臺大管理論叢 2014/12
第 25 卷 第 1 期 1-32
DOI: 10.6226/NTURM2014.NOV.R11026

Basu (1997) 盈餘不對稱及時性觀念下，盈餘落後反應對穩健性比較之影響

The Effect of Earnings Lags on Comparing the Extent of Conservatism Based on Basu's (1997) Asymmetric Timeliness Concept

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Received 2011/6, Final revision received 2012/11

摘 要

本文檢視 Basu (1997) 盈餘不對稱及時性觀念下，盈餘落後反應對穩健性比較之影響。根據盈餘之落後反應、盈餘之不對稱反應以及兩者交互作用之結果，我們預期盈餘的不對稱及時性不僅存在好壞消息發生之當期，亦存在短暫的落後期間，因此以盈餘報酬間關係作為比較公司間穩健性之指標時，須同時考慮當期及累積期之不對稱性大小，亦須同時考慮盈餘落後反應之期間長短。本文以盈餘多期反應模型捕捉盈餘對好壞消息之落後多期反應，預期盈餘的不對稱及時性在當期及落後較短期間為正，在盈餘落後期間拉長、壞消息對盈餘的影響完全反應完後會轉為負。本文以美國 74,550 筆公司 - 年之樣本檢視上述預期，而實證結果均與預期相符。

【關鍵字】穩健性、盈餘不對稱及時性、盈餘落後反應

Abstract

This paper examines the effect of earnings lags on estimating and comparing the extent of conservatism based on Basu's (1997) asymmetric timeliness concept. Based on earnings lags and earnings asymmetry, as well as the interaction between these two; we assert that any comparisons of the extent of conservatism should take the magnitude of both concurrent and cumulative asymmetric timeliness into consideration. The length of recognition lag should also be considered. In the present study, we construct a multi-period model to capture lags in earnings response to good news, as well as to bad news. We predict that positive asymmetric timeliness exists in the current period and with short lags. We also predict that asymmetric timeliness turns negative as lags increase. Using a sample of 74,550 U.S. non-financial and non-utility firm-years, empirical results are consistent with our predictions. Results are also robust to several changes in model and sample specifications.

【Keywords】conservatism, asymmetric timeliness, earnings lags

1. Introduction

Conservatism is an important attribute in accounting. It improves the quality of accounting information and benefits the users of financial statements. Prior literature has referred to conditional conservatism as news-dependent conservatism, which is different from unconditional conservatism (Beaver and Ryan, 2005; Ryan, 2006). Basu (1997) uses a reverse regression, with current earnings and current returns as dependent and independent variables, respectively, to interpret it. His argument is based on the fact that earnings react to good news, which positive returns are used as the proxy at a higher threshold, while earnings react to bad news which negative returns are used as the proxy at a lower threshold. The difference in recognition thresholds results in large concurrent earnings responses to bad news and small concurrent earnings responses to good news. Basu claims that incremental earnings responses to bad news capture the asymmetric recognition of accounting earnings and interprets the asymmetric timeliness of earnings as showing the existence of conditional conservatism.

Due to this concise and effective conclusion, the Basu measure is widely used in academic research. A great number of papers have used the difference in magnitudes of the Basu measure to estimate and compare the extent of conservatism among firms.[1] The Basu model estimates the asymmetric timeliness of earnings based on a one-year period. Conclusions that compare the extent of conservatism among firms based on this model rest on the difference in concurrent asymmetric timeliness and may be subject to estimation errors. We argue that, due to the lagged reaction of earnings to firm news, excluding any lagged asymmetric earnings responses when comparing the extent of conservatism may not fully capture the complete earnings recognition process, and may therefore cause errors. To address these errors, we propose a seven-year-period model that describes how the

1 For example, the extent of conservatism may differ across firms with different characteristics and choices, including sizes, leverage, debt covenants, litigation risk, or whether cross-listed in the U.S. (Chung and Wynn, 2008; Givoly, Hayn, and Natarajan, 2007; Holthausen and Watts, 2001; Khan and Watts, 2009; LaFond and Roychowdhury, 2008; Lang, Raedy, and Yetman, 2003; Nikolaev, 2010; Qiang, 2007), with different corporate governance schemes (Ahmed and Duellman, 2007; Chung and Wynn, 2008; García Lara, García Osma, and Penalva, 2009a, 2009b; LaFond and Roychowdhury, 2008; LaFond and Watts, 2008; Qiang, 2007), or in different industries (Chung and Wynn, 2008; LaFond and Roychowdhury, 2008). Some studies focus on the impact of auditor-related factors on conservatism (Basu, 1997; García Lara et al., 2009b; Qiang, 2007). These are also papers extending and exploring how asymmetric timeliness varies across time (Givoly and Hayn, 2000; Holthausen and Watts, 2001; Ryan and Zarowin, 2003; Shivakumar and Waymire, 2003) or countries (Ball, Kothari, and Robin, 2000; Ball, Robin, and Wu, 2003; Ball, Robin, and Sadka, 2008; Bushman and Piotroski, 2006; Chung and Wynn, 2008; Giner and Rees, 2001; Givoly et al., 2007; Pope and Walker, 1999).

asymmetric timeliness of earnings is manifested under the multi-period concept. Our research design differs from Basu's and aims to identify the lagged asymmetric earnings responses for each period.

This paper is based on multi-period recognition of earnings to firms' events. Basu (1997) re-examines accounting conservatism by demonstrating that the concurrent earnings recognition of bad news is faster than that of good news. When earnings react to firm news with a lag, however, the process through which earnings recognize the entirety of this news will occur over several periods. Therefore, the extent of conservatism should be evaluated by the larger extent of bad news that has been reflected in earnings relative to good news. In other words, the extent of conservatism can be seen in as much as the recognition of bad news is reflected more quickly in concurrent and cumulative earnings than good news. By omitting lagged earnings responses, the comparison will only focus on how earnings react to firm news concurrently, but will not consider how earnings recognize the entire extent of this news. In addition, the measurement of conservatism will be subject to estimation errors when the lagged incremental earnings responses to bad news are excluded. Therefore, incorporating prior-year returns in Basu's model and aggregating the asymmetric timeliness of earnings, for the current and lagged periods, can be more representative of the extent of conservatism and can help mitigate this error. We believe our paper, which is based on the multi-period model, can therefore provide a more accurate estimate than Basu (1997) for asymmetric timeliness earnings when comparing to the extent of conservatism.[2]

The expectations above are examined empirically with variations in signs of asymmetric timeliness during individual periods of a multi-period model. When earnings are expected to reflect bad news faster than good news, both concurrently and cumulatively, earnings responses to bad news are concurrently larger, but decline faster than those to good news. As earnings lags increase, the difference between earnings responses to bad news and good news varies in both magnitude and signs. Therefore, the sign of the asymmetric timeliness in individual periods varies depending on the length of earnings lags. The variation in signs of asymmetric timeliness in individual lagged periods supports our argument, which states the lagged difference between earnings responses to good news and to bad news. We illustrate these implications with cases in which there is a divergence in the extent of conservatism among firms using single- and multi-period models. These cases

2 Accounting principles do not force all bad news to be recognized immediately. When to recognize the bad news depends on the managers' judgment and discretion; therefore, bad news may be equally recognized by two firms concurrently but be recognized differently with lags.

show that the sole reliance on the concurrent asymmetric timeliness of earnings to compare the extent of conservatism among firms may lead to incorrect conclusions. In sum, our findings suggest that considering both the contemporaneous and lagged earnings responses can help estimate and compare the extent of conservatism more completely, especially for firms with a long-lasting process of accounting recognition.

This study differs from prior studies which include lagged earnings responses in the earnings-returns relation (Pope and Walker, 1999; Giner and Rees, 2001; Ryan and Zarowin, 2003) in how to compare the extent of conservatism across firms. Based on earnings lags, we argue that the entirety of news will be recognized with multi-period lags. Therefore, the extent of both concurrent and cumulative asymmetric timeliness should be considered when comparing the extent of conservatism across firms. Prior studies distinguish the impact of prior news on current earnings and eliminate the measurement bias in current earnings; however, they compare the extent of conservatism across firms based on current asymmetric timeliness only. They neither consider the impact of lagged earnings responses on cumulative asymmetric timeliness nor on the entire earnings conservatism.

The contribution of our study is twofold. First, based on both earnings asymmetry and earnings lags, we show that the difference between earnings responses to good news and bad news has lags and the extent of conservatism should be measured concurrently and cumulatively rather than just concurrently. Second, our arguments show that a more complete estimation and comparison of conservatism by considering multi-period earnings responses is needed, and that prior conclusions for comparing the extent of conservatism across firms need to be re-examined. In sum, our study helps to understand how earnings lags affect the estimation and comparison of the extent of conservatism among firms.

The remainder of this paper is organized as follows: Section 2 reviews the related literature, Section 3 describes the hypotheses and the regression equation, Section 4 reveals data sources and descriptive statistics, and Section 5 reports and interprets the empirical results. Section 6 then summarizes the major findings in the conclusion.

2. Literature Review

In this section, we review the literature that helps develop a theoretical basis for our hypotheses. In an efficient market, prices anticipate market expectations and react right away. In contrast, accounting numbers are limited to conventions such as conservatism, reliability, and recognition thresholds; and tend to incorporate economic events at a later date. Since information content is richer in prices than in earnings, earnings reflect price changes with lags, also known as earnings lags (e.g., Ball and Brown, 1968; Beaver, Lambert, and Morse, 1980; Beaver, Lambert, and Ryan, 1987). Assuming that changes in firm values that are reflected in prices will also be reflected in accounting earnings over the life of the firm, earnings lags directly result in current earnings reflecting current and previous returns or price changes (Warfield and Wild, 1992; Beaver and Ryan, 1993). However, there has been no consistent evidence supporting a precise length for earnings lags. Studies by Collins, Kothari, Shanken, and Sloan (1994) and Kothari and Sloan (1992) both find that earnings capture the information of lagged-periods' returns, but the explanatory power increases only slightly beyond three years while Beaver and Ryan (1993) find that book values reflect changes in market values with six-year lags. Moreover, these papers do not explore how earnings respond to good news and to bad news respectively with multi-period lags.

Only a few conservatism studies have included prior news into the earnings-returns relation. Pope and Walker (1999) use several measures to describe different aspects of concurrent asymmetric timeliness when comparing the extent of conservatism for U.K. and U.S. firms (in Fig. 1 of p. 61). They include the past three-year changes in prices for earnings-returns relations and reduce bias in earnings responses due to prior news. However, all of their measurements are based on concurrent earnings responses and do not consider the impact of lagged incremental earnings in response to firms' news when comparing the extent of conservatism across U.S. firms and U.K. firms. Giner and Rees (2001) employ the same method as did Pope and Walker, and find that the concurrent asymmetric timeliness of earnings decreases as one moves across the U.K., France and Germany. Ryan and Zarowin (2003) explore the time trend of magnitudes of current return coefficients while considering summed coefficients of lagged returns. The above papers all compare the extent of conservatism based on the magnitude of the concurrent asymmetric timeliness, though they include prior period news in the earnings-returns regression model. These studies do not consider how earnings lags affect the comparison of asymmetric timeliness across firms and do not provide an explanation for, and signs of, asymmetric timeliness in individual lagged periods, which are important for investigating whether multi-period earnings responses exist and how they are manifested.

Roychowdhury and Watts (2007) argue that Basu's single-period earnings-returns relation captures asymmetric earnings responses to news that arrives in one period only; therefore the Basu measure pinpoints asymmetric verification thresholds rather than aggregate conservatism. They define conservatism as the cumulative effect of past asymmetric timeliness. Moreover, they suggest that the asymmetric timeliness measure better captures the extent of conservatism when this asymmetric timeliness is measured cumulatively over several periods, since the cumulative asymmetric timeliness measure aggregates conservatism better across all periods. Roychowdhury and Watts (2007), Ahmed and Duellman (2007), LaFond and Roychowdhury (2008), LaFond and Watts (2008) and Li (2010) all regress cumulative earnings on cumulative returns and find the cumulative asymmetric timeliness coefficient to still be significant when the horizon of returns increases to three years. Though these empirical results seem to support the existence of lagged asymmetric timeliness, they focus on the cumulative asymmetric timeliness across all prior periods. When asymmetric timeliness is measured against three-year backward-cumulated earnings and returns, it captures the average extent of asymmetric timeliness across periods rather than the variations of asymmetric timeliness in individual periods. Moreover, these papers do not discuss how to compare the extent of conservatism based on cumulative asymmetric timeliness.

3. Hypothesis Development and Regression Equation

3.1 Hypothesis Development

3.1.1 Hypotheses

Our hypotheses examine the effect of earnings lags on the asymmetric timeliness of earnings in support of our argument that estimating and comparing the extent of conservatism. This is based on the concept that asymmetric timeliness should take multi-period asymmetric timeliness into consideration. Our argument is based on both earnings asymmetry and earnings lags. As for earnings asymmetry, the verification threshold for recognizing bad news is different from that for good news (Basu, 1997). This results in the earnings response to bad news being larger than that to good news when economic events occur. As for earnings lags, earnings respond to economic events with multi-period lags and decay (Warfield and Wild, 1992; Beaver and Ryan, 1993). The two elements interact and as a result, the impact of bad news on earnings is less persistent than that of good news. That is, earnings respond to bad news with a shorter lag than to good news. This is because the impact of bad news on earnings is fully recognized sooner than good news, due to a lower verification threshold. Since earnings respond to bad news both with a shorter lag and by a larger magnitude concurrently, the impact of bad news on earnings should be recognized faster than that of good news concurrently and cumulatively and therefore decline faster than those of good news.

Based on the argument above, signs of asymmetric timeliness are positive when earnings responses to bad news are larger than those to good news concurrently, and when they have shorter lag times. When earnings responses to bad news decline with lags and are as large as those to good news, differences in the asymmetric timeliness become insignificant. When earnings responses to bad news decline with longer lags and become smaller than those to good news, differences in the asymmetric timeliness become negative. These result in varying signs of asymmetric timeliness. If the variation exists as expected, our argument that the difference between earnings responses to good news and those to bad news exist with lags will be true, and comparing the extent of conservatism among firms based on the asymmetric timeliness concept should therefore take the effect of earnings lags into consideration. In sum, we state our hypotheses as follows:

H1a: The asymmetric timeliness of earnings is positive at the current period which bad news occurs and at lagged periods closer to the current period.

H1b: The asymmetric timeliness of earnings turns insignificant with a shorter earnings lag.

H1c: The asymmetric timeliness of earnings turns negative with a longer earnings lag.

We make no hypothesis for the length of lags when signs of asymmetric timeliness become insignificant or negative. This is because the goals of our hypotheses are to examine variations in asymmetric timeliness rather than to examine the exact lag periods in which asymmetric timeliness turns insignificant or negative. Besides, the length of lags varies according to the type of news, firms, and industries; however, the empirical results in our study only capture signs of asymmetric timeliness with the average lengths of lags. Therefore, we cannot predict the length of the lags during which signs of asymmetric timeliness turn insignificant or negative.

3.1.2 Illustrative Examples

The concept introduced in Section 3.1.1 can be illustrated with the recognition of bad debt expenses. Firms record bad debt expenses when their customers are judged to be unable to pay their debts. The amount of bad debt is estimated according to their uncollectibility. Therefore, according to the evidence collected at the time of estimation, we can see that uncollectibility may exist with lags. Recognizing bad debts may lag for several periods and using this difference in concurrent asymmetric timeliness will not show the difference in conservatism which shows up in the lagged asymmetric timeliness. We also illustrate how to apply this multi-period concept when comparing the extent of conservatism in the following cases. Suppose the multi-period earnings response model of firms with characteristic A (hereafter, A-type firms) and firms with characteristic B (hereafter, B-type firms) is as follows:

$$E_{i,t}=int.+\delta_0 D_{i,t}+\alpha_0 RET_{i,t}+\beta_0 RET_{i,t}\times D_{i,t}+\delta_1 D_{i,t\text{-}1}+\alpha_1 RET_{i,t\text{-}1}+\beta_1 RET_{i,t\text{-}1}\times D_{i,t\text{-}1}$$
$$+\delta_2 D_{i,t\text{-}2}+\alpha_2 RET_{i,t\text{-}2}+\beta_2 RET_{i,t\text{-}2}\times D_{i,t\text{-}2}+\delta_3 D_{i,t\text{-}3}+\alpha_3 RET_{i,t\text{-}3}+\beta_3 RET_{i,t\text{-}3}\times D_{i,t\text{-}3}$$
$$+\delta_4 D_{i,t\text{-}4}+\alpha_4 RET_{i,t\text{-}4}+\beta_4 RET_{i,t\text{-}4}\times D_{i,t\text{-}4}+\sum_k YD_k YearDummies_y+\varepsilon_{i,t} \quad (1)$$

where *i* denotes A-type firms or B-type firms.

The two cases in Table 1 describe the different earnings recognition processes of these two types of firms. In case 1, A-type and B-type firms have the same magnitude of concurrent asymmetric timeliness ($\beta_{A,0}=\beta_{B,0}=0.2$), but different cumulative positive asymmetric timeliness with one- or two-year lags ($\beta_{A,0}+\beta_{A,1}=\beta_{A,0}+\beta_{A,1}+\beta_{A,2}=0.4$, $\beta_{B,0}+\beta_{B,1}=\beta_{B,0}+\beta_{B,1}+\beta_{B,2}=0.3$). In a multi-period recognition process, A-type firms have a higher degree of conservatism than B-type firms ($\beta_{A,0}+\beta_{A,1}>\beta_{B,0}+\beta_{B,1}$ or $\beta_{A,0}+\beta_{A,1}+\beta_{A,2}>\beta_{B,0}+\beta_{B,1}+\beta_{B,2}$). However, using only concurrent asymmetric timeliness to compare the extent of conservatism for these two firms does not entirely take into consideration the timely recognition lag of bad news, and mistakenly concludes that both firms have the same extent of conservatism. In case 2, both A-type firms and B-type firms have the same magnitude of concurrent and cumulative asymmetric timeliness with a two-year lag ($\beta_{A,0}=\beta_{B,0}=0.1$; $\beta_{A,0}+\beta_{A,1}+\beta_{A,2}=\beta_{B,0}+\beta_{B,1}+\beta_{B,2}=0.3$). However, A-type firms have a shorter lag for recognizing bad news than B-type firms (A-type firms have cumulative asymmetric timeliness equal to 0.3 with a one-year lag, while B-type firms have a two-year lag). Looking at the length of earnings lags, A-type firms have a higher extent of conservatism than B-type firms. However, using just the concurrent asymmetric timeliness will not show the difference in the extent of conservatism between these two-types of firms. Both cases suggest that comparing the extent of conservatism among firms should take the amount of concurrent, cumulative asymmetric timeliness and the length of lag into consideration at the same time.

Table 1 Applying a Multi-period Concept when Comparing the Extent of Conservatism among Firms

Panel A Case 1: The same concurrent asymmetric timeliness, different cumulative asymmetric timeliness

j	0	1	2	3	4
α_j	0.2	0.2	0.2	0.2	0.2
$\beta_{A,j}$	0.2	0.2	0	-0.2	-0.2
$\beta_{B,j}$	0.2	0.1	0	-0.1	-0.2

Panel B Case 2: The same concurrent and cumulative asymmetric timeliness, different lengths of lag

j	0	1	2	3	4
α_j	0.2	0.2	0.2	0.2	0.2
$\beta_{A,j}$	0.1	0.1	0	0	-0.2
$\beta_{B,j}$	0.1	0	0.1	-0.1	-0.1

$$\begin{aligned}E_{i,t} = & int. + \delta_0 D_{i,t} + \alpha_0 RET_{i,t} + \beta_0 RET_{i,t} \times D_{i,t} + \delta_1 D_{i,t\text{-}1} + \alpha_1 RET_{i,t\text{-}1} + \beta_1 RET_{i,t\text{-}1} \times D_{i,t\text{-}1} \\ & + \delta_2 D_{i,t\text{-}2} + \alpha_2 RET_{i,t\text{-}2} + \beta_2 RET_{i,t\text{-}2} \times D_{i,t\text{-}2} + \delta_3 D_{i,t\text{-}3} + \alpha_3 RET_{i,t\text{-}3} + \beta_3 RET_{i,t\text{-}3} \times D_{i,t\text{-}3} \\ & + \delta_4 D_{i,t\text{-}4} + \alpha_4 RET_{i,t\text{-}4} + \beta_4 RET_{i,t\text{-}4} \times D_{i,t\text{-}4} + \sum_k YD_k YearDummies_y + \varepsilon_{i,t}\end{aligned}$$

where *i* denotes A-type firms or B-type firms.

3.2 Regression Equation

We construct this regression equation to examine the variation in lagged asymmetric timeliness. To avoid noises in the earnings-returns relation as earnings lags increase, which may garble our result; we extend the return horizon and aggregate returns as lags increase (Giner and Rees, 2001; Collins and Kothari, 1989; Kothari and Sloan, 1992). The following regression equation examines how earnings incorporate returns with lags and asymmetry, as well as their interaction:

$$\begin{aligned}E_{i,t} = & \ int. + \delta_0 D_{i,t} + \alpha_0 RET_{i,t} + \beta_0 RET_{i,t} \times D_{i,t} + \delta_1 D_{i,t\text{-}1} + \alpha_1 RET_{i,t\text{-}1} + \beta_1 RET_{i,t\text{-}1} \times D_{i,t\text{-}1} \\ & + \delta_2 D_{i,t\text{-}2} + \alpha_2 RET_{i,t\text{-}2} + \beta_2 RET_{i,t\text{-}2} \times D_{i,t\text{-}2} + \delta_{(3,4)} D_{i,(t\text{-}3,t\text{-}4)} + \alpha_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} \\ & + \beta_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} \times D_{i,(t\text{-}3,t\text{-}4)} + \delta_{(5,6,7)} D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \alpha_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} \\ & + \beta_{(5,6,7)} RETi_{,(t\text{-}5,t\text{-}6,t\text{-}7)} \times D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \sum_{k=1980}^{2008} YD_k YearDummies_y \\ & + \sum_{g=1}^{57} ID_g IndustryDummies_s + \varepsilon_{i,t}\end{aligned} \quad (2)$$

where $E_{i,t}$ denotes earnings per share (hereafter, EPS) at year *t*. $RET_{i,t\text{-}k}$ denotes the price difference between the starting price of year *t*-*k* and the ending price of year *t*-*k*, with k=0, 1, and 2. $RET_{i,(t\text{-}3,t\text{-}4)}$ denotes the price difference between the starting price of year *t*-4 and the ending price of year *t*-3. $RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}$ denotes the price difference between the starting price of year *t*-7 and the ending price of year *t*-5. Each *RET* variable is adjusted with dividends and cumulative adjustment factors. EPS and each *RET* variable is then deflated by the starting price of fiscal year *t*-7 for firm *i*. $D_{i,t\text{-}j}$ is a dummy variable, which equals 1 if $RET_{i,t\text{-}j<0}$ for firm *i*, with j = 0, 1, 2, (3,4), (5,6,7) and otherwise equals 0. We do not aggregate current and lagged-one or -two period returns because the earnings-returns relation is stronger.[3] We aggregate lagged-three and -four period returns because prior studies have suggested that the explanatory power of information in returns increases only slightly beyond three lagged-periods (Collins et al., 1994; Kothari and Sloan, 1992). We further aggregate lagged-five to -seven period returns because the earnings-returns relation is relatively smaller for these lagged-five to seven period returns than for lagged-three and four period returns. This allows us to mitigate the effect of noise with longer periods of aggregation. We only include current and lagged-seven year returns in our regression model since we find that the explanatory power (i.e., R^2) of regression equations increases only slightly when lagged-eight period or higher returns are included.[4] Moreover, since we exclude observations with missing values in required variables, sample sizes decrease dramatically when more lagged-period returns are included. To avoid losing sample representativeness due to these small samples and to avoid survivorship bias caused by the inclusion of observations which only have long-term data, we include only current and lagged-seven year returns in our regression model. Like Ryan (2006), we include industry and year dummies in the regression equation to control the effect of industry-specific factors and time-series inconsistency when estimating asymmetric timeliness. Industry dummies are created based on the first two digits of the SIC-code of the firm and year dummies are created for the years in our sample period.

We expect that the incremental impact of bad news on earnings (i.e., coefficients of $RET_{i,t\text{-}j} \times D_{i,t\text{-}j}$ or β_0, β_1, β_2, $\beta_{(3,4)}$ and $\beta_{(5,6,7)}$) will be significantly positive over periods during

3 Prior studies have suggested that stock returns have both signal and noise components and that only the signal component is relevant to firm performance (e.g., Holmstrom, 1982; Sloan, 1993). The association between the signal component of returns and earnings relative to that between the noise component and earnings decreases as earnings lags increase since the information of returns is gradually reflected in earnings. This results in a weak lagged earnings-returns relation. Supposing noises occur without perfectly correlation, aggregating returns can mitigate the impact of these noises on earnings-returns relations and make the relation between returns and lagged earnings stronger.

4 R^2 of the regression equations are 39.48%, 41.50% and 42.88% respectively when lagged-eight, nine and ten period returns are included, in contrast to a R^2 of 37.69% when the lagged-seven period return is included.

which news happens or periods closer to the current one, and will become insignificant and then significantly negative as lags increase.

4. Data

We collect all of our data from Compustat's fundamental annual database (Xpressfeed format). The sample includes all companies, except utility (SIC codes 4000-4999) and financial firms (SIC codes 6000-6999). To avoid survivorship bias, both active and inactive companies are included. The sample period covers the years 1980 to 2009. Observations in the top or bottom 0.5% of deflated current earnings, or current and lagged-period returns are excluded. In addition, observations with any missing values for the required variables are deleted. To control for heteroskedasticity, we use White's (1980) t-statistics.

We calculate lagged-period returns as follows: The ending share price of the period and the dividend for the period are adjusted with the cumulative factor by the ex-date for the period. The starting price of the period is adjusted with the cumulative factor by the ex-date for the preceding period. The return for each period is calculated by adding the adjusted ending price of the period to the adjusted dividend, and then subtracting the adjusted beginning price from this. The result is then deflated by the adjusted starting price of the earliest period for all lagged-period price changes.

Panel A of Table 2 shows mean values of deflated earnings, current and lagged-period returns and dummies of negative returns, each by year. Panel B of Table 2 shows descriptive statistics of deflated earnings, current and lagged-period returns and dummies of negative returns for the sample. The mean for every dummy D is around 40%, indicating that the proportion of observations with negative returns does not fluctuate significantly. Panel C of Table 2 reports correlation coefficients of deflated earnings, as well as current and lagged-period returns. The correlation between earnings and lagged-period returns decreases as earnings lags increase. This is consistent with prior findings that the impact of economic events is recognized in earnings with lags and with steady decay (Warfield and Wild, 1992).

Table 2 Sample Composition and Descriptive Statistics

Panel A Mean values of deflated earnings, current and lagged-period returns and dummies of negative returns, by year

Year	*N*	$E_{i,t}$	$D_{i,0}$	$R_{i,0}$	$D_{i,1}$	$R_{i,1}$	$D_{i,2}$	$R_{i,2}$	$D_{i,(3,4)}$	$R_{i,(3,4)}$	$D_{i,(5,6,7)}$	$R_{i,(5,6,7)}$
1980	2075	0.2060	0.2520	0.7053	0.2906	0.4188	0.2949	0.2418	0.2092	0.3860	0.7195	-0.1374
1981	2036	0.3183	0.4686	0.0931	0.2510	0.9044	0.2952	0.5396	0.2711	0.6356	0.2805	0.5825
1982	1943	0.2993	0.3433	0.8483	0.4740	0.0415	0.2491	1.1379	0.2059	1.2146	0.1091	1.3614
1983	1919	0.2420	0.1746	1.2919	0.3434	0.6130	0.4768	-0.0376	0.1923	1.3713	0.1704	0.9789
1984	1834	0.2261	0.5622	-0.1261	0.1783	1.0088	0.3359	0.5140	0.2814	0.6963	0.2056	0.9201
1985	1753	0.1611	0.2778	0.7775	0.5625	-0.1402	0.1786	0.9348	0.3748	0.4324	0.1306	1.2463
1986	1796	0.1367	0.3680	0.5268	0.2918	0.6096	0.5724	-0.1561	0.1682	1.1413	0.2160	0.8602
1987	1855	0.1380	0.5035	-0.0526	0.3784	0.4550	0.3051	0.5641	0.3035	0.5809	0.2631	0.8896
1988	1820	0.1330	0.3764	0.2388	0.5154	-0.0606	0.3846	0.3724	0.4467	0.3489	0.2703	0.9688
1989	1916	0.1128	0.4228	0.2745	0.3888	0.2444	0.5193	-0.0823	0.3356	0.7634	0.2944	0.7492
1990	2043	0.0558	0.6730	-0.1976	0.4156	0.2408	0.3916	0.1522	0.4523	0.3020	0.2839	0.7325
1991	2204	0.0306	0.3385	0.4070	0.6642	-0.0912	0.4133	0.2058	0.4492	0.1221	0.4301	0.3966
1992	2270	0.0418	0.3987	0.1915	0.3317	0.4736	0.6573	-0.1176	0.3907	0.3207	0.3806	0.4898
1993	2304	0.0461	0.3346	0.3006	0.3950	0.1667	0.3207	0.4001	0.5464	0.0910	0.4067	0.3131
1994	2470	0.0707	0.5057	0.0154	0.3377	0.2830	0.3960	0.1523	0.5045	0.2895	0.4275	0.3150
1995	2615	0.0750	0.3537	0.5050	0.5120	-0.0248	0.3373	0.2994	0.3002	0.5839	0.5094	0.1963
1996	2619	0.0817	0.3799	0.3066	0.3486	0.4997	0.5078	-0.0277	0.3226	0.4687	0.4330	0.4507
1997	2623	0.0741	0.3618	0.4191	0.3774	0.2773	0.3500	0.4346	0.3816	0.2444	0.4278	0.4873
1998	2550	0.0643	0.6365	-0.2853	0.3667	0.4738	0.3745	0.3027	0.4000	0.4744	0.2596	1.0061
1999	2533	0.0716	0.5124	0.3873	0.6328	-0.2723	0.3683	0.3568	0.3071	0.6613	0.3640	0.5217
2000	2559	0.0661	0.5537	0.0521	0.5107	0.3011	0.6327	-0.2184	0.3517	0.5440	0.3560	0.6252
2001	2744	0.0055	0.4825	-0.0441	0.5630	0.0306	0.4923	0.3251	0.5317	0.1138	0.3848	0.5034
2002	2866	0.0049	0.6235	-0.2496	0.4738	0.0084	0.5628	-0.0300	0.5907	0.1355	0.3144	0.8202
2003	3135	0.0483	0.1907	0.6139	0.6265	-0.2141	0.4855	-0.0345	0.5049	0.2923	0.4702	0.3758
2004	3333	0.0694	0.3555	0.3205	0.1845	0.5589	0.6349	-0.2262	0.5467	-0.0577	0.4974	0.4850

2005	3342	0.0637	0.4470	0.2470	0.3543	0.2593	0.1825	0.5009	0.5685	-0.2418	0.5943	0.2399
2006	3365	0.0816	0.4036	0.2679	0.4508	0.3318	0.3581	0.3280	0.3768	0.3523	0.4972	0.3787
2007	3428	0.0597	0.5481	0.1375	0.4084	0.2417	0.4624	0.2689	0.1779	0.8152	0.6321	-0.0238
2008	3404	0.0005	0.8898	-1.0144	0.5358	0.1510	0.4022	0.2683	0.3854	0.6291	0.4345	0.5529
2009	3196	0.0051	0.2926	0.4491	0.8861	-1.0100	0.5188	0.1729	0.3874	0.5451	0.3395	0.7802

For parsimony, $R_{i,k}$ denotes $RET_{i,t-k}$ with k=0, 1, and 2. $R_{i,(3,4)}$ denotes $RET_{i,(t-3,t-4)}$. $D_{i,(3,4)}$ denotes $D_{i,(t-3,t-4)}$. $R_{i,(5,6,7)}$ denotes $RET_{i,(t-5,t-6,t-7)}$. $D_{i,(5,6,7)}$ denotes $D_{i,(t-5,t-6,t-7)}$. $E_{i,t}$ denotes earning per share at year t. $RET_{i,t-k}$ denotes price differences between the starting price of year t-k and the ending price of year t-k, with k=0, 1, and 2. $RET_{(t-3,t-4),i}$ denotes the price difference between the starting price of year t-4 and the ending price of year t-3. $RET_{(t-5,t-6,t-7),i}$ denotes the price difference between the starting price of year t-7 and the ending price of year t-5. The price differences are adjusted with dividends. EPS and each RET variable are deflated by the starting price of fiscal year t-7 for firm i. $D_{i,t-j}$ is a dummy variable, which equals 1 if $RET_{i,t-j} < 0$ for firm i, with j=0, 1, 2, (3,4), (5,6,7) and equals 0 in all other cases.

Panel B Descriptive statistics of deflated earnings, current and lagged-period returns and dummies of negative returns for the pooled sample

Variable	*Mean*	*Med*	*P25*	*P75*	*N*
$E_{i,t}$	0.0882	0.0617	-0.0200	0.1888	74550
$D_{i,0}$	0.4417	0.0000	0.0000	1.0000	74550
$D_{i,1}$	0.4434	0.0000	0.0000	1.0000	74550
$D_{i,2}$	0.4214	0.0000	0.0000	1.0000	74550
$D_{i,(3,4)}$	0.3859	0.0000	0.0000	1.0000	74550
$D_{i,(5,6,7)}$	0.3902	0.0000	0.0000	1.0000	74550
$R_{i,0}$	0.2190	0.0393	-0.2075	0.4658	74550
$R_{i,1}$	0.2009	0.0404	-0.2095	0.4491	74550
$R_{i,2}$	0.2345	0.0602	-0.1750	0.4539	74550
$R_{i,(3,4)}$	0.4432	0.1493	-0.1915	0.7359	74550
$R_{i,(5,6,7)}$	0.5638	0.2214	-0.2981	0.9342	74550

All variable definitions are as in Panel A of Table 2.

Panel C Correlation coefficients of deflated earnings, and current and lagged-period returns

	$R_{i,0}$	$R_{i,1}$	$R_{i,2}$	$R_{i,(3,4)}$	$R_{i,(5,6,7)}$
$E_{i,t}$	0.31	0.31	0.21	0.21	0.12

All variable definitions are as in Panel A of Table 2. Figures in bold indicate that the correlation coefficients are significant at the 5% level or higher.

5. Empirical Analyses

5.1 Regression Results

Panel A of Table 3 shows regression results for the hypotheses. The incremental coefficients of current (β_0), one year lagged (β_1) and two year lagged (β_2) incremental earnings responses to bad news are significantly positive, supporting *H1a*. The asymmetric earnings response coefficient then turns insignificant at the three-four year lagged point ($\beta_{(3,4)}$), supporting *H1b*. It finally turns significantly negative with a five-seven year lag ($\beta_{(5,6,7)}$), supporting *H1c*. In sum, our hypotheses are all supported. These indicate that the impact of differential verification thresholds for recognizing good news and bad news is shown in both the magnitude and the length of earnings responses. While earnings respond to bad news quicker than to good news contemporaneously and/or with short lags, these differences between earnings responses should be seen as a more accurate comparison of the extent of conservatism, since they capture the timelier recognition of bad news. The length of lag for reversing asymmetric timeliness should be also considered when comparing the extent of conservatism, because it shows the difference in speed when incorporating bad news in earnings as opposed to good news across firms. We also examine the Variance Inflation Factors (VIF) for main variables since a problem of multicollinearity may arise due to the multiple returns variables in our regression equation. Results in Panel B of Table 3 show that all values of VIF are smaller than four, indicating that our empirical results are not seriously affected by the problem.

Table 3 Results for the Multi-period Measure of Conservatism

Panel A Regression results

	Controlling fixed year effect		Controlling fixed industry effect		Controlling both effects	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Int.	0.0989	15.52[a]	0.0793	6.84[a]	0.0935	7.36[a]
$D_{i,0}$	-0.0759	-27.06[a]	-0.0699	-25.51[a]	-0.0750	-26.81[a]
$RET_{i,0}$	0.0290	13.78[a]	0.0300	14.32[a]	0.0295	14.06[a]
$RET_{i,0} \times D_{i,0}$	0.0807	16.57[a]	0.0772	15.96[a]	0.0796	16.36[a]
$D_{i,1}$	-0.0382	-13.92[a]	-0.0375	-14.00[a]	-0.0373	-13.60[a]
$RET_{i,1}$	0.0703	26.28[a]	0.0712	26.89[a]	0.0708	26.62[a]
$RET_{i,1} \times D_{i,1}$	0.0435	8.83[a]	0.0406	8.37[a]	0.0418	8.49[a]
$D_{i,2}$	-0.0178	-6.66[a]	-0.0188	-7.17[a]	-0.0164	-6.14[a]
$RET_{i,2}$	0.0721	24.61[a]	0.0719	24.80[a]	0.0724	24.79[a]
$RET_{i,2} \times D_{i,2}$	0.0240	4.72[a]	0.0232	4.58[a]	0.0221	4.36[a]

$D_{i,(3,4)}$	-0.0043	-1.54	-0.0042	-1.55	-0.0020	-0.73
$RET_{i,(3,4)}$	0.0730	29.61[a]	0.0724	29.56[a]	0.0729	29.63[a]
$RET_{i,(3,4)} \times D_{i,(3,4)}$	0.0001	0.01	0.0011	0.24	-0.0023	-0.49
$D_{i,(5,6,7)}$	-0.0050	-1.51	-0.0038	-1.13	-0.0045	-1.34
$RET_{i,(5,6,7)}$	0.0546	20.54[a]	0.0550	20.87[a]	0.0538	20.33[a]
$RET_{i,(5,6,7)} \times D_{i,(5,6,7)}$	-0.0263	-5.46[a]	-0.0305	-6.35[a]	-0.0353	-7.23[a]
Year D.	Yes		No		Yes	
Industry D.	No		Yes		Yes	
Adj-R^2	36.65%		36.09%		37.00%	
N	74550		74550		74550	

$$E_{i,t} = \text{int.} + \delta_0 D_{i,t} + \alpha_0 RET_{i,t} + \beta_0 RET_{i,t} \times D_{i,t} + \delta_1 D_{i,t\text{-}1} + \alpha_1 RET_{i,t\text{-}1} + \beta_1 RET_{i,t\text{-}1} \times D_{i,t\text{-}1} + \delta_2 D_{i,t\text{-}2}$$
$$+ \alpha_2 RET_{i,t\text{-}2} + \beta_2 RET_{i,t\text{-}2} \times D_{i,t\text{-}2} + \delta_{(3,4)} D_{i,(t\text{-}3,t\text{-}4)} + \alpha_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} + \beta_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} \times D_{i,(t\text{-}3,t\text{-}4)}$$
$$+ \delta_{(5,6,7)} D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \alpha_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \beta_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} \times D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}$$
$$+ \sum_{k=1980}^{2008} YD_k YearDummies_y + \sum_{g=1}^{57} ID_g IndustryDummies_s + \varepsilon_{i,t}$$

All variable definitions are as in panel A of Table 2. A superscript of ‘a’, ‘b’, or ‘c’ indicates that the results are significant at the 0.01, 0.05, or 0.10 level in a two-tailed test. To control for heteroskedasticity, we use White’s (1980) t-statistics. Industry dummies are created based on the first two digits of the sic-code of the firm and the year these dummies are created for the years in our sample period.

Panel B The Variance Inflation Factors for main variables

	Controlling fixed year effect	Controlling fixed industry effect	Controlling both effects
$D_{i,0}$	1.37	1.29	1.38
$RET_{i,0}$	2.51	2.96	2.52
$RET_{i,0} \times D_{i,0}$	3.46	3.39	3.47
$D_{i,1}$	1.39	1.31	1.39
$RET_{i,1}$	2.99	2.48	3.00
$RET_{i,1} \times D_{i,1}$	3.51	3.44	3.52
$D_{i,2}$	1.37	1.32	1.37
$RET_{i,2}$	3.18	3.12	3.18
$RET_{i,2} \times D_{i,2}$	3.29	3.26	3.30
$D_{i,(3,4)}$	1.48	1.45	1.49
$RET_{i,(3,4)}$	3.33	3.29	3.34
$RET_{i,(3,4)} \times D_{i,(3,4)}$	2.86	2.82	2.87
$D_{i,(5,6,7)}$	2.87	2.85	2.87
$RET_{i,(5,6,7)}$	3.15	3.09	3.16
$RET_{i,(5,6,7)} \times D_{i,(5,6,7)}$	2.71	2.68	2.75

The significant reverse phenomenon indicates that our modifications of the model help to fully incorporate the recognition process. The significantly negative coefficient of lagged-period returns shows a well-captured relationship between lagged earnings and returns. It also indicates that extending and lengthening the return horizon help solve for the inconsistency in earnings responses and provide a testable specification for examining lagged earnings responses, especially when the timing of earnings recognition and returns are seriously mismatched. In short, our modifications of Pope and Walker's (1999) model help in examining both lags and asymmetry.

Certain phenomena deserve special notice. First, with a t-value of 5.53, the coefficient for lagged one-year positive returns (α_1=0.0708) is significantly higher than current-year positive returns (α_0=0.0295). One plausible explanation for this is that earnings reflect good news with prudence and with a slight delay. Second, with a t-value of 3.18, the lagged one-year incremental earnings response to bad news (β_1=0.0796) is significantly smaller than the current incremental earnings response to bad news (β_0=0.0418). This shows that earnings tend to reflect a larger proportion of bad news contemporaneously, which is consistent with Ryan and Zarowin's (2003) findings.

Empirical results support our hypotheses that comparing the extent of conservatism based on the concept of asymmetric timeliness should take the effect of multi-period lags into consideration. To compare the extent of conservatism among firms in its entirety, magnitudes of the concurrent, cumulative asymmetric timeliness and the length of lags should all be taken into consideration. This means that prior results comparing the extent of conservatism across firms based on the magnitude of single-period asymmetric timeliness may need to be re-examined.[5,6]

In addition to our empirical results, we show how to compare the extent of conservatism among firms with different litigation risks by using a multi-period model. We do not thoroughly re-examine prior results that compare the extent of conservatism based on the concurrent asymmetric timeliness, but focus only on firms with different litigation risks for two reasons. First, the main purpose of our study is to improve the concept of comparing the extent of conservatism based on multi-period asymmetric timeliness, not to re-examine prior results. Second, to re-examine the results of prior studies, appropriate measures for firm

5 Our inferences and results showing multi-period lags in earnings recognition of bad news suggest that accounting conservatism does not force all bad news to be recognized in earnings immediately. Since lags are one attribute of accounting recognition, they do not indicate a lack of conservatism.

6 Roychowdhury and Watts (2007) find a negative association between the beginning market-to-book ratio and the asymmetric timeliness of earnings. Our results are robust when including the market-to-book ratio in our multi-period.

Table 4 Comparing the Extent of Conservatism with Multi-period Earnings Responses

Ind. variable	Coef.	*t*-stat
Intercept	0.0905	22.43[a]
$RET_{i,0}$	0.0363	14.39[a]
$RET_{i,0} \times DC$	-0.0223	-5.12[a]
$RET_{i,0} \times D_{i,0}$	0.0789	12.99[a]
$RET_{i,0} \times D_{i,0} \times DC$	0.0054	0.52
$RET_{i,1}$	0.0813	24.98[a]
$RET_{i,1} \times DC$	-0.0298	-5.12[a]
$RET_{i,1} \times D_{i,1}$	0.0359	5.86[a]
$RET_{i,1} \times D_{i,1} \times DC$	0.0127	1.12
$RET_{i,2}$	0.0807	23.39[a]
$RET_{i,2} \times DC$	-0.0359	-5.60[b]
$RET_{i,2} \times D_{i,2}$	0.0177	2.65[a]
$RET_{i,2} \times D_{i,2} \times DC$	0.0243	2.19[b]
$RET_{i,(3,4)}$	0.0716	23.44[a]
$RET_{i,(3,4)} \times DC$	-0.0046	-0.81
$RET_{i,(3,4)} \times D_{i,(3,4)}$	0.0063	0.99
$RET_{i,(3,4)} \times D_{i,(3,4)} \times DC$	-0.0138	-1.36
$RET_{i,(5,7)}$	0.0533	16.47[a]
$RET_{i,(5,7)} \times DC$	-0.0044	-0.67
$RET_{i,(5,7)} \times D_{i,(5,7)}$	-0.0138	-2.43[a]
$RET_{i,(5,7)} \times D_{i,(5,7)} \times DC$	0.0007	0.07
Return dummies	Yes	
Firm characteristic dummies	Yes	
Adj-R^2	36.30%	
N	76863	

Definitions of *RET*, *D* and their interaction are the same as in Table 3 of this paper. *DC* is a SIC code dummy, value=1 if the SIC code of the observation falls in 2833-2836 (pharmaceuticals / bio-technology), 3570-3577 (computing), 3600-3674 (electronics), 5200-5961 (retailing), 7370-7374 (computing), and 8731-8734 (pharmaceuticals / bio-technology), and 0 otherwise. A superscript of ‘a’, ‘b’, or ‘c’ indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test.

characteristics under the multi-period concept are required. However, measuring long-term and stable firm characteristics comprehensively is complex and requires further study. In the present paper, we have chosen to re-examine the results of the litigation risk impact on the extent of conservatism by using the SIC code of the firm as the litigation risk indicator, since this code is relatively stable in the long run. Results are shown in Table 4. By including multi-period earnings responses in the model to capture how the firm's news is reflected in earnings, we find that under the multi-period concept, firms with different litigation risks have different extent of cumulative asymmetric timeliness but do not have different extent of concurrent asymmetric timeliness. This illustrates that, on average, firms with higher litigation risk may reflect bad news faster and with shorter lags, but fail to show asymmetric timeliness concurrently. Therefore, the conclusion that firms with high litigation risk are more conservative should be made according to both concurrent and cumulative asymmetric timeliness.

5.2 Robustness Checks

5.2.1 The Validity of the Multi-Period Earnings Response Model

We re-estimate the multi-period model using different lengths of returns. The results of re-estimation are compared to prior studies so as to eliminate the possibility that our results come from differences in sample compositions. Moreover, there has been no consistent evidence regarding the length of earnings lags, and the length of a complete earnings response process is also unknown. Therefore, re-estimation increases the robustness of the length of lags in the main empirical result. We re-estimate the multi-period model using independent variables, including current returns and different lengths of lagged returns. The length of these lagged returns ranges from one to ten periods. Empirical results are shown in Table 5. In this table, we illustrate that coefficients of current returns (γ_0) in each regression model are positive, which is consistent with Basu (1997). Coefficients of lagged one- and two- period returns (γ_1 and γ_2) in each regression model are also significantly positive, showing consistent evidence of the existence of asymmetric earnings responses to bad news with sufficiently short lags, which supports *H1a*. Most of the coefficients of lagged three- and four- period returns (γ_3 and γ_4) are positive, although insignificant in some regression models. This shows that earnings responses to bad news decay as lag increases and gradually become as large as those to good news, consistent with *H1b*. Finally, almost half of the coefficients of lagged five- to ten- period returns (γ_5, γ_6, γ_7, γ_8, γ_9, γ_{10}) are negative, showing that earnings responses to bad news diminish faster than those to good news with further earnings lags. This evidence is consistent with *H1c*. Some coefficients of lagged returns are insignificant or have different signs, suggesting that noise in earnings responses increases as lags increase. This supports the aggregation of returns to strengthen the earnings-returns relation in our model specification. This also suggests that inconsistent evidence for signs of lagged returns found in prior studies, such as those of Pope and Walker (1999) and Giner and Rees (2001), may have resulted from a lack of noise considerations in lagged earnings responses.

5.2.2 Validity of the Multi-Period Earnings Response Model for Different Time Periods

We estimate the multi-period model for each of the two fifteen-year periods between 1980 and 2009. Results in column (1) and (2) of Table 6 show that the asymmetric timeliness is positive concurrently and decays and reverses as earnings lags increase for both of the two sub-periods. This suggests that our multi-period model is valid for different time periods.

We also exclude observations in 2008 and 2009 to eliminate the effect of the financial crisis. Results in column (3) of Table 6 suggest that results are robust to the change.

5.2.3 Alternative Model Specifications

We then re-estimate the multi-period model and deflate the equation by the starting price of year *t*. Column (4) of Table 6 shows that, in this case, asymmetric timeliness reverses with two and three to four year lags, which is faster than when the starting price of year *t*-7 is used as the deflator. Though the value of lagged asymmetric timeliness does not turn insignificant before it turns negative, when using an alternative deflator in Table 6, there were still varying signs of asymmetric timeliness, which supports our arguments about multi-period differences in earnings responses to good news and bad news.

5.2.4 Alternative Definitions of Earnings

We substitute earnings per share (EPS) after extraordinary items with either “EPS excluding extraordinary items” or “EPS from operations” in order to see whether there still exists a multi-period asymmetric timeliness of earnings. Our main reason for doing so is that conservatism reflects a prudent reaction to uncertainty in all economic activities. So it should not be caused solely by a particular classification in financial statements, such as non-operating items or extraordinary items (Pope and Walker, 1999; Giner and Rees, 2001).

We estimate the multi-period model with “EPS excluding extraordinary items” or “EPS from operations” at year t which are deflated by the starting price of fiscal year *t*-7 for firm *i* to be dependent variables. Results in columns (1) and (2) of Table 7 indicate that both alternative earning variables show reversing incremental reaction to bad news, as discussed in Section 5.1 Both alternative earning variables fully incorporate bad news earlier than good news. These results suggest that conservatism does not result from specific transactions or classifications in a financial statement.

Table 5 Regression Results for Multi-period Measure of Conservatism

$$E_{i,t} = int. + \sum_{k=0}^{10} \alpha_{i,t-k} D_{i,t-k} + \sum_{k=0}^{10} \beta_k RET_{i,t-k} + \sum_{k=0}^{10} \gamma_k RET_{i,t-k} \times D_{i,t-k} + \sum_{k=1980}^{2008} YD_k YearDummies_y + \sum_{g=1}^{57} ID_g IndustryDummies_s + \varepsilon_{i,t}$$

	(0)		(1)		(2)		(3)		(4)		(5)	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Intercept	-0.2178	-11.55[a]	0.0610	5.65[a]	0.0610	5.65[a]	0.0704	7.27[a]	0.0885	8.92[a]	0.0975	8.97[a]
$D_{i,0}$	0.0118	3.16[a]	-0.0522	-19.72[a]	-0.0539	-24.33[a]	-0.0581	-27.51[a]	-0.0616	-28.09[a]	-0.0685	-28.32[a]
$R_{i,0}$	-0.0090	-2.27[b]	0.0092	3.27[b]	0.0214	9.47[a]	0.0273	13.01[a]	0.0275	12.94[a]	0.0268	12.70[a]
$R_{i,0} \times D_{i,0}$	0.4625	45.70[a]	0.1822	27.04[a]	0.1302	24.54[a]	0.1011	20.59[a]	0.0934	19.13[a]	0.0893	19.36[a]
$D_{i,1}$			-0.0201	-7.40[a]	-0.0256	-10.85[a]	-0.0265	-12.19[a]	-0.0270	-12.17[a]	-0.0304	-12.40[a]
$R_{i,1}$			0.0591	15.54[a]	0.0676	21.41[a]	0.0664	23.81[a]	0.0681	25.17[a]	0.0681	25.11[a]
$R_{i,1} \times D_{i,1}$			0.1117	16.73[a]	0.0606	10.53[a]	0.0504	9.87[a]	0.0508	10.38[a]	0.0520	10.04[a]
$D_{i,2}$					-0.0174	-7.15[a]	-0.0158	-7.15[a]	-0.0108	-4.63[a]	-0.0098	-4.03[a]
$R_{i,2}$					0.0577	16.22[a]	0.0609	19.45[a]	0.0717	23.96[a]	0.0773	25.20[a]
$R_{i,2} \times D_{i,2}$					0.0347	5.73[a]	0.0287	5.24[a]	0.0283	5.04[a]	0.0250	4.70[a]
$D_{i,3}$							-0.0134	-5.73[a]	-0.0070	-2.97[a]	-0.0047	-1.91[b]
$R_{i,3}$							0.0531	14.79[a]	0.0638	17.68[a]	0.0728	22.27[a]
$R_{i,3} \times D_{i,3}$							0.0112	2.05[b]	0.0118	2.03[b]	0.0072	1.27
$D_{i,4}$									-0.0069	-2.85[a]	0.0044	1.72[b]
$R_{i,4}$									0.0525	14.30[a]	0.0634	16.55[a]
$R_{i,4} \times D_{i,4}$									-0.0022	-0.39	0.0091	1.52[c]
$D_{i,5}$											-0.0059	-2.10[b]
$R_{i,5}$											0.0515	12.22
$R_{i,5} \times D_{i,5}$											-0.0141	-2.22[b]
Adj-R^2	6.81%		11.18%		17.12%		22.91%		27.65%		32.46%	
N	150269		135005		121230		109160		98658		89472	

For parsimony, $R_{i,k}$ / $D_{i,k}$ denotes $RET_{i,t\text{-}k}$ / $D_{i,t\text{-}k}$. $RET_{i,t\text{-}k}$ denotes price differences between the starting price of year *t-k* and the ending price of year *t-k*, with k=0, 1,..10. The price differences are adjusted with dividends. *E* and each *RET* variable are deflated by the starting price of fiscal year *t-k* for firm *i*. $D_{i,t\text{-}k}$ is a dummy variable, which equals 1 if $RET_{i,t\text{-}k}<0$ for firm *i* and 0 otherwise.

	(6)		(7)		(8)		(9)		(10)	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Intercept	0.0794	6.65[a]	0.0863	6.69[a]	0.1099	7.74[a]	0.1174	7.67[a]	0.1291	7.27[a]
$D_{i,0}$	-0.0720	-27.38[a]	-0.0741	-26.56[a]	-0.0743	-24.17[a]	-0.0834	-23.87[a]	-0.0868	-23.21[a]
$R_{i,0}$	0.0303	15.65[a]	0.0299	13.95[a]	0.0336	15.57[a]	0.0346	14.56[a]	0.0339	13.99[a]
$R_{i,0} \times D_{i,0}$	0.0848	17.04[a]	0.0795	16.10[a]	0.0743	13.96[a]	0.0682	11.89[a]	0.0640	11.39[a]
$D_{i,1}$	-0.0333	-12.80[a]	-0.0363	-13.38[a]	-0.0367	-12.02[a]	-0.0352	-10.09[a]	-0.0404	-11.15[a]
$R_{i,1}$	0.0707	25.24[a]	0.0716	27.38[a]	0.0709	25.59[a]	0.0718	23.28[a]	0.0679	23.14[a]
$R_{i,1} \times D_{i,1}$	0.0395	7.71[a]	0.0405	8.15[a]	0.0419	7.69[a]	0.0426	7.43[a]	0.0419	7.45[a]
$D_{i,2}$	-0.0113	-4.35[a]	-0.0150	-5.68[a]	-0.0156	-5.45[a]	-0.0166	-5.10[a]	-0.0159	-4.35[a]
$R_{i,2}$	0.0734	24.94[a]	0.0726	24.78[a]	0.0742	25.31[a]	0.0748	24.77[a]	0.0716	20.84[a]
$R_{i,2} \times D_{i,2}$	0.0259	4.68[a]	0.0209	4.10[a]	0.0159	2.82[a]	0.0187	3.05[a]	0.0203	3.08[a]
$D_{i,3}$	-0.0012	-0.47	0.0000	0.00	-0.0076	-2.61[a]	-0.0091	-2.81[a]	-0.0137	-4.00[a]
$R_{i,3}$	0.0777	23.59[a]	0.0787	25.23[b]	0.0678	19.80[a]	0.0709	20.72[a]	0.0656	18.78[b]
$R_{i,3} \times D_{i,3}$	0.0036	0.66	0.0039	0.67	0.0067	1.11	0.0047	0.74	0.0093	1.47[c]
$D_{i,4}$	0.0054	1.99[b]	0.0031	1.18	0.0040	1.40	0.0044	1.33[c]	-0.0011	-0.32
$R_{i,4}$	0.0639	17.10[a]	0.0664	19.05[a]	0.0619	17.38[a]	0.0629	15.96[a]	0.0575	15.40[a]
$R_{i,4} \times D_{i,4}$	0.0123	2.06[b]	0.0028	0.49	0.0123	2.00[b]	0.0074	1.06	0.0095	1.39[c]
$D_{i,5}$	0.0068	2.41[a]	0.0068	2.44[a]	0.0047	1.61[b]	0.0094	2.77	0.0034	0.92
$R_{i,5}$	0.0596	14.10[a]	0.0602	15.51[a]	0.0610	15.28[a]	0.0593	13.62[a]	0.0590	13.34[a]
$R_{i,5} \times D_{i,5}$	0.0057	0.89	0.0068	1.03	0.0038	0.59	0.0138	1.85[b]	0.0066	0.82
$D_{i,6}$	-0.0009	-0.28	0.0087	2.89[a]	0.0063	2.07[b]	0.0070	2.15[b]	0.0058	1.60
$R_{i,6}$	0.0469	10.76[a]	0.0536	11.92[a]	0.0533	12.79[a]	0.0514	11.59[a]	0.0509	11.47[a]
$R_{i,6} \times D_{i,6}$	-0.0011	-0.16	-0.0003	-0.04	0.0035	0.49	0.0103	1.39[c]	0.0083	1.08
$D_{i,7}$			0.0052	1.59[c]	0.0071	2.16[b]	0.0052	1.52[c]	0.0033	0.93[c]
$R_{i,7}$			0.0475	9.02[a]	0.0551	10.78[a]	0.0556	11.25[a]	0.0488	9.57[a]
$R_{i,7} \times D_{i,7}$			0.0047	0.62	-0.0013	-0.16	-0.0101	-1.28	-0.0023	-0.28
$D_{i,8}$					-0.0019	-0.54	-0.0008	-0.21	-0.0046	-1.20
$R_{i,8}$					0.0456	8.11[a]	0.0453	7.63[a]	0.0481	8.73[a]
$R_{i,8} \times D_{i,8}$					-0.0047	-0.57	0.0057	0.65	-0.0051	-0.59
$D_{i,9}$							-0.0006	-0.14	-0.0009	-0.23
$R_{i,9}$							0.0379	6.24[a]	0.0377	6.06[a]
$R_{i,9} \times D_{i,9}$							-0.0052	-0.56	0.0004	0.04
$D_{i,10}$									-0.0074	-1.71[b]
$R_{i,10}$									0.0305	4.83[b]
$R_{i,10} \times D_{i,10}$									-0.0153	-1.43[c]
Adj-R^2	35.40%		37.69%		39.48%		41.50%		42.88%	
N	81339		74022		67404		61443		56004	

Table 6 Regression Results for Sub-periods and Alternative Deflator

	(1)		(2)		(3)		(4)	
	Sample period: 1980-1994		Sample period: 1995-2009		Sample period: 1980-2007		P_{t-1} as the Deflator	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Int.	0.0581	2.80[a]	0.0626	4.20[a]	0.0411	2.83[a]	0.1168	4.96[a]
$D_{i,0}$	-0.0913	-18.56[a]	-0.0640	-19.34[a]	-0.0714	-24.71[a]	0.0253	5.48[a]
$RET_{i,0}$	0.0428	14.51[a]	0.0174	6.23[a]	0.0284	13.40[a]	0.0721	12.52[a]
$RET_{i,0}\times D_{i,0}$	0.0830	9.97[a]	0.0779	12.90[a]	0.0890	16.91[a]	0.3933	23.65[a]
$D_{i,1}$	-0.0545	-10.98[a]	-0.0268	-8.13[a]	-0.0366	-12.53[a]	-0.0125	-2.96[a]
$RET_{i,1}$	0.0777	20.55[a]	0.0631	16.93[a]	0.0706	25.60[a]	0.1086	11.08[a]
$RET_{i,1}\times D_{i,1}$	0.0477	5.41[a]	0.0368	5.88[a]	0.0428	7.69[a]	0.0367	3.14[a]
$D_{i,2}$	-0.0163	-3.40[a]	-0.0158	-4.95[a]	-0.0156	-5.51[a]	-0.0226	-5.45[a]
$RET_{i,2}$	0.0839	18.69[a]	0.0617	16.18[a]	0.0728	23.26[a]	0.0911	8.88[a]
$RET_{i,2}\times D_{i,2}$	0.0167	1.76[c]	0.0259	4.31[a]	0.0199	3.66[a]	-0.0397	-3.26[a]
$D_{i,(3,4)}$	0.0071	1.37	-0.0051	-1.57	-0.0020	-0.71	-0.0409	-10.13[b]
$RET_{i,(3,4)}$	0.0770	20.52[a]	0.0669	20.45[a]	0.0709	27.74[a]	0.0367	4.96[a]
$RET_{i,(3,4)}\times D_{i,(3,4)}$	0.0123	1.27	-0.0044	-0.79	0.0022	0.45	-0.0327	-4.10[a]
$D_{i,(5,6,7)}$	-0.0020	-0.35	-0.0034	-0.85	-0.0065	-1.87[c]	-0.0323	-9.40[a]
$RET_{i,(5,6,7)}$	0.0564	13.76[a]	0.0508	14.63[a]	0.0556	19.83[a]	0.0004	0.12
$RET_{i,(5,6,7)}\times D_{i,(5,6,7)}$	-0.0279	-3.07[a]	-0.0283	-4.85[a]	-0.0383	-7.44[a]	0.0005	0.13
Year D.	Yes		Yes		Yes		Yes	
Industry D.	Yes		Yes		Yes		Yes	
Adj-R^2	43.65%		29.29%		38.06%		20.61%	
N	30238		44312		67950		74409	

$$E_{i,t}=int.+\delta_0 D_{i,t}+\alpha_0 RET_{i,t}+\beta_0 RET_{i,t}\times D_{i,t}+\delta_1 D_{i,t\text{-}1}+\alpha_1 RET_{i,t\text{-}1}+\beta_1 RET_{i,t\text{-}1}\times D_{i,t\text{-}1}$$
$$+\delta_2 D_{i,t\text{-}2}+\alpha_2 RET_{i,t\text{-}2}+\beta_2 RET_{i,t\text{-}2}\times D_{i,t\text{-}2}+\delta_{(3,4)} D_{i,(t\text{-}3,t\text{-}4)}+\alpha_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)}$$
$$+\beta_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)}\times D_{i,(t\text{-}3,t\text{-}4)}+\delta_{(5,6,7)} D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}+\alpha_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}+\beta_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}$$
$$\times D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}+\sum_{k=1980}^{2008} YD_k YearDummies_y+\sum_{g=1}^{57} ID_g IndustryDummies_s+\varepsilon_{i,t}$$

All variable definitions are the same as in panel A of Table 2 except that (1) sample period covers 1980 to 1994 for column (1), (2) sample period covers 1995 to 2009 for column (2), (3) sample period covers 1980 to 2009 for column (3), and (4) P_{t-1} is used as the deflator for column (4). A superscript of ‘a’, ‘b’, or ‘c’ indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test. To control for heteroskedasticity, we use White’s (1980) *t*-statistics. Industry dummies are created based on the first two digits of the SIC-code of the firm and the year dummies are created for the year in our sample period.

5.2.5 Correcting for Cross-Sectional and Time-Series Dependence

We follow Gow, Ormazabal, and Taylor (2010) and calculate standard errors based on the two-way cluster procedure so as to allow inter-correlations of residuals across years and industries. Column (3) of Table 7 shows that results are robust to these changes.

5.2.6 Fama-MacBeth's Procedure and Newey-West Corrected Fama-MacBeth Standard Errors

We also re-estimate Eq. (2) using Fama-MacBeth's (Fama and MacBeth, 1973) procedure for estimating slope coefficients and Newey-West corrected Fama-MacBeth standard errors (Newey and West, 1987) with the sample to solve for cross-sectional and time-series dependence. Results are reported in Table 8 and are consistent with those from the pooled cross-sectional regression. This indicates that our results are not seriously affected by any serial correlation problem. The results are also robust to different lag lengths for Newey-West standard errors.

5.2.7 Validity of Asymmetric Timeliness as a Measure of Conservatism

The Basu measure is widely used in academic research as a measure of conservatism. Some recent studies, however, have expressed concerns about its validity. For example, Dietrich, Muller, and Riedl (2007) demonstrate that the causality between earnings and returns confounds the earnings-returns relation and causes a bias in earnings responses. They also argue that this bias is enhanced by sample truncation and that the Basu measure misinterprets this bias as conservatism. Givoly et al. (2007) argue that the magnitude of asymmetric timeliness is affected by factors unrelated to conservatism. They use actual and simulated data to present an increase in the extent of asymmetric timeliness when news content has a lower degree of uniformity and is more extreme, or when events in the period are more reportable. They also suggest that a firm's disclosure policies and reporting policies interact and enhance the lead-lag earnings-returns relation. This causes magnitudes of asymmetric timeliness to be affected. Patatoukas and Thomas (2011) argue that the asymmetric timeliness of the Basu measure is triggered by two regularities related to scale.

We argue that our hypotheses and our results are robust when considering these critical claims. First, Ball, Kothari, and Nikolaev (2013a, 2013b) use formal econometric analysis to gauge the validity of the Basu measure and oppose Dietrich et al.'s (2007) and Patatoukas and Thomas's (2011) claim. In addition, prior evidence has suggested that earnings respond to returns with lags. This implies that prior assumptions made by Dietrich et al. (2007), in which earnings drive stock returns, are doubtful. Furthermore, our conclusions for comparing the extent of conservatism are not expected to change based on corrections for the

Table 7 Regression Results for Alternative Dependent Variables and Two-way Clustered Standard Errors

	(1) Dep. variable: EPS excluding extra. items		(2) Dep. variable: EPS from operations		(3) Two-way clustered standard errors	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Int.	0.0843	8.55[a]	0.0618	5.89[a]	0.0935	10.72[a]
$D_{i,0}$	-0.0671	-28.39[a]	-0.0473	-17.70[a]	-0.0750	-8.21[a]
$RET_{i,0}$	0.0287	32.77[a]	0.0208	21.60[a]	0.0295	4.60[a]
$RET_{i,0}\times D_{i,0}$	0.0789	42.10[a]	0.0544	27.74[a]	0.0796	8.65[a]
$D_{i,1}$	-0.0354	-14.90[a]	-0.0291	-10.94[a]	-0.0373	-7.24[a]
$RET_{i,1}$	0.0700	67.12[a]	0.0536	46.37[a]	0.0708	11.28[a]
$RET_{i,1}\times D_{i,1}$	0.0392	19.21[a]	0.0268	13.09[a]	0.0418	7.09[a]
$D_{i,2}$	-0.0158	-6.67[a]	-0.0119	-4.51[a]	-0.0164	-5.93[a]
$RET_{i,2}$	0.0709	59.60[a]	0.0591	47.33[a]	0.0724	13.88[a]
$RET_{i,2}\times D_{i,2}$	0.0246	10.59[a]	0.0209	9.00[a]	0.0221	4.39[a]
$D_{i,(3,4)}$	-0.0021	-0.85	-0.0063	-2.32[b]	-0.0020	-0.62
$RET_{i,(3,4)}$	0.0719	67.73[a]	0.0605	55.37[a]	0.0729	17.13[a]
$RET_{i,(3,4)}\times D_{i,(3,4)}$	0.0039	1.62	0.0065	2.97[a]	-0.0023	-0.32
$D_{i,(5,6,7)}$	-0.0032	-0.91	-0.0043	-1.09	-0.0045	-1.14
$RET_{i,(5,6,7)}$	0.0566	45.91[a]	0.0559	48.00[a]	0.0538	13.05[a]
$RET_{i,(5,6,7)}\times D_{i,(5,6,7)}$	-0.0315	-5.28[a]	-0.0279	-4.54[a]	-0.0353	-3.69[a]
Year D.	Yes		Yes		Yes	
Industry D.	Yes		Yes		Yes	
Adj-R^2	39.95%		39.57%		37.00%	
N	74564		37948		74550	

$$
\begin{aligned}
Ei,t = int. &+ \delta_0 D_{i,t} + \alpha_0 RET_{i,t} + \beta_0 RET_{i,t} \times D_{i,t} + \delta_1 D_{i,t\text{-}1} + \alpha_1 RET_{i,t\text{-}1} + \beta_1 RET_{i,t\text{-}1} \times D_{i,t\text{-}1} \\
&+ \delta_2 D_{i,t\text{-}2} + \alpha_2 RET_{i,t\text{-}2} + \beta_2 RET_{i,t\text{-}2} \times D_{i,t\text{-}2} + \delta_{(3,4)} D_{i,(t\text{-}3,t\text{-}4)} + \alpha_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} + \beta_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)} \times D_{i,(t\text{-}3,t\text{-}4)} \\
&+ \delta_{(5,6,7)} D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \alpha_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \beta_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} \times D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)} + \sum_{k=1980}^{2008} YD_k YearDummies_y \\
&+ \sum_{g=1}^{57} ID_g IndustryDummies_s + \varepsilon_{i,t}
\end{aligned}
$$

All variable definitions except Et,i for column (1) and (2) are as in panel A of Table 2. $E_{t,i}$ denotes earnings per share excluding extraordinary items for column (1) or earnings per share from operation at year t for column (2). A superscript of 'a', 'b', or 'c' indicates that the results are significant at the 0.01, 0.05, and 0.10 level in a two-tailed test. To control for heteroskedasticity, we use White's (1980) t-statistics for column (1) and (2). We follow Gow et al. (2010) and calculate standard errors based on the two-way cluster procedure to allow for inter-correlations of residuals across years and across industries. Industry dummies are created based on the first two digits of the sic-code of the firm and the year dummies are created for the years in our sample period.

Table 8 Regression Results Based on Fama-MacBeth's Procedure and Newey-West Corrected Fama-MacBeth Standard Errors

Lag length		0	1	2	3
	Coef.	*t*-value	*t*-value	*t*-value	*t*-value
Int.	0.0805	5.01[a]	4.10[a]	3.49[a]	3.11[a]
$D_{i,0}$	-0.0752	-10.48[a]	-8.31[a]	-7.21[a]	-6.47[a]
$RET_{i,0}$	0.0307	7.94[a]	7.05[a]	6.84[a]	6.78[a]
$RET_{i,0}\times D_{i,0}$	0.0923	12.20[a]	10.82[a]	11.08[a]	11.05[a]
$D_{i,1}$	-0.0420	-6.23[a]	-4.92[a]	-4.20[a]	-3.79[a]
$RET_{i,1}$	0.0690	14.91[a]	14.03[a]	13.40[a]	12.83[a]
$RET_{i,1}\times D_{i,1}$	0.0450	5.85[a]	6.57[a]	7.18[a]	7.15[a]
$D_{i,2}$	-0.0168	-3.91[a]	-3.54[a]	-3.52[a]	-3.33[a]
$RET_{i,2}$	0.0746	13.73[a]	12.41[a]	11.72[a]	11.26[a]
$RET_{i,2}\times D_{i,2}$	0.0179	2.62[a]	3.11[a]	3.25[a]	2.99[a]
$D_{i,(3,4)}$	0.0002	0.05	0.05	0.05	0.05
$RET_{i,(3,4)}$	0.0745	17.90[a]	15.47[a]	15.01[a]	14.48[a]
$RET_{i,(3,4)}\times D_{i,(3,4)}$	0.0023	0.30	0.32	0.31	0.31
$D_{i,(5,6,7)}$	-0.0047	-1.31	-1.32	-1.36	-1.50
$RET_{i,(5,6,7)}$	0.0570	12.27[a]	10.97[a]	10.90[a]	11.14[a]
$RET_{i,(5,6,7)}\times D_{i,(5,6,7)}$	-0.0345	-3.32[a]	-4.07[a]	-3.69[a]	-3.75[a]
Industry D.	Yes				

$$E_{i,t}=int.+\delta_0 D_{i,t}+\alpha_0 RET_{i,t}+\beta_0 RET_{i,t}\times D_{i,t}+\delta_1 D_{i,t\text{-}1}+\alpha_1 RET_{i,t\text{-}1}+\beta_1 RET_{i,t\text{-}1}\times D_{i,t\text{-}1}+\delta_2 D_{i,t\text{-}2}$$
$$+\alpha_2 RET_{i,t\text{-}2}+\beta_2 RET_{i,t\text{-}2}\times D_{i,t\text{-}2}+\delta_{(3,4)} D_{i,(t\text{-}3,t\text{-}4)}+\alpha_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)}+\beta_{(3,4)} RET_{i,(t\text{-}3,t\text{-}4)}$$
$$\times D_{i,(t\text{-}3,t\text{-}4)}+\delta_{(5,6,7)} D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}+\alpha_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}+\beta_{(5,6,7)} RET_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}\times D_{i,(t\text{-}5,t\text{-}6,t\text{-}7)}$$
$$+\sum_{g=1}^{57} ID_g\, IndustryDummies_s+\varepsilon_{i,t}$$

All variable definitions are the same as in panel A of Table 2 except that the coefficients are the average coefficients of 30 annual regression results and standard errors are calculated by the Newey-West corrected Fama-MacBeth standard errors. A superscript of 'a', 'b', or 'c' indicates that the results are significant at one, two, or three years.

biases, since failing to consider the impact of characteristics of the information environment in our study does not lead to a change in the sign of asymmetric timeliness. This all suggests that our results are not seriously affected by Givoly et al.'s (2007) arguments. Fourth, our multi-period model mitigates the lead-lag bias suggested by Givoly et al. (2007) by incorporating lagged earnings responses, which more correctly measures and compares the extent of conservatism. Finally, our results are insensitive to a change in deflators (see Section 5.2.3), and are insensitive when the whole sample is divided into ten groups by the size of deflators. These suggest that our results are not seriously affected by Patatoukas and Thomas's (2011) claim.

6. Conclusion

In this paper, we illustrate the effect of earnings lags on estimating and comparing the extent of conservatism based on Basu's (1997) asymmetric timeliness concept. Looking at earnings lags, earnings asymmetry, and the interaction between these two, we argue that the impact of bad news on earnings should be recognized in earnings more quickly than good news concurrently and cumulatively, and therefore should decline faster than those of good news. Empirical results that show varying signs of asymmetric timeliness support our arguments. Comparing the extent of conservatism based only on signs of the concurrent asymmetric timeliness ignores the magnitude and length of lag of this asymmetric timeliness and may lead to incorrect conclusions.

One limitation of our research is that the market is efficient and reacts to firm news without bias and in a timely fashion. Market over-reaction or under-reaction is assumed not to have a serious impact on price reactions. Moreover, earnings management or other discretionary behavior that garbles the information content of earnings is not allowed in our study. We emphasize that accounting earnings are estimated without managers' self-interest, and therefore reflect the operational reality of the firm.

Given the amount of evidence showing how the extent of conservatism varies among firms based on concurrent asymmetric timeliness, we suggest that future studies put more emphasis on comparing the extent of conservatism based on multi-period earnings responses rather than on the concurrent asymmetric timeliness. Re-examining the results of previous studies may provide more insight into a comparison of conservatism.

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Chi-Chun Liu acknowledges research support from the National Science Council of Taiwan (grant no.97-2410-H-002-048-MY3). Chun-Yang Lin acknowledges financial support from Chen Yung Foundation.

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