive funds from the financiers. They could either use the funds in productive projects, or to benefit themselves. Agency problem arises when the managers benefit themselves to the detriment of the shareholders (e.g., Jensen and Meckling 1976; Fama and Jensen 1983).

Previous literature provides evidence that managers may expropriate the funds from financiers through managerial theft (e.g., Zingales 1994; Shleifer and Vishny 1997), by staying in the position that they are not capable of or less competitive for (Jensen and Ruback 1983), and by getting private benefits of control (Grossman and Hart 1988). In the litigious countries that protect financiers better, managers are more likely to use the later two ways to benefit themselves rather than thieving from their companies. For the private benefits of control, managers may build their empire and strengthen their control powers by making unnecessary acquisition (Jensen 1986), by re-investing free cash rather than paying the cash back to investors, and by investing in projects that benefit themselves rather than increasing firm value (e.g., Jensen 1986; Grossman and Hart 1988). On the other hand, for the managers staying in the position that they are not capable of or less competitive for, intuitively, they may not be qualified managers. Those managers may lack of ability to differentiate good investments from bad investments. Thus, they may make poor investment decisions. In sum, all these expropriation activities from agency conflicts reduce investment efficiency.

3.1.2 Corporate Governance and Investment Efficiency

Corporate governance arises as "a response to the agency problems that arise from the separation of ownership and control in a corporation" (Boubakri, Cosset and Guedhami 2005). As discussed previously, the relationship among agency problem, corporate governance and investment efficiency is quite clear. Agency problem reduces investment efficiency, and corporate governance is introduced to mitigate the agency problem. As a result, the association between corporate governance and investment efficiency should be positive, and the causality runs from corporate governance to investment efficiency.

The link between corporate governance and investment efficiency is examined by several prior studies. For example, Jensen (1986) discusses several issues that are related to the agency theory, and suggests that external monitoring mechanism, such as market of corporate control, effectively curbs over-investment. Gompers, Ishii, and Metrick (2003) find that anti-takeover provisions is negatively associated with firm value and positively related to capital expenditures. They interpret their result as showing that firms make less efficient investment decisions when the firms have weaker shareholder rights. Through an international study, Ferreira and Matos (2008) examine institutional investors' preference on stock investments and the impacts of institutional holdings. They find that foreign and independent institutional ownership is positively linked to firm value and negatively associated with capital expenditures, which suggests that institutional investors play a role in monitoring managerial investment decisions.

3.1.3 Conditional Conservatism and Investment Efficiency

As discussed in previous studies, conditional conservatism also serves as a corporate governance mechanism that: (1) reduces the information asymmetry between managers and outside equity holders (e.g., Ball and Shivakumar 2005; LaFond and Watts 2008) and interests conflicts between shareholders and debt holders (e.g., Ahmed et al. 2002) , and (2) assists board of directors to monitor managers more effectively (Beekes et al. 2004; Ahmed and Duellman 2007b; Garcia Lara et al. 2009b).

For the first role played by conservatism, as discussed in chapter two, the information asymmetry between insiders and outsiders is ameliorated by conditional conservatism (e.g., LaFond and Watts 2008; Hui et al. 2009). For the conservative firms, the CEOs have less power to defer the recognition of bad news. Bad news includes future losses from negative-NPV projects. The CEOs are less likely to invest in the negative-NPV projects when they know ex ante that the losses generated by negative NPV projects will be reflected in the financial reports during their tenure, which will in turn reduce their compensations (Ball 2001; Ball and Shivakumar 2005). In addition, as noted by Garcia Lara et al. (2009b, p.163), "conservative accounting information provides early warning signals to governance bodies such as the board of directors, promoting early investigation into the reasons for bad news". Hence, conservatism also affiliates board of directors to monitor managers more effectively. Consistent with this argument, several prior studies provide empirical evidence that conditional conservatism is positively associated with board quality (Beekes et al. 2004; Ahmed et al. 2007b; Garcia Lara et al. 2009b). As conservatism improves boards' monitoring effectiveness, inefficient investments are more likely to be detected, and the negative-NPV projects are more likely to be abandoned. In sum, the two roles played by conditional conservatism curb over-investment and improve investment efficiency. There are three related studies in this area (e.g., Bushman et al. 2007; Ahmed and Duellman 2007a; Francis and Martin 2010). The differences between my study and the previous research are discussed as in chapter one.

Based on the discussion above, I hypothesize that firms reporting more conservative earnings are less likely to over-invest.

H3.1: Conditional conservatism is negatively associated with over-investment.

3.2 Research Design

In this section, I first describe the Basu (1997) model, which is used to test the direct relationship between conservatism and over-investment. This is followed by a description of the Biddle et al. (2009) model, which is employed to examine the influence of conservatism on firms' investment decisions in situations where over-investment is more likely to occur. For the above two models, both the firm-year and the industry-year over-investment measures are estimated following the method proposed by Biddle et al. (2009). As there is no consensus on which model best captures firms' investment efficiency, I also include the Durnev et al. (2004) model to provide more comprehensive testing on the association between conservatism and investment efficiency.

3.2.1 Using Basu (1997) Model to Examine the Influence of Conservatism on Investment Efficiency

The Basu (1997) model is re-written to examine the influence of conditional conservatism on firms' investment decisions.

$$NI = \alpha+\beta_1 DR+\beta_2 RET+\beta_3 DR*RET+\beta_4 OverInvest\_Firm$$
$$+\beta_5 OverInvest\_Firm*DR+\beta_6 OverInvest\_Firm*RET \qquad (3.1)$$
$$+\beta_7 OverInvest\_Firm*DR*RET+ \varepsilon,$$

where firm and time subscripts are omitted for simplicity. NI is the net income before extraordinary items reported by the end of year t divided by market value of equity at the beginning of the year, RET is the twelve-month buy and hold return ending three months after the fiscal year end of year t, and DR is a dummy variable equals to 1 if RET is negative and 0 otherwise. OverInvest_Firm captures the firm's over-investment level in year t+1, and is the residual from the following regression:

$$Investment_{j,t+1}= \beta_0 + \beta_1 * Sales\_Growth_{j,t}+\varepsilon_{j,t+1}, \qquad (3.2)$$

where $Investment_{j,t+1}$ is firm j's capital expenditure (DATA128) at the end of year t+1 deflated by total assets at the beginning of year t+1. $Sales\_Growth_{j,t}$ is the firms' percentage sales growth from year t-1 to t. After excluding financial firms and observations from industries (industries are classified based on Fama-French 48-industry specification) that have less than 20 observations in a specific year, equation (3.2) is estimated for each industry-year to compute the residuals. Since investment is a function of growth opportunities, which is proxied by sales growth, the residuals from equation (3.2) captures firms' discretionary investment.

The coefficient of β_3 estimated using equation (3.1) measures whether economic losses reflected in the net income in a timelier manner than economic gains for the firms that are unlikely to over-invest. The incremental relation between accounting conservatism and future over-investment is captured by *OverInvest_Firm*DR*RET*. As Hypothesis *H3.1* predicted that conservatism curbs over-investment, the coefficient is expected to be significantly negative.

3.2.2 Using Biddle et al. (2009) Model to Examine the Influence of Conservatism on Investment Efficiency

The Biddle et al. (2009) model is employed to test the association between conservatism and investment efficiency by using firm-specific measures of conservatism.

$$Investment = \alpha+\beta_1 Firm\_conservatism+\beta_2 Conservatism*OverInvest\_Ind +\beta_3 OverInvest\_Ind+\beta_4 Size+\beta_5 Mkt\text{-}to\text{-}Book_i+\beta_6\sigma(CFO)+\beta_7 Z\text{-}score +\beta_8 Tangibility+\beta_9 K\text{-}structure+\beta_{10} CFOsale+\beta_{11} Slack+\beta_{12} Dividend +\beta_{13} Log\_Age+\beta_{14} Oper.\ Cycle +\beta_{15}\ Losses + \varepsilon, \qquad (3.3)$$

where firm and time subscripts are omitted for simplicity. Investment is the capital investment (DATA128) at the end of year t+1 deflated by total assets at the beginning of year t+1. The variable *Firm_Conservatism*, as will be discussed in detail in the following section, is either *CON-Cscore*, *CON-Coeff*, *CON-*R^2, *CON-Accrual* or *Con-Negskew*. *OverInvest_Ind* measures whether the firms are in the setting that over-investment is more likely, and it is the decile rank of the residual from the following regression:

$$Investment\_Ind_{j,t+1}=\beta_0+\beta_1*Sales\_Growth\_Ind_{j,t}+\varepsilon_{j,t+1}, \qquad (3.4)$$

where $Investment\_Ind_{j,t+1}$ is the mean value of the ratio of capital expenditure investment at the end of year t+1 to total assets at the beginning of year t+1 for industry j, $Sales\_Growth\_Ind_{j,t}$ is the mean percentage sales growth from year t-1 to t for industry j. Industries are classified based on Fama-French (1997)

48-industry specification, and financial firms and industries that have less than 20 observations in a specified year are excluded. The residual from estimating equation (3.4) captures industry-level discretionary investment. The industries with higher value of the residuals are considered as the industries that are more likely to over-invest than other industries. For the firms that operate in the over-invested industries, they are in the situation where over-investment is more likely. The residuals are ranked into decile and then are rescaled from 0 to 1 to facilitate the interpretation of the coefficients of equation (3.4).

Several control variables are included. As suggested by prior studies (e.g., Hovakimian and Hovakimian 2005; Biddle and Hilary 2006; Biddle et al. 2009), financial constraints influence firms' investment activities. Therefore, firm size, dividend payout, financial slack (i.e. the ratio of CFO to Sales, and the ratio of cash and short-term investments to net PPE), are included to capture the financial constraints. Minton and Schrand (1999) find that cash flow volatility reduces the accumulated firm-level investment. Thus, cash flow volatility is also included as a control variable. Market-to-book ratio is included to control for the effect of growth opportunities. K-structure, which proxies for the firms' leverage ratio, is included to control for the effect of debt financing. Z-score and Tangibility are included to control for the influence of financial distress.

Biddle et al. (2009) also include firm age, length of operating cycle, and frequencies of losses in their model. The reason they include these variables is that "firms in different stages of the business cycle may have different (discretionary) accruals arising from differences in their business models that are unrelated to earnings management activities" (Biddle et al., 2009, p.117). I also include these control variables in my model but for different reasons. Given that different stages of the business cycle affect the idle cash held by managers, which in turn affect firms' investment, and the variables controlling for business cycle are found to be highly correlated with investment.

The computation of the control variables is shown as follows.

Size = natural log of total assets (DATA6) of firm i at the end of year t.

Mkt-to-Book = the ratio of replacement cost of assets (DATA6+ DATA25*DATA199-DATA60-DATA35) to book value of assets.

σ(CFO) = cash flow volatility of firm i at the end of year t, which is defined as the standard deviation of 5-year cash flow from operations.

Z-score = the proxy for bankruptcy risk of firm i at the end of year t, which is computed as (3.3* Pretax Income(DATA170)+net total sales (DATA12)+0.25* Retained Earnings (DATA36) +0.5*(Current Assets (DATA4)-Current Liabilities (DATA5)) deflated by total assets.

Tangibility = the proxy for bankruptcy cost of firm i at the end of year t, which is defined as DATA8/DATA6.

K-structure = the proxy for the leverage ratio of firm i at the end of year t, which is computed as total long-term debt (DATA9)/ (long-term debt+market value of equity (DATA25* DATA199)).

CFOSale = together with Slack, is a the proxy for the financial slack of firm i at the end of year t, which is computed as cash flow from operation divided by total sales made during the year (DATA12).

Slack = The ratio of Cash and Short-Term Investments (DATA1) to net PPE (DATA8).

Dividend = is a dummy variable, which equals to 1 of dividend (either DATA21>0 or DATA127>0) was paid by firm i during year t, and 0 otherwise.

Log_Age = log of the years that a firm first appears in CRSP until current year.

Oper.Cycle = the log of the ratio of accounts receivables (DATA2) to total sales (DATA12) plus the ratio of inventory (DATA3) to COGS (DATA41) multiplied by 360.

Losses = a dummy variable, equal to 1 if net income before extraordinary items (DATA18) is less than zero, and 0 otherwise.

Following Biddle et al. (2009), I also control for industry fixed-effect (industries are classified based on Fama-French 48-industry specification) to alleviate the concern that industry characteristics may cause firms to over- or under- invest. The time effect is captured by year dummies. The coefficient of β_1 in model (3.3) measures the influence of conservatism on future investment when the firms are less likely to over-invest. The incremental association between conditional conservatism and investment efficiency as future over-investment becomes more likely is captured by *Firm_Conservatism*OverInvest_Ind*. As hypothesis *H1* predicts that conservatism improves firms' investment efficiency, the coefficient is expected to be significantly negative.

3.2.3 Using Durnev et al. (2004) Model to Examine the Influence of Conservatism on Investment Efficiency

Following Durnev et al. (2004) and Greene et al. (2009), I also use the following model to investigate the impacts of conservatism on investment efficiency.

$$|\dot{q} - h| = \alpha + \beta_1 Firm\_conservatism + \beta_2\, segs + \beta_3 \ln(K) + \beta_4 Liquidity + \beta_5 Leverage + \beta_6\, adv + \beta_7 R\&D + \varepsilon, \qquad (3.5)$$

where firm and time subscripts are omitted for simplicity. $\dot{q}$ measures marginal q, which is estimated using ten-year rolling data. The procedure for estimating $\dot{q}$ is discussed in detail in the Appendix. *h* is firms' optimal marginal q. As shown by Durnev et al. (2004), *h* should equal to 1 for the value maximizing firms when ignoring the impacts of taxes and other complications, and it approximates 0.87 when taking taxes into consideration. In the main test, I set *h* equal to 1. In the robustness test, equation (3.5) is re-estimated by taking 0.87 as the optimal marginal q level. Firms are classified as over-invested (under-invested) firms when their marginal qs are lower (higher) than *h*. Since my study explores the association between conservatism and investment efficiency by focusing on the impact of conservatism on curbing over-investment, only the overinvestment firms are included in my sample. Given that $\dot{q}$ captures firms' investment efficiency over ten-year period, the conservatism measures should also be estimated over ten-year window accordingly. Therefore, for the *Con-Cscore* measure, *Firm_Conservatism* equals to average C-score over ten years from year t-9 to t. As the other four conservatism measures (i.e. *CON-Coeff*, *CON-*R^2, *CON-Accrual* or *Con-Negskew*) are estimated using ten-year data, *Firm_Conservatism* equals to the value of those measures at the end of year t.

Following prior studies (e.g., Durnev et al. 2004; Greene et al. 2009), I also include several control variables. Prior studies suggest that diversified firms allocate resources inefficiently across their segments (e.g., Rajan, Servaes, Zingales 2000), and those firms make less efficient investment. Thus, firm diversification is included as a control variable, and it is measured as the average number of different three-digit segments that are reported in Compustat Segments database over the ten-year period from year t-9 to year t. Second, larger firms are more likely to be well established firms with greater financing capability to raise both internal and external funds. Those firms may have already invested in most of the positive NPV projects and are more likely to over-invest when they have excess free cash flow (Jensen 1986). Firm size is also included as a control variable, and it is measured as the natural log of average estimated market value of firm's PPE over ten years from year t-9 to year t. The procedure for estimating the market value of PPE is shown in the Appendix. Third, firms with more cash are more likely to over-invest (e.g, Jensen 1986; Durnev et al. 2004). Thus, I also control for liquidity, which is computed as average ratio of net current assets to PPE over ten years from year t-9 to year t. Fourth, firms' leverage ratio, which is calculated as the average ratio of long-term debt to tangible assets over ten years from year t-9 to t, is included to control for the impact of debt financing. The procedure for estimating tangible assets is also discussed in details in the Appendix. Fifth, it is difficult to predict the profitability generated by intangible assets. As a result, the managers might be more error-prone in making investment decisions for the firms that rely heavily on intangible assets. Thus, R&D expenditures and advertising expenses are employed to control for the possible impact of intangible assets. Finally, as argued by Greene et al. (2009), industry characteristics may cause firms to over- or under- invest. Therefore, three-digit industry fixed effect is also included as a control variable.

The computation of the control variables is shown as follows.

segs = the average number of different three-digit segments that are reported in Compustat Segments database over the ten-year period from year t-9 to year t.

ln(K)= the natural log of average estimated market value of firm's PPE over ten years from year t-9 to year t. The procedure for estimating the market value of PPE is shown in details in the Appendix.

Liquidity= the average ratio of the difference between current assets (DATA4) and current liabilities (DATA34) to market value of PPE over ten years from year t-9 to year t.

Leverage= the average ratio of long-term debt (DATA9) to tangible assets over ten years from year t-9 to t. The procedure for estimating tangible assets is discussed in details in the Appendix.

adv= the accumulated ratio of adverting expenses (DATA45) to tangible assets over ten years from year t-9 to t.

R&D= the accumulated ratio of R&D expenditure (DATA46) to tangible assets over ten years from year t-9 to t.

3.2.4 Firm-Specific Conservatism Measures

Following previous literature, I adopt five firm-specific conservatism measures: the C-score measure as suggested by Khan and Watts (2009), two firm-specific asymmetric timeliness measures based on the Basu (1997) model, and the accruals and skewness measures following Givoly and Hayn (2000).

3.2.4.1 Con-Cscore

To get our first firm-specific conservatism measure, *Con-Cscore*, I first estimate the following equation annually.

$$NI = \alpha+\beta_1 DR+\beta_2 Size+\beta_3 M/B+\beta_4 LEV + RET\,(\mu_1 + \mu_2 Size+ \mu_3 M/B+ \mu_4 Lev)$$
$$+DR*RET(\lambda_1+\lambda_2 Size+\lambda_3 M/B+\lambda_4 Lev)+ \varepsilon , \qquad (3.6)$$

where firm and time subscripts are omitted for simplicity. All the variables are defined as previously. After the coefficients in equation (3.6) are estimated, I use equation (3.7) to calculate the *Con-Cscore*. Higher *Con-Cscore* represents higher conservatism level.

$$CON\text{-}Cscore = \lambda_1 + \lambda_2 Size + \lambda_3 M/B + \lambda_4 LEV \quad (3.7)$$

3.2.4.2 The Two Firm-specific Asymmetric Timeliness Measures Based on the Basu (1997) Model

The second firm-specific conservatism measure is estimated by estimating the Basu (1997) model in time-series.

$$NI = \alpha + \beta_1 DR + \beta_2 RET + \beta_3 DR * RET + \varepsilon, \quad (3.8)$$

where firm and fiscal quarter subscripts are omitted for simplicity. *NI* is defined as net income before extraordinary item at the end of one fiscal quarter, scaled by the market value of equity at the beginning of the quarter. RET is the stock returns over the fiscal quarters. DR is a dummy variable, equal to 1 if RET is negative, and 0 otherwise. For each firm, equation (3.8) is estimated for firms that have at least 24 quarters of available data over the ten-year period from year t-9 to year t. As discussed previously, the estimate of β_2 captures the recognition of good news in earnings, and the sum of β_2 and β_3 captures the recognition of bad news. *Con-Coeff* is calculated as $(\beta_2+\beta_3)/\beta_2$, which reflects the sensitivity of earnings to bad news compared to the sensitivity of earnings to good news. However, the coefficient on β_2 (β_3) does not capture the recognition of good news (asymmetric timeliness of loss recognition) when the sample firm's quarterly returns are all negative (positive) over the sample period. Thus, I require the firms to have at least three positive quarterly returns and at least three negative quarterly returns to facilitate the interpretation of the *Con-Coeff* measure.

The estimate of β_2 is negative for some of the sample firms. For those observations, the model I employ to estimate the *Con-Coeff* measure fails to capture the sensitivity of earnings to good news. As a result, the *Con-Coeff* measure does not capture conservatism for those firms. To address the possible impact of the negative β_2 observations, I exclude the negative β_2 observations from my sample.

The third measure, *Con-*R^2, is estimated by estimating the following model in time-series.

$$NI = \alpha + \beta_1 RET + \varepsilon, \tag{3.9}$$

where firm and fiscal quarter subscripts are omitted for simplicity. All the variables are defined as previously. For each firm, its sample is divided into two subsamples, the subsample with negative returns and the subsample with positive returns. Equation (3.9) is estimated separately for the negative return subsample and the positive return subsample for firms with at least 24 quarters of available data over the ten-year period from year t-9 to year t. While R^2(bad news) is obtained from estimating equation (3.9) using the subsample with negative returns, R^2(good news) is estimated using the subsample with positive returns. To ensure both the R^2(bad news) and R^2(good news) are valid, I require the firms to have at least three positive quarterly returns and at least three negative quarterly returns from year t-9 to t. The *Con-R^2* measure is computed as the ratio of R^2(bad news) to R^2(good news). Greater values of *Con-Coeff* and *Con-R^2* measures represent higher level of conservatism.

Prior studies use both the firm-year data (e.g. Basu 1997; Francis et al. 2004) and firm-quarter data (e.g. Givoly et al. 2007) to estimate the two firm-specific conservatism measures. There are limited observations for each firm when using the firm-year observations to estimate the two measures, which may cause measurement error (Francis et al. 2004). To ameliorate this concern, I use firm-quarter return and earnings to enlarge the sample size for each firm. As a sensitivity test, I also employ the firm-year returns and earnings to check the robustness of the firm-quarter results (see section 3.6).

3.2.4.3 Conservatism Measures Following Givoly and Hayn (2000)

The fourth and fifth proxies of firm-specific conservatism, *Con-Accrual* and *Con-Skewness*, are both from Givoly and Hayn (2000). Both two measures are estimated using firm-year data. Accrual measure of conservatism is computed as the accumulated non-operating accruals over ten years from year t-9 to t scaled by total assets at the end of year t. Previous studies suggest that the cash flow method provides a better estimate of accruals than the balance sheet method, given that some economic activities, such as merger and acquisition, introduce measurement errors to the accruals estimated using the balance sheet method. (Hribar and Collins 2002). Therefore, I use the cash flow method to compute non-operating accruals.

Non-operating accruals = Total Accruals before Depreciation – Operating Accruals,

where Total accruals before depreciation=net income (DATA172) + depreciation (DATA14) - cash flow from operations (DATA308),

and Operating accruals =Δaccounts receivable (-DATA302) + Δinventories (-DATA303) - Δaccount payable and accrued liabilites (DATA304) - Δincome taxes (DATA305).

The more negative non-operating accruals represent higher level of conservatism. As higher values of *Con-Cscore*, *Con-Coeff*, and *Con-*R^2 represent the higher conservatism level, the original value of *Con-Accrual* is multiplied by -1 to maintain consistency in firm-specific conservatism measures.

CON-Skewness is calculated as the difference between the skewness of cash flow from operations over ten years from year t-9 to t and the skewness of earnings during the same period. Both cash flow from operations and earnings are scaled by total assets.

3.2.4.4 Validity Tests for the Firm-Specific Conservatism Measures

The measurement errors of the firm-specific conservatism measures are discussed by several previous studies (e.g., Francis et al. 2004; Givoly et al. 2007). To alleviate the concern that the firm-specific measures do not capture conservatism, earlier research employs the Basu (1997) model to test the validity of the firm-specific conservatism measures (Zhang 2008; Khan and Watts 2009; Garcia Lara et al. 2009a). Thus, following previous literature, I also conduct the validity tests for the firm-specific conservatism measures. After the five firm-specific conservatism measures are ranked into decile and then rescaled from 0 to 1 respectively, the following regression is used to test the validity of the firm-specific conservatism proxies.

$$NI=\alpha+\beta_1 DR+\beta_2 RET+\beta_3 DR*RET+\beta_4 Firm\_Conservatism$$
$$+\beta_5 DR*Firm\_Conservatism+\beta_6 RET*Firm\_Conservatism \qquad (3.10)$$

$+\beta_7 DR*RET*Firm\_Conservatism+\varepsilon$,

where firm and year subscripts are omitted for simplicity. *Firm_Conservatism* is the deciled rank for *Con-Cscore*, *Con-Coeff*, *Con-*R^2, *Con-Accrual* or *Con-Skewness*. All the other variables are defined as previously. For the firm-specific measures that capture conservatism in the Basu (1997) sense, the coefficient on *DR*RET*Firm_Conservatism* is expected to positive.

3.3 Sample Selection Procedure and Descriptive Statistics

3.3.1 Sample Selection Procedure

The sample periods change accordingly for tests based on different conservatism measures:

1. For tests examining the association between conservatism and investment efficiency using the Basu (1997) model, the sample period is from 1980 to 2005.
2. For tests using firm-specific conservatism measures to examine the influence of conservatism on investment efficiency, the sample period is from 1980 to 2005 for tests based on Con-Cscore, Con-Coeff, and Con-R^2.
3. Con-Accrual and Con-Skewness are estimated using the cash flow method. Cash flow data are not available until 1988, and the estimation period for the two measures is ten years. Therefore, the sample period is from 1997 to 2005

for tests based on Con-Accrual and Con-Skewness.

The financial data are obtained from the Compustat database, and the stock returns are collected from the CRSP daily/monthly files. Consistent with prior studies, financial firms (industry code 6000-6999) are excluded from my sample, given that the reporting requirements and accounting regulations for the financial firms are significantly different from other industries. To mitigate the undue influence of outliers, I delete the outliers at the 99% and 1% level for all the variables that are employed in the regressions.[1] As I adopt different models and variables to test the effect of conservatism on investment efficiency, the sample sizes vary across different tests.

3.3.2 Descriptive Statistics and Test of Pearson's Correlation

Table 3.1 reports descriptive statistics for the five firm-specific conservatism measures. Panel A of Table 3.1 shows summary statistics for the observations used to estimate equation (3.3) (BI sample hereafter), Panel B presents descriptive statistics for the sample employed to estimate equation (3.5) (DI sample hereafter). The BI sample is larger than the DI sample, given that the DI sample only include observations with marginal q less than 1.

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[1] Wionsorizing, instead of deleting, these variables at the 99% and 1% level does not affect the results presented in this chapter qualitatively.

[Insert Table 3.1 here]

The mean (median) value of *Con-Cscore* is 0.094 (0.091) in the BI sample, and the distribution is similar to that reported in Khan and Watts (2009). The mean (median) value of *Con-Cscore* is 0.054 (0.050) in the DI sample, which is inconsistent with that reported in prior studies. Since the DI sample only includes over-invested firms, the low mean (median) value of *Con-Cscore* in the DI sample may imply that the over-invested firms report less conservative earnings.

For the other firm-specific conservatism measures, the mean (median) value of *Con-Coeff* in the BI sample is 2.057 (0.634), and that in the DI sample is 1.769 (0.500). The results are inconsistent with Francis et al.'s (2004) study, which presents a mean (median) value of 0.547 (1.000), and Zhang's (2008) result, which reports a mean (median) value of 1.300 (0.620). For the Con-R^2 measure of conservatism, the mean (median) value of Con-R^2 in the BI sample is 42.523 (0.980), and that in the DI sample is 117.959 (1.292). Zhang (2008) presents a mean (median) value of 8.010 (0.920). I provide three explanations for the differences. First, while Francis et al. (2004) and Zhang (2008) employ firm-year data to estimate *Con-Coeff* and *Con-R^2* measures, I use firm-quarter data to estimate these two measures. It is notable that, although both Zhang (2008) and Francis et al. (2004) use firm-year observations to estimate *Con-Coeff*, the statistics for *Con-Coeff* presented by Zhang (2008) are not comparable to those reported by Francis et al. (2004). Second, Zhang (2008) uses a sample of 327 firms to test the influence of conservatism on debt covenant. Her sample size is relatively small and might be not representative. Third, for the *Con-*R^2 measure, while there is a large difference for the mean values of my sample and Zhang (2008) sample, the median values for the two samples are comparable. It indicates that the large mean values of *Con-*R^2 measure in my sample might be driven by extreme values. Thus, the result may also indicate that the main test results may be biased due to the extreme values. To mitigate the concern that the main test results are caused by the extreme values, I also conduct sensitivity tests using the decile rank to check the robustness of the results presented in the main tests.

For the conservatism measures based on Givoly and Hayn (2000), the mean (median) value of *Con-Accrual* in the BI sample is 0.183 (0.065), and that in the DI sample is 0.064 (0.051). The results are inconsistent with prior studies. Hui et al. (2009) present a mean (median) value of 0.000 (0.010), Ahmed and Duellman (2007b) presents a mean (median) value of 0.010 (0.007), and Zhang (2008) presents a mean (median) value of -0.002 (-0.010). The differences may be due to two reasons. First, the different procedures employed in estimating the *Con-Accrual* measure may cause the differences. The accrual measure of conservatism is proposed by Givoly and Hayn (2000). They show that the accumulation of non-operating accruals is prevalently and significantly negative over 24 years, from 1965 to 1998. They argue that the results are attributable to the facts that firms are becoming more conservative over the period. However, Hui et al. (2009) and Ahmed and Duellman (2007b) use the total accruals, rather than non-operating accruals, to construct this conservatism measure. Second, although Zhang (2008) and I employ the same approach to estimate the *Con-Accrual* measure, the sample sizes and sample periods are different. My BI (DI) sample consists of 6,642 (1,339) observations, while Zhang (2008) conducts her tests based on 327 observations. The difference may be due to different sample periods. As discussed previously, Zhang's (2008) sample size is relatively small and might be not representative. Moreover, whereas Zhang's work is based on two-year data from 1999 to 2000, my sample covers nine-year period from 1997 to 2005.

The mean (median) value of *Con-Skewness* in the BI sample is 0.576 (0.524), and that in the DI sample is 0.411 (0.380). Zhang (2008) presents a mean (median) value of 0.420 (-0.600). The difference may be due to the estimation differences. While Zhang (2008) estimates the *Con-Skewness* measure by computing the ratio of the earnings skewness to the cash flow skewness, I estimate the measure following Givoly and Hayn (2000) and calculate

Con-Skewness as the difference between the skewness of cash flow from operations and the skewness of earnings. Although the estimation procedures are different, the information content captured by the two measures is similar.

Panel A of Table 3.2 reports the Pearson correlation matrix among the firm-specific conservatism measures for the BI sample. Overall, the results are mixed. First, *Con-Cscore* is significantly positively correlated with all the other conservatism measures except for the *Con-*R^2 measure. Second, the two firm-specific measures based on the Basu (1997) model, *Con-Coeff* and *Con-*R^2, are significantly positively correlated with the correlation coefficient of 0.3730 (p-value<0.0001). Third, the two conservatism measures based on Givoly and Hayn (2000), *Con-Accrual* and *Con-skewness*, are significantly positively correlated with the correlation coefficient of 0.0869 (p-value<0.0001). Fourth, there is no significant correlation between the two groups of conservatism measures, except for the positive correlation between *Con-Coeff* and *Con-Accrual* (correlation coefficient of 0.0380, with p-value = 0.0154). Finally, it is notable that the correlation coefficients for the positively correlated measures are small (lower than 0.20), except for the significantly positive correlation between *Con-Coeff* and *Con-*R^2 (correlation coefficient of 0.3730, with p-value<0.0001).

[Insert Table 3.2 Here]

Panel B of Table 3.2 reports the Pearson correlation coefficients among the five conservatism proxies for the DI sample. Overall, the results are similar to those presented in Panel A, with the following major exceptions. First, *Con-Cscore* is positively significantly correlated with *Con-Accrual* in the BI sample (correlation coefficient of 0.0609, with p-value<0.0001), while *Con-Cscore* is negatively significantly correlated with *Con-Accrual* in the DI model (correlation coefficient of -0.0883, with p-value= 0.0024). Second, there is no significant correlation between *Con-*R^2 and *Con-Negskew* in the BI sample, while *Con-*R^2 is negatively significantly correlated with *Con-Negskew* in the DI model (correlation coefficient of -0.0357, with p-value= 0.0101). The differences may be due to the reduced sample size.

These results have several implications. First, firm-specific conservatism measures may contain measurement errors, leading to low correlations among them. As suggested in prior studies, *Con-Coeff* and *Con-*R^2 measures are estimated by running the Basu (1997) model in time series. The estimation method causes measurement errors, and thus the two measures are considered as noisy measures by some prior studies (e.g., Francis et al. 2004; Givoly et al. 2007). As discussed previously (see Chapter 2), *Con-Accrual* and *Con-Skewness* capture managers' accounting discretion. The accounting choices could be either news-dependent or news-independent. Therefore, the two measures based on Givoly and Hayn (2000) capture both conditional and unconditional conservatism. These two measures may contain some measurement errors if we use them to proxy for conditional conservatism.

Second, these results may indicate the uniqueness of each conservatism measure. It is possible that different conservatism measures reflect different aspects of conservatism (Givoly et al. 2007). As a result, they are not highly correlated with each other. This explanation further emphasizes the importance of employing different firm-specific conservatism measures, instead of relying on a single conservatism measure, to assess conservatism.

The correlation results are consistent with those presented by Zhang (2008), which provides an analysis for the correlations among *Con-Coeff*, *Con-R^2*, *Con-Accrual*, and *Con-Skewness*. Zhang (2008) also finds that the correlations among the conservatism measures are low (none of the correlation coefficient is higher than 0.25), and that the two measures estimated based on the Basu (1997) model are not significantly correlated with the two Givoly and Hayn (2000) conservatism measures.

3.4 Validity Tests for the Firm-Specific Conservatism Measures

Table 3.3 reports the results of testing the validity of the firm-specific conservatism measures using the Basu (1997) model. The coefficients on *Firm_Conservatism*DR*RET* are all significantly positive at the 0.01 level, except for the *Con-* R^2 measure that is used in the DI sample. The results show that the five conservatism measures do capture firms' conservatism reporting in the Basu (1997) sense. The insignificant coefficient on *Firm_Conservatism*DR*RET* for the *Con-*R^2 measure in the DI sample may be due to the unrepresentative sample that is attributable to the reduced sample size.

[Insert Table 3.3 Here]

3.5 Regression Results

3.5.1 Test Based on the Basu (1997) Model

Table 3.4 reports the results of testing the relationship between conditional conservatism and over-investment directly. The coefficient on *DR*RET*OverInvest_Firm* is significantly negative at the 0.01 level (t-value =-2.84). The result suggests that firms that over-invest in year t+1 do not incorporate economic losses in a timely manner in year t. This is consistent with hypothesis *H3.1*, which predicts that conditional conservatism is negatively associated with over-investment.

[Insert Table 3.4 Here]

It is notable that the coefficients on *OverInvest_Firm*, *DR*OverInvest_Firm*, *RET*OverInvest_Firm*, and *DR*RET*OverInvest_Firm* are low (the coefficient on *OverInvest_Firm* equals to $4*10^{-4}$, the coefficient on *DR*OverInvest_Firm* equals to $1*10^{-4}$, the coefficient on *RET*OverInvest_firm* equals to 0.001, and the coefficient on *DR*RET*OverInvest_Firm* equals to -0.001). The low coefficient might be caused by the magnitude difference between the *OverInvest_Firm* measure and the dependent variable. The dependent variable, the *NI* measure, is computed as the ratio of earnings before extraordinary items to firms' market value of equity, and it ranges from -0.694 at the 1^{th} percentile to 0.296 at the 99^{th} percentile. The *OverInvest_Firm* variable ranges from -20.327 at the 1^{th} percentile to 41.699 at the 99^{th} percentile. Therefore, the low coefficients might be explained by the difference in magnitude between the *OverInvest_Firm* measure and the *NI* measure. To gauge the economic significance of the coefficient on *DR*RET*OverInvest_Firm*, I calculate the changes in timely loss recognition in response to one standard deviation increase in the *OverInvest_Firm* measure. I find that ceteris paribus, the firms' timely loss recognition level increases by 0.004 per one-standard deviation decrease in the *OverInvest_Firm* variable.[2] The result suggests that, while the association

[2] The relative change in timely loss recognition measure in response to a one-standard deviation increase in the OverInvest_Firm measure is estimated using the coefficient on DR*RET*OverInvest_Firm, multiplied by the mean of RET for the observations with negative

between conservatism and investment efficiency is statistically significant, its economic significance is quite small.

3.5.2 Tests based on the Biddle et al. (2009) Model

Table 3.5 summarizes the results from estimating equation (3.3). While the test based on the Basu (1997) approach examines the link between conservatism and investment efficiency directly, this conditional analysis is conducted to examine whether conservatism curbs over-investment for the firms being in a situation where over-investment is more likely. Industry and year effect are controlled but not presented in the table. The control variables generally have expected signs and are consistent with prior literature (e.g., Biddle and Hilary 2006; Biddle et al. 2009), except for the coefficient on *LogAsset*. While Biddle et al. (2009) report that future investment is negatively associated with total assets, I present positive association between the two variables. According to Biddle and Hilary (2006), larger firms are likely to be more transparent, and thus the managers undertake better investment projects. However, firm size may be also positively correlated with investment, as the firms may invest to expand the firm size.

[Insert Table 3.5 Here]

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stock returns, and the standard deviation of the OverInvest_Firm measure for the observations with negative stock returns.

I first estimate equation (3.3) using *Con-Cscore* to proxy for conservatism with a sample of 44,124 firm-year observations over the period from 1980 to 2005. Column (1) reports the regression result. The coefficient on *Con-Cscore*OverInvest_Ind* is significantly negative at the 0.01 level (t-value=-3.70), which suggests that more conservative firms are less likely to over-invest in the following year. In addition, it is notable that the coefficient on *Con-Cscore* is significantly negative at the 0.01 level (t-value=-3.78). As discussed previously, the coefficient on *Con-Cscore* captures the impact of conservatism on future investment when the firms are less likely to invest. Thus, the negative coefficient on *Con-Cscore* indicates that conservative firms tend to invest less when there is no over-investment problem. The result is consistent with Roychowdhury's (2010) argument. As suggested by Roychowdhury (2010), conservatism may reduce investment efficiency. Given that (1) the positive NPV projects may also have the risk of bad outcomes, and (2) the conservative firms recognize bad news in a timely manner than the good news, he argues that conservatism may "predispose risk-averse managers towards accepting low-risk projects and discarding high-risk projects even if they are positive NPV" (Roychowdhury, 2010, p.181).

Columns (2) and (4) of Table 3.5 report the regression result for the tests based on the *Con-Coeff* and *Con-Accrual* measures. I use 27,327 (6,642) firm-year observations to test the association between *Con-Coeff* (*Con-Accrual*) and investment efficiency. Inconsistent with the result shown in Column (1), the coefficients on *Con-Coeff*OverInvest_Ind* and *Con-Accrual*OverInvest_Ind* are significantly positive at the 0.10 level, which indicate that more conservative firms are more likely to over-invest in the following year. As shown in Columns (3) and (5) of Table 3.5, the coefficients on *Firm_Conservatism* and *Firm_Conservatism*OverInvest_Ind* for *Con-*R^2 and *Con-Skewness* are not significantly different from zero.

3.5.3 Tests Based on the Durnev et al. (2004) Model

The results from estimating equation (3.5) are reported in Table 3.6. Three-digit industry fixed effect are controlled but not presented in the table. The coefficients for the control variables have expected signs and are consistent with previous studies (e.g., Durnev et al. 2004; Greene et al. 2009).

[Insert Table 3.6 here]

Column (1) presents the regression result using *Con-Cscore* to proxy for conservatism. The coefficient on *Con-Cscore* is significantly negative at the 0.01 level (t-value=-13.04), which indicates that more conservative firms are less likely to over-invest. The result is consistent with Hypothesis *H3.1*. Column (4) shows the results of the regression of the *Con-Accrual* on corporate capital budgeting. The coefficient on *Con-Accrual* is significantly negative, which is consistent with Hypothesis *H3.1*. With respect to Columns (2), (3) and (5), the coefficients on *Firm_Conservatism* for *Con-Coeff*, *Con-*R^2 and *Con-Skewness* are not significantly different from zero.

Overall, similar to the results based on the Biddle et al. (2009) model, the results based on the Durnev et al. (2004) are also mixed and inconsistent. As discussed previously, one explanation is that these firm-specific measures may contain measurement errors. These results could also be explained by Givoly et al. (2007)'s argument that different firm-specific conservatism measure captures different prospects of conservatism. The firm-specific conservatism measures, except for *Con-Cscore*, may not capture the corporate governance role that conservatism plays in improving investment efficiency.

3.6 Sensitivity Tests

To test the robustness of the main results presented above, I conduct several additional tests in this section.

3.6.1 Test Based on the Ball and Shivakumar (2005) Cash Flow Model

Recent studies (e.g. Givoly et al. 2007; Jenkins and Velury 2008) suggest that the

Basu (1997) model may contain measurement errors, since the Basu's (1997) approach is based on stock returns and the stock price efficiency may vary across firms and over time. Hence, Ball and Shivakumar (2005) model of conservatism is used to check the robustness of the findings from the Basu (1997) model.

$$ACC = \alpha + \beta_1 DR + \beta_2 CFO + \beta_3 DR*CFO + \beta_4 OverInvest\_Firm + \beta_5 OverInvest\_Firm*DR + \beta_6 OverInvest\_Firm*CFO + \beta_7 OverInvest\_Firm*DR*CFO + \varepsilon, \quad (3.11)$$

where firm and time subscripts are omitted for simplicity. ACC is total accrual scaled by averaged total assets, CFO is cash flow from operating activities scaled by averaged total assets. DR is a dummy variable taking the value of 1 when CFO is negative, and 0 otherwise.

The coefficient on *CFO* is expected to be negative, given that cash flows is negatively associated with accruals due to the matching principle. Using negative cash flows to proxy for economic losses, Ball and Shivakumar (2005) suggest that conservative firms are more likely to reflect negative cash flows in accruals. Therefore, the coefficient on *DR*CFO* is expected to be positive. As Hypothesis *H3.1* predicts that conservative firms are less likely to over-invest in the following years, the coefficient on *OverInvest_Firm*DR*CFO* is expected to be negative.

Table 3.7 presents the results of testing the association between conservatism and investment efficiency directly by employing the Ball and Shivakumar (2005) cash flow model. The coefficient on *OverInvest_Firm*DR*CFO* is significantly positive (t-value = 5.39), which indicates that the more conservative firms are more likely to over-invest in the following years. The result is inconsistent with the main findings from the Basu (1997) model. The inconsistent result may be due to the measurement errors of the Ball and Shivakumar (2005) cash flow model, given that cash flows might carry more noises than stock returns in capturing firms' economic gains or losses.

[Insert Table 3.7 Here]

3.6.2 Ranked Value Test

In the main tests, I use the raw value of firms' investment level to test the association between conditional conservatism and future investment directly. In addition, I employ the raw value of the firm-specific conservatism measures to examine the influence of conditional conservatism on investment efficiency. One possible concern is that the results based on the raw values may be biased due to the extreme values. Thus, as a robustness check, the raw values of firms' investment and the five firm-specific conservatism measures are ranked into decile and the ranks are then rescaled from 0 to 1. I re-test the association between conservatism and investment efficiency by using the ranked value to further alleviate the influence of the extreme value.

Table 3.8 reports the regression result based on the Basu (1997) model. As shown in Table 3.8, the coefficient on *DR*RET*OverInvest_Firm* is significantly negative at the 0.01 level (t-value = -3.01), which is consistent with the main test result.

[Insert Table 3.8 Here]

Panel A of Table 3.9 shows the results based on the Biddle et al. (2009) model, and the results are generally consistent with the results presented in Table 3.5, except for the coefficient on *Conservatism*OverInvest_Ind* for *Con-Cscore* and *Con-*R^2 measures. The coefficient on *Conservatism*OverInvest_Ind* for *Con-Cscore* measure is not significantly different from zero. To investigate whether the main test result is due to extreme values, I re-examine the association between *Con-Cscore*OverInvest_Ind* and *Investment* by deleting the *Con-Cscore* variable at the top and bottom 5 percent. After deleting the Con-Cscore variable at the 95% and 5% level, the coefficient on

*Con-Cscore*OverInvest_Ind* is -3.29 (t-value =-1.60) and is not significantly different from zero (result untabulated), which suggest that the main test result may be due to outliers. The coefficient on *Conservatism*OverInvest_Ind* for the *Con-*R^2 measure is positively significant at the 0.05 level (t-value = 2.16). The results indicate that more conservative firms are more likely to over-invest in the following year, which is inconsistent with my hypothesis.

[Insert Table 3.9 Here]

The results of the tests based on the Durnev et al. (2004) model are presented in Panel B of Table 3.9. The results are generally consistent with the results presented in Table 3.6, except for the coefficient on *Con-Accrual*. The main test result shows that the coefficient on *Con-Accrual* is significantly negative at the 0.05 level (t-value = -2.30), while the robustness check reports that the coefficient on the *Con-Accrual* is not significantly different from zero. To investigate possible causes for the difference, I re-examine the link between *Con-Accrual* and marginal q by deleting the *Con-Accrual* variable at the top and bottom 5 percent. The coefficient on *Con-Accrual* is not significantly different from zero (untabulated result), which indicates that the main test result is due to extreme values.

3.6.3 Re-estimating the Two Firm-specific Conservatism Measures Based on the Basu (1997) Model – Firm-year Observations Employed

As discussed earlier, I use firm-quarter observations to estimate the two firm-specific conservatism measures based on the Basu (1997) model. To mitigate the concern that the results I document are due to the estimation method, I use the firm-year observations to re-estimate the two measures.

Equation (3.8) is re-estimated using the firm-year data to estimate the firm-specific *Con-Coeff* measure. *NI* is defined as net income before extraordinary item at the end of one fiscal year scaled by the market value of equity at the beginning of the year. *RET* is the twelve-month stock return ending three months after the end of fiscal year t. *DR* is a dummy variable, equal to 1 if RET is negative, and 0 otherwise. For each firm, equation (3.8) is estimated for firms that have at least six years of available data over the ten-year period from year t-9 to year t. The *Con-Coeff* measure is calculated as $(\beta_2 + \beta_3)/\ \beta_2$. To facilitate the interpretation of the *Con-Coeff* measure, I require the firms to have at least three positive annual returns and at least three negative annual returns during the sample period.

The *Con-*R^2 measure is also re-estimated using the firm-year data. As shown previously, the *Con-*R^2 measure is computed as the ratio of R^2 (bad news) to

R^2 (good news). While R^2(bad news) is obtained from estimating equation (3.8) using the subsample with negative RET, R^2(good news) is estimated using the subsample with positive RET. The sample firms are required to have at least six years of available data over the ten-year period from year t-9 to year t to estimate the *Con-R^2* measure. In addition, to ensure the R^2 (bad news) and R^2 (good news) are valid, I require the firms to have at least three positive annual returns and at least three negative annual returns during the sample period.

Table 3.10 presents the results. The results for the tests based on the Biddle et al. (2009) model are consistent with the results shown in Table 3.5, which show that the results presented in Table 3.5 are not due to estimation procedure. For the tests based on Durnev et al. (2004) model, the coefficient on *Con-Coeff* is not significantly different from zero, which is similar to that reported in Table 3.6, while the coefficient on *Con-R^2* is significantly negative at the 0.10 level, which is consistent with Hypothesis *H3.1* but inconsistent with the main test result.

[Insert Table 3.10 Here]

3.6.4 The Impact of Other Corporate Governance Mechanisms

Prior works suggest that corporate governance also affects reporting conservatism (Beekes et al. 2004; Ahmed and Duellman 2007; Garcia Lara et al.

2009a). As stronger governance leads to more conservative earnings, one possible concern is that the main results capture the association between corporate governance and investment efficiency. To alleviate this concern, I re-examine the influence of conservatism on investment efficiency by including corporate governance variable in the regression analysis. Following prior studies, I employ the anti-takeover provision index developed by Gompers et al. (2003) to proxy for corporate governance. Firms with higher index value are considered having more anti-takeover provisions. To conform this variable to my ordering scheme, I multiply the index value by minus one so that higher value of the measure implies better corporate governance. Following the approach employed by Biddle et al. (2009), I set observations with missing G-index value to zero. Thus, I also include G-index dummy, an indicator variable that equals to one if G-index value is missing and zero otherwise, to control for the potential problems caused by setting missing value to zero.

Panel A of Table 3.11 shows the results based on the Biddle et al. (2009) model, and the results are generally consistent with the results presented in Table 3.5, except for the coefficient on *Conservatism*OverInvest_Ind* for the *Con-Negskew* measure. The evidence on the association between corporate governance and investment efficiency is contrary to my prediction and the results reported by Gompers et al. (2003). The coefficients on *G-Index*OverInvest_Ind* are significantly positive, which suggests that firms with better corporate governance are more likely to over-invest. However, the results are consistent with those reported in Biddle et al. (2009) and Garcia Lara et al. (2010). Both studies report a negative association between corporate governance and future over-investment. Overall, the results on the association between conservatism and investment efficiency after controlling for the quality of corporate governance are mixed and sensitive to different measures.

[Insert Table 3.11 Here]

The results of the tests based on the Durnev et al. (2004) model are presented in Panel B of Table 3.11. The results are generally consistent with the results presented in Table 3.6, except for the coefficient on *Con-*R^2. The main test result shows that the coefficient on *Con-*R^2 is not significantly different from zero, while this test shows that the coefficient on the *Con-*R^2 is negatively significant at the 0.10 level. However, it is notable that the coefficient on *Con-*R^2 equals to $-5*10^{-5}$. To gauge the economic significance of the coefficient on *Con-*R^2, I calculate the changes in investment efficiency in response to one standard deviation change in the *Con-*R^2 measure. I find that ceteris paribus, the firms' investment efficiency changes by 0.00007 per one-standard deviation change in the *Con-*R^2 variable. The result suggests that, while the association between conservatism and investment efficiency is statistically significant, its economic significance is quite small.

3.6.5 Optimal Value of Marginal q Equals to 0.87

As will be shown in the Appendix, firms' optimal value of marginal q equals to 0.87 after taking taxes into consideration. To mitigate the concern that the main test results are caused by misclassifying under-investment observations into the over-investment group, I re-examine the link between conservatism and investment efficiency by setting 0.87 as the optimal marginal q level. The results are reported in Table 3.12. The results are consistent with those reported in Table 3.6, which show that the main test results are not due to the misclassification problem.

[Insert Table 3.12]

3.7 Supplementary Tests for Garcia Lara et al. (2009a) and Garcia Lara et al. (2010)

As discussed previously, Garcia Lara et al. (2009a) contemporarily conduct a study that is similar to my research. However, while they find positive link between conservatism and investment efficiency, I find mixed evidence on the association between conservatism and investment efficiency. Therefore, I conduct several additional analyses, which will be shown in section 3.7.1 and 3.7.2, to investigate the possible reasons that might cause the differences.

Garcia Lara et al. (2010) later revise their paper by employing C-score, instead of the accrual proxy, to measure conservatism. They find consistent evidence that conservatism improves investment efficiency. To provide more rigorous testing on the association between conservatism and investment efficiency, I further extend my thesis by including the Durnev et al. (2004) model. Overall, I find mixed and sometimes contradictory evidence using different models and conservatism measures to test the impacts of conservatism on investment efficiency. The results cast doubt on Garcia Lara et al.’s (2010) conclusion, which is reached based on a sole measure of conservatism. Furthermore, as shown in section 3.6.2, there is no significant association between conservatism and future investment for the test based on the Biddle et al. (2009) model when the C-Score measure is deleted at the top and bottom five percent. The result indicates that Garcia Lara et al.’s (2010) results, which are found based on the tests that winsorize the variables at the top and bottom one percent, may be due to extreme values.

3.7.1 Supplementary Tests for Garcia Lara et al. (2009a)

One notable difference between my study and Garcia Lara et al.'s (2009a) work is that we use different measures to proxy for conditional conservatism. While they use total accruals averaged over three years to proxy for conditional conservatism, I employ the Basu (1997) model and five firm-specific conservatism measures to test the link between conservatism and investment efficiency. Among the five firm-specific conservatism measures, I use non-operating accruals, instead of total accruals, to proxy for accounting conservatism, following the original method suggested by Givoly and Hayn (2000). Is it possible that the different results are due to different estimation method?

It is important to note that Givoly and Hayn (2000) do not consider total accruals as the conservatism proxy. Instead, they decompose total accruals into operating accruals and non-operating accruals. Non-operating accruals are mainly related to managerial discretions, such as write-downs. Therefore, thy argue that non-operating accruals capture managers' accounting choices, which are related to conservatism. And operating accruals, which are computed as the change in accounts such as inventory, accounts receivable and accounts payable, are more related to firms' operating activities, instead of conservatism. As conservatism is only captured by the non-operating accruals, the total accruals proxy may be a noisy measure by including operating accruals.

Garcia Lara et al. (2009a) claim that the total accrual measure captures conditional conservatism by performing a validity test. After estimating the accrual measure of conservatism for each firm, they classify the full sample into five subgroups according to the value of the three-year averaged total accruals. Then they run the Basu (1997) regression for each group, and find that there is an ascending trend for the coefficients on DR*RET from the group that is classified as the least conservative group to the most conservative group. To test the robustness of the Basu (1997) model result, they also examine the validity of the total accruals measure of conservatism using the Ball and Shivakumar (2005) accrual model. Overall, they find strong and robust results in the validity tests, and they claim that the results indicate that the total accruals effectively capture conservatism.

Even if total accruals do proxy for conservatism, it is possible that the purer measure, non-operating accruals, better proxies for conservatism. To investigate this issue, I decompose total accruals into operating accruals and non-operating accruals. Consistent with Garcia Lara et al. (2009a), I estimate the three variables using the balance sheet approach, averaged those variables over three years, and then multiplied them by -1. The three variables are then ranked into decile (from 0 to 1), and the following equation is employed to test the validity of the three variables.

$$NI=\alpha+\beta_1 DR+\beta_2 RET+\beta_3 DR*RET+\beta_4 Con\text{-}ACC+\beta_5\, Con\text{-}ACC*DR$$

$$+\beta_6\, Con\text{-}ACC*RET+\beta_7\, Con\text{-}ACC*DR*RET+\varepsilon, \quad (3.12)$$

where firm and year subscripts are omitted for simplicity. *Con-ACC* is the ranked value of total accruals measure, operating accruals measure, and non-operating accruals measure. Other variables are defined as previously.

Table 3.13 reports the results. While Garcia Lara et al. (2009a) employs 79,803 observations from 1975 to 2006 to test the impact of conservatism, which is proxied by total accruals averaged over three years, on investment efficiency, I use 42,463 observations to conduct the supplementary test. The sample size for the supplementary test is smaller than that for Garcia Lara's (2009a) study, and the reason for the sample size difference is shown as follows. For the tests based on the total accruals measure, my sample originally consists of 73,494 observations. However, both operating accruals and non-operating accruals require more data items to estimate the two variables. For some of the observations, the database has missing data for those items, which reduces the sample size to 42,463 observations for the tests based on operating accruals and non-operating accruals measure. Given that the comparison across the three variables should be conducted based on the same sample, the sample size for the tests based on the total accruals measure is also reduced to 42,463 observations.

[Insert Table 3.13 Here]

As shown in Table 3.13, the coefficient on *Con-ACC*DR*RET* for the total accruals measure is significantly positive at the 0.01 level. However, the coefficient for the non-operating accruals measure is not significantly different from zero. The result is inconsistent with those presented in Table 3.3. The inconsistent results may be caused by the different estimation procedures. While the main test employs non-operating accruals accumulated over six years to proxy for accounting conservatism, the supplementary test uses non-operating accruals averaged over three years. Hence, the results may indicate that the accrual conservatism measure is better able to capture conditional conservatism when it is estimated over a longer horizon. It is notable that although operating accruals is not related to conditional conservatism, operating accruals measure passes the validity tests.

To further examine the possible measurement errors caused by using total accruals to proxy for conservatism, I also re-run Biddle et al. (2009) model to examine the relation between total accruals (operating accruals, or non-operating accruals) and investment efficiency. The results are presented in Table 3.14. Higher values in those accrual measures represent more conservative accounting.

Whist the coefficients on *Con-ACC*OverInvest_Ind* for the total accruals and the operating accruals measures are significantly negative at the 0.01 level, the coefficient on *Con-ACC*OverInvest_Ind* for the non-operating accruals is significantly positive at the 0.01 level. These results suggest that the negative association between the total accrual measure of conservatism and future over-investment found by Garcia Lara et al. (2009a) could be driven by the operating accruals rather than the non-operating accruals.

[Insert Table 3.14 Here]

As shown previously, the proxy for conservatism employed by Garcia Lara et al. (2009a) may not capture the conditional conservatism concept on a theoretical basis. Thus, the positive link between conservatism and investment efficiency shown by Garcia Lara et al. (2009a) may be due to the spurious relation between operating accruals and firms' future investment rather than the actual association between conservatism and investment efficiency. This issue will be investigated in detail in the following section.

3.7.2 The Association between Operating Accruals and Investment

As shown previously, operating accruals, instead of non-operating accruals, are significantly associated with investment efficiency. Thus, a natural question is:

why operating accruals are related to investment efficiency?

To enhance our understanding of the information content captured by *Con-ACC*OverInvest_Ind* for the operating accruals measure, I first analyze the two components of the interaction, over-investment industry and operating accruals. As shown earlier, *OverInvest_Ind* is significantly positively associated with future investment, and Biddle et al. (2009) interpret the result as showing that the firms operating in the over-invested industries are likely to invest more in the following year.

Operating accruals is also positively associated with future investment. Operating accruals are computed as changes in working capital, which reflect firms' investment in working capital. As investment in working capital is related to corporate growth, it is expected to co-vary with firms' other growth-related operating activities, such as investing in fixed assets. Therefore, firms' investment in working capital and investment in fixed assets are highly correlated. Further, the firms that have optimistic future may expand their business, and thus persistently invest more in capital, and the depressed firms that are pessimistic about the firms' future may persistently invest less in capital. Thus, firms' current investment in working capital and future investment in fixed assets may be also highly correlated. The argument is confirmed by Zhang

(2007)'s study, which shows that accruals are not only significantly positively associated with the current capital expenditures, but also strongly positively related to the lead and lag capital expenditure.

Given that the *Con-ACC* measure of the operating accruals is computed as three year average of operating accruals scaled by total assets and then multiplied by -1, and both Garcia Lara et al. (2009a) and my study employ future capital expenditure to proxy for capital investment, the *Con-ACC* measure of the operating accruals should be negatively correlated with the future investment measure.

Overall, the discussion presented above shows that *OverInvest_Ind* is significantly positively correlated with future investment, and the *Con-ACC* measure of operating accruals is strongly negatively associated with future investment. Thus, the negative relation between *Con-ACC*OverInvest_Ind* and future capital expenditure may be explained as the mechanical association between the two variables. Therefore, Garcia Lara et al.'s (2009a) study actually test the relation between investment in working capital and future investment in fixed assets, rather than the impact of conservatism, which should work primarily through non-operating accruals, on investment efficiency.

3.8 Summary and Concluding Remarks

In this chapter, I expand the scope of existing conservatism literature and investment efficiency research by providing direct evidence on the influence of conditional conservatism on investment efficiency. In doing so, I employ the Basu (1997) model and five firm-specific conservatism measures to examine the role conditional conservatism plays in improving investment efficiency. My results are summarized as follows.

Overall, my study provides mixed and inconclusive evidence on the association between accounting conservatism and investment efficiency. I find evidence that conservatism improves investment efficiency by employing the Basu (1997) model. However, the result is economically insignificant. For the test based on the Ball and Shivakumar (2005) model of conservatism, I find evidence that conservatism decreases firms' investment efficiency. Using the raw value of the *Con-Cscore* measure, I document significantly negative association between *Con-Cscore* and investment efficiency. However, for the test based on the Biddle et al. (2009) model, I find no evidence on the relation between *Con-Cscore* and investment efficiency when using the rank value of the *Con-Cscore* measure. For the tests that are based on the *Con-Coeff* measure, I find that conservatism is positively associated with future investment using the Biddle et al. (2009) model, and find no significant relation between *Con-Coeff* and investment efficiency using the Durnev et al. (2004) model. For the tests that are based on the

Con-Accrual measure, I find that *Con-Accrual* is positively related to future investment using the Biddle et al. (2009) model, but is negatively associated with investment efficiency using the Durnev et al. (2004) model. For the tests that employ *Con-R^2* and *Con-Skewness* as the measures of conservatism, I find no association between conservatism and future over-investment.

There are two possible explanations for the results. Measurement error may be cited as a potential reason for not finding significant results. As suggested by Givoly et al. (2007)[3], different firm-specific conservatism measure may capture different aspects of conservatism. For the C-Score measure, since it captures firms' overall conservatism, it may include both the conditional and unconditional components of conservatism. For the two firm-specific measures based on the Basu (1997) model, as suggested by Francis et al. (2004), running the Basu (1997) model in time series may cause measurement errors. Moreover, Givoly et al. (2007) fail to observe conservatism for most of the firms when running the Basu (1997) model using time-series data. For the *Con-Accrual* and *Con-Skewness* measures, as they capture managers' discretion on accounting choices, the two measures capture both news-dependent and news-independent

[3] Givoly et al. (2007) identify three sources of conservatism, including the "failure of the financial reporting system to capture the positive present value of projects and subsequent increases in the value of assets" (p.98), the activities that minimizing the reported value of firms' assets, and the timely loss recognition. According to their definition of the different conservatism sources, I classify the five firm-specific conservatism measures into three groups: (1) As Con-Cscore is estimated based on the theoretical demands of conservatism, the Con-Cscore measure may capture all the three sources of conservatism, (2) Con-Coeff and Con-R^2 may capture firms' timely loss recognition activities, and (3) Con-Accrual and Con-Skewness may capture managers' discretionary activities that minimize the reported value of firms' assets.

conservatism. Therefore, they may contain measurement errors when they are used to proxy for conditional conservatism. Validity tests are conducted to investigate whether the measurement errors impair the firm-specific measures' ability to capture conditional conservatism. As all the firm-specific conservatism measures pass through the validity tests based on the Basu (1997) model, the results provide some assurance that the five firm-specific measures do capture conservatism in Basu's (1997) sense, and the measurement error concern is alleviated to some extent.

Endogeneity is another possible reason for the failure to detect the impact of conservatism on investment efficiency. Demsetz and Lehn (1985) suggest that ownership structure is the endogenous outcome of firms' value maximizing activities, and they provide empirical evidence on their argument by examining the determinants and consequences of firms' ownership structure. They document that several factors, such as firm size, control potential, regulation, and industry characteristics, are related to firms' ownership structure. They interpret their results as showing that firms change their ownership structure to maximize firm value. In addition, they also find that changes in ownership concentration are not significantly associated with firms' future profitability. The result suggest that investors are conscious of the possible effects of the changes in ownership concentration and the firms choose to change ownership structures only when the benefits of doing so offsets the negative impacts due to ownership structure changes. Following Demsetz and Lehn's argument, firms may change their accounting practices, such as conservatism, in response to their environment. For the firms that are in a situation where over-investment is more likely, at the demand of shareholders or debtholders, conservatism emerges to deter this problem. To the extent that accounting conservatism effectively deters the over-investment problem, the equilibrium outcome is that I am not able to observe the influence of conservatism on over-investment. Such evidence, however, is entirely consistent with the disciplinary role played by conservatism to mitigate the over-investment problem.

Chapter Four

The Impact of CEO Retirement on Conservatism

This chapter examines the influence of CEO retirement on accounting conservatism. The first section of this chapter reviews the literature and develops the hypotheses. Section 4.2 describes the research design and sample selection procedure. Section 4.3 and section 4.4 present the results of the regression analyses. Section 4.5 provides the results of the robustness tests. Finally, conclusions are presented in section 4.6.

4.1 Literature Review and Hypotheses Development

4.1.1 The Horizon Problem

Financial reports do not always reflect firm value changes in timely fashion (Dechow and Sloan 1991). For example, the firms recognize bad news that may affect firms' future operations on a timely basis when they employ conservative accounting policy. On the contrary, the good news that may increase the firms' future value will not be recognized as income until the benefits related to the news are realized. For the CEOs whose compensation is tied to firms' financial performance, they may choose to report less conservative earnings to increase their short-term compensation. However, in the absence of conservatism, future losses from the negative NPV projects are not reflected in earnings in a timely manner. The managers may be reluctant to discontinue negative NPV projects that generate profits in the short-run but great losses in the long-run (Ball and Shivakumar 2005). Those activities reduce firms' future profitability. As shown in prior studies, managers may have lower incentives to work for firms' long-term profits, relative to firms' short-term income, when they plan to leave the firms (e.g., Dechow and Sloan 1991; Huson, Wiedman and Wier 2003). Rather, those managers are concerned with short-term benefits that will increase their own wealth. This phenomenon is referred to as the horizon problem (Dechow and Sloan 1991; Gibbons and Murphy 1992).

As discussed in chapter one, compared with the CEOs who are forced to leave the firms, the retiring CEOs are better able to predict when they will leave the firms. In addition, since most of the retiring CEOs are no longer in the job market after they get retired, they are less concerned about their reputation in the job market. Therefore, the horizon problem might be more pronounced for the CEOs who cite "retirement" as the reason for leaving their companies.

4.1.2 The Impact of the Horizon Problem on Conservatism

There are three reasons to expect the retiring CEOs report less conservative earnings in their final years in the office. First, the retiring CEOs may have fewer incentives to report downwardly biased earnings. For example, the retiring executives may be less concerned about the future investment constraints, and thus they are less likely to employ costly corporate governance mechanisms, such as conservatism, to reduce firms' future costs of capital. Moreover, they may defer the recognition of future losses to the tenure of the new CEOs. For instance, for the news that is not mandated to be reported on a timely basis, the retiring CEOs are more likely to choose to defer the recognition of bad news to the new CEOs' tenure. In addition, the retiring CEOs may make operating decisions that are harmful to firms' future performance. For example, they may choose to invest in the negative NPV projects that generate high profits in the short-run, but losses in the long-run (Smith and Watts 1982).

Second, it is argued that managers may opportunistically report upwardly biased earnings to increase their compensation. The opportunism explanation of earnings management suggests that the managers take actions that are not expected by the other contracting parties, in order to benefit themselves. Studies based on the opportunism explanation indicate that managers opportunistically manage earnings, which fools the naive investors, to increase their compensation. Prior research provides mixed and inconclusive evidence on the managerial opportunism explanation for the horizon problem. Butler and Newman (1989) is the first study that empirically explores the impact of CEO departures on the CEOs' discretionary behaviors. They examine the changes in three accounting variables, including finished-good inventory, capital expenditures, and R&D expenditures, surrounding CEO turnovers. They find no evidence that those three items are systematically affected by CEO departures. They argue that the results may be attributable to their failure to control for the impact of the compensation plan on managers' reporting incentives. Dechow and Sloan (1991) provide evidence that the departing CEOs for the firms operating in R&D-intensive industries reduce R&D expenses to boost up earnings. They interpret their results as suggesting that the managers opportunistically reduce R&D expenses to increase their earnings-related compensation. Using a sample of 73 top executive resignations, either voluntary or involuntary, over 4 years, from 1985 to 1988, Pourciau (1993) examines the changes in earnings management surrounding the top executive resignations. She argues that the poorly performing executives could predict the likelihood of being replaced. To delay or avoid of being replaced, those executives may manage earnings to improve firms' financial performance. However, contrary to her prediction, she finds that income-decreasing accruals and write-offs are recorded prior to the top executive departures. She offers several explanations for the result, which includes measurement error, misidentification of the time horizon, sample selection limitation, and increased monitoring effectiveness.

Murphy and Zimmerman (1993) investigate the influence of CEO turnover on stock price and six accounting variables, including R&D, advertising, capital expenditure, accruals, sales, and assets. Their sample consists of 1,630 CEO turnovers over 19 years, from 1971 to 1989. They classify the CEO turnover firms into well-performing firms and inferior-performing firms, and they expect the turnovers occurred in the well-performing firms are less likely to be forced turnovers. They find little evidence that the discretionary expenses, such as R&D expenditure or advertising fees, are reduced before the departures of the voluntarily departing CEOs, which is inconsistent with the horizon problem hypothesis. Using discretionary accruals to proxy for earnings management, Kalyta (2009) further examines the influence of CEO post-retirement pension on the horizon problem. He finds that the retiring CEOs are more likely to report income-increasing discretionary accruals when their pension is tied to the pre-retirement firm performance, which indicates that the horizon problem is more pronounced for those CEOs.

As discussed above, most of the prior works attribute the horizon problem to managers' opportunistic behaviors. However, there are also studies showing that the compensation committees are conscious of the horizon problem and exercise discretion to respond to CEOs' earnings management activities during their last year in the office. For example, Huson et al. (2003) examine the sensitivity of managerial compensation to discretionary accruals. They find that change in managerial compensation is significantly negatively associated with change in discretionary accruals in the last year of the CEOs' tenure, while the two variables are not significantly correlated in the earlier period. They explain the results as implying the compensation committees' concern on the horizon problem. Cheng (2004) examines the relation between changes in CEO compensation and changes in R&D expenditure. Given that CEOs normally retire between 64 and 66 (Murphy 1999), Cheng (2004) considers the CEOs older than 63 years old as retiring CEOs that may have the horizon problem. He finds that for the CEOs that are at least 63 years old, managerial option compensation is positively associated with R&D expenditure. However, for the CEOs who are younger than 63 years old, their option compensation is not significantly related to R&D expenditure. Further, for the firms that may have the horizon problem, he finds no evidence on the reduction of R&D expenditure. He interprets his result as showing that the compensation committees are aware of the horizon problem.

Those papers present evidence that is contrary to the opportunism explanation. However, the retiring CEOs may still have the incentive to report less conservative earnings even if the compensation committees are already aware of those activities. In the literature, there are two explanations for earnings management: one is the opportunism explanation, which is described above, and the other one is the rational response explanation (e.g., Erickson and Wang 1999; Shivakumar 2000). Consistent with Erickson and Wong (1999), Shivakumar (2000) employs the rational response model to explain why firms overstate earnings before seasoned equity offering. Under the managerial response assumption, the investors already expect that the reported earnings are upwardly biased, and the managers have difficulties to show the absence of earnings management. As a result, the managers manipulate earnings in advance, and the investors discount the earnings accordingly. For the earnings that are not overstated, investors may also discount them. Therefore, it is rational for the managers to report upwardly biased earnings.

Huson et al.'s (2003) and Cheng's (2004) results might be explained by the rational response hypothesis of earnings management. The compensation committees expect that the managers report overstated earnings in the terminal year of their tenure, and the managers have difficulties to show the absence of earnings management. For the earnings that are not overstated, the compensation committees may also discount the earnings. As a result, the managers rationally report upwardly biased earnings. Based on both the opportunism explanation and the rational response model, the CEO retirement firms are more likely to report less conservative earnings prior to the retirement of their CEOs. However, the techniques used in this study can not identify which of the two models better explain managers' incentive in preparing financial reports.

Based on the discussion above, I hypothesize that the CEO retirement firms are more likely to report less conservative earnings prior to the retirement of their CEOs.

Hypothesis 4.1: *CEO retirement firms are more likely to prepare less conservative financial reports prior to the retirements of their CEOs.*

4.1.3 Compensation Plan

The influence of the compensation plan on earnings management is widely discussed in the literature. CEO compensation typically consists of salary, bonus, stock option, and other stock related compensation. While the bonus is determined by firms' financial performance, option and other stock-related compensation is tied to firms' stock price performance. Using total accruals and voluntary accounting procedure changes to proxy for earnings management, Healy (1985) examines the influence of the bonus plan on managerial accounting discretion. Some bonus contracts include provisions that specify the upper or the lower bound for the earnings. For the executives whose bonus contracts include upper bound for the earnings, the compensation contracts restrict the maximum bonus which can be paid to the executives. For the bonus plans that specify the lower bound for the earnings, no bonus is paid to the executives if the reported earnings are less than the lower bound. Healy (1985) shows that (1) for the firm-years that earnings are higher than the upper bound, the executives manage earnings downwards, (2) for the firm-years that earnings are less than the lower bound, the executives report income-decreasing accruals to “take a big bath”, and (3) for the firm-years that have no upper or lower bound, the executives report income-increasing accruals to increase the bonus compensation. Further, he finds that firms’ accounting policies are more likely to be changed following the adoption or modification of the compensation plan. Overall, his results show that the executives manage earnings to boost up their earnings-based compensation. Gaver, Gaver and Austin (1995) extend Healy’s (1985) research. They employ discretionary accruals to measure earnings management, while Healy (1985) investigates total accruals. Their sample consists of 837 observations over 11 years, from 1980 to 1990. Contrary to Healy, they find that for the firm-years that earnings are less than the lower bound, executives manage discretionary accruals upwards. They interpret their results as showing that the executives manage earnings to smooth earnings, rather than to maximize the bonus compensation. However, Guidry, Leone and Rock (1999) suggest that using firm-level tests to examine the association between the managerial compensation may cause measurement errors. Hence, they re-examine this issue by using business unit-level data. Given that the unit managers’ bonuses are solely determined by the earnings that are generated by the units, the potential problems that are associated with the firm-level test, such as the aggregation problem and the impact of option compensation, are mitigated. Their result is consistent with Healy's (1985) bonus maximization hypothesis.

The impact of the compensation plan on the horizon problem is examined by Dechow and Sloan (1991). They demonstrate that the managers are more likely to reduce R&D expenditures prior to their retirements when they are compensated mainly based on firms' financial performance, and suggest that those managers have greater incentives to report overstated earnings to increase the earnings-based compensation. As discussed previously, the retiring CEOs may opportunistically or rationally prepare less conservative financial reports to increase firms' reported earnings, which in turn increase their earnings-based compensation. Therefore, compared with the managers whose compensation is primarily based on stock prices, the managers that are compensated primarily based on firms' financial performance have greater incentives to report less conservative earnings. This leads to the following hypothesis:

Hypothesis 4.2: *The retiring CEOs whose compensation is primarily based on earnings prepare less conservative financial reports in the final year of their tenure than the retiring CEOs whose compensation is primarily based on stock* *prices.*

4.2 Research Design

4.2.1 Basic Model

The Basu (1997) model is used to investigate the extent of conservatism.

$$NI = \alpha + \beta_1 DR + \beta_2 RET + \beta_3 DR*RET + \varepsilon, \qquad (4.1)$$

where firm and time subscripts are omitted. All the variables are defined as in chapter two.

To examine the influence of CEO retirement on accounting conservatism, and to investigate the impact of the CEO compensation plan on the association between CEO retirement and accounting conservatism, I expand the Basu (1997) model to measure CEO retirement and construct additional interactive loss recognition terms to capture the effects of the CEO retirement on conservatism. Both the cross-sectional and time-series differences in conservatism are tested, which will be discussed in detail later.

4.2.2 Sample Selection Procedure

Table 4.1 provides the sample selection procedure. The initial sample consists of all the 144,962 observations on the ExecuComp database over 1994 to 2006. Executive age, title, and turnover reasons are collected from this database. We first delete the 123,248 observations for executives other than CEOs. Observations with missing age data are excluded. Stock returns, financial reporting data, and firms' industrial information are collected from CRSP and Compustat. I exclude 681 observations with missing data for stock returns and earnings. Given that the financial firms are subject to different legal constraints, 2,875 financial firms' observations are deleted. The 1,964 turnover year observations for both the leaving CEOs and incoming CEOs are also eliminated from my sample, given that: (1) it is difficult to identify whether the reported earnings are determined by the old CEOs or the incoming CEOs, and (2) new CEOs may "take a big bath" in the first year of their tenure, and take credit for the earnings improvement in the following years (Murphy and Zimmerman 1993). Therefore, the turnover year earnings are not comparable with the earnings reported in the other years. The final sample consists of 15,687 observations, including 2,023 turnover observations.

[Insert Table 4.1 here]

ExecuComp lists four reasons, including deceased, retired, resigned, and unknown, for CEO departures. Among the 2,023 turnover observations, 622 observations are identified as “retired” turnovers by the ExecuComp database. For the rest 1,401 observations, 39 observations are classified as “deceased” turnovers by the ExecuComp database, 462 observations are categorized as “resigned” turnovers, and 900 observations are identified as “unknown” turnovers.

Some CEO departures that are classified as “resigned” turnovers by the Execucomp are reported by the media as retirements. Thus, for the observations that are classified as “resigned” or “unknown” turnovers, or that no reason is given by the Execucomp database, I determine the reasons for CEO replacement by searching the news reports on the Wall Street Journal and PR Newswire databases. Among those observations, 351 turnovers are reported as “retirement” by the Wall Street Journal or the PR Newswire. Thus, in total, 973 out of the 2,023 observations are classified as “retirement” turnovers. The rest 1,050 non-retirement turnovers are not excluded from my sample, and the reasons are shown as follows. This study is conducted to test the influence of the horizon problem, and the departing CEOs who cite reasons other than “retirement” are less likely to be affected by the horizon problem. Therefore, the non-retirement turnovers are also included in the empirical analysis to examine the conservatism difference between the retirement firms and the non-retirement firms. However, my results are robust to the exclusion of the non-retirement turnovers. Given that some of the observations that are used to test hypothesis *H4.1* have missing values in the compensation data, the test of hypothesis *H4.2* is based on the observations for which compensation data are available. Thus, I use a sample of 15,573 observations, including 971 retirement observations, to test hypothesis *H4.2*. For the following tests, all the continuous variables are winsorized at the top 1% and bottom 99% level to mitigate the outlier problem.

4.3 Regression Analyses of Hypothesis 4.1

4.3.1 Cross-Sectional Analysis

The cross-sectional difference in conservatism between the CEO retirement firms and the non-CEO retirement firms is tested using the following regression model:

$$NI = \alpha + \beta_1 DR + \beta_2 RET + \beta_3 DR*RET + \beta_4 CEO\_Retire \qquad (4.2)$$

$$+ \beta_5 CEO\_Retire*DR + \beta_6 CEO\_Retire*RET + \beta_7 CEO\_Retire*DR*RET + \varepsilon,$$

where firm and year subscripts are omitted for simplicity. The definition of *CEO_Retire* varies according to different tests, which will be discussed in detail in the following parts. Other variables are defined as before.

First, the conservatism differences over the pre-retirement period are examined. Prior studies suggest that the horizon problem is more pronounced for the CEOs who are in the final year of their tenure (e.g., Dechow and Sloan 1991; Kalyta 2009). To examine whether the horizon problem influences CEOs' discretionary reporting choices over a longer period, I investigate the long-run differences, as well as the short-run differences, in conservatism between CEO retirement firms and non-CEO retirement firms. Accordingly, *CEO_Retire* is defined variously. Year 0 is the retirement year. In the one-year specification, *CEO_Retire* is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the two-year specification, *CEO_Retire* is coded 1 for year -2 and year -1 observations whose CEOs retire in year 0, and zero otherwise. In the three-year specification, *CEO_Retire* is coded 1 for year -3, -2 and -1 observations whose CEOs retire in year 0, and zero otherwise. The difference in conservatism between CEO retirement firms and non-CEO retirement firms is captured by the coefficient on *CEO_Retire*DR*RET* (β_7).

Another question of interest is that if the firms report less conservative earnings over the period prior to CEO retirement, does the firms' conservatism level changes across the years before the retirement? The conservatism difference across the years before the CEO retirements is also examined. *CEO_Retire* is redefined correspondingly. In the year -1 specification, *CEO_Retire* is coded 1 for the year -1 observations whose CEOs retire in year 0, and zero otherwise. In the year -2 specification, the year -1 observations are deleted, and *CEO_Retire* is coded 1 for the year -2 observations whose CEOs retire in year 0, and zero otherwise. In the year -3 specification, the year -1 and year -2 observations are deleted, and *CEO_Retire* is coded 1 for the year -3 observations whose CEOs retire in year 0, and zero otherwise. This allows us to test whether the retiring CEOs becomes less conservative as they approach their retirement.

Table 4.2 reports the primary results of the cross-sectional tests. Since most of the CEOs have repeated observations over time, I follow the recommendation in Petersen (2009) and correct the coefficients' t-statistics using a clustering procedure that accounts for the dependence in residuals across years for a given CEO. Panel A of Table 4.2 presents the results of testing the influence of CEO retirement over the period prior to retirement. For the one-year test, the coefficient on *CEO_Retire*RET*DR* is significantly negative at the 0.01 level (t-value = -2.75). The coefficients on *CEO_Retire*RET*DR* are not significantly different from zero for the two-year and three-year specifications, which indicates that CEOs do not report less conservatively over the longer horizons before CEO retirement. Taken together, these results suggest that firms report le ss conservative earnings only in the final year prior to CEO retirements. Panel B of Table 4.2 reports the difference in conservatism across the years prior to CEO retirements. The conclusion is the same as before: the retiring CEOs only prepare less conservative reports in the final year.

[Insert Table 4.2 Here]

4.3.2 Time-Series Analysis

One limitation of the cross-sectional test is that: although there is evidence showing that the CEO retirement firms prepare less conservative financial reports than the non-CEO retirement firms, an alternative explanation is that the CEO retirement firms might consistently report less conservative earnings over years. In the cross-sectional test, firm characteristics that may affect conservatism are not controlled for, and it could be that the firms where CEOs retire are systematically different from other firms in such characteristics. Thus, the observed results may not reflect the influence of the horizon problem. Therefore, two additional tests are conducted to examine the validity of the alternative explanation. One is to provide a time-series analysis of the CEO-retirement firms, which examines the change in accounting conservatism over the period prior to CEO retirements. The other test is also a time-series analysis, which investigates whether financial reports prepared by the retiring CEOs are less conservative than those prepared by the new CEOs.

The Changes in Conservatism Over the Pre-Retirement Period

Equation (4.2) is re-estimated to capture the changes in conservatism over the years prior to CEO retirement. Since the test is conducted to examine the change in conservatism for the CEO retirement firms across the years prior to CEO retirements, only the CEO retirement firms are included in the sample. Year 0 is the retirement year. As presented in Table 4.2, the CEO retirement firms prepare less conservative financial reports in year -1, compared with the non-CEO retirement firms. If the CEO retirement firms systematically report less conservative earnings than other firms, I expect to find evidence that those firms' conditional conservatism level does not change significantly from year -2 to year -1. However, if the horizon problem exists, I expect to find evidence that those firms' conservatism level decreases significantly from year -2 to year -1. Therefore, I examine the changes in conditional conservatism from year -2 to year -1 to investigate whether the CEOs are more likely to prepare less conservative financial reports as they approach their retirement. Thus, only the observations from the most recent two years prior to year 0 (year -2 and -1) are included in the sample. To make sure that the comparison is made based on the same firm portfolios, I delete the firms without two years consecutive data (year -2 and -1) preceding to the CEO retirements. *CEO_Retire* is a dummy variable taking a value of one for the year -1 observations, and zero for the year -2 observations. All the other variables are defined as previously.

Panel A of Table 4.3 reports the result of testing the change in conservatism level for the CEO retirement firms over the period prior to CEO retirements. The coefficient on *CEO_Retire*DR*RET* is significantly negative at the 0.05 level (t-value = -2.22). The result suggests that during their tenures, the retiring CEOs are more likely to prepare less conservative reports in the last year of their tenure.

[Insert Table 4.3 Here]

Comparison between the Pre- and Post-Retirement Period

Equation (4.2) is re-estimated to examine the changes in conservatism from the pre- to post-retirement periods for the CEO retirement firms. As shown previously, CEO retirement firms only report less conservative earnings in year -1. If the CEO retirement firms consistently report less conservative earnings over years, I expect to find evidence that those firms do not exhibit higher degrees of conservatism in year 1 than that in year -1. However, if the horizon problem exists, I expect to find evidence that those firms report more conservative earnings in year 1 than that in year -1. To test the change in conservatism, I require that: (1) only the firms with CEO retirement at year 0 are included in the sample, and (2) only the firms that exist in both the pre-retirement (year -1) and post-retirement (year 1) periods are included to make sure that the comparison is made based on the same firm portfolios. *CEO_Retire* is coded as one for the year -1 observations, and zero for the year 1 observations. The coefficient on *CEO_Retire*DR*RET* (β_7) represents the difference in conservatism between year -1 and year 1 for the CEO retirement firms.

Panel B of Table 4.3 reports the results of testing the difference in conservatism between the pre- and post-retirement periods. The coefficient on *CEO_Retire*RET*DR* is significant negative at the 0.01 level (t = -2.93). This result shows that the earnings reported by the retiring CEOs in the final year prior to their retirements (year -1) are less conservative than those reported by the new CEOs in the second year of their tenure (year 1).

Overall, the time-series results are inconsistent with the alternative explanation which argues that the CEO retirement firms consistently report less conservative earnings over years, making it more likely that the horizon problem is the explanation for the observed results.

4.4 Regression Analyses of Hypothesis 4.2

4.4.1 Cross-Sectional Analysis

Equation (4.2) is re-estimated to test the impact of the CEO compensation plan on the association between CEO retirement and accounting conservatism cross-sectionally. Following previous research (e.g., Duru et al. 2005), I use the ratio of cash bonus compensation to total compensation to proxy for earnings-based compensation. Cash bonus is computed as the sum of the salary and bonus compensation. To test the impact of the compensation plan, I partition the sample into three subgroups by year according to the cash bonus compensation ratio: the CEOs that rely mostly on earnings-based compensation (High-EBC sample), CEOs that are compensated based on both financial performance and stock price performance (median-EBC sample), and CEOs that rely mostly on stock-based compensation (low-EBC sample).

As shown in section 4.3, the horizon problem only exists in the last year prior to CEO retirements (year -1). Therefore, I only focus on the influence of the compensation plans on the horizon problem in the final year prior to CEO retirements. *CEO_Retire* is coded as 1 for the year -1 observations for the firms whose CEOs retire in year 0, and zero otherwise. The coefficient on *CEO_Retire*DR*RET* (β_7) represents the difference in conservatism between CEO retirement firms and non-CEO retirement firms.

Table 4.4 reports the results. For the High- and Median- EBC groups, the coefficients on *CEO_Retire*RET* are significantly positive (High-EBC group: coefficient = 0.040, t-value = 2.05; Median-EBC group: coefficient= 0.024, t-value = 1.75), and the coefficients on *CEO_Retire*RET*DR* are negatively significant for the High- and Median- EBC groups (High-EBC group: coefficient = -0.090, t-value = -1.92; Median-EBC group: coefficient= -0.143, t-value = -3.57). The results suggest that for the firms that are classified into the High- and Median- EBC groups, the firms with CEO retirements recognize good news in a timelier manner than the non-CEO retirement firms, and are reluctant to reflect bad news in earnings than the other firms. However, the coefficients on *CEO_Retire*RET* and *CEO_Retire*RET*DR* are not significantly different from zero for the Low-EBC group. The result shows that the firms do not report less conservatively before the retirements of their CEOs when those CEOs are mainly compensated through stock options or other stock-related compensation. The result is consistent with Hypothesis *H4.2* and indicates that the managers' incentive to prepare less conservative financial reports is mitigated by the stock-based compensation plans.

[Insert Table 4.4 Here]

4.4.2 Time-Series Analysis

<u>*The Changes in Conservatism Over the Pre-Retirement Period*</u>

Consistent with the analysis in section 4.3.2, I also conduct two time-series analyses to test Hypothesis *H4.2*. Equation (4.2) is re-estimated for each subgroup to test the time-series changes in conservatism over the years prior to

CEO retirements. As discussed previously, only CEO retirement firms are included in the sample. Observations from the most recent two years prior to year 0 (year -2 to -1) are included. Further, I eliminate the retirement firms that have missing observations in year -2, which reduces the High-EBC group to 289 firms with 578 observations, the Median-EBC group to 255 firms with 510 observations, and the Low-EBC group to 247 firms with 494 observations. CEO_Retire is a dummy variable that equals to one for the year -1 observations, and zero for the year -2 observations. All the other variables are defined as previously. The coefficient on *CEO_Retire*DR*RET* (β_7) represents the changes in conservatism from year -2 to year -1 for the CEO retirement firms.

Panel A of Table 4.5 presents the results. The coefficients on *CEO_Retire*RET*DR* are not significantly different from zero for the Low- and Median- EBC groups, but the coefficient is significantly negative at the 0.05 level for the High-EBC group (t-value = -2.46). In addition, the coefficients on *CEO_Retire*RET* are significantly positive for the High- and Median- EBC groups, but the coefficient is not significantly different from zero for the Low-EBC group. The results show that the CEOs with High- and Median- EBC are more likely to recognize good news in a timelier manner when they approach retirement, and the retiring CEOs with High- EBC are reluctant to realize bad news in earnings in the final year in the office. These results indicate that the

CEOs are more likely to prepare less conservative financial reports prior to their retirements when they are primarily compensated by firms' financial performances, which is consistent with Hypothesis *H4.2*.

[Insert Table 4.5 Here]

<u>Comparison between the Pre- and Post-Retirement Period</u>

Equation (4.2) is re-estimated for each subgroup to test the changes in conservatism from the pre- to post-retirement periods. As shown previously, only the observations with CEO retirement at year 0 are included in the sample. To make sure that the comparison is conducted based on the same sample composition, only the firms that exist in both year -1 and year 1 periods are included. Further, I eliminate the retirement firms with missing observations in year 1, which reduces the High-EBC group to 244 firms with 488 observations, the Median-EBC group to 237 firms with 474 observations, and the Low-EBC group to 187 firms with 374 observations. *CEO_Retire* is a dummy variable that equals to one for the year -1 observations, and zero for the year 1 observations. All the other variables are defined as previously. The coefficient on *CEO_Retire*DR*RET* (β_7) represents the difference in conservatism between year -1 and year 1 for the CEO retirement firms.

Panel B of Table 4.5 reports the results. Consistent with the hypothesis, the coefficient on *CEO_Retire*RET*DR* is significantly negative for the High-EBC firms (t-value= -1.87). However, the coefficient on *CEO_Retire*RET*DR* for the Low- EBC firms is also negative, which is inconsistent with my expectation (t-value= -3.63). The untabulated F-test shows that the coefficients on *CEO_Retire*RET*DR* do not significantly differ across the three compensation groups. The results may indicate that the retiring CEOs, either rely more or rely less on earnings based compensation, report less conservative earnings than the incoming CEOs.

4.5 Robustness Tests

To test the robustness of the main results presented above, I conduct several additional tests in this section.

4.5.1 Sensitivity Test: Controlling for *M/B*, *Size*, and *Leverage*

As previously discussed (Chapter 2), market-to-book ratio, size, and leverage are the three variables that are widely used in prior studies to proxy for the demands of conservatism (e.g. Khan and Watts 2009; LaFond and Watts 2008; Frankel and Roychowdhury 2008). Several papers modify the Basu (1997) approach by including those three factors in the Basu model. In addition, several prior studies employ market-to-book ratio as a proxy for growth opportunities (e.g., Barclay and Smith 1995; Villalonga and Amit 2006). Therefore, including the market-to-book ratio variable in the regression analysis also alleviates the concern that the main results are caused by the firm characteristic differences between mature firms and growth firms. Thus, the following model is employed to check the robustness of the Basu (1997) model.

$$
\begin{aligned}
NI = {} & \alpha + \beta_1 DR + \beta_2 RET + \beta_3 DR*RET + \beta_4 CEO\_Retire \\
& + \beta_5 CEO\_Retire*DR + \beta_6 CEO\_Retire*RET + \beta_7 CEO\_Retire*DR*RET \\
& + B_8 MB + \beta_9 MB*DR + \beta_{10} MB*RET + \beta_{11} MB*DR*RET + B_{12} LEV \qquad (4.3) \\
& + \beta_{13} LEV*DR + \beta_{14} LEV*RET + \beta_{15} LEV*DR*RET + B_{16} LEV \\
& + \beta_{17} LEV*DR + \beta_{18} LEV*RET + \beta_{19} LEV*DR*RET + \varepsilon,
\end{aligned}
$$

where firm and time subscripts are omitted. Market-to-book ratio is computed as the ratio of the market value of equity (DATA25*DATA199) to the book value of equity (DATA60). Leverage ratio is the ratio between the total debt (DATA9+DATA34) and the total assets (DATA6). Firm size is the log of total assets (DATA6). Other variables are as defined under equation (4.2).

For each firm, it is not likely that market-to-book ratio, firm size, and leverage would change significantly from year -2 to year -1, or from year -1 to year 1. Thus, I just estimate equation (4.3) to check the robustness of the cross-sectional results, instead of the time-series results.

Table 4.6 presents the results of testing Hypothesis *H4.1*. Consistent with previous literature (Frankel and Roychowdhury 2007; LaFond and Watts 2007), the coefficients on *MB*DR*RET* are significantly negative, the coefficients on *LEV*DR*RET* are significantly positive, and the coefficients on *Size*DR*RET* are significantly negative. After controlling for these three firm characteristics, the coefficient on *CEO_retire*DR*RET* is still significantly negative for the one-year (or year -1) specification. For the two-year and three-year tests, and the year -2 and year -3 tests, the coefficients on *CEO_Retire*DR*RET* are not significantly different from zero. These results are consistent with those shown in Table 4.2, that is, firms are less likely to incorporate economic losses into earnings only when the CEOs are in year -1. The results further support Hypothesis *H4.1*.

[Insert Table 4.6 Here]

Table 4.7 reports the results of testing Hypothesis *H4.2*. The sample is partitioned into three subgroups, including High-EBC group, Median-EBC group, and Low-EBC group, according to the managers' cash bonus compensation ratio. As shown previously, firms report less conservative earnings only in the final year prior to CEO retirements. Thus, the conservatism difference over (across) the pre-retirement period is not examined in this section. *CEO_Retire* is coded 1 for year -1 observations whose CEOs retire in year 0, and 0 otherwise. Consistent with the results presented in Table 4.4, the coefficient on *CEO_Retire*RET*DR* is not significantly different from zero for the Low-EBC group, while the coefficients on *CEO_Retire*RET*DR* are significantly negative at the 0.05 level for the High- and Median-EBC groups. Consistent with the main findings, the coefficient on *CEO_Retire*RET* for the High- EBC group is significantly positive at the 0.05 level (t-value= 1.99), and the coefficient for the Low-EBC group are not significantly different from zero. However, after controlling for firm characteristics, which represent firms' demands of conservatism, the coefficient on *CEO_Retire*RET* for the Median- EBC group is not significantly different from zero, which is inconsistent with the main findings. Overall, the results further support the view that the horizon problem is more pronounced for the retiring CEOs whose compensation is mainly determined by firms' financial performance.

[Insert Table 4.7 Here]

4.5.2 Ball and Shivakumar (2005) Cash Flow Test of Conservatism

As discussed previously, since Basu's (1997) approach is based on stock returns and the stock price efficiency may vary across firms and over time, the Basu (1997) model may contain measurement errors (e.g. Givoly et al. 2007; Jenkins and Velury 2008). Therefore, Ball and Shivakumar (2005) model of conservatism is used to check the robustness of the findings from the Basu (1997) model.

$$ACC = \alpha + \beta_1 DR + \beta_2 CFO + \beta_3 DR*CFO + \beta_4 CEO\_Retire \quad (4.4)$$
$$+ \beta_5 CEO\_Retire*DR + \beta_6 CEO\_Retire*CFO + \beta_7 CEO\_Retire*DR*CFO,$$

where firm and time subscripts are omitted for simplicity. ACC is total accrual scaled by averaged total assets, CFO is cash flow from operating activities scaled by averaged total assets. DR is a dummy variable taking the value of 1 when CFO is negative, and 0 otherwise. The definition of CEO_Retire will be discussed in the later parts.

Both *H4.1* and *H4.2* are re-examined employing the Ball and Shivakumar (2005) model.

<u>*Test for H4.1*</u>

To test the robustness of the main results for Hypothesis *H4.1*, both the cross-sectional and time-series differences in conservatism are re-examined using the Ball and Shivakumar (2005) cash flow model. Table 4.8 presents the cross-sectional results. For the one-year (or year -1) specification, the coefficient on *CEO_Retire*CFO*DR* is significantly negative (t-value = -3.09). On the contrary, the coefficients on *CEO_Retire*CFO*DR* are not significantly different from zero for two-year period, three-year period, year -2, or year -3 tests. The evidence presented in Table 4.8 further supports the view that firms prepare less conservative financial reports in the final year prior to the retirement of their CEOs.

[Insert Table 4.8 Here]

Table 4.9 reports the time-series results. Panel A of Table 4.9 reports the result of testing the changes in conservatism over the years prior to the CEO retirements. The coefficient on *CEO_Retire*CFO*DR* (β_7) captures the changes in conservatism from year -2 to year -1 for the CEO retirement firms. The estimate of β_7 is significantly negative at the 0.05 level (t-value = -2.03). The result is consistent with the main findings from the Basu (1997) model.

[Insert Table 4.9 Here]

Panel B of Table 4.9 presents the results of testing the differences in conservatism between outgoing CEOs and incoming CEOs by using the Ball and

Shivakumar (2005) model. The coefficient on *CEO_Retire*CFO*DR* (β_7) captures the difference in conservatism between the pre- (year -1) and post-retirement (year 1) period for the CEO retirement firms. The estimate of β_7 on *CEO_Retire*CFO*DR* is significantly negative at 0.01 level (t-value = -2.84). Again, the result is consistent with the results from the Basu (1997) model.

Test for H4.2

Ball and Shivakumar (2005) cash flow model is also employed to test the robustness of the main results of Hypothesis *H4.2*. As shown earlier, the sample is partitioned into three subgroups, including High-EBC group, Median-EBC group, and Low-EBC group. Table 4.10 presents the cross-sectional results of testing H4.2. The coefficients on *CEO_Retire*CFO*DR* are all significantly negative at the 0.05 level for the three groups. Moreover, the untabulated F-test indicates that the coefficients on *CEO_Retire*CFO*DR* do not significantly differ across the three compensation groups. The result is inconsistent with the main findings from the Basu (1997) model.

[Insert Table 4.10 Here]

Table 4.11 presents the time-series results. Panel A of Table 4.11 reports the results of testing the changes in conservatism over the years prior to the CEO retirements. The coefficient on *CEO_Retire*CFO*DR* for the High-EBC group is -0.147 (t-value = -0.23), that for the Median-EBC group is -1.588 (t-value = -1.05), and that for the Low-EBC group is -0.458 (t-value= -1.19). For all the three subgroups, none of the coefficients on *CEO_Retire*CFO*DR* is significantly different from zero. In addition, the F-tests indicate that the coefficients on *CEO_Retire*CFO*DR* do not significantly differ across the three compensation groups (F-value=0.22). The results are inconsistent with the findings from the Basu (1997) model.

[Insert Table 4.11 Here]

Panel B of Table 4.11 presents the results of testing the differences in conservatism between the outgoing CEOs and the incoming CEOs for the three compensation groups. The coefficient on *CEO_Retire*CFO*DR* for the High-EBC group is -0.153 (t-value = -0.43), that for the Median-EBC group is -1.803 (t-value = -2.18), and that for the Low-EBC group is -1.051 (t-value= -3.10). The results suggest that for the departing CEOs whose compensation is primarily based on earnings, they do not report less conservative earnings prior to their retirement, compared with the earnings reported by the new CEOs.

The results presented in Table 4.10 and Table 4.11 are inconsistent with the main findings, and it may be due to the measurement errors of the Ball and Shivakumar (2005) cash flow model. Compared with the forward-looking stock returns employed in the Basu's (1997) approach, annual cash flows may be noisy in measuring firms' economic gains or losses.

4.5.3 Matching Sample

Tests for H4.1

It is argued that employing the model with omitted variables that are related to both the dependent variable and key experimental variables may cause biased result. Therefore, another possible concern is that the results I document are due to omitted variables. In the previous section, three factors, including M/B, leverage, and size, are included in the regression to control for the omitted variables that are related to the litigation, regulation, contracting and taxes demands of conservatism. However, one limitation of this approach is that the effects of some other variables, such as time period or industry, are left out of consideration. In this section, the omitted variables are controlled by employing the matching sample. The CEO retirement firms are matched with the non-CEO retirement firms by firm size, industry and year. The matching approach not only controls for the impacts of firm size and industry on firms' conservatism level, but also relaxes the linearity assumption for the firm size and industry effects in regression analysis. For each CEO retirement observation (from the 973 observations), I select a non-CEO retirement observation (from the 14,714 observations) that (1) has the same fiscal year, (2) is from the same industry, which is classified based on Fama-French 48 industry specification, and (3) has a firm size, which is proxied by total assets, closest to that of the retirement firms. The firms failing to find their matches are dropped, and 928 retirement firms get their matches.

Panel A of Table 4.12 demonstrates that the difference in total assets between the CEO-retirement firms and non-CEO retirement firms is not significant (t-value=0.08 and Z-value=0.09). Panel B of Table 4.12 presents the results of estimating equation (4.2) by using the matching sample. Consistent with the main results, the coefficient on *CEO_Retire*RET*DR* is significantly negative at the 0.01 level (t-value = -2.69).

[Insert Table 4.12 Here]

Tests for H4.2

Table 4.13 presents the results of testing Hypothesis *H4.2* using the matching sample. In each sample year, each CEO retirement firm is matched with a non-CEO retirement firm in term of firm size, industry, year and EBC group. The firms failing to find their matches are dropped, and 853 retirement firms get their matches. Panel A of Table 4.13 shows that the difference in total assets between the CEO-retirement firms and non-CEO retirement firms is not significant (t=0.27 and Z=-0.20 for the High-EBC firms, t=0.38 and Z=0.34 for the Median-EBC firms, and t= 0.04 and Z=-0.03 for the Low-EBC firms). While the coefficient on *CEO_Retire*RET*DR* for High-EBC group is significantly negative at the 0.05 level (t-value= -2.07), the coefficients on *CEO_Retire*RET*DR* for the Median- and Low- EBC subgroups are not significantly different from zero. The result is consistent with hypothesis *H4.2*. However, inconsistent with the main findings, the coefficient on *CEO_Retire*RET*DR* is not significantly different from zero for the Median-EBC group. The inconsistency may be due to two explanations. On one hand, it may suggest that the coefficients in Table 4.4 are biased due to the failure of controlling for the possible impacts of industry and other firm characteristics. On the other hand, given that the matching procedure reduces the sample size (from 324 observations for the Median-EBC group in Table 4.4 to 287 observations in Table 4.12), the matching sample may be less representative of the population.

[Insert Table 4.13 Here]

4.5.4 Further Analysis: Controlling for CEO Age

Prior studies suggest that CEOs that are forced to leave the firms might be reported as retired CEOs by the media (Warner et al. 1988; DeFond and Park 1999; Huson et al. 2001). Therefore, one possible concern is that some forced turnovers are misclassified as retirement observations in my sample. Most of the previous studies employ CEO retirement age as a proxy for normal retirement to address the misclassification issue (e.g., Engel et al. 2003). Farrell and Whidbee (2003) indicate that the CEOs are likely to voluntarily leave the firms when they reach the age of 60. Further, using a sample of 1,089 CEO departures over 26 years, Murphy (1999) shows that 62% of the CEOs leave the firms at ages of 60 to 66. Following earlier work, I re-test *H4.1* and *H4.2* by including only the CEOs that retire at ages of 60 to 66 in the retirement sample to alleviate the misclassification problem.

Tests for H4.1

Table 4.14 presents the cross-sectional result. As the retirement sample only consists of the CEOs that retire at ages from 60 to 66, the observations with retirement ages lower than 60 or greater than 66 are re-classified into the non-retirement group. Consistent with the main results, for the one-year specification (or year -1) test, the coefficient on *CEO_retire*RET*DR* is significantly negative at the 0.05 level (t-value = -2.35). On the contrary, for the two-year, three-year, year -2, and year -3 specifications, the coefficients on

*CEO_Retire*RET*DR* are not significantly different from zero.

[Insert Table 4.14 Here]

Table 4.15 presents the time-series results. Panel A of Table 4.15 reports the results of testing the changes in conservatism level for the CEO retirement firms over the period prior to CEO retirements. The coefficient on *CEO_Retire*DR*RET* is significantly negative at the 0.10 level (t-value = -1.92). Panel B of Table 4.15 presents the results of examining the changes in conservatism from the pre- to post-retirement period. Consistent with the main findings, the coefficient on *CEO_Retire*DR*RET* is significantly negative at the 0.05 level (t-value = -2.51).

[Insert Table 4.15 Here]

<u>*Tests for H4.2*</u>

Table 4.16 presents the cross-sectional results of testing Hypothesis *H4.2*. While the coefficient on *CEO_Retire*RET*DR* is significantly negative at the 0.01 level (t-value=-2.73) for the High-EBC group, the coefficients on *CEO_Retire*RET*DR* are not significantly different from zero for the Median- and Low- EBC groups. The result further supports the view that the CEOs report

less conservative earnings when they are primarily compensated based on firms' financial performance, which is consistent with my hypothesis.

[Insert Table 4.16 Here]

Table 4.17 presents the time-series results. Panel A of Table 4.17 reports the results of testing the changes in conservatism over the pre-retirement period. The coefficient on *CEO_Retire*RET*DR* is significantly negative at the 0.10 level (t-value = -1.82) for the High-EBC group, and the coefficients on *CEO_Retire*RET*DR* are not significantly different from zero for the Low- and Median-EBC groups. The result is consistent with Hypothesis *H4.2*.

[Insert Table 4.17 Here]

Panel B of Table 4.17 reports the results of examining the difference in conservatism between the pre- and post-retirement periods. While the coefficient on *CEO_Retire*RET*DR* is significantly negative at the 0.10 level (t-value = -1.71) for the Low- EBC group, and the coefficients on *CEO_Retire*RET*DR* are not significantly different from zero for the High- and Median- EBC groups. The results are inconsistent with the main findings, which are reported in Panel B of Table 4.5, and are opposite to hypothesis *H4.2*. Several tests are conducted to investigate the possible reasons that may cause the inconsistency. To conserve space, I just discuss the results of the tests without tabulating them.

First, additional analyses are conducted to alleviate the concern on extreme observations. As the sample sizes for the three EBC groups are reduced, some observations that are not identified as outliers in the full sample may cause substantial changes in the fitted model when the sample size is largely reduced. I delete the observations with Cook's Distance greater than or equal to one. However, the result reported in Panel B of Table 4.17 is qualitatively unaffected by excluding the observations with Cook's Distance greater than or equal to one.

Recall that Panel A of Table 4.17 shows that only the CEOs that are classified into the High-EBC group are more likely to report less conservative earnings when they approach retirements, while the results presented in the Panel B of Table 4.17 indicate that only the retiring CEOs in the Low-EBC group are more likely to report less conservative earnings than the incoming CEOs. Therefore, I further conduct several analyses to figure out the possible reasons for the discrepancy. I only include the year -2, year -1 and year 1 observations in the sample. To make sure that the comparison is made based on the same firm portfolios, I delete the firms with missing observations over the three years (year -2, -1 and 1). For the High-EBC group, there are 106 firms that have observations across the three years (year -2, year -1 and year 1). For the test that examines the conservatism difference between year -2 and year -1, the coefficient on CEO_Retire*RET*DR is significantly negative at the 0.01 level (t-value=-2.76). For the test that explores the conservatism difference between year -1 and year 1, the coefficient on *CEO_Retire*RET*DR* is not significantly different from zero. For the Median-EBC group, there are 115 firms that have observations across the three years (year -2, year -1 and year 1). For both the test that examines the conservatism difference between year -2 and year -1 and the test that investigates the conservatism difference between year -1 and year 1, the coefficients on *CEO_Retire*RET*DR* are not significantly different from zero. For the Low-EBC group, there are 98 firms that have observations across the three years (year -2, year -1 and year 1). For both the test that examines the conservatism difference between year -2 and year -1 and the test that investigates the conservatism difference between year -1 and year 1, the coefficients on *CEO_Retire*RET*DR* are not significantly different from zero. Given that the test that examines the conservatism difference between year -1 and 1 is based on 115 firms, the result indicates that the significantly negative coefficient on *CEO_Retire*RET*DR* for the Low-EBC group, which is reported in Panel B of Table 4.17, is driven by the 17 observations that are not overlapped with the sample that is used to test the changes in conservatism from year -2 to year -1.

4.6 Concluding Remarks

Using a sample of 15,687 firm-year observations over the 1994 to 2006 period, I compare the accounting conservatism between the CEO retirement firms and non-CEO retirement firms. In addition, using a sample of 15,573 firm-year observations over the same period, I also examine whether CEO compensation plans influence on the association between CEO retirement and reporting conservatism. My results can be summarized as follows:

First, testing the cross-sectional and time-series difference in conservatism, I document that the CEO retirement firms prepare less conservative financial reports prior to the retirements of their CEOs. I employ several additional analyses, including Ball and Shivakumar (2005) cash flow test of conservatism, matching sample, and restricting the CEO retirement age to range from 60 to 66 year old, to check the robustness of the findings. The results from the robustness checks are generally consistent with the main findings. Second, I find that the CEO compensation plan affects the relation between CEO retirement and conditional conservatism. The retiring CEOs are more likely to report less conservative earnings prior to their retirements when their compensation is highly contingent on firms' financial performance. However, I find mixed evidence in the robustness tests. As discussed above, the mixed evidence might be attributable to the low power of tests associated with small sample size.

This study has several contributions. First, to my knowledge, this research is the first study that provides empirical evidence on the impact of CEO retirement on conditional conservatism. In addition, while previous literature shows mixed and inclusive results on the influence of the horizon problems on earnings management, this study provides consistent evidence on the association between CEO retirement and conditional conservatism. Finally, my study also extends knowledge on CEO compensation plan by documenting the influence of compensation plan on horizon problem.

Chapter Five

Summary and Future Research

5.1 Summary

In chapter two, recent papers on the definition, determinants, consequences and measures of conservatism are reviewed. This chapter provides theories for building up the hypotheses that are tested in chapters three and four, and comments on the conservatism measures and models that are employed in the later two chapters.

In chapter three, using 1,339 to 80,528 firm-year observations over 1980 to 2006 (sample sizes vary accordingly for tests based on different conservatism measures and models), I examine the association between conditional conservatism and investment efficiency. Five firm-specific measures of conservatism, including C-score, time-series measures of conservatism based on Basu (1997) model, and Givoly and Hayn (2000) measures, and three models, including the Basu (1997) model, the Biddle et al. (2009) model, and the Durnev et al. (2004) model, are employed to investigate this issue.

Overall, the results are sensitive to different conservatism measures and models. For test based on the Basu (1997) model, I document that there is a negative association between reporting conservatism and investment efficiency, which is consistent with the hypothesis that conditional conservatism curbs over-investment. However, the result is not economically significant. Using the raw value of the *Con-Cscore* to proxy for conservatism, I find that *Con-Cscore* is negatively related to over-investment. However, for the test based on the Biddle et al. (2009) model, the link between conservatism and investment efficiency is not significant when the ranked value of Con-Cscore is employed. For the tests based on the *Con-Coeff* measure, I document that there is no significant association between conservatism and over-investment using the Durnev et al. (2004) model, while I find that *Con-Coeff* is positively related to future over-investment using the Biddle et al. (2009) model. For the tests based on *Con-*R^2 and *Con-Negskew* measures, I find that there is no significant correlation between conditional conservatism and firms' investment efficiency. Employing *Con-Accrual* to measure conservatism, I document positive association between *Con-Accrual* and future investment efficiency using the Biddle et al. (2009) model, and I find that *Con-Accrual* is negatively related to over-investment using the Durnev et al. (2004) model.

As discussed in chapter three, the results are open to two possible explanations. First, the firm-specific conservatism measures may have measurement errors. Second, endogeneity can be another explanation. It is possible that firms change their accounting practices, such as conservatism, in response to their environment. Conservatism emerges as a governance mechanism to deter the over-investment problem when the firms are in a situation where over-investment is more likely. To the extent that accounting conservatism curbs over-investment effectively, the equilibrium outcome is that I may not observe the link between conservatism and over-investment.

Chapter four consists of two research questions. First, the influence of CEO retirement on reporting conservatism is investigated. In addition, I also examine the impact of CEO compensation plan on the link between CEO retirement and reporting conservatism. Overall, I find evidence that is consistent with my hypotheses. Employing a sample of 15,687 firm-year observations over the 1994 to 2006 period, I document that firms exhibit lower degree of conservatism prior the retirement of their CEOs. Moreover, using 15,573 observations over the same period, I find that CEOs that rely primarily on earnings-based compensation are more likely to prepare less conservative earnings before their retirement.

5.2 Limitations and Future Research

Chapter three may be extended in two ways. First, I may further examine whether the firms that are more likely to over-invest adopt more conservative accounting practices. The industry-level discretionary investment (see section

3.2.2) and the free cash flow measure proposed by Richardson (2006) can be used to identify the firms that are more likely to over-invest at the *ex ante* sense. If conservatism emerges as a corporate governance mechanism in response to over-investment, I expect to find evidence showing that firms report more conservative earnings when they are more likely to over-invest.

In addition, time-series approach can be employed to investigate the link between conservatism and investment efficiency. I may examine whether the firms becoming more over-invested prepare more conservative financial reports in the following years. If the firms adopt more conservative accounting policy to deter the over-investment problem, I expect to find evidence showing that firms exhibit a greater degree of conservatism after an increase in over-investment level.

In chapter four, I examine the impact of CEO retirement on reporting conservatism. Moreover, I also explore the influence of compensation plan on the association between CEO retirement and conservatism. I find that the retiring CEOs that rely primarily on earnings-based compensation are more likely to report less conservative earnings prior to their retirement. However, my analysis has paid little attention to investigate whether the retiring CEOs with high earnings-based compensation receive higher compensation by preparing less conservative financial reports. I can develop a model to predict CEOs' accounting-based compensation and test whether the retiring CEOs for the less conservative firms get "abnormally high" compensation. The results may extend my thesis by providing evidence on the consequence of less conservative reporting. Another area for future research is to examine the incoming CEOs' activities to see whether they would "undo" what the retired CEOs have done. The results will complement this study by providing evidence from the new CEOs' angle.

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APPENDIX: MARGINAL Q ESTIMATION PROCEDURE

A.1. Motivation

Efficient capital budgeting means that managers invest in positive NPV projects and reject or discontinue negative NPV projects. The NPV is defined as the present value of the future net cash flows. The firms with optimal capital budgeting invest in the projects if and only if

$$E[NPV] = E\left[\sum_{t=1}^{\infty} \frac{cf_t}{(1+r)^t} - C_0\right], \qquad \text{(A1)}$$

where E is the expectation operator, cf_t is the net cash flows generated by the project at year t, r is the discount rate, and C_0 is the set-up cost for the investment.

As firms' profitability indexes (PI) equal to

$$E[PI] = \frac{E\left[\sum_{t=1}^{\infty} \frac{cf_t}{(1+r)^t}\right]}{C_0} = \frac{E\left[C_0 - C_0 + \sum_{t=1}^{\infty} \frac{cf_t}{(1+r)^t}\right]}{C_0} = 1 + \frac{E[NPV]}{C_0}, \qquad \text{(A2)}$$

the firms that make optimal corporate budgeting decisions only undertake the projects that have profitability indexes higher than 1. Marginal q is defined as the unexpected incremental firm value associated with firms' unexpected marginal investment (Durnev et al. 2004, Greene, Hornstein and White 2009). Thus, marginal q can be written as

$$\dot{q} = \frac{\Delta V}{\Delta K} = \frac{E\left[\sum_{t=1}^{\infty} \frac{cf_t}{(1+r)^t}\right]}{C_0} = 1 + \frac{E[NPV]}{C_0} = E[PI] \quad , \tag{A3}$$

where ΔV is change in firm value, and ΔK captures change in investment. Under the assumption of no taxes and other complexities, the marginal q should equal to 1 for the value maximizing firms. For the firms with marginal qs higher (lower) than 1, those firms are under-invested (over-invested) firms. The impacts of taxes and other complications will be discussed in A.3.

A.2. Procedure for Estimating Marginal q

The procedure for estimating marginal q is first developed by Durnev et al. (2004), and they employ the industry-level marginal q to examine the influence of stock price informativeness on corporate capital investment. This methodology is later extended by Greene et al. (2009) and firm-specific marginal q is calculated using the following procedure.

The marginal q for firm i can be denoted as:

$$\dot{q}_i = \frac{\Delta V_{i,t}}{\Delta A_{i,t}} = \frac{V_{i,t} - E_{t-1}V_{i,t}}{A_{i,t} - E_{t-1}A_{i,t}} = \frac{V_{i,t} - V_{i,t-1}(1+\hat{r}_{i,t} - \hat{d}_{i,t})}{A_{i,t} - A_{i,t-1}(1+\hat{g}_{i,t} - \hat{\delta}_{i,t})}, \qquad \text{(A4)}$$

where $V_{i,t}$ is the market value of firm i at the end of year t, and $A_{i,t}$ is the total assets of firm i at the end of year t. E_{t-1} is the expectation operator, which captures the information available to the firms at the end of year t-1. The expected firm value for year t, which is estimated based on the information extant at year t-1, can be substituted by $V_{i,t-1}(1+\hat{r}_{i,t} - \hat{d}_{i,t})$. $V_{i,t-1}\hat{r}_{i,t}$ captures the expected return from owning firm i, and $V_{i,t-1}\hat{d}_{i,t}$ is firm i's disbursement to investors, including dividends, stock repurchases, and interest expenses. The expected total assets for year t can be substituted by $A_{i,t-1}(1+\hat{g}_{i,t} - \hat{\delta}_{i,t})$. $A_{i,t-1}\hat{g}_{i,t}$ is the expected capital expenses, and $A_{i,t-1}\hat{\delta}_{i,t}$ captures the depreciation of the capital goods.

Rearranging equation (A4), I get the following equation:

$$\frac{V_{i,t} - V_{i,t}}{A_{i,t}} = -\dot{q}_i(\hat{g}_i - \hat{\delta}_i) + \dot{q}_i \frac{A_{i,t} - A_{i,t-1}}{A_{i,t}} - \xi_i \frac{D_{i,t-1}}{A_{i,t-1}} + r_i \frac{V_{i,t-1}}{A_{i,t-1}}, \quad \text{(A5)}$$

Thus, the empirical model to estimate marginal q can be derived as:

$$\frac{\Delta V_{i,t}}{A_{i,t-1}} = \beta_{0,i} + \beta_{1,i} \frac{\Delta A_{i,t}}{A_{i,t-1}} + \beta_{2,i} \frac{D_{i,t-1}}{A_{i,t-1}} + \delta P_t + \mu_{i,t}, \quad \text{(A6)}$$

where $D_{i,t-1}$ is firm i's total disbursements to investors (DATA21 + DATA19 + DATA115 + DATA15) at year t-1. The procedure for estimating $A_{i,t}$ and $V_{i,t}$ will be discussed in detail in A.4. Following Greene et al. (2009), I also include P_t to control for the cyclical economic factors that may have influence on all the firms. Equation (A6) is estimated using rolling ten-year window for each firm, and $\beta_{1,i}$ captures firm i's marginal q.

A.3. Taxes

As shown by Durnev et al. (2004) and Greene et al. (2009), firms' optimal marginal q may be subject to taxes and other complications. Taking taxes into consideration, firms' marginal q can be re-written as $\frac{(1-T_{CG})(V_{i,t}-E_{t-1}V_{i,t})}{(1-T_D)(A_{i,t}-E_{t-1}A_{i,t})}$, where T_{CG} is the capital gains taxes the investors need to pay upon selling the shares, and T_D is the personal income taxes the investors need to pay when receiving dividends. Therefore, equation (A6) can be re-rewritten as:

$$\frac{\Delta V_{i,t}}{A_{i,t-1}} = \beta_{0,i} + q_{i,t}\frac{(1-T_D)\Delta A_{i,t}}{(1-T_{CG})A_{i,t-1}} + \beta_{2,i}\frac{D_{i,t-1}}{A_{i,t-1}} + \delta P_t + \mu_{i,t}\,, \qquad \text{(A7)}$$

which means that the estimated $\beta_{1,i}$ captures $q_{i,t}\frac{(1-T_D)}{(1-T_{CG})}$. The estimated β_1 for the firms that makes optimal investment decisions equals to $1*\frac{(1-T_D)}{(1-T_{CG})}$, rather than 1. In the 1990s, taxes on disbursement approximate 33%, and taxes on capital gains approximate 14%. Therefore, after taking taxes into consideration, the estimated β_1 approximates 0.87 for firms that make optimal investment decisions.

A.4. Procedure for Estimating V and A

Following Durnev et al. (2004) and Greene et al. (2009), I estimate $V_{i,t}$ and $A_{i,t}$ using the following equations:

$$V_{i,t} = P_t\,(CS_{i,t} + PS_{i,t} + LTD_{i,t} + SD_{i,t} - STA_{i,t}), \tag{A8}$$

$$A_{i,t} = INV_{i,t} + K_{i,t}, \tag{A9}$$

where

CS = market value of common shares outstanding (DATA25*DATA199),

PS = estimated market value of preferred shares, which is computed as preferred dividend paid (DATA19) divided by the Moody's baa preferred share dividend yield. The Moody's baa preferred share dividend yield is available at: http://research.stlouisfed.org/fred/data/irates/baa,

LTD = long-term debt (DATA9),

SD = book value of short-term debt, which is computed as current liability (DATA34) minus short-term notes (DATA206),

STA = book value of current assets (DATA4),

P = GDP deflator, which is included to adjust for inflation. GDP deflator data is available at: http://research.stlouisfed.org/fred/data/ppi/ppifgs,

INV = market value of inventories, which is computed as the sum of total inventory (DATA3) and LIFO reserve (DATA240).

K = market value of PPE, which is computed using the following procedure. First, I convert both the PPE figures and the capital expenditure figures to 1983 dollars using P_t. The depreciation rate of PPE is assumed to be 10% per annum. PPE at the end of year t is PPE at the end of year t-1 minus 10% depreciation plus capital expenditure at year t. Market value of PPE at the end of year t is estimated recursively using data over ten years from year t-9 to t.

TABLE 3.1

Descriptive Statistics

Panel A: Conservatism Measures for the BI sample

Proxies	N	Mean	Std. Dev	Q1	Median	Q3
Con-Cscore	44,124	0.094	0.093	0.036	0.091	0.144
Con-Coeff	27,327	2.057	8.450	-0.371	0.634	2.444
Con-R^2	40,873	42.523	284.458	0.180	0.980	0.540
Con-Accrual	6,642	0.183	0.427	0.001	0.065	0.196
Con-Skewness	15,791	0.576	1.183	-0.208	0.524	1.375

Panel B: Conservatism Measures for the DI sample

Proxies	N	Mean	Std. Dev	Q1	Median	Q3
Con-Cscore	7,562	0.054	0.062	0.008	0.050	0.094
Con-Coeff	6,529	1.769	11.662	-0.539	0.500	2.099
Con-R^2	9,939	117.959	908.839	0.228	1.292	7.688
Con-Accrual	1,339	0.064	0.146	-0.004	0.051	0.122
Con-Skewness	5,238	0.411	1.330	-0.504	0.380	1.331

Variable Definitions:

Con-Cscore = $\lambda_{1,t} + \lambda_{2,t}\,Size_{j,t} + \lambda_{3,t}\,M/B_{j,t} + \lambda_{4,t}\,Lev_{j,t}$, where $\lambda_{1,t}$ to $\lambda_{4,t}$ are estimated following Rhan and Watts (2007).

Con-Coeff = the ratio of the coefficient on bad news to good news estimated using the Basu (1997) model with at least 24 quarters of available data over the ten-year period from year t-9 to year t for each firm.

Con-R^2 = the ratio of R-square for the bad news subsample with negative stock returns to the R-square for the good news subsample with positive stock returns.

Con-Accrual = the ten-year accumulated non-operating accruals scaled by total assets (DATA6).

Con-Skewness = The difference between the skewness of cash flow from operations over 10 years and the skewness of earnings (DATA18) during ten-year period.

TABLE 3.2

Pearson Correlation Matrices

Panel A: Pearson Correlation Matrix for the BI sample

	Con-Cscore	***Con-Coeff***	***Con-R^2***	***Con-Accrual***	***Con-Skewness***
Con-Cscore	1.0000	0.0251	-0.0085	0.0609	0.0222
		<0.0001	*0.1103*	*<0.0001*	*0.0008*
Con-Coeff		1.0000	0.3730	0.0380	0.0087
			<0.0001	*0.0154*	*0.2839*
Con-R^2			1.0000	0.0085	-0.0074
				0.5024	*0.2590*
Con-Accrual				1.0000	0.0869
					<0.0001
Con-Skewness					1.0000

Panel B: Pearson Correlation Matrix for the DI sample

	Con-Cscore	***Con-Coeff***	***Con-R^2***	***Con-Accrual***	***Con-Skewness***
Con-Cscore	1.0000	-0.0026	-0.0063	-0.0883	-0.0068
		0.8554	*0.5877*	*0.0024*	*0.6451*
Con-Coeff			0.4069	0.0014	-0.0260
			<0.0001	*0.9682*	*0.1324*
Con-R^2			1.0000	-0.0242	-0.0357
				0.3790	*0.0101*
Con-Accrual				1.0000	0.2519
					<0.0001
Con-Skewness					1.0000

*Correlations are Pearson (Significance levels are shown in italics).

All the variables are defined as previously.

TABLE 3.3
Validity Tests for Conservatism Measures

Panel A: BI sample

	(1) Con-Cscore		(2) Con-Coefficient		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats
Intercept	0.073	45.86***	0.056	21.83***	0.055	21.99***	0.067	11.22***	0.061	15.08***
DR	-0.004	-1.32	-0.012	-2.50**	-0.005	-1.07	0.013	1.19	-0.016	-2.18**
RET	0.006	2.39**	0.018	5.77***	-0.002	-0.73	0.024	3.75***	-0.027	-6.50***
*DR*RET*	0.050	5.03***	0.003	10.84***	0.279	22.71***	0.097	3.57***	0.190	10.43***
Firm_Conservatism	-0.017	-6.11***	0.144	3.45***	0.013	2.98***	-0.050	-4.88***	-0.023	-3.30***
*Firm_Conservatism*DR*	-0.019	-3.67***	0.020	2.55**	0.007	0.86	-0.042	-2.27**	0.035	2.73***
*Firm_Conservatism*RET*	0.002	0.50	-0.005	-1.01	-0.007	-1.41	-0.050	-5.41***	0.024	3.53***
*Firm_Conservatism*DR*RET*	0.157	10.40***	0.182	8.46***	0.070	3.36***	0.175	4.23***	0.149	4.87***
Sample Period	1980-2005		1980-2005		1980-2005		1997- 2005		1997-2005	
No. of obs.	44,124		21,327		40,873		6,642		15,791	
F-value	777.39		502.53		669.67		141.16		210.90	
Adjusted R^2	0.11		0.11		0.10		0.13		0.09	

Panel B: DI sample

	(1) Con-Cscore		(2) Con-Coefficient		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats	Coeff	t-stats
Intercept	0.060	19.28***	0.080	21.77***	0.076	22.77***	0.051	5.15***	0.066	15.48***
DR	0.003	0.46	-0.030	-4.35***	-0.004	-0.59	0.026	1.46	-0.003	-0.36
RET	-0.005	-0.67	0.013	1.54	0.002	0.23	0.057	3.03***	0.011	1.21
*DR*RET*	0.105	4.38***	0.034	1.23	0.249	10.72***	0.075	1.37	0.099	3.48***
Firm_Conservatism	0.020	3.88***	-0.016	-2.68***	-0.006	-0.99	0.037	2.24**	-0.001	-0.16
*Firm_Conservatism*DR*	-0.005	-0.55	0.063	5.37***	0.017	1.63	-0.049	-1.67*	0.028	2.16**
*Firm_Conservatism*RET*	0.008	0.75	0.026	2.02**	0.011	0.95	-0.171	-6.13***	-0.037	-2.40**
*Firm_Conservatism*DR*RET*	0.233	6.19***	0.339	7.78***	0.060	1.53	0.399	4.52***	0.363	7.82***
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	7,562		6,529		9,939		1,339		5,238	
F-value	136.39		135.73		163.18		30.97		110.25	
Adjusted R^2	0.24		0.13		0.10		0.14		0.13	

NI = net income before extraordinary item (DATA18) for one fiscal year scaled by the market value of equity (DATA25*DATA199) at the beginning of the year.

RET = the stock return for a 12-month period ending three months after fiscal year t.

DR = a dummy variable, equal to 1 if RET is negative, and 0 otherwise.

Firm_Conservatism= the deciled rank of Con-Cscore, Con-Coeff, Con-R^2, Con-Accrual or Con-Skewness.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 3.4
Association between asymmetric timeliness and Over-investment – Evidence from the Basu (1997) Model

	Coeff.	t-stats.
Intercept	0.056	55.73***
DR	-0.017	-9.50***
RET	-0.020	-17.56***
*DR*RET*	0.248	56.61***
OverInvest_Firm	$4*10^{-4}$	5.12***
DR OverInvest_Firm*	$1*10^{-4}$	0.44
RET OverInvest_Firm*	0.001	5.28***
*DR*RET* OverInvest_Firm*	-0.001	-2.84***
No. of obs.	80,022	
Adjusted R^2	0.09	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

NI = net income before extraordinary item (DATA18) for one fiscal year scaled by the market value of equity (DATA25*DATA199) at the beginning of the year.

RET = the stock return for a 12-month period ending three months after fiscal year t.

DR = a dummy variable, equal to 1 if RET is negative, and 0 otherwise.

OverInvest_Firm= firms' over-investment level in year t +1, which is the residual from estimating the following regression by industry-year:
$Investment_{j,t+1}= \beta_0 + \beta_1 * Sales\_Growth_{j,t}+\varepsilon_{j,t+1},$
where $Investment_{j,t+1}$ is firm j's capital expenditure (DATA128) at the end of year t+1 deflated by total assets at the beginning of year t+1 multiplied by 100. $Sales\_Growth_{j,t}$ is the firms' percentage sales growth from year t-1 to t. The industries (industries are classified based on Fama-French 48-industry specification) that have less than 20 observations in a specified year are excluded.

TABLE 3.5

The Association between Conservatism and Investment Efficiency – Tests Based on the Biddle et al. (2009) Model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-4.399	-3.78***	-0.010	-0.84	$-2*10^{-4}$	-0.68	-0.964	-1.76*	0.044	0.35
*Conservatism*OverInvest_Ind*	-6.435	-3.70***	0.037	1.71*	0.001	1.26	1.829	1.75*	0.136	0.61
OverInvest_Ind	5.791	17.12***	4.469	13.30***	4.380	15.89***	3.772	5.16***	3.593	7.53***
LogAsset	-0.045	-1.06	0.200	5.22***	0.239	7.78***	0.254	3.32***	0.158	3.23***
Mkt-to-Book	1.305	20.67***	1.373	20.01***	1.136	22.15***	0.816	8.34***	0.903	12.59***
σ(CFO)	5.084	5.57***	3.482	2.97***	4.139	4.80***	1.912	1.00	3.821	2.66***
Z-score	0.348	4.60***	0.280	3.28***	0.423	6.58***	0.346	2.35**	0.318	3.32***
Tangibility	11.972	31.78***	12.158	27.62***	12.284	35.19***	11.057	12.12***	10.483	17.90***
K-structure	-2.714	-7.90***	-4.106	-12.05***	-4.270	-15.80***	-4.624	-6.15***	-4.448	-9.51***
Ind. K-structure	-6.107	-4.49***	-9.585	-6.86***	-7.027	-6.02***	-5.098	-1.60	-14.298	-5.26***
CFOsale	1.875	5.62***	2.565	5.86***	0.599	3.18***	0.421	1.26	0.631	2.54**
Slack	-0.138	-6.87***	-0.159	-6.92***	-0.106	-5.96***	-0.030	-1.07	-0.110	-4.99***
Dividend	-0.730	-6.12***	-0.858	-6.12***	-0.373	-3.26***	-0.505	-1.71*	-0.440	-2.26**
Log_Age	-0.944	-10.67***	-1.043	-9.40***	-1.063	-11.91***	-1.234	-5.03***	-1.054	-6.88***
Oper. Cycle	-0.623	-5.40***	-0.727	-5.27***	-0.567	-5.34***	-0.352	-1.36	-0.487	-2.83***
Losses	-2.961	-20.18***	-2.967	-17.40***	-2.934	-21.86***	-2.694	-8.01***	-2.899	-12.93***
Industry FE controlled	Yes		Yes		Yes		Yes		Yes	
Year Controlled	Yes		Yes		Yes		Yes		Yes	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	44,124		27,327		40,873		6,642		15,791	
F-value	135.09		84.06		140.92		26.12		59.14	
Adjusted R^2	0.16		0.19		0.18		0.19		0.18	

Table 3.5 (Continued)

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Conservatism=	represents Con-Cscore, Con-Coeff, Con-R^2, Con-Accrual or Con-Skewness.
Size =	natural log of total assets (DATA6) of firm i at the end of year t,
Mkt-to-Book =	the ratio between replacement cost of assets (DATA6+DATA25*DATA199-DATA60-DATA35) and book value of assets.
σ(CFO) =	cash flow volatility of firm i at the end of year t, which is defined as the standard deviation of 5-year cash flow from operations.
Z-score =	the proxy for bankruptcy risk of firm i at the end of year t, which is computed as (3.3* Pretax Income(DATA170)+net total sales (DATA12)+0.25* Retained Earnings (DATA36)+0.5*(Current Assets(DATA4)-Current Liabilities (DATA5)) deflated by total assets.
Tangibility =	the proxy for bankruptcy cost of firm i at the end of year t, which is defined as DATA8/DATA6.
K-structure =	the proxy for the leverage ratio of firm i at the end of year t, which is computed as total long-term debt (DATA9)/(long-term debt+market value of equity (DATA25*DATA199)).
CFOSale =	is computed as cash flow from operation divided by total sales made during the year (DATA12).
Slack =	the ratio of Cash and Short-Term Investments (DATA1) to net PPE (DATA8).
Dividend =	is a dummy variable, which equals to 1 of dividend (either DATA21>0 or DATA127>0) was paid by firm i during year t, and 0 otherwise.
Log_Age =	log of the years that a firm first appears in CRSP until current year.
Oper.Cycle =	the log of the ratio of accounts receivables (DATA2) to total sales (DATA12) plus the ratio of inventory (DATA3) to COGS (DATA41) multiplied by 360.
Losses =	a dummy variable, equal to 1 if net income before extraordinary items (DATA18) is less than zero, and 0 otherwise.

TABLE 3.6
The Association between Conservatism and Investment Efficiency – Tests Based on the Durnev et al. (2004) model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-5.906	-13.04***	0.001	0.62	$3*10^{-6}$	0.17	-1.409	-2.30**	-0.009	-0.38
segs	-0.018	-0.87	-0.131	-4.48***	-0.160	-7.05***	-0.129	-1.36	-0.126	-3.57***
ln(K)	-0.158	-8.36***	0.082	4.48***	0.088	6.20***	0.119	2.18**	0.090	4.16***
Liquidity	0.210	3.44***	0.632	8.23***	0.622	10.76***	0.867	7.24***	0.594	8.05***
Leverage	-0.207	-2.35**	-0.779	-7.36***	-0.644	-8.06***	-0.623	-2.17**	-0.574	-5.34***
adv	1.091	2.27**	2.302	3.96***	3.548	8.49***	10.618	7.61***	3.641	6.26***
R&D	4.533	15.05***	6.302	19.34***	5.824	23.73***	6.207	11.45***	6.777	22.05***
Industry FE Controlled	Yes		Yes		Yes		Yes		Yes	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	7,562		6,529		9,939		1,339		5,238	
F-value	12.00		14.59		22.01		8.86		16.20	
Adjusted R^2	0.24		0.31		0.32		0.45		0.37	

Table 3.6 (Continued)

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Conservatism=	For the Con-Cscore measure, Conservatism equals to average C-score over ten years from year t-9 to year t. For the other conservatism measures, including Con-Coeff, Con-R^2, Con-Accrual, Con-Negskew, Conservatism equals to the value of those measures at the end of year t.
segs=	the average number of different three-digit segments that are reported in Compustat Segments database over the ten-year period from year t-9 to year t.
ln(K)=	the natural log of average estimated market value of firm's PPE over ten years from year t-9 to year t. The procedure for estimating the market value of PPE will be shown in details later.
Liquidity=	the average ratio of the difference between current assets (DATA4) and current liabilities (DATA34) to market value of PPE over ten years from year t-9 to year t.
Leverage=	the average ratio of long-term debt (DATA9) to tangible assets over ten years from year t-9 to t. The procedure for estimating tangible assets will be discussed in details in the later part.
adv=	the accumulated ratio of adverting expenses (DATA45) to tangible assets over ten years from year t-9 to t.
R&D=	the accumulated ratio of R&D expenditure (DATA46) to tangible assets over ten years from year t-9 to t.

Table 3.7
Additional Test on the association between Asymmetric timeliness and Over-investment – Evidence from the Ball and Shivakumar (2005) Cash Flow Model

	Coeff.	t-stats.
Intercept	-0.013	-16.03***
DR	0.017	12.46***
CFO	-0.472	-78.30***
*DR*CFO*	0.632	78.61***
OverInvest_Firm	0.001	8.18***
DR OverInvest_Firm*	$-4*10^{-4}$	-3.10***
CFO OverInvest_Firm*	-0.002	-5.07***
*DR*CFO* OverInvest_Firm*	0.004	5.39***
No. of obs.	82,716	
Adjusted R^2	0.11	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

ACC= total accrual scaled by average total assets (DATA6),

CFO= CFO is cash flow from operating activities scaled by average total assets,

DR= dummy variable, takes the value of 1 in the case of negative CFO and 0 otherwise.

OverInvest_Firm= firms' over-investment level in year t+1, which is the residual from estimating the following regression by industry-year:

$Investment_{j,t+1} = \beta_0 + \beta_1 * Sales\_Growth_{j,t} + \varepsilon_{j,t+1},$

where $Investment_{j,t+1}$ is firm j's capital expenditure (DATA128) at the end of year t+1 deflated by total assets at the beginning of year t+1 and then multiplied by 100. $Sales\_Growth_{j,t}$ is the firms' percentage sales growth from year t-1 to t. The industries (industries are classified based on Fama-French 48-industry specification) that have less than 20 observations in a specified year are excluded.

Table 3.8
Additional Test on the Association between Asymmetric Timeliness and Over-investment – Ranked Value of the OverInvest_Firm Measure

	Coeff.	t-stats.
Interceptt	0.033	16.58***
DR	-0.023	-6.56***
RET	-0.032	-13.74***
*DR*RET*	0.262	34.67***
OverInvest_Firm	0.042	12.59***
DR OverInvest_Firm*	0.011	1.80*
RET OverInvest_Firm*	0.021	5.66***
*DR*RET* OverInvest_Firm*	-0.042	-3.01***
No. of obs.	80,022	
Adjusted R^2	0.10	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

NI = net income before extraordinary item (DATA18) for one fiscal year scaled by the market value of equity (DATA25*DATA199) at the beginning of the year.

RET = the stock return for a 12-month period ending three months after fiscal year t.

DR = a dummy variable, equal to 1 if RET is negative, and 0 otherwise.

OverInvest_Firm= firms' over-investment level in year t+1, which is the decile rank of the residual from estimating the following regression by industry-year:

$Investment_{j,t+1} = \beta_0 + \beta_1 * Sales\_Growth_{j,t} + \varepsilon_{j,t+1},$

where $\text{Investment}_{j,t+1}$ is firm j's capital expenditure (DATA128) at the end of year t+1 deflated by total assets at the beginning of year t+1 and then multiplied by 100. $\text{Sales\_Growth}_{j,t}$ is the firms' percentage sales growth from year t-1 to t. The industries (industries are classified based on Fama-French 48-industry specification) that have less than 20 observations in a specified year are excluded.

TABLE 3.9
Additional Tests on the Association between Conservatism and Investment Efficiency – Ranked Value of the Conservatism Measures

Panel A: Tests Based on the Biddle et al. (2009) model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-3.537	-9.24***	-0.363	-1.11	-0.377	-1.41	-0.922	-1.35	0.285	0.62
*Conservatism*OverInvest_Ind*	0.692	1.41	1.076	1.82*	1.042	2.16**	1.576	1.23	0.274	0.33
OverInvest_Ind	4.080	11.06***	4.013	9.05***	3.822	10.46***	3.301	3.51***	3.533	5.71***
LogAsset	-0.199	-3.79***	0.200	5.20***	0.228	7.53***	0.258	3.41***	0.157	3.22***
Mkt-to-Book	1.060	16.74***	1.372	20.00***	1.164	22.85***	0.816	8.34***	0.904	12.60***
σ(CFO)	3.668	4.26***	3.469	2.96***	3.707	4.36***	1.842	0.97	3.828	2.66***
Z-score	0.358	5.00***	0.280	3.28***	0.359	5.71***	0.373	2.65***	0.317	3.31***
Tangibility	12.163	34.37***	12.146	27.59***	12.105	35.06***	11.059	12.17***	10.486	17.90***
K-structure	1.974	-5.51***	-4.103	-12.04***	-4.269	-16.06***	-4.595	-6.11***	-4.448	-9.51***
Ind. K-structure	-8.434	-6.04***	-9.535	-6.83***	-8.915	-7.23***	-5.110	-1.60	-14.280	-5.25***
CFOsale	1.221	4.69***	2.575	5.88***	0.675	3.61***	0.405	1.22	0.631	2.54**
Slack	-0.113	-6.21***	-0.159	-6.92***	-0.111	-6.37***	-0.031	-1.10	-0.110	-4.98***
Dividend	-0.910	-8.04***	-0.857	-6.11***	-0.528	-4.61***	-0.520	-1.76*	-0.439	-2.25**
Log_Age	-0.863	-10.33***	-1.040	-9.37***	-1.055	-11.90***	-1.238	-5.03***	-1.054	-6.88***
Oper. Cycle	-0.645	-5.95***	-0.727	-5.27***	0.615	-5.85***	-0.351	-1.36	-0.489	-2.84***
Losses	-2.823	-20.45***	-2.967	-17.40***	-2.909	-21.94***	-2.671	-7.90***	-2.899	-12.94***
Industry FE	Yes		Yes		Yes		Yes		Yes	
Year Controlled	Yes		Yes		Yes		Yes		Yes	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997- 2005	
No. of obs.	44,124		27,327		40,873		6,642		15,791	
F-value	124.12		96.81		124.01		26.09		59.14	
Adjusted R^2	0.18		0.19		0.19		0.18		0.18	

Table 3.9 (Continued)

Panel B: Tests Based on the Durnev et al. (2004) model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-1.468	-15.68***	0.060	0.74	-0.013	-0.21	-0.398	-1.45	-0.058	-0.59
segs	-0.039	-1.93*	-0.130	-4.45***	-0.160	-7.05***	-0.122	-1.28	-0.126	-3.57***
ln(K)	-0.211	-10.72***	0.082	4.49***	0.088	6.20***	0.125	2.27**	0.090	4.16***
Liquidity	0.136	2.23**	0.632	8.23***	0.622	10.76***	0.901	7.62***	0.593	8.05***
Leverage	-0.252	-2.96***	-0.778	-7.23***	-0.644	-8.06***	-0.641	-2.22**	-0.573	-5.32***
adv	1.003	2.10**	2.311	3.98***	3.548	8.49***	10.625	7.60***	3.644	6.27***
R&D	4.325	14.44***	6.307	19.35***	5.824	23.73***	5.935	11.39***	6.779	22.05***
Industry FE	Controlled		Controlled		Controlled		Controlled		Controlled	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	7,081		6,529		9,939		1,339		5,238	
F-value	12.48		14.59		22.01		8.82		16.21	
Adjusted R^2	0.24		0.31		0.32		0.45		0.37	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.
All the variables are defined as previously.

TABLE 3.10
Additional Test on the Firm-specific Conservatism Measures Based on the Basu (1997) Model

Panel A: Tests Based on the Biddle et al. (2009) Model

	(1) Con-Coeff		(2) Con-R^2	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-0.010	-1.23	$1*10^{-4}$	0.23
*Conservatism*OverInvest_Ind*	0.029	1.92*	0.001	0.84
OverInvest_Ind	4.099	11.61***	3.827	12.88***
LogAsset	0.219	5.25***	0.255	7.51***
Mkt-to-Book	1.404	16.99***	1.191	19.44***
σ(CFO)	4.629	3.77***	4.002	4.29***
Z-score	0.384	4.19***	0.471	6.56***
Tangibility	11.695	24.69***	12.027	31.31***
K-structure	-3.590	-10.24***	-4.010	-14.13***
Ind. K-structure	-8.754	-6.35***	-9.243	-7.20***
CFOsale	2.897	5.92***	0.871	3.99***
Slack	-0.106	-4.06***	-0.071	-3.73***
Dividend	-0.670	-4.60***	-0.597	-4.93***
Log_Age	-0.672	-5.46***	-0.790	-7.83***
Oper. Cycle	-0.557	-3.81***	-0.572	-4.88***
Losses	-2.609	-15.03***	-2.589	-18.60***
Industry FE	Controlled		Controlled	
Year Controlled	Controlled		Controlled	
Sample Period	1980-2005		1980-2005	
No. of obs.	21,740		31,918	
F-value	60.74		89.96	
Adjusted R^2	0.17		0.18	

TABLE 3.10 (Continued)

Panel B: Tests Based on the Durnev et al. (2004) Model

	(1) Con-Coeff		**(2) Con-R^2**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-0.001	-0.57	$-1*10^{-4}$	-1.80^{*}
segs	-0.191	-4.24^{***}	-0.169	-5.54^{***}
ln(K)	0.175	6.71^{***}	0.132	7.19^{***}
Liquidity	1.087	11.71^{***}	1.051	16.01^{***}
Leverage	-0.463	-3.18^{***}	-0.411	-4.11^{***}
adv	4.913	6.98^{***}	3.700	6.52^{***}
R&D	6.901	20.87^{***}	6.417	24.47^{***}
Industry FE	Controlled		Controlled	
Sample Period	1980-2005		1980-2005	
No. of obs.	4,704		6,758	
F-value	16.90		21.86	
Adjusted R^2	0.41		0.40	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Con-Coeff and Con-R^2 are estimated using the annual returns and earnings data.

All the variables are defined as previously.

TABLE 3.11
The Association between Conservatism and Investment Efficiency – Corporate Governance Measure Controlled

Panel A: Tests Based on the Biddle et al. (2009) Model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-3.015	-2.53**	-0.010	-1.22	$-2*10^{-4}$	-0.55	-0.984	-1.79*	0.257	2.37**
*Conservatism*OverInvest_Ind*	-4.337	-2.62***	0.028	1.86*	0.001	1.09	1.716	1.64	-0.428	-2.15**
G-Index	-0.286	-5.83***	-0.227	-3.60***	-0.227	-4.76***	-0.311	-3.28***	-0.210	-3.68***
*G-Index*OverInvest_Ind*	0.175	3.88***	0.030	0.50	0.129	2.97***	0.151	1.63	0.177	3.24***
G-Index Dummy	2.222	5.19***	2.435	4.37***	1.870	4.45***	1.943	2.40**	1.151	2.38**
OverInvest_Ind	5.193	15.61***	4.133	11.32***	4.524	15.89***	4.324	5.43***	4.239	9.12***
LogAsset	0.104	2.36**	0.250	5.74***	0.250	7.84***	0.213	2.39**	0.191	3.74***
Mkt-to-Book	1.276	21.19***	1.422	17.16***	1.171	22.90***	0.816	8.29***	0.941	14.98***
σ(CFO)	3.615	4.20***	4.554	3.71***	3.739	4.39***	2.024	1.06	2.737	2.29**
Z-score	0.383	5.34***	0.385	4.20***	0.365	5.80***	0.345	2.34**	0.324	4.00***
Tangibility	12.300	34.70***	11.673	24.57***	12.147	35.13***	11.164	12.23***	10.784	20.30***
K-structure	-3.245	-9.65***	-3.639	-10.38***	-4.322	-16.25***	-4.707	-6.21***	-4.821	-11.33***
Ind. K-structure	-7.845	-5.60***	-8.879	-6.43***	-8.971	-7.26***	-5.090	-1.59	-13.225	-5.18***
CFOsale	1.274	4.89***	2.953	6.03***	0.688	3.68***	0.426	1.28	0.393	2.18**
Slack	-0.114	-6.21***	-0.103	-3.97***	-0.110	-6.28***	-0.027	-0.95	-0.086	-4.73***
Dividend	-0.918	-8.11***	-0.689	-4.73***	-0.539	-4.70***	-0.541	-1.83*	-0.742	-4.04***
Log_Age	-0.931	-11.04***	-0.718	-5.77***	-1.090	-12.18***	-1.370	-5.45***	-0.919	-7.00***
Oper. Cycle	-0.644	-5.92***	-0.561	-3.84***	-0.613	-5.82***	-0.330	-1.28	-0.556	-3.68***
Losses	-2.864	-20.73***	-2.596	-14.96***	-2.903	-21.90***	-2.690	-8.00***	-2.993	-14.84***
Industry FE	Yes		Yes		Yes		Yes		Yes	
Year Controlled	Yes		Yes		Yes		Yes		Yes	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	44,124		27,327		40,873		6,642		15,791	
F-value	118.88		58.76		119.78		25.08		67.16	
Adjusted R^2	0.18		0.17		0.19		0.19		0.18	

Table 3.11 (Continued)

Panel B: Tests Based on the Durnev et al. (2004) Model

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-6.103	-13.49***	0.001	0.66	$-5*10^{-5}$	-1.81*	-1.387	-2.26**	-0.005	-0.20
G-Index	0.021	1.59	0.019	0.92	0.025	1.19	-0.100	-2.05**	-0.003	-0.15
G-Index Dummy	-0.470	-3.40***	-0.400	-1.83*	-0.200	-0.91	0.707	1.37	-0.173	-0.87
segs	-0.029	-1.40	-0.146	-4.93***	-0.163	-5.27***	-0.148	-1.54	-0.126	-3.58***
ln(K)	-0.187	-9.60***	0.068	3.60***	0.135	7.19***	0.072	1.12	0.063	2.67***
Liquidity	0.154	2.51**	0.605	7.84***	1.050	15.94***	0.867	7.21***	0.575	7.76***
Leverage	-0.261	-2.95***	-0.807	-7.60***	-0.400	-3.98***	-0.680	-2.35**	-0.580	-5.38***
adv	1.088	2.27**	2.267	3.90***	3.710	6.54***	10.528	7.46***	3.593	6.18***
R&D	4.295	14.20***	6.182	18.86***	6.435	24.43***	6.207	11.47***	6.744	21.94***
Industry FE	Controlled		Controlled		Controlled		Controlled		Controlled	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	7,562		6,529		9,939		1,339		5,238	
F-value	12.16		14.53		21.67		8.80		16.11	
Adjusted R^2	0.24		0.31		0.40		0.45		0.37	

G-Index= the value of Gompers index multiplied by minus one.

G-Index Dummy= dummy variable, equals to one if G-index value is missing and zero otherwise

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

All the variables are defined as previously.

TABLE 3.12

Additional Tests Using the Durnev et al. (2004) Model – Optimal Marginal q Equals to 0.87

	(1) Con-Cscore		(2) Con-Coeff		(3) Con-R^2		(4) Con-Accrual		(5) Con-Negskew	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Conservatism	-5.964	-12.62***	0.001	0.66	$4*10^{-7}$	0.02	-1.431	-2.21**	-0.017	-0.69
segs	-0.025	-1.19	-0.144	-4.72***	-0.175	-7.38***	-0.126	-1.25	-0.135	-3.65***
ln(K)	-0.165	-8.39***	0.091	4.72***	0.089	6.07***	0.093	1.64	0.089	3.94***
Liquidity	0.261	4.14***	0.709	8.90***	0.672	11.30***	0.928	7.36***	0.648	8.51***
Leverage	-0.198	-2.16**	-0.769	-7.03***	-0.637	-7.70***	-0.659	-2.19**	-0.576	-5.18***
adv	0.941	1.90*	2.302	3.84***	3.537	8.20***	10.875	7.41***	3.572	5.93***
R&D	4.462	14.50***	6.102	18.31***	5.657	22.59***	6.026	10.88***	6.608	21.01***
Industry FE	Controlled		Controlled		Controlled		Controlled		Controlled	
Sample Period	1980-2005		1980-2005		1980-2005		1997-2005		1997-2005	
No. of obs.	7,081		6,123		9,342		1,265		4,926	
F-value	11.73		14.43		21.55		9.02		15.85	
Adjusted R^2	0.24		0.32		0.33		0.47		0.38	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.
All the variables are defined as previously.

Table 3.13
Supplementary Tests – Validity Tests for Garcia Lara et al.'s (2009a) Conservatism Measure

	(1) Total Accrual Measure		(2) Operating Accrual Measure		(3) Non-operating Accrual Measure	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Intercept	0.085	51.88***	0.084	52.07***	0.084	51.14***
DR	-0.007	-2.31**	-0.007	-2.25**	-0.006	-2.01**
RET	-0.005	-2.37**	-0.006	-2.92***	-0.006	-2.82***
*DR*RET*	0.399	49.38***	0.403	50.08***	0.403	49.45***
Con-ACC	-0.143	-6.56***	-0.180	-7.21***	0.186	3.29***
*Con-ACC*DR*	-0.127	-3.28***	-0.188	-4.15***	0.028	0.27
*Con-ACC*RET*	-0.058	-2.68***	-0.129	-5.32***	0.060	1.13
*Con-ACC*DR*RET*	0.544	6.35***	0.758	7.48***	-0.013	-0.06
Sample Period	1975-2006		1975-2006		1975-2006	
No. of obs.	42,463		42,463		42,463	
F-value	873.99		919.72		762.98	
Adjusted R^2	0.126		0.132		0.112	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Con-ACC= Ranked value of total accrual measure, operating accrual measure and non-operating accrual measure.

All the other variables are defined as before.

Table 3.14
Supplementary Tests – Re-examination of Garcia Lara et al.'s (2009a) Conservatism Measure

	Total Accrual Measure		**Operating Accrual Measure**		**Non-operating Accrual Measure**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
Con-ACC	19.939	5.82***	-0.926	-0.23	22.799	2.72***
*Con-ACC*OverInd*	-40.025	-8.39***	-41.310	-7.45***	25.826	2.18**
OverInd	9.546	16.61***	9.407	16.43***	9.298	16.20***
LogAsset	-0.096	-1.25	-0.209	-2.72***	-0.189	-2.44**
Mkt-to-Book	4.960	41.01***	4.783	39.48***	4.879	40.21***
σ(CFO)	26.545	3.72***	21.865	3.04***	24.061	3.30***
Z-score	1.758	12.07***	1.470	10.09***	1.786	12.37***
Tangibility	-18.917	-22.84***	-18.980	-23.06***	-18.680	-22.63***
K-structure	-9.696	-15.00***	-9.940	-15.44***	-9.508	-14.74***
Ind. K-structure	-4.607	-1.62	-5.768	-2.04**	-5.269	-1.86*
CFOsale	1.033	4.91***	1.123	5.35***	0.951	4.52***
Slack	1.411	39.74***	1.440	40.61***	1.414	39.84***
Dividend	-2.251	-7.60***	-2.206	-7.46***	-2.294	-7.75***
Log_Age	-2.743	-13.27***	-2.360	-11.40***	-2.594	-12.56***
Oper. Cycle	-0.092	-0.37	0.741	-3.03***	0.107	0.45
Losses	-6.436	-18.72***	-6.094	-17.76***	-6.499	-18.95***
Industry FE	Yes		Yes		Yes	
Year Controlled	Yes		Yes		Yes	
Sample Period	1975-2006		1975-2006		1975-2006	
No. of obs.	42,463		42,463		42,463	
F-value	187.98		191.79		188.46	
Adjusted R^2	0.261		0.264		0.261	

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Con-ACC= an indicator for total accruals, operating accruals or non-operating accruals.

All the other variables are defined as before.

Table 4.1
Sample Selection Procedure

	# of Obs.
Initial Sample in ExecuComp Database	144,962
Less: observations for executives other than CEO	(123,248)
Less: observations with missing CEO age	(507)
Less: observations with missing return or earnings data	(681)
Less: financial industry observations (SIC: 6000-6999)	(2,875)
Less: turnover year observations	(1,964)
Sample to test H4.1	15,687
Less: observations without compensation data	(114)
Sample to test H4.2	15,573

Table 4.2
CEO Retirement and Conservatism
Basu (1997) Conservatism Model – Cross-sectional Results

Panel A: Conservatism difference over the periods prior to CEO retirement

	One-Year		Two-Year		Three-Year	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.013	-4.21***	-0.012	-3.92***	-0.012	-3.79***
*RET*DR*	0.192	19.92***	0.190	19.33***	0.188	18.94***
CEO_Retire	0.006	1.11	0.008	2.13**	0.007	1.91*
*CEO_Retire*DR*	-0.018	-2.03**	-0.008	-1.20	-0.003	-0.46
*CEO_Retire*RET*	0.008	0.57	-0.005	-0.55	-0.005	-0.59
*CEO_Retire*RET*DR*	-0.081	-2.75***	-0.030	-1.03	-0.010	-0.35
Adj. R^2	0.09		0.09		0.08	
Obs.	15,687		15,678		15,687	
Retirement Obs.	973		1,795		2,494	
Non-retirement Obs.	14,714		13,883		13,193	

Year 0 is the retirement year. In the one-year specification, CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the two-year specification, CEO_retire is coded 1 for year -2 and year -1 observations whose CEOs retire in year 0, and zero otherwise. In the three-year specification, CEO_retire is coded 1 for year -3, -2 and -1 observations whose CEOs retire in year 0, and zero otherwise.

Table 4.2 (Continued)

Panel B: Conservatism difference across the years prior to CEO retirement

	Year -1		Year -2		Year -3	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.013	-4.21***	-0.012	-3.92***	-0.012	-3.79***
*RET*DR*	0.192	19.92***	0.190	19.32***	0.188	18.94***
CEO_Retire	0.006	1.11	0.010	1.87*	0.002	0.43
*CEO_Retire*DR*	-0.018	-2.03**	0.007	0.63	0.010	0.84
*CEO_Retire*RET*	0.008	0.57	-0.017	-1.33	-0.004	-0.26
*CEO_Retire*RET*DR*	-0.081	-2.75***	0.045	0.99	0.036	0.64
Adj. R^2	0.09		0.09		0.09	
Obs.	15,687		14,714		13,892	
Retirement Obs.	973		822		699	
Non-retirement Obs.	14,714		13,892		13,193	

In the year -1 specification, CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the year -2 specification, the year -1 observations are deleted, and CEO_retire is coded 1 for year -2 observations whose CEOs retire in year 0, and zero otherwise. In the year -3 specification, the year -1 and year -2 observations are deleted, CEO_retire is coded 1 for year -3 observations whose CEOs retire in year 0, and zero otherwise.

NI = net income before extraordinary items (DATA18) at the end of the reporting year divided by market value of equity (DATA25*DATA199) at the beginning of the year.

RET = twelve-month buy and hold return ending three months after the end of fiscal year t.

DR = dummy variable, equals to 1 if RET is negative, and 0 otherwise.

CEO_retire = as defined previously.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.3
Test on CEO Retirement and Conservatism
Basu (1997) Model – Time-Series Results

Panel A: Comparison for conservatism between year -2 and year -1

	Coeff.	t-stats.
Intercept	0.064	13.09***
DR	0.011	1.07
RET	-0.021	-1.66*
*DR*RET*	0.229	5.08***
CEO_Retire	-0.003	-0.41
*CEO_Retire*DR*	-0.025	-1.82*
*CEO_Retire*RET*	0.014	0.76
*CEO_Retire*DR*RET*	-0.105	-2.22**
Adj. R^2	0.10	
Obs.	1,590	

Only the CEO retirement firms are included in the sample, and year 0 is the retirement year. It is further required that only the observations from the most recent two years prior to year 0 (year -2 and year -1) are included. CEO_Retire is a dummy variable taking the value of one to indicate that the CEO retirement observations are in year -1, and zero otherwise. All the other variables are defined before.

Panel B: Comparison for conservatism between year -1 and year 1

	Coeff.	t-stats.
Intercept	0.063	7.40***
DR	0.004	0.31
RET	-0.042	-1.53
*DR*RET*	0.265	5.18***
CEO_Retire	$3*10^{-4}$	0.03
*CEO_Retire*DR*	-0.012	-0.84
*CEO_Retire*RET*	0.030	0.97
*CEO_Retire*DR*RET*	-0.163	-2.93***
Adj. R^2	0.09	
Obs.	1,342	

Only the CEO retirement firms are included in the sample. Year 0 is the retirement year. Only the year -2 and year -1 observations are included. CEO_Retire is a dummy variable taking a value of one for year -1 observations of the CEO retirement firms, and zero otherwise. All the other variables are defined before.
Significance tests use clustered standard errors.
*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.4

The Impact of Earnings-Based Compensation on the Association between CEO Retirement and Conservatism – Cross-sectional Results

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.013	-2.17**	-0.009	-1.64	-0.013	-3.10***
*RET*DR*	0.208	11.61***	0.190	11.50***	0.170	11.32***
CEO_Retire	-0.009	-1.11	-0.001	-0.25	0.016	2.58***
*CEO_Retire*DR*	0.007	0.54	-0.020	-1.52	-0.037	-2.31**
*CEO_Retire*RET*	0.040	2.05**	0.024	1.75*	-0.010	-0.62
*CEO_Retire*RET*DR*	-0.090	-1.92*	-0.143	-3.57***	-0.058	-1.18
Adj. R^2	0.09		0.08		0.08	
Obs.	5,193		5,194		5,186	
Retirement Obs.	355		324		292	
Non-retirement Obs.	4,838		4,870		4,894	

CEO_Retire= a dummy variable that is coded as 1 for the year -1 observations whose CEOs retire in year 0, and zero otherwise.

Other variables are defined as previously.

High EBC, median EBC, and low EBC groups are classified based on the earnings based compensation ratio.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.5
The Impact of Earnings-Based Compensation on the Association between CEO Retirement and Conservatism – Time-Series Results

Panel A: Comparison for conservatism between year -2 and year -1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.025	-1.28	-0.049	-1.30	-0.005	-0.48
*RET*DR*	0.310	4.63***	0.122	2.67***	0.199	2.36**
CEO_Retire	-0.018	-1.46	-0.019	-1.43	0.008	1.07
*CEO_Retire*DR*	-0.007	-0.35	0.008	0.40	-0.049	-1.89*
*CEO_Retire*RET*	0.059	1.79*	0.065	1.72*	-0.019	-1.07
*CEO_Retire*RET*DR*	-0.190	-2.46***	-0.051	-0.86	-0.085	-1.06
Adj. R^2	0.12		0.06		0.14	
Obs.	578		510		494	

Year 0 is the retirement year. Only the year -2 and year -1 observations of the CEO retirement firms are included in the sample. CEO_Retire is a dummy variable taking a value of one for year -1 observations of the CEO retirement firms, and zero otherwise.

Panel B: Comparison for conservatism between year -1 and year 1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.049	-2.87***	0.017	1.02	-0.093	-4.83***
*RET*DR*	0.234	3.93***	0.203	4.38***	0.343	6.10***
CEO_Retire	-0.020	-1.40	0.005	0.49	0.005	0.32
*CEO_Retire*DR*	0.009	0.36	-0.013	-0.64	-0.032	-1.15
*CEO_Retire*RET*	0.073	2.84***	-0.002	-0.08	0.062	2.82***
*CEO_Retire*RET*DR*	-0.144	-1.87*	-0.151	-2.32**	-0.259	-3.63***
Adj. R^2	0.05		0.11		0.15	
Obs.	488		474		374	

Year 0 is the retirement year. Only the year -1 and year 1 observations of the CEO retirement firms are included in the sample. CEO_Retire is a dummy variable taking a value of one for year -1 observations of the CEO retirement firms, and zero otherwise. All the other variables are defined before.

High EBC, median EBC, and low EBC groups are classified based on the earnings based compensation ratio.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.6
CEO Retirement and Conservatism - Basu (1997) Conservatism Model
Factors Influencing the Demand for Conservatism are Controlled

Panel A: Conservatism difference over the periods prior to CEO retirement

	One-year		**Two-year**		**Three-year**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.042	-3.06***	-0.043	-3.15***	-0.043	-3.11***
*RET*DR*	0.269	6.21***	0.272	6.31***	0.274	6.30***
CEO_Retire	0.007	1.20	0.008	1.90*	0.006	1.75*
*CEO_Retire*DR*	-0.023	-2.39**	-0.011	-1.53	-0.007	-1.19
*CEO_Retire*RET*	-0.003	-0.18	-0.011	-1.11	-0.010	-1.17
*CEO_Retire*RET*DR*	-0.065	-2.10**	-0.020	-0.64	-0.012	-0.42
MB	-0.001	-2.20**	-0.001	-2.15**	-0.001	-2.12**
*MB*DR*	-0.001	-1.63	-0.001	-1.62	-0.001	-1.62
*MB*RET*	$9*10^{-6}$	0.04	$-7*10^{-6}$	-0.03	$-2*10^{-5}$	-0.08
*MB*RET*DR*	-0.009	-2.80***	-0.009	-2.77***	-0.009	-2.76***
LEV	-0.004	-0.30	-0.003	-0.30	-0.003	-0.28
*LEV*DR*	0.007	0.38	0.007	0.38	0.007	0.39
*LEV*RET*	-0.080	-3.62***	-0.080	-3.63***	-0.080	-3.64***
*LEV*RET*DR*	0.356	6.16***	0.356	6.19***	0.358	6.17***
Size	0.004	3.98***	0.004	3.87***	0.004	3.87***
*Size*DR*	0.002	0.84	0.002	0.82	0.001	0.76
*Size*RET*	0.007	3.45***	0.008	3.60***	0.008	3.57***
*Size*RET*DR*	-0.023	-3.29***	-0.024	-3.46***	-0.025	-3.45***
Adj. R^2	0.12		0.12		0.12	
Obs.	15,687		15,687		15,687	
Retirement Obs.	973		1,795		2,494	
Non-retirement Obs.	14,714		13,892		13,193	

Year 0 is the retirement year. In the one-year specification, CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the two-year specification, CEO_Retire is coded 1 for year -2 and year -1 observations whose CEOs retire in year 0, and zero otherwise. In the three-year specification, CEO_retire is coded 1 for year -3, -2 and -1 observations whose CEOs retire in year 0, and zero otherwise.

Table 4.6 (Continued)

Panel B: Conservatism difference across the years prior to CEO retirement

	Year -1		Year -2		Three-Year	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.042	-3.06***	-0.049	-3.53***	-0.049	-3.35***
*RET*DR*	0.269	6.21***	0.284	6.31***	0.294	6.41***
CEO_Retire	0.007	1.20	0.008	1.58	0.002	0.40
*CEO_Retire*DR*	-0.023	-2.39**	0.006	0.56	0.001	0.05
*CEO_Retire*RET*	-0.003	-0.18	-0.019	-1.61	-0.007	-0.54
*CEO_Retire*RET*DR*	-0.065	-2.10**	0.049	1.04	0.006	0.12
MB	-0.001	-2.20**	-0.001	-1.87*	-0.001	-1.84*
*MB*DR*	-0.001	-1.63	-0.002	-1.84*	-0.001	-1.57
*MB*RET*	$9*10^{-6}$	0.04	$1*10^{-5}$	0.06	$9*10^{-6}$	0.04
*MB*RET*DR*	-0.009	-2.80***	-0.009	-2.78***	0.008	-2.53**
LEV	-0.004	-0.30	-0.002	-0.19	0.002	-0.18
*LEV*DR*	0.007	0.38	0.010	0.57	0.011	0.61
*LEV*RET*	-0.080	-3.62***	-0.084	-3.74***	-0.083	-3.44***
*LEV*RET*DR*	0.356	6.16***	0.383	6.66***	0.393	6.64***
Size	0.004	3.98***	0.004	3.43***	0.004	3.43***
*Size*DR*	0.002	0.84	0.002	1.09	0.002	0.89
*Size*RET*	0.007	3.45***	0.009	4.02***	0.009	3.76***
*Size*RET*DR*	-0.023	-3.29***	-0.027	-3.72***	-0.029	-3.94***
Adj. R^2	0.12		0.12		0.09	
Obs.	15,687		14,714		13,892	
Retirement Obs.	973		822		699	
Non-retirement Obs.	14,714		13,892		13,193	

In the year -1 specification, CEO_Retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the year -2 specification, the year -1 observations are deleted, and CEO_Retire is coded 1 for year -2 observations whose CEOs retire in year 0, and zero otherwise. In the year -3 specification, the year -1 and year -2 observations are deleted, CEO_Retire is coded 1 for year -3 observations whose CEOs retire in year 0, and zero otherwise.

MB = Market-to-book ratio, which is computed as the ratio between market value of equity (DATA25*DATA199) and book value of equity (DATA60).

LEV = Leverage ratio, which is calculated as the total debt (DATA9+DATA34) divided by total assets (DATA6).

Size= Firm size, which is computed as the log of total assets (DATA6).

All the other variables are defined as previously.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.7
The Influence of Compensation Plan on the Association between CEO Retirement and Conservatism – Factors Influencing the Demands of Conservatism are Controlled

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.040	-1.50	-0.047	-1.50	-0.048	-2.16**
*RET*DR*	0.280	3.30***	0.339	3.98***	0.202	3.19***
CEO_Retire	-0.012	-1.44	0.002	0.32	0.015	2.13**
*CEO_Retire*DR*	0.005	0.40	-0.022	-1.70*	-0.043	-2.60***
*CEO_Retire*RET*	0.043	1.99**	0.011	0.86	-0.023	-1.19
*CEO_Retire*RET*DR*	-0.109	-2.30**	-0.106	-2.48**	-0.045	-0.91
MB	$-3*10^{-4}$	-0.36	$-2*10^{-4}$	-0.31	-0.001	-1.82*
*MB*DR*	-0.002	-1.16	$3*10^{-5}$	0.02	-0.002	-1.59
*MB*RET*	$-3*10^{-4}$	-1.24	$-7*10^{-5}$	-0.07	$4*10^{-4}$	1.14
*MB*RET*DR*	-0.001	-0.24	0.001	0.10	-0.016	-4.28***
LEV	0.012	0.53	-0.021	-1.03	-0.001	-0.03
*LEV*DR*	-0.032	-1.03	0.025	0.74	0.003	0.11
*LEV*RET*	-0.120	-2.81***	-0.078	-1.77*	-0.067	-2.12**
*LEV*RET*DR*	0.475	4.95***	0.452	4.25***	0.196	2.23**
Size	0.005	2.01**	0.006	2.78***	0.006	3.84***
*Size*DR*	0.005	1.30	-0.002	-0.59	0.001	0.43
*Size*RET*	0.009	1.83*	0.010	2.06**	0.007	2.09**
*Size*RET*DR*	-0.032	-2.35**	-0.045	-3.30***	-0.006	-0.62
Adj. R^2	0.13		0.12		0.12	
Obs.	5,193		5,194		5,186	
Retirement Obs.	355		324		292	
Non-retirement Obs.	4,838		4,870		4,894	

CEO_Retire is a dummy variable that is coded as 1 for the year -1 observations of CEO retirement firms in year 0, and zero otherwise. Other variables are defined as previously.

High-EBC, Median-EBC, and Low-EBC groups are classified based on the earnings based compensation ratio.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.8
Additional Test on CEO Retirement and Conservatism
Ball and Shivakumar (2005) Model - Cross-sectional Results

Panel A: Conservatism difference over the periods prior to CEO retirement

	One-year		**Two-year**		**Three-year**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
CFO	-0.415	-29.39***	-0.416	-28.65***	-0.418	-28.16***
*CFO*DR*	0.668	11.23***	0.662	11.01***	0.665	10.91***
CEO_Retire	-0.008	-1.71*	-0.006	-1.29	-0.005	-1.30
*CEO_Retire*DR*	0.018	1.23	0.028	1.77**	0.023	1.59
*CEO_Retire*CFO*	0.058	1.57	0.043	1.24	0.045	1.37
*CEO_Retire*CFO*DR*	-0.630	-3.09***	-0.357	-1.21	-0.277	-1.13
Adj. R^2	0.15		0.15		0.15	
Obs.	16,040		16,040		16,040	
Retirement Obs.	987		1,812		2,514	
Non-retirement Obs.	15,053		14,228		13,526	

Year 0 is the retirement year. In the one-year specification, CEO_Retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the two-year specification, CEO_Retire is coded 1 for year -2 and year -1 observations whose CEOs retire in year 0, and zero otherwise. In the three-year specification, CEO_Retire is coded 1 for year -3, -2 and -1 observations whose CEOs retire in year 0, and zero otherwise.

Table 4.8 (Continued)

Panel B: Conservatism difference across the years prior to CEO retirement

	Year -1		**Year -2**		**Year -3**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
CFO	-0.415	-29.39***	-0.416	-28.65***	-0.418	-28.16***
*CFO*DR*	0.668	11.23***	0.662	11.01***	0.665	10.91***
CEO_Retire	-0.008	-1.71*	-0.003	-0.50	-0.004	-0.58
*CEO_Retire*DR*	0.018	1.23	0.044	1.86*	0.004	0.14
*CEO_Retire*CFO*	0.058	1.57	0.024	0.53	0.046	0.85
*CEO_Retire*CFO*DR*	-0.630	-3.09***	0.111	0.25	-0.141	-0.34
Adj. R^2	0.15		0.14		0.14	
Obs.	16,040		15,053		14,228	
Retirement Obs.	987		825		702	
Non-retirement Obs.	15,053		14,228		13,526	

In the year -1 specification, CEO_Retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the year -2 specification, the year -1 observations are deleted, and CEO_Retire is coded 1 for year -2 observations whose CEOs retire in year 0, and zero otherwise. In the year -3 specification, the year -1 and year -2 observations are deleted, CEO_Retire is coded 1 for year -3 observations whose CEOs retire in year 0, and zero otherwise.

ACC= total accruals scaled by average total assets (DATA6),

CFO= CFO is cash flow from operating activities scaled by average total assets,

DR= dummy variable, takes the value of 1 in the case of negative CFO and 0 otherwise.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.9
Additional Test on CEO Retirement and Conservatism
Ball and Shivakumar (2005) Model - Time-Series Results

Panel A: Comparison for conservatism between year -2 and year -1

	Coeff.	t-stats.
Intercept	-0.012	-2.60***
DR	0.051	3.67***
CFO	-0.400	-11.92***
*CFO*DR*	0.779	4.81***
CEO_Retire	-0.007	-1.06
*CEO_Retire*DR*	-0.017	-0.90
*CEO_Retire*CFO*	0.044	0.93
*CEO_Retire*CFO*DR*	-0.469	-2.03**
Adj. $\bar{R}^2$	0.19	
Obs.	1,614	

Year 0 is the retirement year. Only the year -2 and year -1 observations of the CEO retirement firms are included in the sample. CEO_Retire is a dummy variable taking a value of one for the year -1 observations of the CEO retirement firms, and zero otherwise. All the other variables are defined before.

Panel B: Comparison for conservatism between year -1 and year 1

	Coeff.	t-stats.
Intercept	-0.023	-4.77***
DR	0.019	1.30
CFO	-0.375	-10.31***
*CFO*DR*	0.549	3.22***
CEO_Retire	0.005	0.71
*CEO_Retire*DR*	0.015	0.76
*CEO_Retire*CFO*	0.018	0.36
*CEO_Retire*CFO*DR*	-0.641	-2.84***
Adj. $\bar{R}^2$	0.20	
Obs.	1,372	

Year 0 is the retirement year. Only the year -1 and year 1 observations of the CEO retirement firms are included in the sample. CEO_Retire is coded as one for year -1 observations, and zero for year 1 observations. All the other variables are defined before.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.10
The Impact of Compensation Plan on the Association between CEO Retirement and Conservatism
- Ball and Shivakumar (2005) Model (Cross-Sectional Results)

	High-EBC		**Median-EBC**		**Low-EBC**	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
CFO	-0.400	-15.82***	-0.467	-22.81***	-0.387	-20.78***
*CFO*DR*	0.726	6.03***	0.664	5.66***	0.609	7.12***
CEO_Retire	-0.003	-0.42	-0.012	-1.42	-0.012	-1.18
*CEO_Retire*DR*	0.009	0.49	-0.006	-0.19	0.018	0.65
*CEO_Retire*CFO*	-0.004	-0.07	0.092	1.40	0.094	1.38
*CEO_Retire*CFO*DR*	-0.735	-2.18**	-1.387	-2.23**	-0.584	-2.16**
Adj. R^2	0.14		0.19		0.12	
Obs.	5,307		5,311		5,302	
Retirement Obs.	357		331		297	
Non-retirement Obs.	4,950		4,980		5,005	

Year 0 is the retirement year. CEO_Retire is a dummy variable, and it takes the value of one for the year -1 observations of the CEO retirement firms, and zero otherwise.
All the other variables are defined before.
Significance tests use clustered standard errors.
*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.11
Additional Tests on The Impact of Earnings-Based Compensation on the Association between CEO Retirement and Conservatism
– Ball and Shivakumar (2005) Model (Time-series Results)

Panel A: Comparison for conservatism between year -2 and year -1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
CFO	-0.412	-5.19***	-0.545	-7.98***	-0.252	-3.15***
*CFO*DR*	0.437	0.59	1.280	1.06	0.819	1.54
CEO_Retire	0.006	0.63	-0.023	-2.48**	-0.006	-0.60
*CEO_Retire*DR*	-0.025	-0.94	0.011	0.30	-0.042	-0.83
*CEO_Retire*CFO*	-0.018	-0.23	0.168	2.24**	-0.013	-0.18
*CEO_Retire*CFO*DR*	-0.147	-0.23	-1.588	-1.05	-0.458	-1.19
Adj. R^2	0.24		0.31		0.10	
Obs.	582		520		504	

Year 0 is the retirement year. CEO_Retire is a dummy variable taking a value of one to indicate that the CEO retirement observations are in year -1, and zero for CEO retirement observations that are in year -2.

Panel B: Comparison for conservatism between year -1 and year 1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
CFO	-0.490	-8.38***	-0.320	-5.29***	-0.307	-4.22***
*CFO*DR*	0.303	1.08	1.177	2.01**	0.715	2.88***
CEO_Retire	-0.009	-0.89	0.014	1.18	0.008	0.57
*CEO_Retire*DR*	0.027	0.84	-0.068	-1.50	0.024	0.69
*CEO_Retire*CFO*	0.105	1.28	-0.055	-0.64	0.019	0.19
*CEO_Retire*CFO*DR*	-0.153	-0.43	-1.803	-2.18**	-1.051	-3.10***
Adj. R^2	0.27		0.20		0.16	
Obs.	494		486		384	

Year 0 is the retirement year. CEO_Retire is a dummy variable taking a value of one to indicate that the CEO retirement observations are in year -1, and zero for CEO retirement observations that are in year 1. All the other variables are defined before.
Significance tests use clustered standard errors.
*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.12
Additional Test on CEO Retirement and Conservatism
Basu (1997) Model – Matched Sample (according to size)

Panel A: Descriptive Statistics

	Retirement Firms	**Non-Retirement Firms**	**Test of Differences**
N	928	928	
Mean	7.524	7.529	t= 0.08
Median	7.453	7.465	Z= 0.09

Panel B: Regression Result

	Coeff.	**t-stats.**
Intercept	0.050	11.49***
DR	0.017	1.93*
RET	0.008	1.30
*RET*DR*	0.202	8.62***
CEO_Retire	0.012	1.88*
*CEO_Retire*DR*	-0.033	-2.78***
*CEO_Retire*RET*	-0.015	-1.54
*CEO_Retire*RET*DR*	-0.087	-2.69***
Adj. R^2	0.106	
Obs.	1,856	

NI= net income before extraordinary items (DATA18) at the end of year t divided by market value of equity (DATA25* DATA199) at the beginning of the year.
RET= twelve-month buy and hold return ending three months after the end of fiscal year t.
DR= dummy variable, equals to 1 if RET is negative, and 0 otherwise.
CEO_Retire= equals to 1 if the CEOs will retire in the coming year and 0 otherwise.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.13

Additional Test on the Influence of Compensation on the Association between CEO Retirement and Conservatism

Basu (1997)Model – Matched Sample (according to size)

Panel A: Descriptive Statistics

	Retirement Firms	Non-Retirement Firms	Test of Differences
High EBC firms			
N	318	318	
Mean	6.905	6.931	t= 0.27
Median	6.771	6.799	Z= -0.20
Median EBC firms			
N	287	287	
Mean	7.474	7.434	t= 0.38
Median	7.337	7.391	Z= 0.34
Low EBC firms			
N	248	248	
Mean	8.113	8.119	t= 0.04
Median	7.980	7.968	Z= -0.03

Panel B: Regression Result

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	0.005	0.39	0.009	1.00	-0.021	-1.43
*RET*DR*	0.263	6.00***	0.136	3.52***	0.097	1.92*
CEO_Retire	0.004	0.33	-0.004	-0.44	0.009	0.73
*CEO_Retire*DR*	-0.026	-1.12	-0.015	-0.81	-0.017	-0.70
*CEO_Retire*RET*	0.013	0.58	0.006	0.37	0.010	0.56
*CEO_Retire*RET*DR*	-0.130	-2.07**	-0.071	-1.27	-0.010	-0.16
Adj. R^2	0.11		0.07		0.09	
Obs.	636		574		496	

CEO_Retire equals to 1 if CEOs will retire in the coming year and 0 otherwise. All the other variables are defined as before.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.14
Additional Test on the Association between CEO Retirement and Conservatism
– CEO Age Controlled (Cross-Sectional Results)

Panel A: Conservatism difference over the periods prior to CEO retirement

	One-Year		Two-Year		Three-Year	
	Coeff.	t-stats.	Coeff.	t-stats.	Coeff.	t-stats.
RET	-0.013	-4.22***	-0.012	-4.02***	-0.012	-7.20***
*RET*DR*	0.190	19.96***	0.188	19.55***	0.187	28.70***
CEO_Retire	0.009	1.27	0.013	2.35**	0.011	2.57***
*CEO_Retire*DR*	-0.023	-1.94*	-0.009	-1.05	-0.002	-0.20
*CEO_Retire*RET*	0.005	0.25	-0.012	-0.77	-0.009	-1.41
*CEO_Retire*RET*DR*	-0.095	-2.35**	-0.016	-0.47	0.002	0.08
Adj. R^2	0.09		0.09		0.09	
Obs.	15,687		15,687		15,687	
Retirement Obs.	550		1,025		1,429	
Non-retirement Obs.	15,137		14,662		14,258	

I perform the additional analysis assuming the normal age of retirement is from 60 to 66. Only the CEOs that cite retirement as the departure reason and are at ages from 60 to 66 when they leave the positions are included in the retirement sample. Year 0 is the retirement year. In the one-year specification, CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the two-year specification, CEO_retire is coded 1 for year -2 and year -1 observations whose CEOs retire in year 0, and zero otherwise. In the three-year specification, CEO_retire is coded 1 for year -3, -2 and -1 observations whose CEOs retire in year 0, and zero otherwise.

Table 4.14 (Continued)

Panel B: Conservatism difference across the years prior to CEO retirement

	Year -1		Year -2		Year -3	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.013	-4.22***	-0.012	-4.02***	-0.012	-3.91***
*RET*DR*	0.190	19.96***	0.188	19.55***	0.187	19.27***
CEO_Retire	0.009	1.27	0.016	2.12**	0.006	0.86
*CEO_Retire*DR*	-0.023	-1.94*	0.011	0.82	0.013	0.92
*CEO_Retire*RET*	0.005	0.25	-0.024	-1.17	-0.006	-0.28
*CEO_Retire*RET*DR*	-0.095	-2.35**	0.075	1.26	0.035	0.51
Adj. R2	0.09		0.09		0.08	
Obs.	15,687		15,137		14,662	
Retirement Obs.	550		475		404	
Non-retirement Obs.	15,137		14,662		14,258	

Only the CEOs that cite retirement as the departure reason retire at the ages from 60 to 66 when they leave the positions are included in the retirement sample. Year 0 is the retirement year. In the year -1 specification, CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. In the year -2 specification, the year -1 observations are deleted, and CEO_retire is coded 1 for year -2 observations whose CEOs retire in year 0, and zero otherwise. In the year -3 specification, the year -1 and year -2 observations are deleted, CEO_retire is coded 1 for year -3 observations whose CEOs retire in year 0, and zero otherwise.

NI = net income before extraordinary items (DATA18) at the end of the reporting year divided by market value of equity (DATA25*DATA199) at the beginning of the year.

RET = twelve-month buy and hold return ending three months after the end of fiscal year t.

DR = dummy variable, equals to 1 if RET is negative, and 0 otherwise.

* Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.15
Additional Test on CEO Retirement and Conservatism
– CEO Age Controlled (Time-Series Results)

Panel A: Comparison for conservatism between year -2 and year -1

	Coeff.	t-stats.
RET	-0.026	-1.22
*DR*RET*	0.254	4.28***
CEO_Retire	-0.003	-0.27
*CEO_Retire*DR*	-0.037	-1.83*
*CEO_Retire*RET*	0.016	0.56
*CEO_Retire*DR*RET*	-0.151	-1.92*
Adj. R^2	0.10	
Obs.	924	

I perform the additional analysis assuming the normal age of retirement is from 60 to 66. Year 0 is the retirement year. Only the year -2 and year -1 observations of the CEOs that cite retirement as the departure reason and are at ages between 60 and 66 when they leave the firms are included in the retirement sample. CEO_Retire is coded one for the year -1 observations, and zero for the year -2 observations of the CEO retirement firms.

Panel B: Comparison for conservatism between year -1 and year 1

	Coeff.	t-stats.
RET	-0.060	-4.15***
*DR*RET*	0.256	6.10***
CEO_Retire	-0.002	-0.25
*CEO_Retire*DR*	-0.005	-0.30
*CEO_Retire*RET*	0.049	2.62***
*CEO_Retire*DR*RET*	-0.141	-2.51**
Adj. R^2	0.08	
Obs.	776	

Year 0 is the retirement year. Only the year -1 and year 1 observations of the firms whose CEOs cite retirement as the departure reason and are at ages between 60 and 66 when they leave the firms are included in the retirement sample. CEO_Retire is a dummy variable taking the value of one for the year -1 observations of the CEO retirement firms, and zero for the year 1 observations of the CEO retirement firms.
All the other variables are defined before.
Significance tests use clustered standard errors.
*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.16
Additional Test on The Impact of Compensation Plan on the Association between CEO Retirement and Conservatism
(CEO Age Controlled, Cross-Sectional Results)

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	**t-stats.**	**Coeff.**	**t-stats.**	**Coeff.**	**t-stats.**
RET	-0.012	-2.10**	-0.008	-1.55	-0.014	-3.24***
*RET*DR*	0.207	11.92***	0.183	11.39***	0.168	11.20***
CEO_Retire	$3*10^{-4}$	0.03	0.004	0.65	0.020	1.54
*CEO_Retire*DR*	-0.024	-1.44	-0.011	-0.62	-0.043	-1.63
*CEO_Retire*RET*	0.027	1.25	0.003	0.17	-0.010	-0.27
*CEO_Retire*RET*DR*	-0.161	-2.73***	-0.055	-0.81	-0.083	-1.12
Adj. R^2	0.09		0.08		0.09	
Obs.	5,193		5,194		5,186	
Retirement Obs.	178		201		169	
Non-retirement Obs.	5,015		4,993		5,017	

Only the CEOs that cite retirement as the departure reason and are at ages from 60 to 66 when they leave the firms are included in the retirement sample. Year 0 is the retirement year. CEO_retire is coded 1 for year -1 observations whose CEOs retire in year 0, and zero otherwise. Other variables are defined as previously.

High EBC, median EBC, and low EBC groups are classified based on the earnings based compensation ratio.

Significance tests use clustered standard errors.

*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.

Table 4.17
Additional Test on The Impact of Compensation Plan on the Association between CEO Retirement and Conservatism
(CEO Age Controlled, Time-Series Results)

Panel A: Comparison for conservatism between year -2 and year -1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	t-stats.	Coeff.	t-stats.	Coeff.	t-stats.
RET	-0.018	-0.36	-0.065	1.51	0.003	0.23
*RET*DR*	0.237	2.36**	0.136	2.23**	0.207	2.41**
CEO_Retire	-0.023	-0.90	-0.021	-1.43	0.012	0.88
*CEO_Retire*DR*	-0.027	-0.96	0.018	0.72	-0.072	-1.64
*CEO_Retire*RET*	0.082	1.22	0.065	1.54	-0.029	-0.75
*CEO_Retire*RET*DR*	-0.264	-1.82*	0.002	0.02	-0.123	-0.83
Adj. R^2	0.14		0.10		0.13	
Obs.	302		330		288	

Year 0 is the retirement year. Only the year -2 and year -1 observations of the CEOs that cite retirement as the departure reason and are at ages from 60 to 66 when they leave the firms are included in the retirement sample. CEO_Retire is coded one for the year -1 observations, and zero for the year -2 observations of the CEO retirement firms.

Panel B: Comparison for conservatism between year -1 and year 1

	High-EBC		Median-EBC		Low-EBC	
	Coeff.	t-stats.	Coeff.	t-stats.	Coeff.	t-stats.
RET	-0.107	-4.56***	-0.008	-0.31	-0.011	-0.38
*RET*DR*	0.236	2.54**	0.199	3.26***	0.258	3.43***
CEO_Retire	-0.021	-1.06	$1*10^{-4}$	0.01	0.022	1.32
*CEO_Retire*DR*	0.003	0.08	0.008	0.28	-0.041	-1.30
*CEO_Retire*RET*	0.131	3.38***	0.001	0.03	-0.015	-0.46
*CEO_Retire*RET*DR*	-0.147	-1.22	-0.095	-0.95	-0.160	-1.71*
Adj. R^2	0.10		0.10		0.09	
Obs.	248		288		230	

Year 0 is the retirement year. Only the year -1 and year 1 observations of the firms whose CEOs cite retirement as the departure reason and are at ages from 60 to 66 when they leave the firms are included in the retirement sample. CEO_Retire is a dummy variable taking the value of one for the year -1 observations of the CEO retirement firms, and zero for the year 1 observations of the CEO retirement firms.
Other variables are defined as previously.
High EBC, median EBC, and low EBC groups are classified based on the earnings based compensation ratio.
Significance tests use clustered standard errors.
*, **, and *** indicates significance at 0.10, 0.05, and 0.01 level, respectively. Tests are two-tailed.