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以非線性及多期盈餘不對稱反應重新檢驗會計穩健性與公司特質之關聯

An Application of Nonlinear and Multi-Period Asymmetric Timeliness of Earnings to Re-Examine Relations between Conservatism and Firm Characteristics

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本論文係洪詩詠 君（r98722007）在國立臺灣大學會計學系、所完成之碩士學位論文，於民國 100 年 5 月 4 日承下列考試委員審查通過及口試及格，特此證明

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論文摘要

穩健性影響會計理論及實務良多，Basu(1997)提出穩健性存在於盈餘對壞消息的認列門檻較好消息低，基於價格領先盈餘的假設，將當期正(負)的股價報酬率作為好(壞)消息的代理變數，利用盈餘對資訊的不對稱反應來測試盈餘是否存在穩健性，後續許多文獻亦利用盈餘對資訊的不對稱反應比較不同公司或年代的穩健程度。Lin 和 Liu (2011)根據會計穩健的性質，認為盈餘的不對稱性在好或壞消息程度較大的時候會更加明顯(非線性盈餘不對稱反應)，而消息公開後盈餘的不對稱性會隨時間經過減弱(多期盈餘不對稱反應)；除外，在利用不對稱盈餘反應比較穩健程度時，應將盈餘對好壞消息反應分別比較。

本研究利用非線性及多期盈餘不對稱反應來比較不同公司與會計穩健性之關聯性，所檢視的公司特質為債權人及股東對股利政策之衝突、公司特有風險以及成長機會，本研究利用舉債程度、股利發放程度及營業風險作為債權人及股東對股利政策之衝突的代理變數；利用公司規模及權益市價對帳面價值之比率作為成長機會的代理變數。

實證結果顯示在盈餘不對稱反應、盈餘對好或壞消息的各別反應、非線性和多期盈餘不對稱反應下，公司特質與穩健的關聯性有不一致的情形，顯示過去文獻利用 Basu (1997)比較穩健性之結論，需要以非線性及多期盈餘不對稱反應重新檢視。

關鍵字：盈餘不對稱反應；非線性盈餘不對稱反應；多期盈餘不對稱反應；公司規模；舉債程度；股利發放程度；營業風險

Abstract

Basu (1997) perceives conservatism as lower verification threshold for bad news than good news. He devises a reverse regression equation of earnings and stock returns to capture asymmetric timeliness of earnings. Prior research uses asymmetric timeliness of Basu (1997) model to compare the extents of conservatism. However, Lin and Liu (2011) argue that the components of asymmetric timeliness should be considered respectively and that the effect of nonlinearity and multi-period lag should be considered due to the essence of conservatism.

This paper examines the relations between conservatism and firm characteristics by incorporating nonlinearity and multi-period lag effect into Basu (1997) model. Firm characteristics examined in this paper are bondholder-shareholder conflicts over dividend policy, firm-specific uncertainty, and growth opportunity. I use leverage, dividend payment and operating uncertainty as proxies for bondholder-shareholder conflicts over dividend policy and use size and market-to-book ratio as proxies for growth opportunity.

The empirical results indicate that firms with different characteristics exhibit different extents of conservatism to different magnitudes of news and to different type of news. Further, multi-period asymmetric timeliness captures the extent of conservatism while not captured by concurrent asymmetric timeliness. The empirical results imply the importance of re-examination of results of prior literature.

Keywords: conditional conservatism; nonlinear earnings responses; multi-period earnings responses; size; leverage; dividend payment; operating uncertainty

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1. Introduction

1.1 Motivation

Conservatism is one of the main essences of accounting. It has influenced accounting practices and theories for centuries. Recent research classifies conservatism into two forms: conditional and unconditional conservatism (Beaver and Ryan, 2005). Unconditional conservatism is news-independent (e.g. R&D accounting), which leads to recording losses before difficult-to-verify news occurs and biasing the book value downward. Conditional conservatism is news-dependent (e.g. impairment accounting), which is interpreted by Basu (1997) as lower verification threshold for bad news than good news. Under the assumption of price-lead-earnings, he uses positive (negative) stock returns as a proxy for good (bad) news. A reverse regression equation with current earnings and returns as dependent and independent variables respectively is designed to capture the difference between earnings responses to good news and bad news. Positive incremental earnings responses to bad news are interpreted as asymmetric timeliness of earnings and further the existence of conservatism. Basu (1997) measure captures only the extent of conditional conservatism, and thus conservatism discussed in this study is referred to conditional conservatism if not specified clearly.

Prior research suggests and offers evidence that the two forms of conservatism are interrelated (Qiang, 2007). Unconditional conservatism leads to recording losses before news occurs, and thereby provides a cushion for future bad news (Basu, 1997). For example, the cost of R&D is expensed as it occurs due to unconditional conservatism. If bad news related to the R&D project happens later, it does not trigger assets write-off since the unverifiable value increase of the R&D project was never recorded at the first place (Roychowdhury and Watts, 2007).

Piles of papers use Basu's model to measure or compare conservatism across time or countries (Chung and Wynn, 2008). Some papers use it to investigate the relation between some specific firm characteristics and conservatism, such as quality of auditing, information asymmetry, and legal responsibility of managers and so on (Basu, 1997; Qiang, 2007; Chung and Wynn, 2008; LaFond and Roychowdhury, 2008; LaFond and Watts, 2008).

Despite of the popularity of Basu model, there are some challenges that mainly argue about if the magnitude of asymmetric timeliness of current earnings is valid to verify the extent of conservatism. Lin and Liu (2011) present evidence of the effects of nonlinearity and multi-period lags on Basu (1997) measure of asymmetric timeliness and argue those effects should be considered when assessing or comparing the extents of conservatism by Basu (1997) measure. Further, accounting conservatism exists in earnings recognitions of both good news and bad news. Compared to prior studies, they argue both earnings responses to good news and those to bad news should be considered instead of focusing on the asymmetric timeliness of earnings responses only when comparing the extents of conservatism.

1.2 Empirical Results

This study's objectives are to

(1) re-examine the results of prior studies by considering conservatism for earnings responses to good news and bad news respectively,

(2) re-examine the results of prior studies by considering the effects of nonlinearity and multi-period lags on Basu (1997) measure, and

(3) compare the results of relations between firm characteristics and accounting conservatism measured by asymmetric timeliness, components of asymmetric timeliness, components of nonlinear asymmetric timeliness, and components of multi-period asymmetric timeliness.

The sample includes all non-regulated U.S. firms from 1980 to 2009. Empirical results support the extent of conservatism in our sample by Basu (1997) model with consideration of nonlinear and multi-period earnings responses.

Leverage, dividend payment and operating uncertainty are proxies for bondholder-shareholder conflicts. Results of impact of leverage on conservatism in nonlinear model are mixed. Results of one definition of leverage indicate that higher leverage firms tend to response to bad news in small magnitude rather than bad news in large magnitude more conservatively. Results of the other one are indeterminable. The positive relation between leverage and earnings responses to bad news also exists in the lagged periods. Regarding results of dividend payment and conservatism, they suggest firms with higher dividend payment have lower extent of conservatism in recognition of both good news and bad news in small magnitude. And negative relations also exist in the lagged periods. However, firms with higher dividend payment tend to be more conservative in recognition of bad news in large magnitude. Results of nonlinear model indicate firms with higher operating uncertainty are less conservative in recognition of bad news in small magnitude. Nevertheless, those firms tend to cumulatively recognize news in a more conservative way in the lagged periods.

As for firm-specific uncertainty, results of Basu and nonlinear earnings responses model are indeterminable. Results of multi-period earnings responses model show that firms with higher firm-specific uncertainty have higher extent of conservatism for recognition of bad news but lower extent of conservatism for recognition of good news.

I use size and market-to-book ratio as proxies for growth opportunity. Regarding the impact of firm size, results of nonlinear earnings responses model suggest larger firms adopt less conservative accounting while those firms tend to recognize bad news in large magnitude more conservatively. It is consistent with that larger firms have higher litigation demand for conservatism (Khan and Watts, 2009) and that firms (directors or auditors) are likely to be sued for overstatements of earnings than for understatements (García Lara et al., 2009b). Likewise, it is consistent with that larger firms are expected to have higher political costs (Ahmed et al., 2002) and that losses from overvalued assets and overstated earnings are more observable and usable in the political process (Watts, 2003a). Firms with higher market-to-book ratio (hereafter, M/B ratio) tend to be more conservative as prior literature suggests. The empirical negative relation between M/B ratio and conservatism in concurrent period is likely due to buffer problem (LaFond and Roychowdhury, 2008). With regard to the results, positive relations between M/B ratio and conservatism exist in recognition of bad news in large magnitude. Further, those firms are more conservative in cumulative recognition of news in lagged periods.

Collectively, earnings responses to bad news seem to have higher impacts on asymmetric timeliness than those to good news. Besides, I use two definitions of leverage and size respectively as a robustness check. Results of different definitions of variables are more consistent in multi-period earnings responses models.

1.3 Contributions

In summary, this paper follows Lin and Liu (2011) and argues that impacts of nonlinear and multi-period earnings responses should be considered when comparing the extents of conservatism. This study is the first to examine the impact of firm characteristics on conservatism with consideration of nonlinear and multi-period earnings responses and with consideration of the components of asymmetric timeliness.

Collectively, this contributes to the research of conservatism. When Lin and Liu (2011) suggest effects of nonlinear and multi-period earnings responses on Basu (1997) measure exist, it is essential to re-examine those results in prior literature using Basu measure to compare the extents of conservatism. I believe this re-examination can offer evidence and improve the validity of results in comparison.

The remainder of this study is organized as follows. Section 2 introduces concepts of nonlinear and multi-period earnings responses, model specifications, and relations between firm characteristics and conservatism in different situations. Section 3 summarizes explanations and relations between firm characteristics and conservatism concluding from prior literature. Section 4 describes data sources. Section 5 presents empirical results of relations between firm characteristics and conservatism in different situations. Section 6 summarizes major findings and research limitations as conclusions.

2. Concepts, Model Specifications, and Situations

2.1 Concepts of Nonlinearity and Multi-period Effect on Asymmetric Earnings Responses

Basu (1997) measure implies the asymmetric timeliness of current earnings responses to bad news and those to good news can be a measure to verify the extent of conservatism. Basu model does not consider impacts of magnitudes of news or lagged earnings responses on conservatism. However, these two factors can also reflect extent of conservatism and they can offer a deeper insight into Basu (1997) measure (Lin and Liu, 2011).

Lin and Liu (2011) suggest earnings responses to both good news and bad news are not constant; instead they will change with the absolute magnitudes of news. To be more specific, earnings responses to good news decrease with the absolute magnitudes of good news and those to bad news increase with the absolute magnitudes of bad news. The phenomena can be explained in three aspects. First, accounting earnings do not or only partially record the publicly available good news concurrently because accounting principles limit concurrent recognition of revenues to “realizable” and “earned”. And the probability of meeting the two components of favorable economic events decreases while the absolute magnitudes of those favorable economic events increase. Second, bad news of small absolute magnitudes is likely to be caused by temporary volatility in operation or business environment which is likely to reverse in a short period. Consequently, it is not required to be recorded in earnings. However, as the absolute magnitudes of bad news increase, the persistence of loss increases which is unlikely to recover in a short period. Therefore, it is required to record the permanent loss in earnings (e.g. impairment accounting). Third, unconditional conservatism preempts current earnings from current bad news (Basu, 1997; Roychowdhury and Watts, 2007). As the magnitudes of unfavorable economic events increase, it is likely that more expenses or losses will be recorded. Collectively, the extent of asymmetric timeliness increases both with the magnitudes of good news and bad news, which means asymmetric timeliness of earnings responses is nonlinear and more manifest when a large return occurs[1].

Based on the assumption of price-leading-earnings, it takes time to incorporate the information component of stock price into earnings. News might be reflected into concurrent earnings incompletely, and the remainder is reflected in the lagged earnings. Lin and Liu (2011) suggest the extent of conservatism can be observed not only in one single period but also in the following several periods, which is multi-period lag effect on Basu (1997) model. Length of earnings lag is interpreted as length of period between news become publicly available and it is fully reflected in earnings. Due to the higher verification threshold for recognizing good news (Basu, 1997), it takes longer time to reflect good news in earnings, which means the longer length of earnings lag for good

[1] To clarify the concept of nonlinearity effect on Basu model, figures in Appendix A are cited from Lin and Liu (2011). Panel A depicts the relation between contemporaneous earnings and returns under Basu model and nonlinear model; Panel B depicts the earnings responses implied by Basu model and nonlinear model.

news than those for bad news. If conservatism exists, bad news is recognized in concurrent earnings in a larger magnitude, fully reflected in earnings in a shorter period, and therefore the impact of bad news on lagged earnings decays faster than that of good news. The differences between multi-period earnings responses to good news and those to bad news result in existences and variations of differential earnings responses (DERs hereafter). A positive DER occurs when bad news is recorded in a larger magnitude than good news around the happening of news. Positive DERs remain but decay when earnings reflect both bad news and good news gradually but earnings responses to good news are still smaller than those to bad news. Positive DERs vanish and then turn negative when earnings responses to good news become larger than those to bad news or bad news has been fully recognized in earnings but good news has not. Negative DERs vanish when both types of news are reflected in earnings completely[2].

2.2 Model Specifications of Nonlinear and Multi-period Asymmetric Timeliness of Earnings Responses

2.2.1 Basu (1997) model

Basu (1997) interprets conservatism as asymmetric timeliness of earnings responses. He interprets good news and bad news as positive stock returns and negative

[2] To clarify the concept of multi-period lags effect on Basu model, figure in Appendix B is cited from Lin and Liu (2011). It depicts the earnings responses to bad news and those to good news in multi-period earnings responses model.

stock returns respectively. Due to lower verification threshold for bad news in accounting, earnings responses to bad news should be larger than those to good news. The difference between earnings responses to good news and bad news is asymmetric timeliness of earnings responses.

The following regression model is Basu (1997) measure of conservatism:

$$E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \varepsilon_{i,t} \quad \text{......(1)}$$

where $E_{i,t}$ denotes earnings per share of firm i at year t deflated by starting price at year t. $RET_{i,t}$ denotes the annual stock returns of fiscal year t[3]. $D_{i,t}$ is a dummy, which equals 1 if $RET_{i,t} < 0$ and 0 otherwise.

Earnings responses to good news (ERGN hereafter) can be captured by β_1 and those to bad news (ERBN hereafter) can be captured by $(\beta_1 + \gamma_1)$. Thus γ_1 is asymmetric timeliness of earnings responses. If the extent of conditional conservatism exists, γ_1 is expected to be positive.

Prior studies use Basu (1997) model to compare the extents of conservatism.

$$E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t} \quad \text{......(2)}$$

$DC_{i,t}$ is a certain firm characteristic of firm i at year t. All other variables are the

[3] $RET_{i,t}$ in Basu (1997) denotes the annual stock returns of fiscal year t or the 12-month period covers 9 months before fiscal year-end to 3 months after fiscal year-end. In this study, the former definition is adopted.

same as in Eq. (1).

θ_1 and (θ_1 +λ_1) capture impacts of firm characteristics on ERGN and ERBN respectively. Prior studies use impacts of firm characteristics on asymmetric timeliness of earnings responses (i.e., λ_1) to verify relation between certain firm characteristic and conservatism. To be more specific, if impact of firm characteristic on conservatism is positive, λ_1 is expected to be positive.

In contrast with prior studies, Lin and Liu (2011) argue the incremental impacts of firm characteristics on both ERGN and ERBN should be considered instead of impact on asymmetric timeliness only when comparing the extents of conservatism across firms because conservatism influences not only recognition of bad news but also that of good news. Positive relation between firm characteristic and conservatism might exist in only recognition of good news or bad news. If firm characteristic is positively related to conservatism in recognition of good news, θ_1 is expected to be negative. Likewise, if the positive relation holds in recognition of bad news, (θ_1 +λ_1) is expected to be positive.

2.2.2 Nonlinear Earnings Responses Model

In nonlinear earnings responses model, it is expected that asymmetric timeliness of earnings responses is more manifest when large good news or bad news occurs. The following regression model is designed to test the expectation (Lin and Liu, 2011).

$$E_{i,t}= \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \varepsilon_{i,t} \quad \ldots(3)$$

$RET2_{i,t}$ denotes the square of $RET_{i,t}$. Definitions of all other variables are the same as in Eq. (1). To keep the sign of earnings-returns relation positive, the coefficient of $RET2_{i,t} \times D_{i,t}$ is multiplied by –1.

Earnings responses to good news and bad news in small magnitude can be captured by β_1 and ($\beta_1 + \gamma_1$) respectively. Likewise, β_2 and ($-\beta_2 + \gamma_2$) depict the incremental ERGN and ERBN respectively when magnitudes of news increase[4]. As mentioned in 2.1, ERBN will increase as the magnitudes of bad news increase while ERGN will decrease as the magnitudes of good news increase if the extent of conservatism exists. Thus β_2 and ($-\beta_2 + \gamma_2$) are expected to be negative and positive respectively.

With consideration of nonlinear earnings responses, I can examine if positive or negative relation between firm characteristics and conservatism still exists in recognition of good news and bad news in different magnitudes. The following equation is used to investigate relation between conservatism and firm characteristics (Lin and Liu, 2011).

$$E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \lambda_2 (-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t} \quad (4)$$

4 When referring to earnings responses to bad news, β_2 is multiplied by –1 since the sign of earnings-negative returns changes after squared.

$DC_{i,t}$ is a certain firm characteristic of firm i at year t. All other variables are the same as in Eq. (3).

θ_1 and $(\theta_1 + \lambda_1)$ capture impacts of firm characteristics on ERGN and ERBN in relatively small magnitude respectively; signs of θ_2 and $(-\theta_2 + \lambda_2)$ capture impacts of firm characteristics on ERGN and ERBN of different magnitudes[5]. If firms with certain characteristic have higher extent of conservatism, positive relation should exist no matter which type of news is (good news or bad news) or what magnitude of news is (large magnitude or small magnitude). To be more specific, either of the following two criteria should be met if firms with certain characteristic have higher extent of conservatism:

(1) $\theta_1 < 0$, $\theta_2 < 0$, $(\theta_1 + \lambda_1) > 0$ and $(-\theta_2 + \lambda_2) > 0$.

(2) At least one coefficient (or the sum of coefficients) has the same sign predicted in (1) and the other coefficients (or the sum of coefficients) are equal to zero.

In the contrary, if firms with certain characteristic have lower extent of conservatism, either of the following two criteria should be met:

(3) $\theta_1 > 0$, $\theta_2 > 0$, $(\theta_1 + \lambda_1) < 0$ and $(-\theta_2 + \lambda_2) < 0$.

[5] Similar with analysis in footnote 4, θ_2 is multiplied by –1 and then plus λ_2 when referring to the incremental impacts of firm characteristics on earnings responses to bad news, since the sign of earnings-negative returns changes after squared.

(4) At least one coefficient (or the sum of coefficients) has the same sign predicted in (3) and the other coefficients (or the sum of coefficients) are equal to zero.

If none of the four criteria is met, except that all of the coefficient and the sum of coefficients are equal to zero, relations between firm characteristics and conservatism might change in recognitions of news in different magnitudes or different types of news.

2.2.3 Multi-period Earnings Responses Model

As mentioned in 2.1, the essence of conservatism is pronounced not only in concurrent period but also in the several following periods. The following regression model is designed to observe multi-period lagged earnings responses (Lin and Liu, 2011).

$$E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varepsilon_{i,t} \quad (5)$$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$

denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise.

Concurrent and lagged ERGNs (ERBNs) are β_0, β_1, β_2, $\beta_{(3,4)}$, and $\beta_{(5,7)}$ ($(\beta_0 + \gamma_0)$, $(\beta_1 + \gamma_1)$, $(\beta_2 + \gamma_2)$, $(\beta_{(3,4)} + \gamma_{(3,4)})$, and $(\beta_{(5,7)} + \gamma_{(5,7)})$. γ_0 , γ_1, γ_2, $\gamma_{(3,4)}$,, and $\gamma_{(5,7)}$ capture DERs in each period. As mentioned in 2.1, if the extent of conservatism exists, DER to news in concurrent period is significantly positive. Significant positive DERs to news in the leading 1- period, leading 2- period, leading 3- to 4- period exist but decay as time passes, and eventually DER to news in the leading 5- to 7- period turns negative because bad news has been completely reflected in earnings but good news has not[6]. Collectively, DERs are expected to decrease as lags increase if the extent of conservatism exists.

While each ERGN and ERBN depict earnings responses to good news and bad news respectively in individual period, the sum of ERGNs and ERBNs capture the cumulative earnings responses to news. Based on the reasons that cumulative earnings responses reflect the degree of earnings responses to news in the whole recognition

[6] Returns of leading 3- to 7-period are aggregated because the signal component of returns is relatively smaller than the noise component and thus the earnings-returns relation is weaker (Lin and Liu, 2011). To mitigate the noise, returns of leading 3- and 4-period are aggregated. Returns of leading 5- to 7-period are aggregated due to the same reason.

progress and mitigate the impact of temporary earnings responses, cumulative earnings responses to good news (CERGN hereafter) and those to bad news (CERBN hereafter) are valid to measure and compare the extents of conservatism. Therefore, the criteria used above to measure the extent of conservatism can be transformed into two criteria when comparing the extents of conservatism between firm i and firm j. If firm i tends to adopt more conservative accounting than firm j, both the following two criteria should be met:

(1) $CERGN_{i,(t-n,t)} - CERGN_{j,(t-n,t)} \leq 0$ for every n and

$CERGN_{i,(t-n,t)} - CERGN_{j,(t-n,t)} < 0$ at least for one n.

(2) $CERBN_{i,(t-n,t)} - CERGN_{j,(t-n,t)} \geq 0$ for every n and

$CERBN_{i,(t-n,t)} - CERGN_{j,(t-n,t)} > 0$ for at least one n.

where $CERGN_{i(j),(t-n,\ t)} = \Sigma\ ERGN_{i(j),t-k}$, $CERBN_{i(j),\ (t-n,\ t)} = \Sigma\ ERBN_{i(j),t-k}$, and (t–k) denotes the period which ERGNs (ERBNs) occur, where k = 0, n_1, n_2,..., n. (t–n, t) denotes periods of ERGN (ERBN) occurrences which the CERGN (CERBN) covers.

If the two criteria are met simultaneously, earnings of firm i cumulatively recognize both good news and bad news in a more conservative way. If criteria (1) (criteria (2)) is met, conservatism only exists in cumulative recognition of good news (bad news) only.

While the mechanism of comparing the extents of conservatism is introduced in the previous paragraph, the regression model used to compare conservatism across firms with consideration of multi-period lag earnings responses is as follows.

$$E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0} \times DC_{i,t-0} + \lambda_1 RET_{i,t-1} \times DC_{i,t-1} + \lambda_2 RET_{i,t-2} \times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0} \times D_{i,t-0} \times DC_{i,t-0} + \varphi_1 RET_{i,t-1} \times D_{i,t-1} \times DC_{i,t-1} + \varphi_2 RET_{i,t-2} \times D_{i,t-2} \times DC_{i,t-2} + \varphi_{(3,4)} RET_{i(t-3,t-4)} \times D_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i(t-5,t-7)} \times DC_{i,(t-5,t-7)} + \varepsilon_{i,t} \quad (6)$$

$DC_{i,t}$ is a certain firm characteristic of firm i at year t. All other variables are the same as in Eq. (5).

Impacts of firm characteristic on earnings responses to concurrent and leading good (bad news) are captured by λ_0, λ_1, λ_2, $\lambda_{(3,4)}$, and $\lambda_{(5,7)}$ ($(\lambda_0 + \varphi_0)$, $(\lambda_1 + \varphi_1)$, $(\lambda_2 + \varphi_2)$, $(\lambda_{(3,4)} + \varphi_{(3,4)})$, and $(\lambda_{(5,7)} + \varphi_{(5,7)})$). If firms with certain characteristic have higher extent of conservatism, positive relation should exist in recognitions of both good news and bad news. That is, firms with certain characteristic tend to take longer (shorter) time to fully reflect good (bad) news or reflect smaller (larger) magnitude of good (bad) news in one specific period. If so, both the following two criteria should be met:

(1) $\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* ≤ 0 for every n and

$\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* < 0 for at least one n.

(2) $\Sigma(\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* ≥ 0 for every n and

$\Sigma(\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* > 0 for at least one n.

If only criteria (1) (criteria (2)) is met, firms with certain characteristic tend to be more conservative in recognition of good (bad) news rather than bad (good) news.

Conversely, if firms with certain characteristic have lower extent of conservatism, both the following two criteria should be met:

(3) $\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* ≥ 0 for every n and

$\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* > 0 for at least one n.

(4) $\Sigma(\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* ≤ 0 for every n

and $\Sigma(\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* < 0 for at least one n.

2.3 **Existence of Relations Between Firm Characteristics and the Extent of Conservatism in Different Situations**

As discussed in 2.2, nonlinear earnings responses model captures ERGNs and ERBNs of different magnitudes and multi-period earnings responses model captures lagged earnings responses to news. Due to the essence of accounting conservatism, the difference between ERGN and ERBN (i.e., asymmetric timeliness) is more manifest when a large return occurs and DERs decrease as lags increase (Lin and Liu, 2011). Lin and Liu (2011) also argue the components of asymmetric timeliness earnings responses (i.e., ERGNs and ERBNs) instead of asymmetric timeliness of earnings responses only offer a deeper insight into the extent of conservatism when using Basu (1997) measure to compare conservatism across firms, countries, or time.

The following are discussions of relations between firm characteristics of interest and conservatism in different situations. I follow empirical results of prior literature mainly based on asymmetric timeliness in Basu (1997) model to state the relations[7]. I do not expect relations between firm characteristics and the extent of conservatism measured by components of asymmetric timeliness in Basu model, nonlinear and multi-period earnings responses models are the same as by asymmetric timeliness in Basu model. This study aims to re-examine the associations between firm characteristics and conservatism while considering the effect of nonlinear and multi-period responses on Basu (1997) measure.

Leverage

Situation 1.1: Firms with higher leverage have higher extent of asymmetric timeliness.

[7] Stated relations of dividend payment and operating uncertainty are from results of prior research based on bias component of book-to-market ratio (Beaver and Ryan, 2000) and negative total accruals (Givoly and Hayn, 2000).

To examine Situation 1.1, firms with higher leverage should have incremental earnings responses to bad news over those to good news, which can be measured by Basu (1997) model. If situation 1.1 exists, λ_1 in Eq. (2) is positive. In the contrary, if firms with higher leverage have lower extent of asymmetric timeliness of earnings, λ_1 in Eq. (2) is negative.

Situation 1.2: Firms with higher leverage have higher extent of conservatism for earnings responses to good news and bad news.

To examine Situation 1.2, both the following criteria should be met:

(1) Firms with higher leverage have smaller earnings responses to good news.

(2) Firms with higher leverage have larger earnings responses to bad news.

The two criteria above can also be measured by Basu (1997) model. The difference is that in situation 1.2, the components of asymmetric timeliness of earnings responses (i.e., ERGNs and ERBNs) are examined respectively instead of asymmetric timeliness of earnings responses only. Criteria (1) and (2) are met when θ_1 and $(\theta_1 + \lambda_1)$ in Eq. (2) are negative and positive respectively. In contrast, if firms with higher leverage have lower extent of conservatism for earnings responses to good news and bad news, θ_1 and $(\theta_1 + \lambda_1)$ in Eq. (2) should be positive and negative respectively.

Situation 1.3: Firms with higher leverage have higher extent of conservatism when considering nonlinear earnings responses.

To examine Situation 1.3, all the following criteria should be met:

(1) Firms with higher leverage have smaller earnings responses to good news of small absolute magnitudes than those to bad news of small absolute magnitudes.

(2) Firms with higher leverage have smaller earnings responses to good news of large absolute magnitudes than those of small absolute magnitudes.

(3) Firms with higher leverage have larger earnings responses to bad news of small absolute magnitudes than those to good news of small absolute magnitudes.

(4) Firms with higher leverage have larger earnings responses to bad news of large absolute magnitudes than those of small absolute magnitudes.

The four criteria above can be measured by nonlinear earnings responses model (Lin and Liu, 2011). The difference between Basu (1997) model and nonlinear model is the latter considers relations between magnitudes of news and conservatism as discussed in 2.2.2. Criteria (1) is met when θ_1 in Eq. (4) is negative, criteria (2) is met when θ_2 in Eq. (4) is negative, criteria (3) is met when $(\theta_1 + \lambda_1)$ in Eq. (4) is positive, and the last criteria is met when $(-\theta_2 + \lambda_2)$ in Eq. (4) is positive. Conversely, if firms with higher leverage have lower extent of conservatism when considering nonlinear earnings responses, in Eq. (4), θ_1 should positive, θ_2 should be positive, $(\theta_1 + \lambda_1)$ should be negative, and $(-\theta_2 + \lambda_2)$ should be negative.

Situation 1.4: Firms with higher leverage have higher extent of conservatism when considering multi-period earnings responses.

To examine Situation 1.4, both the following criteria should be met:

(1) Firms with higher leverage have smaller cumulative earnings responses to good news.

(2) Firms with higher leverage have larger cumulative earnings responses bad news.

The two criteria above can be measured by multi-period earnings responses model (Lin and Liu, 2011). The difference between Basu (1997) model and multi-period model is the latter considers relations of lagged earnings responses and conservatism as discussed in 2.2.3. For ease to illustrate, cumulative differential earnings responses (i.e., CDERs) are used when comparing the extents of conservatism and impacts of firm characteristics on CDERs depict relations between firm characteristics and conservatism. Criteria (1) is met when $\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* in Eq. (6) is negative or equal to zero for every n and is negative for at least one n. Criteria (2) is met when $\Sigma\, (\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* in Eq. (6) is positive or equal to zero for every n and is positive for at least one n. In contrast, if firms with higher leverage have lower extent of conservatism when considering multi-period earnings responses, $\Sigma\, \lambda_{t-k}$ *(k=0, 1, 2,…,7)* in Eq. (6) is positive or equal to zero for every n and is positive for at least one n; $\Sigma\, (\lambda_{t-k} + \varphi_{t-k})$ *(k=0, 1, 2,…,7)* in Eq. (6) is negative or equal to zero for every n and is negative for at least one n.

Discussions are about relations of other firm characteristics and conservatism in four different situations which are the same as above. I state relations in different situations that are to be examined in this study respectively in Table 1. As for measures of conservatism, they are abridged to avoid redundancy.

[Insert Tb. 1 here]

3. Re-Examinations of Impacts of Firm Characteristics on Basu (1997) Measure of Asymmetric Timeliness

3.1 Role of Conservatism in Mitigating Bondholder-Shareholder Conflicts over Dividend Policy

Ahmed et al. (2002) demonstrate that conservatism plays an important role in mitigating bondholder-shareholder conflicts over dividend policy. They follow Beaver and Ryan (2000) and Givoly and Hayn (2000) and use bias component of book-to-market ratio (market-based model hereafter) and net total accruals (accrual-based model hereafter) respectively to measure conservatism[8]. The effect of accounting conservatism on mitigating those conflicts comes from two sources. First,

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[8] Beaver and Ryan (2000) perceive conservatism as book value is persistently lower than marker value due to accounting process. The bias component of book-to-ratio captures overall conservatism. Givoly and Hayn (2000) recognize conservatism as an issue of the timing and sequencing of revenues and expenses relative to the associated cash flows. They use negative total accruals and negative non-operating accruals to capture overall conservatism and conditional conservatism respectively.

conservatism helps avoid overpayment of dividends to shareholders which can transfer wealth from bondholders to shareholders by reducing the assets available for meeting bondholders' fixed claims and hence increasing the default risk for bondholders. The application of accounting conservatism might be explicitly required by bondholders (e.g. upper bound on dividend payment) to protect their rights. Second, borrowing firms can reduce their cost of debt by accepting tighter restrictions on their ability to pay dividends, via conservative accounting. Nonetheless, secured debt can also mitigate those conflicts. If secured debt is a widely used alternative, then it might bias against the prediction of effect of conservatism on mitigating those conflicts. Leverage, dividends payment, and operating uncertainty are proxies for bondholder-shareholder conflicts over dividend policy.

3.1.1 Leverage

There are substantial and growing evidence that firms with higher leverage have larger asymmetric timeliness of earnings responses (Qiang, 2007; LaFond and Roychowdhury, 2008; LaFond and Watts, 2008; Chung and Wynn, 2008; Khan and Watts 2009). Previous studies (Khan and Watts, 2009; LaFond and Roychowdhury, 2008; LaFond and Watts, 2008) suggest the positive relation comes from two sources. First, conservatism can be used as an effective mechanism to reduce information asymmetry. Conservatism can reduce the likelihood of overpaying dividends or pursuing high earnings thus forgoing positive NPV project since it restricts the tendency of management to overstate earnings or assets. Conservative accounting numbers can offer orderly liquidation value of net assets to equity holders as a control for other sources of information. Second, conservatism can offer lower bound measure that can ex post trigger debt covenant in a timelier fashion. Due to the two reasons, firms with higher conservatism have lower ex ante cost of debt and are more likely to finance through debt. Firms with higher leverage have higher litigation demand for conservatism because they are more likely to be sued due to financial distress. Those firms also have higher taxation demand for conservatism since they tend to be more mature and thus have higher tax payment (Khan and Watts, 2009). Further, due to the accounting inability to reflect unverifiable growth option, firms with high growth options are less likely to finance through debts. Khan and Watts (2009) provide evidence that firms with higher leverage (measured as long-term debt plus short-term debt deflated by market value of equity) have larger asymmetric timeliness of earnings while those ERGNs are insignificant.

LaFond and Roychowdhury (2008) use leverage, market-to-book ratio and size as proxies for IOS and suggest that firms with higher leverage have stronger contract demand for conservatism. Their empirical results show that leverage (measured as total debt deflated by total assets) is positively associated with asymmetric timeliness of earnings in Basu measure.

LaFond and Watts (2008) also indicate leverage is positively related to conservatism. The positive relation comes from two sources. First is contract demand. Second, leverage is expected to decline with growth option, and consequently decline with information asymmetry. As information asymmetry increases, which harms the value of firms, the demand for governance mechanism becomes stronger and thus conservatism becomes pronounced. However, empirical results show that firms with higher leverage (measured as total debts divided by total assets) have smaller ERGNs and larger asymmetric timeliness of earnings responses after controlling information asymmetry.

Ahmed et al. (2002) suggest higher leverage intensifies the conflicts of interest with shareholders and the concern over excess distributions. Thereby, firms with higher leverage are likely to experience greater bondholder-shareholder conflicts over dividend policy. Leverage (measured as the ratio of long-term debt to assets) is positively related to overall conservatism in market-based model while the relation is insignificant in accrual-based model.

3.1.2 Dividend Payment

If a firm pays a low level of dividends, then bondholder are less likely to be concerned about dividend overpayment. Conversely, paying a high dividend payment potentially intensifies conflicts with bondholders. Thus, high dividend payment might indicate more severe bondholder-shareholder conflicts over dividend policy. Dividend payment (measured as common dividends divided by total assets) is positively related to overall conservatism in both market-based model and accrual-based model.

3.1.3 Operation Uncertainty

Firms that face a relatively high degree of operating uncertainty are more likely to experience large positive or negative shocks to their earnings and assets values. If large positive but unsustainable shocks are reflected in earnings, retained earnings might be inflated, possibly resulting in overpayment of dividends. Greater operating uncertainty implies a greater risk that current dividends transfer too many resources to shareholders, reducing protection for bondholders. Consequently, the higher operating uncertainty, the more severe bondholder-shareholder conflicts over dividend policy. Operating uncertainty (measured as standard deviation of returns on assets) is positively related to overall conservatism in both market-based model and accrual-based model.

3.2 Firm-Specific Uncertainty

Like discussions in 3.2.3, firms with higher firm-specific volatility might also have more severe bondholder-shareholder conflicts over dividend policy (Khan and Watts, 2009). Firms with higher firm-specific volatility are likely to have higher stock losses, increasing the likelihood of litigation and generating demand for conservatism.

Besides, those firms have future gains that are less verifiable ex ante and more susceptible to gaming, generating a higher contracting demand and governance demand for conservatism. Khan and Watts (2009) provide empirical results that firm-specific volatility (measured as standard deviation of stock return) is positively related to asymmetric timeliness of earnings responses[9].

3.3 Growth Option

Khan and Watts (2009) investigate the relation between firm's investment opportunity set (IOS hereafter) and conservatism through four explanations[10] (Watts, 2003a). They note firms with more growth options relative to assets-in-place are more likely to have less debt (or fewer debt contracts) or fewer accounting-based compensation contracts, more likely to have a higher probability of litigation, more likely to have lower taxable earnings and more likely to be unregulated. Consequently, they try to capture variation of IOS since it is related to variation in these four factors and ultimately variation in conservatism. M/B ratio and size are proxies for firm's IOS. Basu (1997) model is used to measure the extent of conservatism. The following are possible explanations of how M/B ratio and size are associated with conservatism.

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9 Khan and Watts (2009) interpret incremental timeliness of bad news as C_Score and uses it as a measure of conservatism. They use C_Score as measure of conservatism and show that firms with longer investment cycles, higher firm-specific risk, and higher information asymmetry have higher extents of conservatism.

10 Watts (2003a) suggests accounting is conservative for four reasons; those are (debt or compensation) contracting, litigation, tax, and regulatory explanations.

3.3.1 Firm Size

Khan and Watts (2009) suggest larger firms are likely to be more mature and to have richer information environments (e.g. more stock analysts following), reducing both overall uncertainty and information asymmetry related to the realizability of projected gains. Larger firms also have more complex operation and more segments which might increase information asymmetry. However, the net effect is larger firms have lower information asymmetry on average and thus lower demand for conservatism (Khan and Watts, 2009; LaFond and Watts, 2008; Ahmed et al., 2002). Firms with larger size are more likely to be exposed to litigation risk since the expected recovery from them is higher (Khan and Watts, 2009; Chung and Wynn, 2008). Since firms (directors or auditors) are likely to be sued for overstatements of earnings than for understatements (García Lara et al., 2009b), accounting conservatism can be an effective way to reduce firm's litigation risk by reporting expected loss earlier. Tax demand for conservatism from larger firms is lower since they have more divisions to aggregate gains with losses across divisions and more accounts to smooth or defer high earnings, thereby reducing present value of their tax liability. Khan and Watts (2009) show impact of firm size (measured as natural log of market value of equity) on ERGNs is positive and its impact on asymmetric timeliness of earnings responses is negative.

LaFond and Roychowdhury (2008) include size (measured as natural log on market value of equity) as proxy for IOS and examine its relation with conservatism. Empirical results show that larger firms have larger ERGNs and smaller asymmetric earnings timeliness.

Chung and Wynn (2008) indicate that larger firms are more likely to be sued since they are perceived as “deep pockets” and that those firms are more likely to purchase legal liability coverage. Further, firms with higher managerial legal liability coverage, using directors’ and officers’ (D&O) liability insurance coverage and cash for indemnification as a proxy, tend to recognize bad news in a less timely manner and the association is more pronounced in firms with greater legal liability exposure. Their empirical results show that larger firms have larger ERGNs and smaller asymmetric earnings timeliness.

However, there is also empirical result that supports positive relation between size and conservatism since larger firms lead to more political costs, resulting higher extent of conservatism to lower those costs (Ahmed et al., 2002).

3.3.2 Market-to-Book Ratio

Khan and Watts (2009) indicate firms with higher M/B ratio have more growth options relative to assets-in-place. Growth options are positively related to agency cost and conservatism is an efficient corporate governance response to agency cost. High M/B ratio firms also have more volatile stock returns because a greater proportion of their market value is from risky growth options. Therefore, they are more likely to have huge losses that trigger lawsuits and have higher litigation demand for conservatism. M/B ratio is also directly associated with conservatism since asymmetric verification thresholds for gains versus losses build up a downward bias of net assets relative to market value. The understatement is also reinforced by unconditional conservatism. Thus relation between M/B ratio and conservatism is positive. However, the positive relation might not be observed empirically due to “buffer problem” over short horizons (Roychowdhury and Watts, 2007)[11]. Firms with higher M/B ratio have smaller ERGNs but do not have lower or higher asymmetric timeliness of earnings responses (Khan and Watts, 2009).

LaFond and Roychowdhury (2008) include beginning M/B ratio to control IOS and the impact of past asymmetric timeliness of earnings with respect to returns on future earnings timeliness over short horizons (Roychowdhury and Watts, 2007). Empirical results show that firms with higher beginning M/B ratio have both smaller ERGNs and smaller asymmetric timeliness of earnings. LaFond and Watts (2008) also include ending M/B ratio as a control variable for growth option and predict its impact

[11] Roychowdhury and Watts (2007) interpret the negative relation between ending M/B ratio and asymmetric timeliness of earnings as results of buffer effect. When good news happens, firms with higher beginning M/B ratio have low ERGN because a large proportion of the increases is due to unverifiable increases in assets. When bad news happens, those firms have lower ERBN because a large proportion of the decreases is from declines in the value of unverifiable assets which are not recorded at the first place. Since in short period ending M/B ratio is a function of beginning M/B ratio, ending M/B ratio might be negatively related to conservatism. The longer the period (3 years or more), the beginning M/B ratio effect weakens and ending M/B ratio shows positive relation with conservatism.

on asymmetric earnings responses is negative in short-term due to buffer problem. The empirical results support the prediction above while the negative impact of ending M/B ratio on ERGNs is insignificant.

To be comparable, I summarize the past empirical results of relations between firm characteristics and conservatism, measure of conservatism, sample period, and the way to exclude outliers of those literature mentioned above in Table 2.

[Insert Tb. 2 here]

4. Data

Data on standard deviation of monthly stock returns are collected from the CRSP's monthly stock file. The other data are collected from the Compustat's fundamental annual Database (Xpressfeed format). The sample includes all companies except utility (SIC code 4000-4999) and financial firms (SIC code 6000-6999). The sample period covers from 1980 to 2009. To avoid survivorship bias, both active and inactive companies are included. Observations with any missing value in required variables or in calculations of required variables are excluded. To avoid extreme value, for each Basu and nonlinear earnings responses model with different firm characteristics, observations of deflated current earnings, current returns and each current variable of firm characteristic, which fall in the top or bottom 1% of the distributions, are excluded respectively to reduce the effects of outliers. As for each multi-period earnings responses model with different firm characteristics, observations of deflated current earnings, current and leading-period returns and each current and leading-period variables of firm characteristic, which fall in the top or bottom 0.5% of the distributions, are also excluded respectively. Data from different databases are merged by CUSIP number. Any observations, which do not exist in both databases, are excluded.

Stock returns are calculated as follows. Both ending price of the period and stock dividends for the period are adjusted with cumulative factor by ex-date for the period. Starting price of the period is adjusted with cumulative factor by ex-date for the preceding period. Returns for each period are calculated by adding adjusted ending price to adjusted stock dividends, subtracting adjusted starting price and then deflated by adjusted starting price of the earliest period of all leading-period price changes.

Table 3 reports definitions of all variable used in this study.

Definitions of firm characteristics follow those in prior studies. Because there are many definitions of leverage and size among previous studies, I adopt two definitions that are most commonly used as a robustness check.

[Insert Tb. 3 here]

5. Empirical Results

5.1 Descriptive Statistics

Panel A and B in Table 4 present median, mean and standard deviations of variables used in nonlinear model and multi-period model respectively except those representing firm characteristics. Stock returns of nonlinear model is positively skewed (median=0.0000; mean=0.1112) while earnings show negatively skewed (median=0.0273; mean=－0.0610) . Due to the essence of conservatism, earnings generate more frequently and timelier recognition of bad news than good news through accruals. Negative skewness of earnings but positive skewness of stock returns also illustrates the extent of conservatism (Chung and Wynn, 2008).

Panel C presents descriptive statistics of variables representing firm characteristics. The distributions are similar to those reported in prior literature (Khan and Watts, 2009; Ahmed et al., 2002). Standard deviations of MB and SV in our sample period are much greater. One possible reason is that our sample period covers the period of financial crisis.

[Insert Tb. 4 here]

5.2 Results of Different Situations

This section follows expectations and criteria stated in section 2.3 and examines the empirical results of relations between firm characteristics and conservatism in four situations. Moreover, this paper also provides evidence of the existence of conservatism in this sample by nonlinear and multi-period asymmetric timeliness. The first two columns of Panel A-1 and A-2 in Table 5.1 and 5.5 or Panel A in Table 5.2, 5.3, 5.4, and 5.6 present the results of Eq. (1) respectively. All of the results indicate the extent of conservatism measured by asymmetric timeliness in Basu model (i.e., coefficients of $RET_{i,t} \times D_{i,t}$ are significantly positive). The third and fourth columns of Panel A-1 and A-2 in Table 5.1 and 5.5 or Panel A in Table 5.2, 5.3, 5.4, and 5.6 present the results of Eq. (3) respectively. With consideration of nonlinearity effect on Basu model, most of the results present significantly negative coefficients of $RET_{i,t}$ and $RET2_{i,t}$, and significantly positive coefficients of $RET_{i,t} \times D_{i,t}$ and $(-1) \times RET2_{i,t} \times D_{i,t}$, revealing the extent of conservatism. The first two columns of Panel A-1 and A-2 in Table 6.1 and 6.5 or Panel A in Table 6.2, 6.3, 6.4, and 6.6 present the results of Eq. (5) respectively. Coefficients of $RET_{i,t-0} \times D_{i,t-0}$, $RET_{i,t-1} \times D_{i,t-1}$, $RET_{i,t-2} \times D_{i,t-2}$, $RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)}$, and $RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)}$ capture DERs in each period. DERs decrease as lags increase as expected, indicating the existence of conservatism.

Leverage

Situation 1.1: Results of impacts of leverage on asymmetric timeliness

The fifth and sixth columns of Panel A-1 and A-2 in Table 5.1 present the results of Eq. (2) when DC is equal to LEV1 and LEV2 respectively. When DC is equal to LEV1, positive coefficient (0.1734, t=3.57) of $RET_{i,t}\times D_{i,t}\times DC_{i,t}$ indicates positive relation between LEV1 and asymmetric timeliness, which is consistent with prior literature. However, when DC is equal to LEV2, coefficient of $RET_{i,t}\times D_{i,t}\times DC_{i,t}$ is negative (−0.0292, t=−3.75), indicating negative relation between LEV2 and asymmetric timeliness. Our results of different definitions of leverage in Eq. (2) are conflicting.

Situation 1.2: Results of impacts of leverage on components of asymmetric timeliness

The second and third columns of Panel B-1 and B-2 in Table 5.1 show the signs of ERGN and ERBN when DC is equal to LEV1 and LEV2 respectively based on the results of Eq. (2). When DC is equal to LEV1, positive ($\theta_1 + \lambda_1$) (0.2091, F-value=24.09) suggest that firms with higher leverage have larger ERBN, indicating higher extent of conservatism for ERBN while the extent of conservatism for ERGN is indeterminable.

When DC is equal to LEV2, positive θ_1 (0.0106, F-value =2.92) and negative ($\theta_1 + \lambda_1$) (−0.0185, F-value=15.85) suggest that firms with higher leverage have lower extent of conservatism in recognition of both good news and bad news. Our results of different definitions of leverage are still conflicting in this situation.

Situation 1.3: Results of impacts of leverage on components of nonlinear asymmetric timeliness

The last two columns of Panel A-1 and A-2 in Table 5.1 show the results of Eq. (4)

when DC is equal to LEV1 and LEV2 respectively. Further information about four criteria in situation 1.3 in section 2.3 is presented in the last two columns of Panel B-1 and B-2 in Table 5.1.When DC is equal to LEV1, θ_1, θ_2, $(\theta_1 + \lambda_1)$, and $(-\theta_2 + \lambda_2)$ are all insignificant (0.0553, −0.0085, 0.2399, and −0.0186, F-value =1.41, 2.67, 0.27, and 0.01), suggesting impacts of LEV1 on components of nonlinear asymmetric timeliness are all indeterminable. When DC is equal to LEV2, positive $(\theta_1 + \lambda_1)$ (0.0788, F-value=14.72) and negative $(-\theta_2 + \lambda_2)$ (−0.0892, F-value=25.09) indicate firms with higher LEV2 adopt more conservatism in recognition of bad news in small magnitude while less conservatism in recognition of bad news in large magnitude.

It is unable to conclude that firms with higher leverage have higher or lower extent of conservatism when considering nonlinear earnings responses since results under different criteria are mixed. Collectively, impacts of leverage on conservatism do not exist in recognition of good news while impacts of leverage on conservatism in recognition of bad news in small and large magnitude are mixed.

Situation 1.4: Results of impacts of leverage on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A-1 and A-2 in Table 6.1 report the results of Eq. (6) when DC is equal to LEV1 and LEV2 respectively. Further information about two criteria in situation 1.4 is presented in Panel B-1 and B-2 of Table 6.1. When

DC is equal to LEV1, ($\lambda_0 + \lambda_1 + \lambda_2$) and ($\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$)[12] are significantly positive (0.0724, and 0.0893, F-value=4.26 and 3.51) while λ_0, ($\lambda_0 + \lambda_1$), ($\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$), and ($\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$) are insignificant, indicating firms with higher leverage have larger CERGNs; $\Sigma\,(\lambda_{t-k} + \varphi_{t-k})$ $(k=0, 1, 2,\ldots,7)$ are all significantly positive (0.1089, 0.1595, 0.1776, 0.2141, and 0.2213, F-value =17.94, 25.04, 20.85, 15.63 and 8.09), indicating firms with higher leverage have larger CERBNs. When DC is equal to LEV2, empirical results are similar.

In this situation, it is unable to draw a conclusion since only one of the two criteria is met. I can only conclude that with consideration of multi-period earnings responses, firms with higher leverage have higher extent of conservatism for bad news but lower one for good news.

Similar with analysis of LEV1 and LEV2 above, analysis of other variables is as follows.

Dividend Payment

Situation 2.1: Results of impacts of dividend payment on asymmetric timeliness

The fifth and sixth columns of Panel A in Table 5.2 present the results of Eq. (2) when DC is equal to DIV. Coefficient of $RET_{i,t}\times D_{i,t}\times DC_{i,t}$ is negative (−2.1969, t=−

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[12] I multiply $\lambda_{(3,4)}$ and ($\lambda_{(3,4)} + \varphi_{(3,4)}$) by 2 because they represent the average ERGN (ERBN) for two years (i.e., lagged 3 and 4 years). Due to the same reason, $\lambda_{(5,7)}$ and ($\lambda_{(5,7)} + \varphi_{(5,7)}$) are multiplied by 3.

3.58).Thus, firms with higher DIV have smaller extents of asymmetric timeliness.

Situation 2.2: Results of impacts of dividend payment on components of asymmetric timeliness

When DC is equal to DIV, the second and third columns of Panel B in Table 5.2 indicate firms with higher DIV have larger ERGN (1.6388, F-value =36.4) while if firms with higher DIV have larger ERBN is indeterminable (−0.5581, F-value =1.03). Thus negative relation between DIV and conservatism exists in this situation.

Situation 2.3: Results of impacts of dividend payment on components of nonlinear asymmetric timeliness

The last two columns of Panel A in Table 5.2 show the results of Eq. (4) when DC is equal to DIV. The last two columns of Panel B in Table 5.2 indicate:

(1) Firms with higher DIV have larger earnings responses to good news of small absolute magnitudes than those to bad news of small absolute magnitudes (1.8358, F-value =21.42).

(2) Firms with higher DIV have smaller earnings responses to bad news of small absolute magnitudes than those to good news (−7.8274, F-value =26.51).

(3) Firms with higher DIV have larger earnings responses to bad news of large absolute magnitudes than those of small absolute magnitudes (11.9446, F-value =24.35).

While relation of DIV and conservatism in recognition of good news in large magnitude is indeterminable (−7.8274, F-value =1.36). Due to the mixed results, incremental impact of DIV on conservatism with consideration of nonlinear earnings responses is inconclusive.

Situation 2.4: Results of impacts of dividend payment on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A in Table 6.2 report the results of Eq. (6) when DC is equal to DIV. Panel B of Table 6.2 indicates:

(1) Firms with higher DIV have larger CERGNs.

(2) Firms with higher DIV have smaller CERBNs.

It suggests firms with higher DIV have lower extent of conservatism when considering the multi-period earnings responses, inconsistent with previous studies.

Operating Uncertainty

Situation 3.1: Results of impacts of operating uncertainty on asymmetric timeliness

The fifth and sixth columns of Panel A in Table 5.3 present the results of Eq. (2) when DC is equal to STDROA. Coefficient of $RET_{i,t} \times D_{i,t} \times DC_{i,t}$ is negative (−0.0757, t=−5.97).Thus, firms with higher STDROA have smaller extents of asymmetric timeliness.

Situation 3.2: Results of impacts of operating uncertainty on components of asymmetric timeliness

When DC is equal to STDROA, the second and third columns of Panel B in Table 5.5 indicate that firms with higher STDROA have smaller ERBN (−0.0733, F-value =43.63). While if firms with higher STDROA have smaller ERGN is indeterminable (0.0024, F-value =0.15). Thus negative relation between STDROA and conservatism exists in this situation.

Situation 3.3: Results of impacts of operating uncertainty on components of nonlinear asymmetric timeliness

The last two columns of Panel A in Table 5.3 show the results of Eq. (4) when DC is equal to STDROA. The last two columns of Panel B in Table 5.3 indicate firms with higher STDROA have smaller earnings responses to bad news of small absolute magnitudes than those to good news (−0.0724, F-value =3.07).

While the relation of STDROA and conservatism in recognition of good news in small and large magnitudes, and bad news in large magnitude are all indeterminable (0.0236, −0.0064, and −0.0273, F-value =2.10, 1.37, and 0.38). With consideration of nonlinear earnings responses, firms with higher STDROA have lower extent of conservatism but only in recognition of bad news in small magnitude, inconsistent with previous research.

Situation 3.4: Results of impacts of operating uncertainty on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A in Table 6.3 report the results of Eq. (6) when DC is equal to STDROA. Panel B of Table 6.3 indicates:

(1) Firms with higher STDROA have smaller CERGNs.

(2) Firms with higher STDROA have larger CERBNs.

It suggests firms with higher STDROA have higher extent of conservatism when considering multi-period earnings responses, consistent with prior research.

Firm-Specific Uncertainty

Situation 4.1: Results of impacts of firm-specific uncertainty on asymmetric timeliness

The fifth and sixth columns of Panel A in Table 5.4 present the results of Eq. (2) when DC is equal to SV. Coefficient of $RET_{i,t}\times D_{i,t}\times DC_{i,t}$ is insignificantly positive (0.0050, t=0.63).Thus, incremental impact of SV on asymmetric timeliness is indeterminable.

Situation 4.2: Results of impacts of firm-specific uncertainty on components of asymmetric timeliness

When DC is equal to SV, the second and third columns of Panel B in Table 5.4 indicate that relations between SV and conservatism of recognition of both good news and bad news are indeterminable (0.0029, and 0.0079, F-value =0.35 and 1.64).

Situation 4.3: Results of impacts of firm-specific uncertainty on components of nonlinear asymmetric timeliness

The last two columns of Panel A in Table 5.4 present the results of Eq. (4) when DC is equal to SV. The last two columns of Panel B in Table 5.4 indicate that impacts of SV on components of nonlinear asymmetric timeliness are all indeterminable (−0.0039, 0.0017, −0.0059, and 0.0149, F-value =0.16, 0.61, 0.12, 0.57).

Situation 4.4: Results of impacts of firm-specific uncertainty on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A in Table 6.4 report the results of Eq. (6) when DC is equal to SV. Panel B of Table 6.4 indicates:

(1) Firms with higher SV have larger CERGNs.

(2) Firms with higher SV have larger CERBNs.

Due to the mixed results, incremental impact of SV on conservatism with consideration of multi-period earnings responses is inconclusive.

Size

Situation 5.1: Results of impacts of firm size on asymmetric timeliness

The fifth and sixth columns of Panel A-1 and A-2 in Table 5.5 present the results of Eq. (2) when DC is equal to SIZE1 and SIZE2 respectively. When DC is equal to SIZE1, coefficient of $RET_{i,t} \times D_{i,t} \times DC_{i,t}$ is negative (−0.0462, t=12.42), consistent with prior literature. Thus, firms with larger SIZE1 have lower extent of asymmetric timeliness. However, the results of SIZE2 are conflicting. When DC is equal to SIZE2, coefficient of $RET_{i,t} \times D_{i,t} \times DC_{i,t}$ is positive (0.0188, t=5.76).

Situation 5.2: Results of impacts of firm size on components of asymmetric timeliness

When DC is equal to SIZE1, the second and third columns of Panel B-1 in Table 5.5 indicate firms with larger SIZE1 have smaller ERBN (−0.0454, F-value=200.94), while ERGN is indeterminable (0.0008, F-value=0.18).

When DC is equal to SIZE2, the second and third columns of Panel B-2 in Table 5.5 indicate:

(1) Firms with larger SIZE2 have larger ERGN (0.0133, F-value =68.64).

(2) Firms with larger SIZE2 have larger ERBN (0.0321, F-value =127.16).

Situation 5.3: Results of impacts of firm size on components of nonlinear asymmetric timeliness

The last two columns of Panel A-1 and A-2 in Table 5.5 show the results of Eq. (4)

when DC is equal to SIZE1 and SIZE2 respectively. When DC is equal to SIZE1, the last two columns of Panel B-1 in Table 5.5 indicate:

(1) Firms with larger SIZE1 have smaller earnings responses to good news of small absolute magnitudes than those to bad news of small absolute magnitudes (－0.0095, F-value =6.55).

(2) Firms with larger SIZE1 have larger earnings responses to good news of large absolute magnitudes than those of small absolute magnitudes (0.0033, F-value =6.71).

(3) Firms with larger SIZE1 have smaller earnings responses to bad news of small absolute magnitudes than those to good news of small absolute magnitudes (－0.0935, F-value =76.53).

(4) Firms with larger SIZE1 have larger earnings responses to bad news of large absolute magnitudes than those of small absolute magnitudes (0.0530, F-value =18.29).

When DC is equal to SIZE2, results in the last two columns of Panel B-2 in Table 5.5 are quite similar except that the relation between SIZE1 and conservatism in recognition of good news in small magnitude is indeterminable (0.0038, F-value =1.53).

It is unable to conclude the incremental impact of size on conservatism with consideration of nonlinear earnings responses because only partial criteria are met.

Situation 5.4: Results of impacts of firm size on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A-1 and A-2 in Table 6.5 report the results of Eq. (6) when DC is equal to SIZE1 and SIZE2 respectively. Further information about the two criteria in Situation 1.4 is presented in Panel B-1 and B-2 of Table 6.5. When DC is equal to SIZE1, the last two columns of Panel B-1 of Table 6.5 indicate firms with larger SIZE1 have smaller CERGNs and CERBNs. When DC is equal to SIZE2, the results in the last two columns of Panel B-2 of Table 6.5 are quite similar except the incremental impacts on CERGNs are indeterminable.

Results of SIZE1 indicate larger firms have lower extent of conservatism considering multi-period earnings responses while results of SIZE2 are mixed.

Market-to-Book Ratio

Situation 6.1: Results of impacts of M/B ratio on asymmetric timeliness

The fifth and sixth columns of Panel A in Table 5.6 present the results of Eq. (2) when DC is equal to MB. Coefficient of $RET_{i,t} \times D_{i,t} \times DC_{i,t}$ is negative (−0.0025, t=−3.02). Thus, firms with higher MB have lower extent of asymmetric timeliness.

Situation 6.2: Results of impacts of M/B ratio on components of asymmetric timeliness

When DC is equal to MB, the second and third columns of Panel B in Table 5.6 indicate firms with higher MB have smaller ERBN (−0.0022, F-value =8.18). Whether firms with higher MB have smaller ERGN is indeterminable (0.0003, F-value =0.96).

Situation 6.3: Results of impacts of M/B ratio on components of nonlinear asymmetric timeliness

The last two columns of Panel A in Table 5.6 show the results of Eq. (4) when DC is equal to MB. The last two columns of Panel B in Table 5.6 indicate:

(1) Firms with higher MB have smaller earnings responses to bad news of small absolute magnitudes than those to good news of small absolute magnitudes (−0.0155, F-value =29.82).

(2) Firms with higher MB have larger earnings responses to bad news of large absolute magnitudes than those of small absolute magnitudes (0.0154, F-value =24.65).

However, incremental impacts of MB on ERGN in different magnitudes are indeterminable (−0.0004, and 0.0002, F-value =0.23, and 1.02). Due to the mixed results, incremental impact of MB on conservatism with consideration of nonlinear earnings responses is inconclusive.

Situation 6.4: Results of impacts of M/B ratio on components of multi-period asymmetric timeliness

The third and fourth columns of Panel A in Table 6.6 report the results of Eq. (6) when DC is equal to MB. Panel B of Table 6.6 indicates:

(1) Firms with higher MB have smaller CERGNs.

(2) Firms with higher MB have larger CERBNs.

It suggests firm with higher MB have higher extent of conservatism when considering multi-period earnings responses, consistent with prior literature.

[Insert Tb. 5 here]

[Insert Tb. 6 here]

5.3 Summary of Empirical Results and Further Discussions

For comparison, I summarize results of prior literature and the empirical results in Table 7. Since results are mixed in each situation, results under different criteria (a criterion) in each situation are stated respectively. The difference between results of prior literature and my empirical results on asymmetric timeliness might be resulting from the difference of observations or outlier exclusions. Nevertheless, the results of DIV and STDROA are not based on Basu (1997) model (Ahmed et al., 2002); instead they are based on market-based measure (Beaver and Ryan, 2000) and accrual-based model (Givoly and Hayn, 2000). Basu (1997) model measures conditional conservatism while the other two measures overall conservatism.

The higher leverage (LEV1) the larger asymmetric timeliness, consistent with prior literature. Considering the components of asymmetric timeliness, the larger asymmetric timeliness comes from those firms adopt more conservative accounting in recognition of bad news. However, results of impact on components of nonlinear asymmetric timeliness are indeterminable. Results of impacts on components of multi-period asymmetric timeliness also show that positive relation between leverage and conservatism in recognition of bad news exists in lagged periods. Nevertheless, results of LEV2 show that negative relation between leverage and asymmetric timeliness is composed of recognition of both good news and bad news in a less conservative way. In nonlinear earnings responses model, it indicates that higher leverage firm recognize bad news in small magnitude more conservatively while recognize bad news in large magnitude less conservatively. Considering multi-period earnings responses, results are similar with those of LEV1. In the four explanations of conservatism, contracting demand is a more fully developed argument for conservatism (Watts, 2003a). Prior research suggests contracting demand induces only conditional conservatism (Qiang, 2007; García Lara et al., 2009b). Empirical results of lower or indeterminable extent of conservatism in bad news in large magnitude suggest results of prior research need to be re-examined with consideration of nonlinear and multi-period earnings responses.

Firms with higher DIV have smaller asymmetric timeliness since those firms have greater ERGN. Considering nonlinear and multi-period earnings responses, negative relations between DIV and conservatism still exist. The only exception is that higher DIV firms tend to be more conservative in recognition of bad news in large magnitude.

Firms with higher STDROA have smaller asymmetric timeliness, which is resulting from the less conservative recognition in bad news. Negative relation between STDROA and conservatism also exists in recognition of bad news in small magnitude. However, higher STDROA firms cumulatively recognize both good news and bad news in a more conservative way. It suggests multi-period earnings responses model captures other information that is not captured by Basu (1997) model.

Positive relation between SV and conservatism only exists in cumulatively larger earnings responses in lagged periods. This indicates the importance of multi-period earnings responses model because the effects of conservatism on earnings responses might not exist in the concurrent period while exist in the lagged periods.

The larger firms (SIZE1) the less asymmetric timeliness, which is resulting from the less conservative recognition of bad news. Negative relation between firm size and conservatism can be observed in earnings recognition of good news in large magnitude and bad news in small magnitude. However, firms with larger size tend to be more conservative in recognition of bad news in large magnitude. It is consistent with that larger firms have higher litigation demand for conservatism (Khan and Watts, 2009) and that firms (directors or auditors) are likely to be sued for overstatements of earnings than for understatements (García Lara et al., 2009b). Likewise, it is consistent with that larger firms are expected to have higher political costs (Ahmed et al., 2002) and that losses from overvalued assets and overstated earnings are more observable and usable in the political process (Watts, 2003a). Negative relation between size and conservatism in recognition of bad news also exists in lagged periods. However, results of SIZE2 are contradicting in Basu (1997) model. Relation between firm size and asymmetric timeliness is positive and it mainly comes from more conservative recognition of bad news. Besides, empirical results of different definitions of variables are more consistent in multi-period model than those in Basu (1997) model.

The higher MB firms the smaller asymmetric timeliness, partially consistent with prior literature. Empirically negative relation might stem from buffer problem (LaFond and Roychowdhury, 2008). The smaller asymmetric timeliness mainly comes from the smaller ERBN. When considering nonlinear earnings responses, firms with higher MB have larger earnings responses to bad news in large magnitude as expected. As discussed in 3.1.2, buffer problem will be mitigated as the aggregated period becomes longer (LaFond and Roychowdhury, 2008). Results of impacts on components of multi-period asymmetric timeliness show that positive relations between MB and conservatism in recognition of both good news and bad news exist in lagged periods.

[Insert Tb. 7 here]

6. Conclusion

This paper aims to re-examine impacts of firm characteristics on the extent of conservatism with consideration of nonlinear and multi-period earnings responses, which can shed further light on the nature and effects of conservatism. Basu (1997) model measures the extent of conservatism by asymmetric timeliness of earnings. Compared to prior studies, this study follows Lin and Liu (2011) and argues that the components of asymmetric timeliness (i.e., ERGN and ERBN) should be considered respectively when comparing the extents of conservatism (Lin and Liu, 2011). Moreover, this study follows Lin and Liu (2011) and uses nonlinear and multi-period earnings responses models to compare the extents of conservatism. Nonlinear earnings responses model captures the incremental effects of firm characteristics on conservatism in recognition of good news and bad news in different magnitudes. Multi-period earnings responses model captures earnings responses in the lagged periods.

Collectively, my empirical results imply results of prior studies need to be re-examined with consideration of nonlinear and multi-period earnings responses. Further, my empirical results suggest that comparing extents of conservatism with asymmetric timeliness on different data period results in different conclusions. The robustness of results in prior research needs to be re-examined. Moreover, my empirical results show that some relations between firm characteristics and conservatism are inconclusive especially in nonlinear model (e.g. SIZE1) and that results of nonlinear and multi-period model are sometimes inconsistent (e.g. STDROA).

This paper is the first paper which compares impacts of firm characteristics (i.e., bondholder-shareholder conflicts over dividend policy, firm-specific uncertainty, and growth option) on conservatism considering nonlinear and multi-period models. It exclusively contributes to offer evidence for impacts of firm characteristics on conservatism in different models. There are some limitations of this paper. First, I use univariate regressions to investigate relations between firm characteristics and the extent of conservatism, and I do not identify possible correlated omitted variables. Second, I do not compare results of nonlinear model and multi-period model. Third, I do not consider the impact of CPA reputation on audited financial reports. Relevant modifications and discussions are leaved for further research.

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Tables

Table 1 Existence of relations between firm characteristics and the extent of conservatism in different situations

Variables of firm characteristics	*Asymmetric timeliness* [a]	*Components of asymmetric timeliness* [b]	*Components of nonlinear asymmetric timeliness* [c]	*Components of multi-period asymmetric timeliness* [d]
Leverage	Situation 1.1 Firms with higher leverage have higher extent of asymmetric timeliness.	Situation 1.2 Firms with higher leverage have higher extent of conservatism for earnings responses to good news and bad news.	Situation 1.3 Firms with higher leverage have higher extent of conservatism when considering nonlinear earnings responses.	Situation 1.4 Firms with higher leverage have higher extent of conservatism when considering multi-period earnings responses.
Dividend Payment	Situation 2.1 Firms with higher dividend payment have higher extent of asymmetric timeliness.	Situation 2.2 Firms with higher dividend payment have higher extent of conservatism for earnings responses to good news and bad news.	Situation 2.3 Firms with higher dividend payment have higher extent of conservatism when considering nonlinear earnings responses.	Situation 2.4 Firms with higher dividend payment have higher extent of conservatism when considering multi-period earnings responses.
Operating Uncertainty	Situation 3.1 Firms with higher operating uncertainty have higher extent of asymmetric timeliness.	Situation 3.2 Firms with higher operating uncertainty have higher extent of conservatism for earnings responses to good news and bad news.	Situation 3.3 Firms with higher operating uncertainty have higher extent of conservatism when considering nonlinear earnings responses.	Situation 3.4 Firms with higher operating uncertainty have higher extent of conservatism when considering multi-period earnings responses.
Firm-Specific Uncertainty	Situation 4.1 Firms with higher firm-specific uncertainty have higher extent of asymmetric timeliness.	Situation 4.2 Firms with higher firm-specific uncertainty have higher extent of conservatism for earnings responses to good news and bad news.	Situation 4.3 Firms with higher firm-specific uncertainty have higher extent of conservatism when considering nonlinear earnings responses.	Situation 4.4 Firms with higher firm-specific uncertainty have higher extent of conservatism when considering multi-period earnings responses.

Size	Situation 5.1 Firms with larger size have lower extent of asymmetric timeliness.	Situation 5.2 Firms with larger size have lower extent of conservatism for earnings responses to good news and bad news.	Situation 5.3 Firms with larger size have lower extent of conservatism when considering nonlinear earnings responses.	Situation 5.4 Firms with larger size have lower extent of conservatism when considering multi-period earnings responses.
M/B Ratio	Situation 6.1 Firms with higher M/B ratio have higher/lower extent of asymmetric timeliness.	Situation 6.2 Firms with higher M/B ratio have higher extent of conservatism for earnings responses to good news and bad news.	Situation 6.3 Firms with higher M/B ratio have higher extent of conservatism when considering nonlinear earnings responses.	Situation 6.4 Firms with higher M/B ratio have higher extent of conservatism when considering multi-period earnings responses.

[a] This column reports the expected impacts of the firm characteristics on comparing the extents of conservatism based on Basu's (1997) measure of asymmetric timeliness (except DIV and STDROA). Since Ahmed et al. (2002) compares the impacts of DIV and STDROA on conservatism based on market-based measure (Beaver and Ryan, 2000) and accrual-based model (Givoly and Hayn, 2000), the expected impacts of DIV and STDROA on comparing the extents of conservatism are reported based on those two models. Criteria of this measure are introduced in section 2.3.

[b] This column reports the impacts of the firm characteristics on components of asymmetric timeliness. Criteria of this measure are introduced in section 2.3. The stated relation between firm characteristics and conservatism are results in prior research using asymmetric timeliness. I do not make expectation in these situations.

[c] This column reports the impacts of the firm characteristics on components of nonlinear asymmetric timeliness. Criteria of this measure are introduced in section 2.3. The stated relation between firm characteristics and conservatism are results in prior research using asymmetric timeliness. I do not make expectation in these situations.

[d] This column reports the impacts of the firm characteristics on components of multi-period asymmetric timeliness. Criteria of this measure are introduced in section 2.3. The stated relation between firm characteristics and conservatism are results in prior research using asymmetric timeliness. I do not make expectation in these situations.

Table 2 Literature

Related papers	***Models***	***Expected relations***	***Sample periods***	***Outliers***
Leverage				
Khan and Watts (2009)	Basu model (1997) $E_{i,t} = \beta_1 + \beta_2 D_{i,t} + \beta_3 RET_{i,t} + \beta_4 RET_{i,t} D_{i,t} + e_{i,t}$ $G\_Score_{i,t} = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 MB_{i,t} + \mu_4 LEV_{i,t}$ $C\_Score_{i,t} = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t}$ LEV is as long-term debt plus short term debt deflated by market value of equity.	*Positive*	1962-2005	Firms in the top and bottom 1% of earnings, returns, size, market-to-book ratio, leverage and depreciation each year or price per share is less than $1
LaFond and Roychowdhury (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 OWN_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 LEV_{i,t-1}$ $+\beta_5 SIZE_{i,t-1} + \beta_6 LIT_{i,t-1} + \beta_7 OWN_{i,t-1} D_{i,t} + \beta_8 MB_{i,t-1} D_{i,t}$ $+\beta_9 LEV_{i,t-1} D_{i,t} + \beta_{10} SIZE_{i,t-1} D_{i,t} + \beta_{11} LIT_{i,t-1} D_{i,t} + \beta_{12} RET_{i,t}$ $+\beta_{13} OWN_{i,t-1} RET_{i,t} + \beta_{14} MB_{i,t-1} RET_{i,t} + \beta_{15} LEV_{i,t-1} RET_{i,t}$ $+\beta_{16} SIZE_{i,t-1} RET_{i,t} + \beta_{17} LIT_{i,t-1} RET_{i,t} + \beta_{18} RET_{i,t} D_{i,t}$ $+\beta_{19} OWN_{i,t-1} RET_{i,t} D_{i,t} + \beta_{20} MB_{i,t-1} RET_{i,t} D_{i,t}$ $+\beta_{21} LEV_{i,t-1} RET_{i,t} D_{i,t} + \beta_{22} SIZE_{i,t-1} RET_{i,t} D_{i,t}$ $+\beta_{23} LIT_{i,t-1} RET_{i,t} D_{it} + e_{i,t}$ LEV is the scaled decile rank of total debt divided by total assets.	*Positive*	1994-2004	Not mentioned
LaFond and Watts (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 RET_{i,t} + \beta_3 RET_{i,t} D_{i,t} + \beta_4 MB_{i,t}$ $+\beta_5 MB_{i,t} D_{i,t} + \beta_6 MB_{i,t} RET_{i,t} + \beta_7 MB_{i,t} RET_{i,t} D_{i,t} + \beta_8 LEV_{i,t}$ $+\beta_9 LEV_{i,t} D_{i,t} + \beta_{10} LEV_{i,t} RET_{i,t} + \beta_{11} LEV_{i,t} RET_{i,t} D_{i,t} + \beta_{12} PIN_{i,t}$ $+\beta_{13} PIN_{i,t} D_{i,t} + \beta_{14} PIN_{i,t} RET_{i,t} + \beta_{15} PIN_{i,t} RET_{i,t} D_{i,t} + e_{i,t}$ LEV is total debt divided by total assets at the end of year.	*Positive*	1983-2001	Firms in the top and bottom 1% of earnings, returns

Ahmed et al. (2002)	Market-value-based measure of conservatism (Beaver and Ryan, 2000)[a] Net-accrual-based measure of conservatism (Givoly and Hayn, 2000)[b] $CON_i = \beta_0 + \beta_1 STDROA_i + \beta_2 DIV_i + \beta_3 LEV_i + \beta_4 ROA_i$ $+\beta_5 SIZE_i + \beta_6 SALESGRO_i + \beta_7 RNDADV + \varepsilon_i$ CON_i =market-value-based measure or accrual-based measure LEV is long-term debt divided by total assets.	*Positive (partially supported)*	1987-1992 1993-1998	Not mentioned
Dividend payment				
Ahmed et al. (2002)	Market-value-based measure of conservatism (Beaver and Ryan, 2000) [a] Net-accrual-based measure of conservatism (Givoly and Hayn, 2000) [b] $CON_i = \beta_0 + \beta_1 STDROA_i + \beta_2 DIV_i + \beta_3 LEV_i + \beta_4 ROA_i$ $+\beta_5 SIZE_i + \beta_6 SALESGRO_i + \beta_7 RNDADV + \varepsilon_i$ CON_i =market-value-based measure or accrual-based measure DIV is common dividends divided by total assets.	*Positive*	1987-1992 1993-1998	Not mentioned
Standard deviation of ROA				
Ahmed et al. (2002)	Market-value-based measure of conservatism (Beaver and Ryan, 2000) [a] Net-accrual-based measure of conservatism (Givoly and Hayn, 2000) [b] $CON_i = \beta_0 + \beta_1 STDROA_i + \beta_2 DIV_i + \beta_3 LEV_i + \beta_4 ROA_i$ $+\beta_5 SIZE_i + \beta_6 SALESGRO_i + \beta_7 RNDADV + \varepsilon_i$ CON_i =market-value-based measure or accrual-based measure DIV is common dividends divided by total assets.	*Positive*	1987-1992 1993-1998	Not mentioned
Stock returns volatility				
Khan and Watts (2009)	Basu model (1997) $E_{i,t} = \beta_1 + \beta_2 D_{i,t} + \beta_3 RET_{i,t} + \beta_4 RET_{i,t} D_{i,t} + e_{i,t}$ $G\_Score_{i,t} = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 MB_{i,t} + \mu_4 LEV_{i,t}$ $C\_Score_{i,t} = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t}$ $C_{Score_{i,t}} = \beta_4 = v_1 + v_2 Volatility_{i,t} + v_3 bid-ask\ spread_{i,t}$ $+v_4 firm\ age_{i,t} + v_5 length\ of\ investment_{i,t}$ Volatility is standard deviation of daily stock return.	*Positive*	1962-2005	Firms in the top and bottom 1% of earnings, returns, size, market-to-book ratio, leverage and depreciation each year or price per share is less than $1

Size				
Khan and Watts (2009)	Basu model (1997) $E_{i,t} = \beta_1 + \beta_2 D_{i,t} + \beta_3 RET_{i,t} + \beta_4 RET_{i,t} D_{i,t} + e_{i,t}$ $G\_Score_{i,t} = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 MB_{i,t} + \mu_4 LEV_{i,t}$ $C\_Score_{i,t} = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t}$ SIZE is natural log of market value of equity.	*Negative*	1962-2005	Firms in the top and bottom 1% of earnings, returns, size, market-to-book ratio, leverage and depreciation each year or price per share is less than $1
LaFond and Roychowdhury (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 OWN_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 LEV_{i,t-1}$ $+\beta_5 SIZE_{i,t-1} + \beta_6 LIT_{i,t-1} + \beta_7 OWN_{i,t-1} D_{i,t} + \beta_8 MB_{i,t-1} D_{i,t}$ $+\beta_9 LEV_{i,t-1} D_{i,t} + \beta_{10} SIZE_{i,t-1} D_{i,t} + \beta_{11} LIT_{i,t-1} D_{i,t} + \beta_{12} RET_{i,t}$ $+\beta_{13} OWN_{i,t-1} RET_{i,t} + \beta_{14} MB_{i,t-1} RET_{i,t} + \beta_{15} LEV_{i,t-1} RET_{i,t}$ $+\beta_{16} SIZE_{i,t-1} RET_{i,t} + \beta_{17} LIT_{i,t-1} RET_{i,t} + \beta_{18} RET_{i,t} D_{i,t}$ $+\beta_{19} OWN_{i,t-1} RET_{i,t} D_{i,t} + \beta_{20} MB_{i,t-1} RET_{i,t} D_{i,t}$ $+\beta_{21} LEV_{i,t-1} RET_{i,t} D_{i,t} + \beta_{22} SIZE_{i,t-1} RET_{i,t} D_{i,t}$ $+\beta_{23} LIT_{i,t-1} RET_{i,t} D_{i,t} + e_{i,t}$ SIZE is the scaled decile rank of market value of equity at the beginning of fiscal year.	*Negative*	1994-2004	Not mentioned
Chung and Wynn (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 RANK_{i,t} + \beta_3 HIGHTECH_{i,t} + \beta_4 CROSS_{i,t}$ $+\beta_5 RANK_{i,t} D_{i,t} + \beta_6 HIGHTECH_{i,t} D_{i,t} + \beta_7 CROSS_{i,t} D_{i,t}$ $+\beta_8 RET_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} MB_{i,t} + \beta_{11} OWN_{i,t} + \beta_{12} RET_{i,t} D_{i,t}$ $+\beta_{13} SIZE_{i,t} D_{i,t} + \beta_{14} MB_{i,t} D_{i,t} + \beta_{15} OWN_{i,t} D_{i,t}$ $+\beta_{16} RANK_{i,t} RET_{i,t} + \beta_{17} HIGHTECH_{i,t} RET_{i,t}$ $+\beta_{18} CROSS_{i,t} RET_{i,t} + \beta_{19} SIZE_{i,t} RET_{i,t} + \beta_{20} MB_{i,t} RET_{i,t}$ $+\beta_{21} OWN_{i,t} RET_{i,t} + \beta_{22} RANK_{i,t} RET_{i,t} D_{i,t}$ $+\beta_{23} HIGHTECH_{i,t} RET_{i,t} D_{i,t} + \beta_{24} CROSS_{i,t} RET_{i,t} D_{i,t}$ $+\beta_{25} SIZE_{i,t} RET_{i,t} D_{i,t} + \beta_{26} MB_{i,t} RET_{i,t} D_{i,t} + \beta_{27} OWN_{i,t} RET_{i,t} D_{i,t}$ $+\beta_{28} MILLS_{i,t} + e_{i,t}$ SIZE is the natural log of total assets at the beginning of fiscal year.	*Negative*	1998-2004 (Canadian firms)	Not mentioned

Market-to-book ratio				
Khan and Watts (2009)	Basu model (1997) $E_{i,t} = \beta_1 + \beta_2 D_{i,t} + \beta_3 RET_{i,t} + \beta_4 RET_{i,t} D_{i,t} + e_{i,t}$ $G\_Score_{i,t} = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 MB_{i,t} + \mu_4 LEV_{i,t}$ $C\_Score_{i,t} = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t}$ MB is the ratio of market-to-book at the end of year.	*Positive(partially supported)*	1962-2005	Firms in the top and bottom 1% of earnings, returns, size, market-to-book ratio, leverage and depreciation each year or price per share is less than $1
LaFond and Roychowdhury (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 OWN_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 LEV_{i,t-1}$ $+\beta_5 SIZE_{i,t-1} + \beta_6 LIT_{i,t-1} + \beta_7 OWN_{i,t-1} D_{i,t} + \beta_8 MB_{i,t-1} D_{i,t}$ $+\beta_9 LEV_{i,t-1} D_{i,t} + \beta_{10} SIZE_{i,t-1} D_{i,t} + \beta_{11} LIT_{i,t-1} D_{i,t} + \beta_{12} RET_{i,t}$ $+\beta_{13} OWN_{i,t-1} RET_{i,t} + \beta_{14} MB_{i,t-1} RET_{i,t} + \beta_{15} LEV_{i,t-1} RET_{i,t}$ $+\beta_{16} SIZE_{i,t-1} RET_{i,t} + \beta_{17} LIT_{i,t-1} RET_{i,t} + \beta_{18} RET_{i,t} D_{i,t}$ $+\beta_{19} OWN_{i,t-1} RET_{i,t} D_{i,t} + \beta_{20} MB_{i,t-1} RET_{i,t} D_{i,t}$ $+\beta_{21} LEV_{i,t-1} RET_{i,t} D_{i,t} + \beta_{22} SIZE_{i,t-1} RET_{i,t} D_{i,1}$ $+\beta_{23} LIT_{i,t-1} RET_{i,t} D_{it} + e_{i,t}$ MB is the scaled decile rank of the market-to-book ratio at the beginning of year.	*Negative*	1994-2004	Not mentioned
LaFond and Watts (2008)	Basu model (1997) $E_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 RET_{i,t} + \beta_3 RET_{i,t} D_{i,t} + \beta_4 MB_{i,t}$ $+\beta_5 MB_{i,t} D_{i,t} + \beta_6 MB_{i,t} RET_{i,t} + \beta_7 MB_{i,t} RET_{i,t} D_{i,t} + \beta_8 LEV_{i,t}$ $+\beta_9 LEV_{i,t} D_{i,t} + \beta_{10} LEV_{i,t} RET_{i,t} + \beta_{11} LEV_{i,t} RET_{i,t} D_{i,t} + \beta_{12} PIN_{i,t}$ $+\beta_{13} PIN_{i,t} D_{i,t} + \beta_{14} PIN_{i,t} RET_{i,t} + \beta_{15} PIN_{i,t} RET_{i,t} D_{i,t} + e_{i,t}$ MB is the ratio of market-to-book at the end of year.	*Negative*	1983-2001	Firms in the top and bottom 1% of earnings, returns

[a] Market-value-based measure of conservatism (Beaver and Ryan, 2000): $BTM_{it} = \alpha + \alpha_i + \alpha_t + \sum_k^n \beta_k RET_{it-k} + e_{it}$

The bias component of book-to-market ratio (α_i) is used to interpret the extent of conservatism.

BTM_{it} denotes the book-to-market ratio for firm i at fiscal year-end t; α denotes the intercept across all firms and years; α_i denotes the persistent firm-specific bias component of book-to-market ratio over the sample period; α_t denotes the year-specific component of book-to-market ratio across all firms; and RET_{it-k} denotes the stock return (with dividends) for firm i in year t.

[b] Net-accrual-based measure of conservatism (Givoly and Hayn, 2000): The measure is the sum of total accruals excluding depreciation (net income before extraordinary items plus depreciation expense less operating cash flows) deflated by assets and averaged within sample period respectively.

Table 3 Variable definitions

Variables	***Definition***	***Database***	***Period***
E_t	Earnings per share after extraordinary items deflated by the starting price of year; adjusted by stock dividend	COMPUSTAT $E_t = \frac{EPSPI_t}{ADJEX\_F_t} \div \frac{PRCC\_F_0}{ADJEX\_F_0}$	1980-2009
RET_t	Price differences between the starting price and the ending price of year; RETs are adjusted by the dividends; each RET is deflated by the starting price of year	COMPUSTAT $RET_t = \left(\frac{PRCC_{F_t} + DVPSX_{F_t}}{ADJEX_{F_t}} - \frac{PRCC_{F_{t-}}}{ADJEX_{F_{t-}}}\right.$ $\div \frac{PRCC\_F_0}{ADJEX\_F_0}$	1980-2009
$LEV1_t$	Long-term debt deflated by total assets	COMPUSTAT $LEV1_t = \frac{DLTT_t}{AT_t}$	1980-2009
$LEV2_t$	Long-term debt plus short term debt deflated by market value of equity	COMPUSTAT $LEV2_t = \frac{DLTT_t + LCT_t}{CSHO_t \times PRCC\_F_t}$	1980-2009
DIV_t	Common dividends deflated by total assets	COMPUSTAT $DIV_t = \frac{DV_t}{AT_t}$	1980-2009
$STDROA_t$	STDROA is standard deviation of ROA[a]; ROA is net income before extraordinary items, deflated by total assets at the beginning of the year.	COMPUSTAT $STDROA_t = \sigma(ROA_k)$, k=t−1, t−2,……,t−7 ; $ROA_t = \frac{IB_t}{AT_{t-1}}$	1980-2009
SV_t	SV is stock price volatility; defined as the annual standard deviation of monthly stock returns.	CRSP $SV_t = \sigma(RET_k) \times \sqrt{12}, k = 1,2,3,\ldots\ldots,12$	1980-2009
$SIZE1_t$	Natural log of market value of equity	COMPUSTAT $SIZE1_t = \ln(CSHO_t \times PRCC\_F_t)$	1980-2009
$SIZE2_t$	Natural log of total assets	COMPUSTAT $SIZE2_t = \ln(AT_t)$	1980-2009
MB_t	The ratio of market value of equity to book value of equity at the end of the year	COMPUSTAT $MB_t = \frac{CSHO_t \times PRCC\_F_t}{CEQ_t}$	1980-2009

[a] The length of period to calculate standard deviation of ROA is current period and the preceding seven years in order to match up the length of period used in multi-period earnings responses model.

[b] Definition of LEV1 follows Ahmed et al. (2002); that of LEV2 follows Khan and Watts (2009). Definitions of DIV and STDROA follow Ahmed et al. (2002). Definition of SV follows Khan and Watts (2009). Definition of SIZE1 follows Khan and Watts (2009); that of SIZE2 follows Chung and Wynn (2008). Definition of MB follows Khan and Watts (2009).

Table 4 Descriptive statistics

Panel A Variables in the nonlinear model

Variable	*Median*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
$E_{i,t}$	0.0273	-0.0610	0.3791	-3.7480	3.7874
$D_{i,t}$	0.0000	0.4980	0.5000	0.0000	1.0000
$RET_{i,t}$	0.0000	0.1112	0.7382	-0.9999	5.0444
$RET2_{i,t}$	0.1198	0.5572	1.8250	0.0000	25.4464
$RET_{i,t} \times D_{i,t}$	0.0000	-0.1896	0.2615	-0.9999	0.0000
$RET2_{i,t} \times D_{i,t}$	0.0000	0.1043	0.1947	0.0000	0.9999

Definitions of all variables are the same as in Table 3.

The descriptive statistics for each variable used in Basu and nonlinear models are full sample after deleting firm in the top and bottom 1% of earnings and returns.

Panel B Variables in the multi-period model

Variable	*Median*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
$E_{i,t}$	0.0432	0.0542	0.3272	-3.4182	3.4000
$D_{i,t-0}$	0.0000	0.4646	0.4987	0.0000	1.0000
$D_{i,t-1}$	0.0000	0.4642	0.4987	0.0000	1.0000
$D_{i,t-2}$	0.0000	0.4397	0.4964	0.0000	1.0000
$D_{i,(t-3,t-4)}$	0.0000	0.4225	0.4940	0.0000	1.0000
$D_{i,(t-5,t-7)}$	0.0000	0.4229	0.4940	0.0000	1.0000
$RET_{i,t-0}$	0.0162	0.1353	1.7126	-19.3291	19.5203
$RET_{i,t-1}$	0.0173	0.1384	1.5940	-17.6649	18.4269
$RET_{i,t-2}$	0.0383	0.1805	1.4705	-16.6667	16.9625
$RET_{i,(t-3,t-4)}$	0.0904	0.3474	1.7420	-15.1971	18.2857
$RET_{i,(t-5,t-7)}$	0.1518	0.5054	1.4894	-1.0000	14.8667
$RET_{i,t-0} \times D_{i,t-0}$	0.0000	-0.3216	1.0116	-19.3291	0.0000
$RET_{i,t-1} \times D_{i,t-1}$	0.0000	-0.3031	0.9270	-17.6649	0.0000
$RET_{i,t-2} \times D_{i,t-2}$	0.0000	-0.2567	0.8210	-16.6667	0.0000
$RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)}$	0.0000	-0.2769	0.7738	-15.1971	0.0000
$RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)}$	0.0000	-0.1976	0.2953	-1.0000	0.0000

Definitions of all variables are the same as in Table 3.

The descriptive statistics for each variable used in multi-period model are full sample after deleting firm years in the top and bottom 0.5% of earnings and returns.

Panel C Variables of firm characteristics

Variable	*Median*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
LEV1	0.1030	0.1613	0.1840	0.0000	1.0842
LEV2	0.4355	1.1002	2.1181	0.0000	23.2403
DIV	0.0000	0.0065	0.0135	-0.0339	0.0983
STDROA	0.1735	0.4284	1.0199	0.0017	14.8018
SV	0.7288	1.3215	2.6627	0.0000	44.1199
SIZE1	4.1923	4.3048	2.3796	-2.2680	10.6338
SIZE2	4.3882	4.4628	2.3608	-2.3752	11.0965
MB	1.6758	2.4418	6.4164	-69.0924	72.4109

Definitions of all variables are the same as in Table 3.

The descriptive statistics for each firm characteristic used in Basu and nonlinear models (multi-period model) are full sample after deleting firms in the top and bottom 1% (0.5%)of earnings, returns and each firm characteristic respectively.

Table 5.1 Regression results for Basu model and the nonlinear model (DC=LEV)

Panel A-1 Regression results

DC =LEV1	***Basu model***		***Nonlinear model***		***Basu model + LEV1***		***Nonlinear model + LEV1***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0165	9.07 [a]	0.0060	2.73 [a]	0.0246	9.05 [a]	0.0150	4.53 [a]
$RET_{i,t}$	-0.0112	-3.54	0.0227	3.54 [a]	-0.0164	-4.04	0.0137	1.59 [c]
$RET_{i,t}×DC_{i,t}$					0.0357	1.53	0.0553	1.19
$RET2_{i,t}$			-0.0109	-4.77 [a]			-0.0095	-3.26 [a]
$RET2_{i,t}×DC_{i,t}$							-0.0085	-0.52
$RET_{i,t}×D_{i,t}$	0.3993	54.02 [a]	0.1866	8.32 [a]	0.3740	38.84 [a]	0.1439	4.68 [a]
$RET_{i,t}×D_{i,t}×DC_{i,t}$					0.1734	3.57 [a]	0.1846	1.20
$(–1)×RET2_{i,t}×D_{i,t}$			0.1936	7.13 [a]			0.2167	6.15 [a]
$(–1)×RET2_{i,t}×D_{i,t}×DC_{i,t}$							-0.0271	-0.16
$D_{i,t}$	0.0074	2.52 [b]	-0.0074	-1.92 [c]	0.0037	0.86	-0.0153	-2.63 [a]
$DC_{i,t}$					-0.0513	-3.51 [a]	-0.0552	-3.19 [a]
$D_{i,t}×DC_{i,t}$					0.0317	1.39	0.0418	1.37
Adj-R^2	6.88%		6.99%		7.09%		7.21%	
N	129671		129671		129671		129671	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t}×D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}×D_{i,t} + \gamma_2 (–1)×RET2_{i,t}×D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}×DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}×DC_{i,t} + \gamma_1 RET_{i,t}×D_{i,t} + \lambda_1 RET_{i,t}×D_{i,t}×DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}×DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}×DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t}×DC_{i,t} + \gamma_1 RET_{i,t}×D_{i,t} + \lambda_1 RET_{i,t}×D_{i,t}×DC_{i,t}$ $+ \gamma_2 (–1)×RET2_{i,t}×D_{i,t} + \lambda_2 (–1)×RET2_{i,t}×D_{i,t}×DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $LEV1_{i,t}$ denotes long-term debt deflated by total assets of firm i at year t. In Khan and Watts (2009), the coefficient of $RET_{i,t} \times LEV_{i,t}$ is 0.005(t=0.77); the coefficient of $RET_{i,t} \times D_{i,t} \times LEV_{i,t}$ is 0.033 (t=1.86). In LaFond and Roychowdhury (2008), the coefficient of $RET_{i,t} \times LEV_{i,t}$ is −0.003(t=−0.34); the coefficient of $RET_{i,t} \times D_{i,t} \times LEV_{i,t}$ is 0.117 (t= 4.42). In Ahmed et al. (2002), the coefficient of $LEV_{i,t}$ is 0.316 (one-tailed p-value=0.001,) in using market-value-based measure of accounting conservatism (Beaver and Ryan, 2000); the coefficient of $LEV_{i,t}$ is 0.001(one-tailed p-value=0.450) in using accrual-based measure of accounting conservatism (Givoly and Hayn, 2000). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-1 Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + LEV1		***Nonlinear model +LEV1***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	0.0357	2.33	0.0553	1.41
θ_2	–			-0.0085	0.27
$\theta_1 + \lambda_1$	+	0.2091	24.09 [a]	0.2399	2.67
$-\theta_2 + \lambda_2$	+			-0.0186	0.01

A superscript of 'a', 'b', or 'c' in Panel B-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between leverage and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Panel A-2 Regression results

DC =LEV2	*Basu model*		*Nonlinear model*		*Basu model + LEV2*		*Nonlinear model + LEV2*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0149	8.09 [a]	0.0053	2.36 [b]	0.0459	16.97 [a]	0.0376	11.91 [a]
$RET_{i,t}$	-0.0148	-4.63	0.0161	2.52 [a]	-0.0252	-6.44	0.0007	0.09
$RET_{i,t} \times DC_{i,t}$					0.0106	1.71 [c]	0.0063	0.55
$RET2_{i,t}$			-0.0098	-4.41 [a]			-0.0081	-3.29 [a]
$RET2_{i,t} \times DC_{i,t}$							0.0012	0.37
$RET_{i,t} \times D_{i,t}$	0.3409	52.17 [a]	0.3172	16.1 [a]	0.2631	36.78 [a]	0.2008	8.88 [a]
$RET_{i,t} \times D_{i,t} \times DC_{i,t}$					-0.0292	-3.75 [a]	0.0725	3.09 [a]
$(-1) \times RET2_{i,t} \times D_{i,t}$			-0.0180	-0.81			0.0155	0.68
$(-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t}$							-0.0879	-4.85 [a]
$D_{i,t}$	-0.0076	-2.67 [a]	0.0031	0.84	-0.0008	-0.20	-0.0023	-0.42
$DC_{i,t}$					-0.0396	-10.29 [a]	-0.0381	-8.82 [a]
$D_{i,t} \times DC_{i,t}$					-0.0172	-3.45 [a]	0.0017	0.25
Adj-R^2	5.66%		5.71%		12.15%		12.28%	
N	127292		127292		127292		127292	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t}$ $+ \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \lambda_2 (-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $LEV2_{i,t}$ denotes the long-term debt plus short term debt deflated by market value of equity of firm i at year t. In Khan and Watts (2009), the coefficient of $RET_{i,t}\times LEV_{i,t}$ is 0.005(t=0.77); the coefficient of $RET_{i,t}\times D_{i,t}\times LEV_{i,t}$ is 0.033 (t=1.86). In LaFond and Roychowdhury (2008), the coefficient of $RET_{i,t}\times LEV_{i,t}$ is –0.003(t=−0.34); the coefficient of $RET_{i,t}\times D_{i,t}\times LEV_{i,t}$ is 0.117 (t= 4.42). In Ahmed et al. (2002), the coefficient of $LEV_{i,t}$ is 0.316 (one-tailed p-value=0.001) in using market-based measure of accounting conservatism; the coefficient of $LEV_{i,t}$ is 0.001(one-tailed p-value=0.450) in using accrual-based measure of accounting conservatism. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-2 Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + LEV2		***Nonlinear model +LEV2***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	0.0106	2.92 [c]	0.0063	0.30
θ_2	–			0.0012	0.13
$\theta_1 + \lambda_1$	+	-0.0185	15.85 [a]	0.0788	14.72 [a]
$-\theta_2 + \lambda_2$	+			-0.0892	25.09 [a]

A superscript of 'a', 'b', or 'c' in Panel B-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between leverage and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 5.2 Regression results for Basu model and the nonlinear model (DC=DIV)

Panel A Regression results

DC =DIV	*Basu model*		*Nonlinear model*		*Basu model + DIV*		*Nonlinear model + DIV*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0159	8.75 [a]	0.0048	2.18 [b]	-0.0085	-3.76 [a]	-0.0215	-7.73 [a]
$RET_{i,t}$	-0.0126	-4.02	0.0233	3.70 [a]	-0.0077	-2.25	0.0315	4.40 [a]
$RET_{i,t} \times DC_{i,t}$					1.6388	6.03 [a]	1.8358	4.63 [a]
$RET2_{i,t}$			-0.0117	-5.20 [a]			-0.0123	-5.06 [a]
$RET2_{i,t} \times DC_{i,t}$							-0.2499	-1.17
$RET_{i,t} \times D_{i,t}$	0.3988	54.00 [a]	0.1925	8.59 [a]	0.3669	45.23 [a]	0.1448	5.65 [a]
$RET_{i,t} \times D_{i,t} \times DC_{i,t}$					-2.1969	-3.58 [a]	-9.6632	-6.15 [a]
$(-1) \times RET2_{i,t} \times D_{i,t}$			0.1830	6.75 [a]			0.1914	6.43 [a]
$(-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t}$							11.6946	4.81 [a]
$D_{i,t}$	0.0058	1.97 [b]	-0.0074	-1.90 [c]	0.0072	1.98 [b]	-0.0076	-1.56
$DC_{i,t}$					2.0350	20.29 [a]	2.1045	20.26 [a]
$D_{i,t} \times DC_{i,t}$					0.4661	2.88 [a]	-0.0694	-0.36
Adj-R^2	6.91%		7.02%		7.85%		8.00%	
N	128030		128030		128030		128030	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \lambda_2 (-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $DIV_{i,t}$ denotes common dividends deflated by total assets of firm i at year t. In Ahmed et al. (2002), the coefficient of $DIV_{i,t}$ is 3.557 (one-tailed p-value=0.001) in using market-value-based measure of accounting conservatism (Beaver and Ryan, 2000) ; the coefficient of $DIV_{i,t}$ is 0.404(one-tailed p-value=0.001) in using accrual-based measure of accounting conservatism (Givoly and Hayn, 2000). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + DIV		***Nonlinear model +DIV***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	1.6388	36.4 [a]	1.8358	21.42 [a]
θ_2	–			-0.2499	1.36
$\theta_1 + \lambda_1$	+	-0.5581	1.03	-7.8274	26.51 [a]
$-\theta_2 + \lambda_2$	+			11.9446	24.35 [a]

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between dividend payment and conservatism, which is drawn from the results of prior literature based on market-based measure of conservatism (Beaver and Ryan, 2000) and accrual-based measure of conservatism (Givoly and Hayn, 2000).

Table 5.3 Regression results for Basu model and the nonlinear model (DC=STDROA)

Panel A Regression results

DC =STDROA	*Basu model*		*Nonlinear model*		*Basu model + STDROA*		*Nonlinear model + STDROA*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0184	6.84 [a]	0.0162	5.00 [a]	0.0322	11.17 [a]	0.0326	9.35 [a]
$RET_{i,t}$	-0.0024	-0.45	0.0054	0.49	0.0072	1.25	0.0074	0.64
$RET_{i,t}\times DC_{i,t}$					0.0024	0.39	0.0236	1.45
$RET2_{i,t}$			-0.0028	-0.61			-0.0002	-0.04
$RET2_{i,t}\times DC_{i,t}$							-0.0064	-1.17
$RET_{i,t}\times D_{i,t}$	0.4826	34.13 [a]	0.0563	1.37 [c]	0.4941	31.31 [a]	-0.0032	-0.07
$RET_{i,t}\times D_{i,t}\times DC_{i,t}$					-0.0757	-5.97 [a]	-0.0960	-2.16 [b]
$(-1)\times RET2_{i,t}\times D_{i,t}$			0.4993	9.10 [a]			0.6158	9.79 [a]
$(-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t}$							-0.0337	-0.76
$D_{i,t}$	0.0256	5.52 [a]	-0.0273	-4.55 [a]	0.0316	6.40 [a]	-0.0310	-4.85 [a]
$DC_{i,t}$					-0.0569	-8.48 [a]	-0.0657	-7.58 [a]
$D_{i,t}\times DC_{i,t}$					-0.0005	-0.06	0.0017	0.14
Adj-R^2	7.34%		7.62%		8.41%		8.82%	
N	61758		61758		61758		61758	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t}$

$+ \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \lambda_2 (-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $STDROA_{i,t}$ denotes standard deviation of ROA of firm i between year t and year t-7 ; ROA denotes net income before extraordinary items deflated by total assets at the beginning of the year t. In Ahmed et al. (2002), the coefficient of $STDROA_{i,t}$ is 2.079 (one-tailed p-value=0.001) in using market-value-based measure of accounting conservatism (Beaver and Ryan, 2000); the coefficient of $STDROA_{i,t}$ is 0.216(one-tailed p-value=0.001) in using accrual-based measure of accounting conservatism (Givoly and Hayn, 2000). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + STDROA		***Nonlinear model +STDROA***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	0.0024	0.15	0.0236	2.10
θ_2	–			-0.0064	1.37
$\theta_1 + \lambda_1$	+	-0.0733	43.63 [a]	-0.0724	3.07 [c]
$-\theta_2 + \lambda_2$	+			-0.0273	0.38

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between standard deviation of ROA (proxy for operating uncertainty) and conservatism, which is drawn from the results of prior literature based on market-based measure of conservatism (Beaver and Ryan, 2000) and accrual-based measure of conservatism (Givoly and Hayn, 2000).

Table 5.4 Regression results for Basu model and the nonlinear model (DC=SV)

Panel A Regression results

DC =SV	*Basu model*		*Nonlinear model*		*Basu model + SV*		*Nonlinear model + SV*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	-0.0007	-0.15	-0.0003	-0.06	0.0027	0.50	0.0000	0.00
$RET_{i,t}$	-0.0509	-6.83	-0.0519	-3.58	-0.0545	-5.84	-0.0468	-2.60 [a]
$RET_{i,t}\times DC_{i,t}$					0.0029	0.59	-0.0039	-0.39
$RET2_{i,t}$			0.0002	0.07			-0.0020	-0.47
$RET2_{i,t}\times DC_{i,t}$							0.0017	0.78
$RET_{i,t}\times D_{i,t}$	0.4521	24.73 [a]	0.2283	3.90 [a]	0.4452	22.22 [a]	0.2321	3.74 [a]
$RET_{i,t}\times D_{i,t}\times DC_{i,t}$					0.0050	0.63	-0.0020	-0.10
$(-1)\times RET2_{i,t}\times D_{i,t}$			0.2442	3.55 [a]			0.2210	3.09 [a]
$(-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t}$							0.0166	0.83
$D_{i,t}$	0.0062	0.80	-0.0275	-2.67 [a]	0.0009	0.10	-0.0269	-2.37 [b]
$DC_{i,t}$					-0.0026	-1.21	-0.0002	-0.07
$D_{i,t}\times DC_{i,t}$					0.0041	1.33	-0.0004	-0.08
Adj-R^2	4.84%		4.89%		4.85%		4.91%	
N	29718		29718		29718		29718	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t}$

$+ \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \lambda_2 (-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $SV_{i,t}$ denotes standard deviation of monthly stock return of firm i in year t. In Khan and Watts (2009), the coefficient of $SV_{i,t}$ is 1.615(t=7.29) when the dependent variable is C_Score, which is γ in Basu model. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + SV		***Nonlinear model +SV***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	0.0029	0.35	-0.0039	0.16
θ_2	–			0.0017	0.61
$\theta_1 + \lambda_1$	+	0.0079	1.64	-0.0059	0.12
$-\theta_2 + \lambda_2$	+			0.0149	0.57

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between stock volatility (proxy for firm-specific uncertainty) and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 5.5 Regression results for Basu model and the nonlinear model (DC=SIZE)

Panel A-1 Regression results

DC =SIZE1	***Basu model***		***Nonlinear model***		***Basu model + SIZE1***		***Nonlinear model + SIZE1***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0141	7.51 [a]	0.0027	1.19	-0.1071	-15.82 [a]	-0.1313	-16.01 [a]
$RET_{i,t}$	-0.0147	-4.56	0.0219	3.37 [a]	-0.0124	-1.17	0.0689	3.18 [a]
$RET_{i,t} \times DC_{i,t}$					0.0008	0.43	-0.0095	-2.56 [a]
$RET2_{i,t}$			-0.0117	-5.13 [a]			-0.0257	-3.59 [a]
$RET2_{i,t} \times DC_{i,t}$							0.0033	2.59 [a]
$RET_{i,t} \times D_{i,t}$	0.4008	54.04 [a]	0.2149	9.55 [a]	0.3920	21.18 [a]	0.5168	8.58 [a]
$RET_{i,t} \times D_{i,t} \times DC_{i,t}$					-0.0462	-12.42 [a]	-0.0840	-7.43 [a]
$(-1) \times RET2_{i,t} \times D_{i,t}$			0.1588	5.89 [a]			-0.2395	-4.01
$(-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t}$							0.0564	4.52 [a]
$D_{i,t}$	0.0050	1.67 [c]	-0.0048	-1.22	-0.0245	-2.48 [b]	0.0335	2.50 [b]
$DC_{i,t}$					0.0240	21.62 [a]	0.0270	20.03 [a]
$D_{i,t} \times DC_{i,t}$					0.0015	0.91	-0.0086	-3.82 [a]
Adj-R^2	6.53%		6.62%		10.69%		10.77%	
N	129960		129960		129960		129960	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t} \times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t} \times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t} \times DC_{i,t} + \gamma_1 RET_{i,t} \times D_{i,t} + \lambda_1 RET_{i,t} \times D_{i,t} \times DC_{i,t}$ $+ \gamma_2 (-1) \times RET2_{i,t} \times D_{i,t} + \lambda_2 (-1) \times RET2_{i,t} \times D_{i,t} \times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t} \times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $SIZE1_{i,t}$ denotes nature log of market value of equity of firm i at year t. In Chung and Wynn (2008), the coefficient of $RET_{i,t} \times SIZE_{i,t}$ is 0.01 (t=6.00); the coefficient of $RET_{i,t} \times D_{i,t} \times SIZE_{i,t}$ is −0.02 (t= −1.08). In LaFond and Roychowdhury (2008), the coefficient of $RET_{i,t} \times SIZE_{i,t}$ is 0.024(t=2.84); the coefficient of $RET_{i,t} \times D_{i,t} \times SIZE_{i,t}$ is −0.238 (t= −3.91). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-1indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-1 Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + SIZE1		***Nonlinear model +SIZE1***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	+	0.0008	0.18	-0.0095	6.55 [b]
θ_2	+			0.0033	6.71 [a]
$\theta_1 + \lambda_1$	–	-0.0454	200.94 [a]	-0.0935	76.53 [a]
$-\theta_2 + \lambda_2$	–			0. 0530	18.29 [a]

A superscript of 'a', 'b', or 'c' in Panel B-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates negative relation between size and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Panel A-2 Regression results

DC =SIZE2	***Basu model***		***Nonlinear model***		***Basu model + SIZE2***		***Nonlinear model + SIZE2***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0162	8.83 [a]	0.0062	2.77 [a]	-0.0933	-17.17 [a]	-0.1135	-16.94 [a]
$RET_{i,t}$	-0.0136	-4.24	0.0188	2.92 [a]	-0.0472	-6.18	0.0143	0.86
$RET_{i,t}\times DC_{i,t}$					0.0133	8.29 [a]	0.0039	1.24
$RET2_{i,t}$			-0.0104	-4.54 [a]			-0.0184	-3.57 [a]
$RET2_{i,t}\times DC_{i,t}$							0.0028	2.56 [b]
$RET_{i,t}\times D_{i,t}$	0.4086	54.42 [a]	0.1880	8.25 [a]	0.2680	17.93 [a]	0.4117	8.43 [a]
$RET_{i,t}\times D_{i,t}\times DC_{i,t}$					0.0188	5.76 [a]	-0.0982	-10.29 [a]
$(-1)\times RET2_{i,t}\times D_{i,t}$			0.2049	7.41 [a]			-0.2650	-5.29
$(-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t}$							0.1586	13.93 [a]
$D_{i,t}$	0.0066	2.21 [b]	-0.0100	-2.55 [b]	-0.0319	-3.96 [a]	0.0118	1.09
$DC_{i,t}$					0.0199	21.86 [a]	0.0229	20.68 [a]
$D_{i,t}\times DC_{i,t}$					0.0109	7.86 [a]	-0.0073	-4.02 [a]
Adj-R^2	6.89%		6.99%		9.18%		9.58%	
N	129914		129914		129914		129914	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t}$ $+ \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \lambda_2 (-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy variable, which equals 1 if $RET_{i,t} < 0$. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t}\times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. $SIZE2_{i,t}$ denotes nature log of total assets of firm i at year t. In Khan and Watts (2009), the coefficient of $RET_{i,t} \times SIZE_{i,t}$ is 0.005(t=2.25); the coefficient of $RET_{i,t} \times D_{i,t} \times SIZE_{i,t}$ is −0.033 (t=−7.42). In LaFond and Roychowdhury (2008), the coefficient of $RET_{i,t} \times SIZE_{i,t}$ is 0.024(t=2.84); the coefficient of $RET_{i,t} \times D_{i,t} \times SIZE_{i,t}$ is −0.238 (t=−3.91). In Chung and Wynn (2008), the coefficient of $RET_{i,t} \times SIZE_{i,t}$ is 0.01 (t=6.00); the coefficient of $RET_{i,t} \times D_{i,t} \times SIZE_{i,t}$ is −0.02 (t=−1.08). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-2 Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + SIZE2		***Nonlinear model +SIZE2***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	+	0.0133	68.64. [a]	0.0038	1.53
θ_2	+			0.0028	6.53 [b]
$\theta_1 + \lambda_1$	–	0.0321	127.16 [a]	-0.0943	109.47 [a]
$-\theta_2 + \lambda_2$	–			0.1557	188.86 [a]

A superscript of 'a', 'b', or 'c' in Panel B-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates negative relation between size and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 5.6 Regression results for Basu model and the nonlinear model (DC=MB)

Panel A Regression results

DC =MB	*Basu model*		*Nonlinear model*		*Basu model + MB*		*Nonlinear model + MB*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0149	7.91 [a]	0.0048	2.10 [b]	0.0140	5.89 [a]	0.0031	1.06
$RET_{i,t}$	-0.0121	-3.69	0.0205	3.14 [a]	-0.0142	-3.54	0.0220	2.69 [a]
$RET_{i,t}\times DC_{i,t}$					0.0003	0.98	-0.0004	-0.48
$RET2_{i,t}$			-0.0105	-4.53 [a]			-0.0117	-4.27 [a]
$RET2_{i,t}\times DC_{i,t}$							0.0002	1.01
$RET_{i,t}\times D_{i,t}$	0.4067	53.68 [a]	0.2023	8.80 [a]	0.4065	49.57 [a]	0.2293	9.16 [a]
$RET_{i,t}\times D_{i,t}\times DC_{i,t}$					-0.0025	-3.02 [a]	-0.0151	-5.04 [a]
$RET2_{i,t}\times D_{i,t}$			0.1852	6.69 [a]			0.1519	5.25 [a]
$(-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t}$							0.0156	5.03 [a]
$D_{i,t}$	0.0071	2.34 [b]	-0.0073	-1.83 [c]	0.0029	0.81	-0.0058	-1.22
$DC_{i,t}$					0.0005	1.26	0.0006	1.28
$D_{i,t}\times DC_{i,t}$					0.0012	2.38 [b]	-0.0008	-1.16
Adj-R^2	6.77%		6.86%		6.87%		6.98%	
N	129830		129830		129830		129830	

Basu model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \beta_1 RET_{i,t} + \beta_2 RET2_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \varepsilon_{i,t}$

Basu model + DC : $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

Nonlinear earnings response model + DC: $E_{i,t} = \alpha_0 + \alpha_1 D_{i,t} + \alpha_2 DC_{i,t} + \alpha_3 D_{i,t}\times DC_{i,t} + \beta_1 RET_{i,t} + \theta_1 RET_{i,t}\times DC_{i,t} + \beta_2 RET2_{i,t} + \theta_2 RET2_{i,t}\times DC_{i,t} + \gamma_1 RET_{i,t}\times D_{i,t} + \lambda_1 RET_{i,t}\times D_{i,t}\times DC_{i,t} + \gamma_2 (-1)\times RET2_{i,t}\times D_{i,t} + \lambda_2 (-1)\times RET2_{i,t}\times D_{i,t}\times DC_{i,t} + \varepsilon_{i,t}$

$E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t deflated by the starting price of year t. $RET_{i,t}$ denotes the annual return of firm i of year t, $D_{i,t}$ is a dummy

variable, which equals 1 if $RET_{i,t}$ < 0. $RET2_{i,t}$ denotes the square of $RET_{i,t}$. I multiply $RET2_{i,t}\times D_{i,t}$ by –1 to keep the sign of the earnings-returns relation to be positive. In Khan and Watts (2009), the coefficient of $RET_{i,t}\times MB_{i,t}$ is −0.006(t=−2.00); the coefficient of $RET_{i,t}\times D_{i,t}\times MB_{i,t}$ is −0.007 (t=−0.93). In LaFond and Roychowdhury (2008), the coefficient of $RET_{i,t}\times MB_{i,t}$ is −0.025(t=−2.1); the coefficient of $RET_{i,t}\times D_{i,t}\times MB_{i,t}$ is −0.120 (t=−1.68). In Chung and Wynn (2008), the coefficient of $RET_{i,t}\times MB_{i,t}$ is 0.00 (t=4.24); the coefficient of $RET_{i,t}\times D_{i,t}\times MB_{i,t}$ is −0.02 (t=−1.24). To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering nonlinear earnings responses

		Basu model + MB		***Nonlinear model +MB***	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**	**Coef.**	**F-stat**
θ_1	–	0.0003	0.96	-0.0004	0.23
θ_2	–			0.0002	1.02
$\theta_1 + \lambda_1$	+	-0.0022	8.18 [a]	-0.0155	29.82 [a]
$-\theta_2 + \lambda_2$	+			0.0154	24.65 [a]

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between M/B ratio and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 6.1 Results for the multi-period model (DC=LEV)

Panel A-1 Regression results

DC =LEV1	***Multi-period model***		***Multi-period model +LEV1***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0730	18.91 [a]	0.0700	13.23 [a]
$RET_{i,t-0}$	0.0201	7.64 [a]	0.0221	6.58 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			-0.0147	-0.73
$RET_{i,t-0}\times D_{i,t-0}$	0.0763	13.26 [a]	0.0565	8.49 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			0.1236	3.59 [a]
$RET_{i,t-1}$	0.0633	19.28 [a]	0.0572	14.96 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			0.0348	1.37
$RET_{i,t-1}\times D_{i,t-1}$	0.0396	6.87 [a]	0.0370	5.48 [a]
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			0.0158	0.44
$RET_{i,t-2}$	0.0636	18.13 [a]	0.0560	13.62 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			0.0523	2.25 [b]
$RET_{i,t-2}\times D_{i,t-2}$	0.0255	4.34 [a]	0.0311	4.64 [a]
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			-0.0342	-1.02
$RET_{i,(t-3,t-4)}$	0.0670	22.50 [a]	0.0657	17.67 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.0084	0.45
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0062	1.21	0.0062	1.04
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.0098	0.39
$RET_{i,(t-5,t-7)}$	0.0562	18.15 [a]	0.0599	16.25 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0215	-1.40 [c]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0238	-4.56 [a]	-0.0251	-3.65 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			0.0239	0.62
Dummies	Yes		Yes	
Adj-R^2	29.94%		30.78%	
N	53516		53516	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $LEV1_{i,t-k}$ denotes long-term debt deflated by total assets of firm i at year t−k. $LEV1_{i,(t-3,t-4)}$ denotes average long-term debt deflated by total assets of firm i at year t−3 and t−4. $LEV1_{i,(t-5,t-7)}$ denotes average long-term debt deflated by total assets of firm i at year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-1 Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +LEV1	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	-0.0147	0.53
$\lambda_0 + \lambda_1$	–	0.0201	0.44
$\lambda_0 + \lambda_1 + \lambda_2$	–	0.0724	4.26 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	0.0893	3.51 [c]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	–	0.0247	0.16
$\lambda_0 + \varphi_0$	+	0.1089	17.94 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	0.1595	25.04 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	0.1776	20.85 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	0.2141	15.63 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	0.2213	8.09 [a]

A superscript of 'a', 'b', or 'c' in Panel B-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between leverage and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Panel A-2 Regression results

DC =LEV2	***Multi-period model***		***Multi-period model +LEV2***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0705	19.17 [a]	0.0709	15.95 [a]
$RET_{i,t-0}$	0.0186	7.59 [a]	0.0161	4.86 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			0.0228	1.74 [c]
$RET_{i,t-0}\times D_{i,t-0}$	0.0744	13.80 [a]	0.0516	8.58 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			-0.0028	-0.20
$RET_{i,t-1}$	0.0603	20.29 [a]	0.0483	14.66 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			0.0320	3.32 [a]
$RET_{i,t-1}\times D_{i,t-1}$	0.0388	7.09 [a]	0.0394	6.59 [a]
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			-0.0261	-2.60 [a]
$RET_{i,t-2}$	0.0589	17.24 [a]	0.0492	13.09 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			0.0234	2.24 [b]
$RET_{i,t-2}\times D_{i,t-2}$	0.0304	5.35 [a]	0.0356	6.03 [a]
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			-0.0228	-2.13 [b]
$RET_{i,(t-3,t-4)}$	0.0683	23.86 [a]	0.0629	21.27 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.0056	1.67 [c]
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0058	1.17	0.0088	1.69 [c]
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.0056	-1.45
$RET_{i,(t-5,t-7)}$	0.0574	19.05 [a]	0.0538	16.51 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			0.0021	0.81
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0216	-4.53 [a]	-0.0158	-2.69 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0039	-0.69
Dummies	Yes		Yes	
Adj-R^2	31.93%		35.91%	
N	51231		51231	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $LEV2_{i,t-k}$ denotes the long-term debt plus short term debt deflated by market value of equity of firm i at year t−k. $LEV2_{i,(t-3,t-4)}$ denotes average the long-term debt plus short term debt deflated by market value of equity of firm i at year t−3 and t−4. $LEV2_{i,(t-5,t-7)}$ denotes average the long-term debt plus short term debt deflated by market value of equity of firm i at year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-2 Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +LEV2	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	0.0228	3.02 [c]
$\lambda_0 + \lambda_1$	–	0.0549	14.17 [a]
$\lambda_0 + \lambda_1 + \lambda_2$	–	0.0782	21.46 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	0.0895	26.12 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	–	0.0959	27.06 [a]
$\lambda_0 + \varphi_0$	+	0.0201	71.69 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	0.0260	74.34 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	0.0266	66.46 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	0.0267	1.25
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$ $+ \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	0.0212	0.59

A superscript of 'a', 'b', or 'c' in Panel B-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between leverage and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 6.2 Results for the multi-period model (DC=DIV)

Panel A Regression results

DC =DIV	***Multi-period model***		***Multi-period model +DIV***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0752	19.28 [a]	0.0756	14.89 [a]
$RET_{i,t-0}$	0.0180	6.94 [a]	0.0176	6.17 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			0.2120	1.56
$RET_{i,t-0}\times D_{i,t-0}$	0.0790	13.85 [a]	0.0812	13.04 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			-1.0291	-4.07 [a]
$RET_{i,t-1}$	0.0611	18.63 [a]	0.0609	16.67 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			0.1190	0.71
$RET_{i,t-1}\times D_{i,t-1}$	0.0435	7.49 [a]	0.0430	6.76 [a]
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			-0.7039	-2.50 [a]
$RET_{i,t-2}$	0.0625	17.87 [a]	0.0625	16.73 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			-0.1300	-1.03
$RET_{i,t-2}\times D_{i,t-2}$	0.0334	5.51 [a]	0.0317	4.92 [a]
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			-0.2475	-0.78
$RET_{i,(t-3,t-4)}$	0.0702	23.36 [a]	0.0700	20.91 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.2850	-1.49
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0050	0.94	-0.0008	-0.13
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.9844	1.71 [c]
$RET_{i,(t-5,t-7)}$	0.0589	18.63 [a]	0.0560	15.77 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			0.2229	1.15
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0215	-4.06 [a]	-0.0245	-4.04 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.1386	-0.40
Dummies	Yes		Yes	
Adj-R^2	30.53%		30.94%	
N	50787		50787	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $DIV_{i,t-k}$ denotes common dividends deflated by total assets of firm i at year t−k. $DIV_{i,(t-3,t-4)}$ denotes average common dividends deflated by total assets of firm i at year t−3 and t−4. $DIV_{i,(t-5,t-7)}$ denotes average common dividends deflated by total assets of firm i at year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +DIV	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	0.2120	2.43
$\lambda_0 + \lambda_1$	–	0.3310	2.87 [c]
$\lambda_0 + \lambda_1 + \lambda_2$	–	0.2010	0.87
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	-0.3690	0.86
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	–	0.2998	0.23
$\lambda_0 + \varphi_0$	+	-0.8172	18.92 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	-1.4021	24.82 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	-1.7796	19.19 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	-0.3807	19.47 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$ $+ \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	-0.1277	9.86 [a]

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between dividend payment and conservatism, which is drawn from the results of prior literature based on market-based measure of conservatism (Beaver and Ryan, 2000) and accrual-based measure of conservatism (Givoly and Hayn, 2000).

Table 6.3 Results for the multi-period model (DC=STDROA)

Panel A Regression results

DC =STDROA	***Multi-period model***		***Multi-period model +STDROA***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0802	12.92 [a]	0.0752	12.12 [a]
$RET_{i,t-0}$	0.0189	4.53 [a]	0.0242	5.66 [a]
$RET_{i,t-0} \times DC_{i,t-0}$			-0.0086	-1.56
$RET_{i,t-0} \times D_{i,t-0}$	0.0774	8.63 [a]	0.0529	5.88 [a]
$RET_{i,t-0} \times D_{i,t-0} \times DC_{i,t-0}$			0.0394	3.77 [a]
$RET_{i,t-1}$	0.0705	13.61 [a]	0.0728	13.36 [a]
$RET_{i,t-1} \times DC_{i,t-1}$			-0.0073	-1.01
$RET_{i,t-1} \times D_{i,t-1}$	0.0293	3.38 [a]	0.0252	2.74 [a]
$RET_{i,t-1} \times D_{i,t-1} \times DC_{i,t-1}$			0.0004	0.04
$RET_{i,t-2}$	0.0550	9.81 [a]	0.0593	10.68 [a]
$RET_{i,t-2} \times DC_{i,t-2}$			-0.0061	-1.08
$RET_{i,t-2} \times D_{i,t-2}$	0.0356	3.58 [a]	0.0266	2.65 [a]
$RET_{i,t-2} \times D_{i,t-2} \times DC_{i,t-2}$			-0.0022	-0.27
$RET_{i,(t-3,t-4)}$	0.0678	13.08 [a]	0.0689	13.99 [a]
$RET_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)}$			-0.0137	-3.55 [a]
$RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)}$	-0.0001	-0.01	-0.0082	-0.91
$RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)}$			0.0085	1.14
$RET_{i,(t-5,t-7)}$	0.0560	10.28 [a]	0.0535	9.57 [a]
$RET_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)}$			-0.0092	-1.42
$RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)}$	-0.0163	-1.73 [b]	-0.0188	-1.70 [b]
$RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)}$			-0.0285	-1.89 [c]
Dummies	Yes		Yes	
Adj-R^2	28.71%		30.57%	
N	24033		24033	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0} \times DC_{i,t-0} + \lambda_1 RET_{i,t-1} \times DC_{i,t-1} + \lambda_2 RET_{i,t-2} \times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0} \times D_{i,t-0} \times DC_{i,t-0} + \varphi_1 RET_{i,t-1} \times D_{i,t-1} \times DC_{i,t-1} + \varphi_2 RET_{i,t-2} \times D_{i,t-2} \times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)} \times D_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)} \times D_{i\,(t-5,t-7)} \times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $STDROA_{i,t-k}$ denotes standard deviation of ROA of firm i between year t−k and year t−k−7, k = 0, 1, 2. $STDROA_{i,(t-3,t-4)}$ denotes standard deviation of ROA of firm i between year t−3 and t−11. $STDROA_{i,(t-5,t-7)}$ denotes standard deviation of ROA of firm i between year t−5 and t−14. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +STDROA	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	-0.0086	2.42
$\lambda_0 + \lambda_1$	–	-0.0158	5.88 [b]
$\lambda_0 + \lambda_1 + \lambda_2$	–	-0.0219	6.89 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	-0.0493	17.76 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times \lambda_{(5,7)}$	–	-0.0770	10.80 [a]
$\lambda_0 + \varphi_0$	+	0.0308	18.17 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	0.0239	6.05 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	0.0157	2.11
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	0.0052	4.61 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times \lambda_{(5,7)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	-0.1079	0.79

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between standard deviation of ROA (proxy for operating uncertainty) and conservatism, which is drawn from the results of prior literature based on market-based measure of conservatism (Beaver and Ryan, 2000) and accrual-based measure of conservatism (Givoly and Hayn, 2000).

Table 6.4 Results for the multi-period model (DC=SV)

Panel A Regression results

DC =SV	***Multi-period model***		***Multi-period model +SV***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0696	10.44 [a]	0.0794	4.93 [a]
$RET_{i,t-0}$	0.0117	2.18 [b]	0.0089	0.50
$RET_{i,t-0} \times DC_{i,t-0}$			0.0075	0.22
$RET_{i,t-0} \times D_{i,t-0}$	0.0887	7.98 [a]	0.0490	1.61 [b]
$RET_{i,t-0} \times D_{i,t-0} \times DC_{i,t-0}$			0.0674	1.19
$RET_{i,t-1}$	0.0647	11.42 [a]	0.0330	2.59 [a]
$RET_{i,t-1} \times DC_{i,t-1}$			0.0674	2.63 [a]
$RET_{i,t-1} \times D_{i,t-1}$	0.0484	4.79 [a]	0.0794	3.43 [a]
$RET_{i,t-1} \times D_{i,t-1} \times DC_{i,t-1}$			-0.0724	-1.71 [c]
$RET_{i,t-2}$	0.0659	11.12 [a]	0.0643	6.69 [a]
$RET_{i,t-2} \times DC_{i,t-2}$			0.0047	0.16
$RET_{i,t-2} \times D_{i,t-2}$	0.0269	2.57 [a]	0.0296	1.73 [b]
$RET_{i,t-2} \times D_{i,t-2} \times DC_{i,t-2}$			-0.0271	-0.44
$RET_{i,(t-3,t-4)}$	0.0691	10.72 [a]	0.0638	7.86 [a]
$RET_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)}$			0.0239	1.03
$RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)}$	-0.0003	-0.04	0.0039	0.32
$RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)}$			-0.0465	-1.17
$RET_{i,(t-5,t-7)}$	0.0601	11.10 [a]	0.0645	8.23 [a]
$RET_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)}$			-0.0122	-0.81
$RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)}$	-0.0169	-2.03 [b]	-0.0528	-2.42 [a]
$RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)}$			0.0517	1.27
Dummies	Yes		Yes	
Adj-R^2	29.36%		29.79%	
N	19451		19451	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0} \times DC_{i,t-0} + \lambda_1 RET_{i,t-1} \times DC_{i,t-1} + \lambda_2 RET_{i,t-2} \times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)} \times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0} \times D_{i,t-0} + \gamma_1 RET_{i,t-1} \times D_{i,t-1} + \gamma_2 RET_{i,t-2} \times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)} \times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)} \times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0} \times D_{i,t-0} \times DC_{i,t-0} + \varphi_1 RET_{i,t-1} \times D_{i,t-1} \times DC_{i,t-1} + \varphi_2 RET_{i,t-2} \times D_{i,t-2} \times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)} \times D_{i,(t-3,t-4)} \times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)} \times D_{i\,(t-5,t-7)} \times DC_{i,\,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $SV_{i,t-k}$ denotes standard deviation of monthly stock return of firm i in year t−k. $SV_{i,(t-3,t-4)}$ denotes standard deviation of monthly stock return of firm i between year t−3 and year t−4. $SV_{i,(t-5,t-7)}$ denotes standard deviation of monthly stock return of firm i at year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +SV	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	0.0075	0.05
$\lambda_0 + \lambda_1$	–	0.0749	3.74 [c]
$\lambda_0 + \lambda_1 + \lambda_2$	–	0.0795	2.68
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	0.1274	3.14 [c]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	–	0.0908	1.27
$\lambda_0 + \varphi_0$	+	0.0748	3.13 [c]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	0.0698	2.00
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	0.0473	0.48
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	0.0022	2.13
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	0.1206	3.03 [c]

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between stock volatility (proxy for firm-specific uncertainty) and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 6.5 Results for the multi-period model (DC=SIZE)

Panel A-1 Regression results

DC =SIZE1	***Multi-period model***		***Multi-period model +SIZE1***	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0725	18.67 [a]	0.0121	0.99
$RET_{i,t-0}$	0.0196	7.44 [a]	0.0527	5.29 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			-0.0054	-4.13 [a]
$RET_{i,t-0}\times D_{i,t-0}$	0.0763	13.34 [a]	0.1217	6.72 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			-0.0105	-3.68 [a]
$RET_{i,t-1}$	0.0627	19.04 [a]	0.1037	9.47 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			-0.0070	-4.47 [a]
$RET_{i,t-1}\times D_{i,t-1}$	0.0410	7.18 [a]	0.0213	1.27
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			0.0017	0.63
$RET_{i,t-2}$	0.0636	18.28 [a]	0.1043	8.91 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			-0.0068	-3.84 [a]
$RET_{i,t-2}\times D_{i,t-2}$	0.0264	4.43 [a]	-0.0091	-0.53
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			0.0052	1.79 [c]
$RET_{i,(t-3,t-4)}$	0.0675	22.30 [a]	0.0888	9.38 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.0037	-2.46 [b]
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0054	1.05	-0.0081	-0.60
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.0024	1.01
$RET_{i,(t-5,t-7)}$	0.0563	18.10 [a]	0.0654	7.37 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0016	-1.08
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0235	-4.51 [a]	-0.0706	-4.66 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			0.0097	3.37 [a]
Dummies	Yes		Yes	
Adj-R^2	29.92%		32.18%	
N	53701		53701	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,\,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $SIZE1_{i,t-k}$ denotes nature log of market value of equity of firm i at year t−k. $SIZE1_{i,(t-3,t-4)}$ denotes nature log of average market value of equity of firm i at year t−3 and t−4. $SIZE1_{i,(t-5,t-7)}$ denotes nature log of average market value of equity of firm i year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-1 Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +SIZE1	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	+	-0.0054	17.07 [a]
$\lambda_0 + \lambda_1$	+	-0.0125	47.83 [a]
$\lambda_0 + \lambda_1 + \lambda_2$	+	-0.0193	65.58 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	+	-0.0267	57.59 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	+	-0.0315	33.71 [a]
$\lambda_0 + \varphi_0$	–	-0.0159	53.18 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	–	-0.0212	48.33 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	–	-0.0229	35.20 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	–	-0.0255	26.13 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$ $+ \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	–	-0.0012	4.15 [b]

A superscript of 'a', 'b', or 'c' in Panel B-1 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates negative relation between size and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Panel A-2 Regression results

DC =SIZE2	*Multi-period model*		*Multi-period model +SIZE2*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0741	19.08 [a]	0.0433	3.80 [a]
$RET_{i,t-0}$	0.0188	7.30 [a]	0.0230	2.71 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			-0.0009	-0.64
$RET_{i,t-0}\times D_{i,t-0}$	0.0779	13.61 [a]	0.1164	6.91 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			-0.0073	-2.58 [a]
$RET_{i,t-1}$	0.0638	19.33 [a]	0.0674	6.19 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			-0.0007	-0.39
$RET_{i,t-1}\times D_{i,t-1}$	0.0385	6.75 [a]	0.0198	1.16
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			0.0027	0.91
$RET_{i,t-2}$	0.0630	18.14 [a]	0.0636	6.67 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			-0.0003	-0.16
$RET_{i,t-2}\times D_{i,t-2}$	0.0273	4.54 [a]	0.0170	1.06
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			0.0015	0.53
$RET_{i,(t-3,t-4)}$	0.0676	22.40 [a]	0.0678	8.29 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.0002	-0.11
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0047	0.91	0.0059	0.48
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.0003	-0.13
$RET_{i,(t-5,t-7)}$	0.0551	17.70 [a]	0.0568	7.20 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0002	-0.15
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0212	-4.04 [a]	-0.0407	-3.17 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			0.0055	2.06 [b]
Dummies	Yes		Yes	
Adj-R^2	29.78%		31.07%	
N	54078		54078	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $SIZE2_{i,t-k}$ denotes nature log of total assets of firm i at year t−k. $SIZE2_{i,(t-3,t-4)}$ denotes nature log of average total assets of firm i at year t−3 and t−4. $SIZE2_{i,(t-5,t-7)}$ denotes nature log of average total assets of firm i year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B-2 Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +SIZE2	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	+	-0.0009	0.42
$\lambda_0 + \lambda_1$	+	-0.0016	0.59
$\lambda_0 + \lambda_1 + \lambda_2$	+	-0.0019	0.56
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	+	-0.0022	0.41
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	+	-0.0029	0.28
$\lambda_0 + \varphi_0$	–	-0.0082	14.27 [a]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	–	-0.0063	4.55 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	–	-0.0050	1.84
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	–	-0.0059	4.21 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	–	0.0098	0.12

A superscript of 'a', 'b', or 'c' in Panel B-2 indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates negative relation between size and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 6.6 Results for the multi-period model (DC=MB)

Panel A Regression results

DC =MB	*Multi-period model*		*Multi-period model +MB*	
Ind. variable	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Intercept	0.0728	18.80 [a]	0.0637	13.52 [a]
$RET_{i,t-0}$	0.0195	7.45 [a]	0.0442	8.93 [a]
$RET_{i,t-0}\times DC_{i,t-0}$			-0.0036	-6.03 [a]
$RET_{i,t-0}\times D_{i,t-0}$	0.0777	13.47 [a]	0.0465	6.28 [a]
$RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0}$			0.0055	5.68 [a]
$RET_{i,t-1}$	0.0639	19.69 [a]	0.0760	17.18 [a]
$RET_{i,t-1}\times DC_{i,t-1}$			-0.0017	-3.80 [a]
$RET_{i,t-1}\times D_{i,t-1}$	0.0392	6.86 [a]	0.0259	3.97 [a]
$RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1}$			0.0025	3.65 [a]
$RET_{i,t-2}$	0.0642	18.25 [a]	0.0695	15.59 [a]
$RET_{i,t-2}\times DC_{i,t-2}$			-0.0006	-1.80 [b]
$RET_{i,t-2}\times D_{i,t-2}$	0.0253	4.18 [a]	0.0194	2.87 [b]
$RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2}$			0.0004	0.76
$RET_{i,(t-3,t-4)}$	0.0676	22.29 [a]	0.0659	19.18 [a]
$RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			0.0001	0.45
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}$	0.0050	0.96	0.0026	0.46
$RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)}$			-0.0005	-1.24
$RET_{i,(t-5,t-7)}$	0.0562	17.93 [a]	0.0532	15.69 [a]
$RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0004	-1.52 [c]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}$	-0.0257	-4.88 [a]	-0.0268	-4.65 [a]
$RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)}$			-0.0001	-0.16
Dummies	Yes		Yes	
Adj-R^2	30.14%		31.55%	
N	53096		53096	

Multi-period model: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varepsilon_{i,t}$

Multi-period model + DC: $E_{i,t} = \alpha + \alpha_0 D_{i,t-0} + \alpha_1 D_{i,t-1} + \alpha_2 D_{i,t-2} + \alpha_{(3,4)} D_{i,(t-3,t-4)} + \alpha_{(5,7)} D_{i,(t-5,t-7)} + \delta_0 DC_{i,t-0} + \delta_1 DC_{i,t-1} + \delta_2 DC_{i,t-2} + \delta_{(3,4)} DC_{i,(3,4)} + \delta_{(5,7)} DC_{i,(5,7)} + \beta_0 RET_{i,t-0} + \beta_1 RET_{i,t-1} + \beta_2 RET_{i,t-2} + \beta_{(3,4)} RET_{i,(t-3,t-4)} + \beta_{(5,7)} RET_{i,(t-5,t-7)} + \lambda_0 RET_{i,t-0}\times DC_{i,t-0} + \lambda_1 RET_{i,t-1}\times DC_{i,t-1} + \lambda_2 RET_{i,t-2}\times DC_{i,t-2} + \lambda_{(3,4)} RET_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \lambda_{(5,7)} RET_{i,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \gamma_0 RET_{i,t-0}\times D_{i,t-0} + \gamma_1 RET_{i,t-1}\times D_{i,t-1} + \gamma_2 RET_{i,t-2}\times D_{i,t-2} + \gamma_{(3,4)} RET_{i,(t-3,t-4)}\times D_{i,(t-3,t-4)} + \gamma_{(5,7)} RET_{i,(t-5,t-7)}\times D_{i,(t-5,t-7)} + \varphi_0 RET_{i,t-0}\times D_{i,t-0}\times DC_{i,t-0} + \varphi_1 RET_{i,t-1}\times D_{i,t-1}\times DC_{i,t-1} + \varphi_2 RET_{i,t-2}\times D_{i,t-2}\times DC_{i,t-2} + \varphi_{(3,4)} RET_{i\,(t-3,t-4)}\times D_{i,(t-3,t-4)}\times DC_{i,(t-3,t-4)} + \varphi_{(5,7)} RET_{i\,(t-5,t-7)}\times D_{i\,(t-5,t-7)}\times DC_{i,(t-5,t-7)} + \varepsilon_{i,t}$

where $E_{i,t}$ denotes earning per share after extraordinary items of firm i at year t. $RET_{i,t-k}$ denotes the

price difference between the starting price of year t–k and the ending price of year t–k for firm i if k = 0, 1 or 2. $RET_{i,(t-3,t-4)}$ denotes the price difference between the starting price of year t–4 and the ending price of year t–3 for firm i. $RET_{i,(t-5,t-7)}$ denotes the price difference between the starting price of year t–7 and the ending price of year t–5 for firm i. *RET*s are adjusted by the dividends. $E_{i,t}$ and each *RET* variable are deflated by the starting price of year t–7. $D_{i,t-k}$, $D_{i,(t-3,t-4)}$ and $D_{i,(t-5,t-7)}$ are dummy variables, which equal 1 if $RET_{i,t-k}$, $RET_{i,(t-3,t-4)}$ or $RET_{i,(t-5,t-7)} < 0$ respectively and 0 otherwise. $MB_{i,t-k}$ denotes market-to-book ratio of firm i at the end of year t−k. $MB_{i,(t-3,t-4)}$ denotes average market-to-book ratio of firm i at the end of year t−3 and t−4. $MB_{i,(t-5,t-7)}$ denotes average market-to-book ratio of firm i at the end of year t−5, t−6 and t−7. To control for heteroskedasticity, I use White's t-statistics (1980). A superscript of 'a', 'b', or 'c' in Panel A indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a one-tailed test if the coefficient has the predicted sign or in a two-tailed test if the coefficient is significantly different from zero.

Panel B Comparison of the extents of conservatism when considering multi-period earnings responses

		Multi-period model +MB	
Ind. variable	**Expected sign**	**Coef.**	**F-stat**
λ_0	–	-0.0036	36.40 [a]
$\lambda_0 + \lambda_1$	–	-0.0053	54.07 [a]
$\lambda_0 + \lambda_1 + \lambda_2$	–	-0.0060	60.93 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)}$	–	-0.0057	38.98 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$	–	-0.0068	42.27 [a]
$\lambda_0 + \varphi_0$	+	0.0019	6.09 [b]
$\lambda_0 + \lambda_1 + \varphi_0 + \varphi_1$	+	0.0026	7.30 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + \varphi_0 + \varphi_1 + \varphi_2$	+	0.0024	5.20 [b]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)}$	+	0.0017	23.87 [a]
$\lambda_0 + \lambda_1 + \lambda_2 + 2\times\lambda_{(3,4)} + 3\times\lambda_{(5,7)}$ $+ \varphi_0 + \varphi_1 + \varphi_2 + 2\times\varphi_{(3,4)} + 3\times\varphi_{(5,7)}$	+	0.0003	14.43 [a]

A superscript of 'a', 'b', or 'c' in Panel B indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test if the coefficient is significantly different from zero. The expected sign indicates positive relation between M/B ratio and conservatism, which is drawn from the results of prior literature based on asymmetric timeliness of earnings in Basu model.

Table 6 Summary of empirical results

Variables of firm characteristics [a]	*Results of prior literature* [b]	*Results of impacts on asymmetric timeliness* [c]	*Results of impacts on components of asymmetric timeliness* [d]		*Results of impacts on components of nonlinear asymmetric timeliness* [e]		*Results of impacts on components of multi-period asymmetric timeliness* [f]	
LEV1	*Positive*	*Positive*	ERGN:	*Indeterminable*	ERGN:	*Indeterminable*	CERGN:	*Negative*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Positive*	ERBN:	*Indeterminable*	CERBN:	*Positive*
					ERBN_INC	*Indeterminable*		
LEV2	*Positive*	*Negative*	ERGN:	*Negative*	ERGN:	*Indeterminable*	CERGN:	*Negative*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Negative*	ERBN:	*Positive*	CERBN:	*Positive*
					ERBN_INC	*Negative*		
DIV	*Positive*	*Negative*	ERGN:	*Negative*	ERGN:	*Negative*	CERGN:	*Negative*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Indeterminable*	ERBN:	*Negative*	CERBN:	*Negative*
					ERBN_INC	*Positive*		
STDROA	*Positive*	*Negative*	ERGN:	*Indeterminable*	ERGN:	*Indeterminable*	CERGN:	*Positive*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Negative*	ERBN:	*Negative*	CERBN:	*Positive*
					ERBN_INC	*Indeterminable*		

SV	*Positive*	*Indeterminable*	ERGN:	*Indeterminable*	ERGN:	*Indeterminable*	CERGN:	*Negative*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Indeterminable*	ERBN:	*Indeterminable*	CERBN:	*Positive*
					ERBN_INC	*Indeterminable*		
SIZE1	*Negative*	*Negative*	ERGN:	*Indeterminable*	ERGN:	*Positive*	CERGN:	*Positive*
					ERGN_INC:	*Negative*		
			ERBN:	*Negative*	ERBN:	*Negative*	CERBN:	*Negative*
					ERBN_INC	*Positive*		
SIZE2	*Negative*	*Positive*	ERGN:	*Negative*	ERGN:	*Indeterminable*	CERGN:	*Indeterminable*
					ERGN_INC:	*Negative*		
			ERBN:	*Positive*	ERBN:	*Negative*	CERBN:	*Negative*
					ERBN_INC	*Positive*		
MB	*Positive/Negative*	*Negative*	ERGN:	*Indeterminable*	ERGN:	*Indeterminable*	CERGN:	*Positive*
					ERGN_INC:	*Indeterminable*		
			ERBN:	*Negative*	ERBN:	*Negative*	CERBN:	*Positive*
					ERBN_INC	*Positive*		

[a] See Table 3 for detailed definitions.

[b] This column reports the expected impacts of the firm characteristics on comparing the extents of conservatism based on Basu's (1997) measure of asymmetric timeliness (except DIV and STDROA). Since Ahmed et al. (2002) compares the impacts of DIV and STDROA on conservatism based on market-based measure (Beaver and Ryan, 2000) and accrual-based model (Givoly and Hayn, 2000), the expected impacts of DIV and STDROA on comparing the extents of conservatism are reported based on those two models. Positive (Negative, Indeterminable) indicates that firms which have the characteristic have a higher (lower, the same) extent of conservatism than those which do not have. Definitions of Positive, Negative and Indeterminable are the same for the remaining of this table.

[c] This column reports the impacts of the firm characteristics on Basu's (1997) measure of asymmetric timeliness based on my empirical results.

[d] This column reports the impacts of the firm characteristics on components of asymmetric timeliness based on my empirical results. Components of asymmetric timeliness include earnings responses to good news (ERGN) and those to bad news (ERBN).

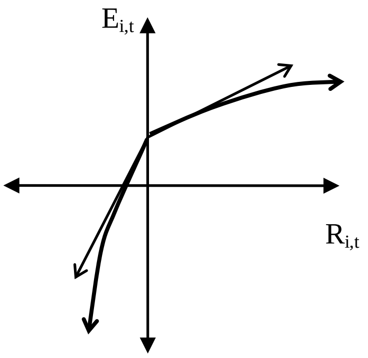
[e] This column reports the impacts of the firm characteristics on components of nonlinear asymmetric timeliness based on my empirical results. Components of nonlinear asymmetric timeliness include earnings responses to good news (ERGN), those to bad news (ERBN), incremental earnings responses to good news of large magnitudes (ERGN_INC) and those to bad news of large absolute magnitudes (ERBN_INC).

[f] This column reports the impacts of the firm characteristics on components of multi-period asymmetric timeliness based on my empirical results. Components of multi-period asymmetric timeliness include cumulative earnings responses to good news (CERGN) and those to bad news (CERBN).

Appendix[13]

Appendix 1 The expected relation between contemporaneous earnings (earnings responses) and returns of different magnitudes implied by Basu model and by the nonlinear earnings response model

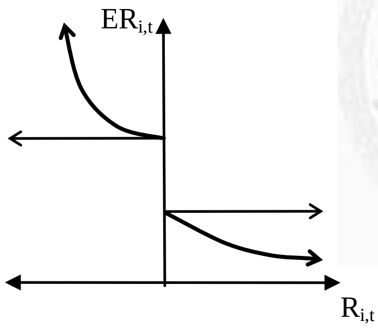
Panel A The expected relation between contemporaneous earnings and returns under conservatism



The relation between contemporaneous earnings and returns implied by Basu model

The relation between contemporaneous earnings and returns implied by the nonlinear earnings response model

Panel B Expected earnings responses to returns under conservatism



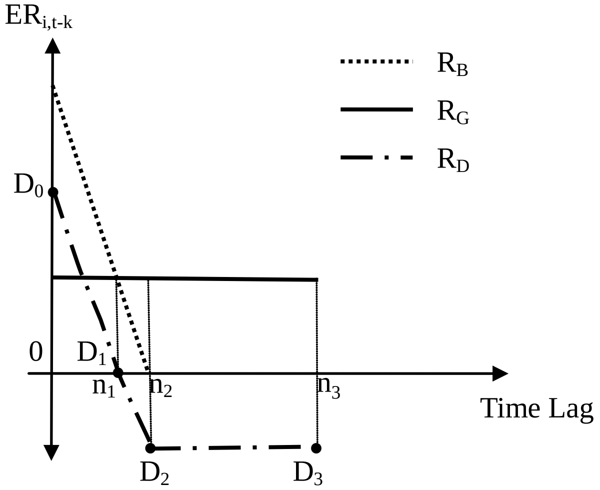
Earnings responses implied by Basu model

Earnings responses implied by the nonlinear earnings response model

This figure illustrates the expected relation between contemporaneous earnings and returns (Panel A) and expected earnings responses to returns (Panel B) implied by Basu's (1997) model and by the nonlinear earnings response model. $E_{i,t}$, $ER_{i,t}$, and $R_{i,t}$ denote earnings, earnings responses and annual returns for firm i in year t. The earnings response $ER_{i,t}$ refers to the contemporaneous sensitivity of earnings to returns. In Basu model, earnings respond both to positive returns and negative returns positively and with a constant rate. In contrast, in a nonlinear earnings response model, earnings respond to positive (negative) returns positively but with a decreasing (an increasing) rate. In Basu model, magnitudes of earnings responses to positive (negative) returns do not change with the absolute magnitudes of returns. In a nonlinear earnings response model, however, earnings responses to positive (negative) returns decrease (increase) with the absolute magnitudes of positive (negative) returns.

[13] Figures in Appendix are cited from Lin and Liu (2011) to illustrate the concepts.

Appendix 2 Multi-period earnings responses to good news and those to bad news



This figure describes multi-period earnings responses to good news and those to bad news. The horizontal axis Time Lag refers to the time lag k for recognizing good news or bad news if $k \neq 0$, $k = n_1, n_2, \ldots$ $k = 0$ denotes no time lag to recognize the publicly available news. n_1 denotes the time lag which the earnings response to bad news and that to good news are similar in magnitude. n_2 (n_3) denotes the time lag which bad (good) news is fully recognized in earnings, also the total length of earnings lags for recognizing bad (good) news. The vertical axis $ER_{i,t-k}$ refers to concurrent earnings responses to news if $k = 0$ or lagged k-period earnings responses to news for firm i if $k \neq 0$. R_G, R_B and R_D denote (lagged) earnings responses to good news, (lagged) earnings responses to bad news and (lagged) differential earnings responses during the recognition process respectively. D_0, D_1, D_2 and D_3 denote DERs of different lags. Notations for firms and time are suppressed for R_G, R_B and R_D for parsimony. R_D at $k = 0$ is positive, showing a conservative reporting for concurrent earnings. However, the DER varies during the recognition process. Because the earnings response to bad news is smaller than that to good news as lag increases, the positive DER reverses.