AN EXAMINATION OF THE IMPACT OF VOLUNTARY DISCLOSURE ON POST-EARNINGS ANNOUNCEMENT DRIFT

A Dissertation presented to the Faculty of the Graduate School
University of Missouri

In Partial Fulfillment
Of the Requirements for the Degree

Doctor of Philosophy

by
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AUGUST 2008

The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

AN EXAMINATION OF THE IMPACT OF VOLUNTARY DISCLOSURE ON POST-EARNINGS ANNOUNCEMENT DRIFT

presented by Changjiang Wang,

a candidate for the degree of doctor of philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

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Dedications

To my parents Fengying Wu and Xilin Wang

For their vision, hard work, inspiration, and their faith in education.

To Xicai Huang and Tianfei Zheng, my wife's parents, for their continuing support throughout my educational process.

To my wife Ping Zheng for her love, support, and belief in me.

To my children Hannah and Grace for the joys they have brought.

ACKNOWLEDGEMENTS

I am most indebted to my dissertation chair, Dr. Inder Khurana, for his guidance and direction. From him I have learned the character of a true scholar. I would also like to thank the members of my dissertation committee: Paul Brockman, Jere Francis, Raynolde Pereira, and Ken Shaw for their support. Specifically, I'd like to thank Dr. Brockman for his excellent and thought-invoking teaching in his investment seminar. I am very grateful to Dr. Francis for his direction and suggestions for my Ph.D. study. He is not only a successful researcher but also an exemplary educator. I learned much as Dr. Shaw's research assistant. Dr. Pereira has been a great mentor to me and instilled in me the willingness to share knowledge and help others.

I am grateful to Dr. Thomas Howard, director of School of Accountancy, for his support of doctoral students. I'd like to thank Dr. Arunachalam for his excellent teaching in his behavioral accounting research seminar. I'd also like to thank professors David Farber, Jenice Prather-Kinsey, Elaine Maudlin, Bill Moser, Pat Wheeler, and May Zhang for their support. I am very fortunate to be in a program with such a great faculty.

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ABSTRACT

This study investigates the impact of voluntary disclosure in the form of management earnings guidance on post-earnings announcement drift (PEAD). Prior research contends that investors' delayed response to the information contained in earnings contributes to PEAD. This delayed response occurs because either investors fail to understand the full implications of current earnings for future earnings or transactions costs prevent a complete and immediate response to earnings news. To the extent that management earnings guidance (MEG) overcomes these shortcomings, I examine three research questions. First, does MEG mitigate PEAD? Second, what is causal channel through which MEG mitigates PEAD? Third, is the impact of MEG on PEAD sensitive to the quality of MEG? Using management earnings guidance data from First Call for the period between 1996 and 2006, I show that MEG mitigates PEAD. I also find that MEG not only improves the extent to which investors incorporate prior earnings information into their earnings expectations but also provides information about future earnings which is uncorrelated with prior earnings information. Further, I find the mitigation effect of guidance on PEAD increases with guidance quality in terms of precision, accuracy, and usefulness. Overall, my study provides evidence on the effectiveness of voluntary disclosure and the channel through which it can alleviate the accounting anomaly of PEAD.

Chapter 1

Introduction

Post-earnings announcement drift (PEAD), which refers to a phenomenon that abnormal returns following earnings announcements drift in the same direction as the unexpected earnings, has been the subject of extensive research in accounting[1]. This predictability of abnormal returns represents mispricing and can lead to resource allocation inefficiency. In this study, I investigate whether voluntary disclosure in the form of management earnings guidance mitigates PEAD. Specifically, I examine three related research questions. First, does management earnings guidance mitigate PEAD? Second, what is causal channel through which management earnings guidance mitigates PEAD? Third, does the impact of management earnings guidance on PEAD vary with the quality of guidance?

Prior studies (e.g. Bernard and Thomas 1989, 1990) suggest that the delayed response to announced earnings is a more plausible explanation for PEAD than the incomplete risk adjustment explanation. Two explanations have been proposed for why the delayed response to announced earnings occurs. One explanation is that investors and analysts fail to recognize fully the implications of current earnings for future earnings (Bernard and Thomas 1989, 1990; Abarbanell and Bernard 1992). Another explanation for the delayed response to announced earnings is that transactions costs prevent a

[1] See Kothari (2001) for a brief review.

complete and immediate response to earnings announcements from informed trading (Bhushan 1994; Ng, Rusticus, and Verdi 2007).

Ajinkya and Gift (1984) argue and provide evidence that management earnings guidance aligns investors' expectations with managements' expectations about future earnings. To the extent that management possesses inside firm-specific information that is not available to investors, management earnings guidance can mitigate investors' naïve earnings expectations, thereby accelerating investors' response to the implications of announced earnings for future earnings. Prior research (e.g. Ajinkya and Gift 1984; Coller and Yohn 1997; Lennox and Park 2006) also shows that management earnings guidance can reduce information asymmetry. To the extent that management earnings guidance reduces information asymmetry, it can also mitigate the delayed response to the implications of announced earnings for future earnings through informed trading. That is, I expect management earnings guidance to mitigate the magnitude of PEAD. To empirically test this prediction and the mechanism through which management earnings guidance mitigates PEAD, I perform both cross-sectional and time-series tests.

First, I examine whether PEAD is less pronounced for firm-quarters with management earnings guidance than for firm-quarters without management earnings guidance, after controlling for factors that have been found to be associated with PEAD. Specifically, I examine whether the observed relation between announced earnings surprises and subsequent abnormal stock returns are reduced by the issuance of management earnings guidance.

Second, to investigate whether management earnings guidance mitigates PEAD by accelerating investors' response to the implications of announced earnings for future earnings, I examine whether firm-quarters with management earnings guidance incorporate more predictable earnings from past earnings information in investors' earnings expectations than firm-quarters without management earnings guidance. Prior research (Bernard and Thomas 1990) provides evidence that investors perceive quarterly earnings to follow a seasonal random walk model, while the underlying earnings process follows a more complicated seasonal change first order autoregressive model[2]. I use the Mishkin (1983) framework, which is a recursive system of two equations, to test whether earnings expectation embedded in share prices more accurately reflects the autocorrelation of seasonally differenced quarterly earnings for firm-quarters with management earnings guidance relative to firm-quarters without management earnings guidance.

Next, I examine the mechanism by which management earnings guidance accelerates investors' response to the implications of announced earnings for future earnings. Management earnings guidance can contain information about future earnings that are predictable from prior earnings information but in a more transparent form. Therefore, as investors revise their earnings expectations to reflect this information, investors' expectations appear to incorporate the serial correlation in seasonally differenced earnings (Soffer and Lys 1999). Management earnings guidance can also provide new information about future earnings that is orthogonal to prior earnings information. The additional information about future earnings can potentially reduce information asymmetry and lower the transactions costs, thereby facilitating informed

[2] Later research shows that in addition to the time series models of Foster (1977) and Brown and Rozeff (1979), first order autoregressive (AR1) and integrated moving average (IMA) can also generate the positive correlation between unexpected earnings of adjacent quarters and a negative correlation with unexpected earnings of fourth lag quarter (Brown and Han 2000; Narayanamoorthy 2006).

trading. To empirically examine the mechanism, I derive a model and examine the time-series impact of management earnings guidance on the incorporation of prior earnings information and future earnings information that is orthogonal to prior earnings information into investors' expectations for future earnings.

Finally, I examine whether the mitigation effect of management earnings guidance on PEAD varies with the quality of management earnings guidance. I first classify the quality of guidance based on the form of guidance. Management can provide both quantitative (e.g. point and range) and qualitative earnings guidance. Baginski, Conrad, and Hassell (1993) find that the forms of management earnings guidance are different in their information content and uncertainty resolution effect. The guidance is of higher quality if the guidance is more precise. Within the quantitative guidance, I further classify the quality of guidance based on its accuracy and usefulness. The guidance is of higher quality if the guidance is ex post more accurate and useful. To be more accurate, it means that the absolute value between actual earnings and management earnings guidance is less. To be useful, it means that the guidance is more accurate than the prevailing analyst forecast consensus before the guidance (Williams 1996). I expect the impact of management earnings guidance on the reduction of PEAD to vary with the quality of management guidance.

Using management earnings guidance data for the period between 1996 and 2006 from the comprehensive First Call Company Issued Guidelines (CIG) database, I find that provision of management earnings guidance mitigates PEAD in both the quarter for which the guidance was provided and in the following quarter. I also find firm-quarters with management earnings guidance incorporate more implications of prior earnings information into investors' earnings expectations. Time series analysis provides some evidence that investors' earnings expectations immediately after management earnings guidance incorporate more predictable past earnings information than those immediately before management earnings guidance. Time series analysis suggests management earnings guidance also provides incremental information about future earnings that is orthogonal to prior earnings information, suggesting that management earnings guidance improves the accuracy of investors' earnings expectations. Further, I find the mitigation effect of guidance on PEAD increases with guidance quality in terms of guidance precision, accuracy and usefulness of current guidance.

Overall, the findings of this study contribute to the literature on both voluntary disclosure and PEAD. First, this study provides empirical evidence that management earnings guidance, a voluntary managerial disclosure, accelerates investors' response to the implications of announced earnings for future earnings, thereby mitigating PEAD. Therefore, this study supports the argument of Soffer and Lys(1999) that information released in between the earnings announcements can move the stock price to the level that implicitly incorporate the serial correlation in seasonally differenced earnings. It complements Kimbrough (2005) which shows conference calls reduce analysts and market underreaction to announced earnings news. The present study is different from Kimbrough (2005) in that management earnings guidance is a different communication media from conference calls, and this study further examines the mechanism through which management earnings guidance mitigates PEAD, while Kimbrough (2005) does not. Moreover, this study provides some evidence supporting the argument of Ng, Rusticus, and Verdi (2007) that post-announcement value-relevant information can move the stock to its fundamental value.

Second, this study also contributes to the literature on the role of voluntary disclosure in the capital markets. Recent management earnings guidance literature mainly focuses on management's self-interest incentives for providing management earnings guidance, such as insider trading (Cheng and Lo 2006), and managing market's expectations to meet or beat them (Cotter, Tuna, and Wysocki 2006). Moreover, prior voluntary disclosure literature focuses on the benefits accruing to the firm by examining how voluntary disclosure reduces cost of capital (Frankel, McNichols and Wilson 1995; Botosan 1997), litigation risk (Skinner 1994), and open-market share repurchase prices (Brockman, Khurana, and Martin 2007). In contrast, this study provides empirical evidence on the role of management earnings guidance, a specific type of voluntary disclosure, in mitigating a well documented market anomaly. Thus, the empirical evidence that providing management earnings guidance can increase price efficiency and this benefit varies with the quality of the guidance have direct implications for managers in determining their disclosure practices. This study also contributes to the current debate as to whether the practice of providing management earnings guidance should be eliminated due to its possible adverse effects (Fuller and Jensen 2002) and therefore has implications for regulators.

Finally, this study provides evidence on the intertemporal impact of management earnings guidance. Prior research on the benefits of the issuance of management earnings guidance are mainly short-window event studies that measure the impact of earnings forecast immediately after the issuance of the guidance (Hirst, Koonce, and

Venkataraman 2008). This study provides evidence on the benefit of management earnings guidance not only for the period immediately after its issuance but also for the period after the announcement of guided earnings.

Chapter 2

Literature review and hypothesis development

2.1 Literature on PEAD

Ball and Brown (1968) documented PEAD by finding that stock prices drift up to two months in the same direction as the announced annual earnings surprises. This drift continues to persist for at least 60 trading days after the quarterly earnings announcements (Foster, Olsen, and Shevlin 1984; Bernard and Thomas 1989). Subsequent research has offered several explanations for why PEAD occurs and persists. More recent research (e.g. Bernard and Thomas 1989; Narayanamoorthy 2006; Ng, Rusticus, and Verdi 2007) has argued that the delayed response to announced earnings arising from either market underreactions or transactions costs is a more plausible explanations for PEAD than an incomplete risk adjustment explanation[3].

The market underreaction explanation for PEAD argues that the market fails to recognize the full implications of current quarterly earnings for future quarterly earnings. Prior research (e.g. Rendleman, Jones, and Latane 1987; Freeman and Tse 1989; Bernard and Thomas 1990) argue and provide evidence that the market seems to use a seasonal random walk model and ignore the serial correlation in the seasonally-differenced

[3] Ball, Kothari, and Watts (1993) argue that investment risk increases for firms with high unexpected earning and decreases for firms with low unexpected earnings. However, the change of beta (firm risk with regard to the market portfolio) is far too small to explain the magnitude of the actual drift. Indeed, Bernard and Thomas (1989) find that PEAD is robust to a series of risk adjustment tests. The fact that the drift consistently has the predicted sign and has concentrated around subsequent quarterly earnings announcements suggests that the risk-based arguments for PEAD are unlikely (Bernard, Thomas and Wahlem 1997).

quarterly earnings to forecast quarterly earnings[4]. Moreover, recent research (Rangan and Sloan 1998; Narayanamoorthy 2006) shows that the magnitude of PEAD is systematically associated with both inter-temporal difference and cross-sectional difference in the magnitude of serial correlation in seasonally-differenced quarterly earnings[5]. Based on the evidence that at two days before the earnings announcement about 50% of serial correlation of seasonally differenced earnings is incorporated in investors' earnings expectations, Ball and Bartov (1996) conclude that investors are not entirely naïve about the autocorrelation patterns in quarterly earnings. However, Soffer and Lys (1999) question the conclusion of Ball and Bartov (1996) by arguing that it is not investors' rationality but information disseminated between earnings announcements which revises investors' expectations to the level that implicitly incorporates the serial correlation of earnings surprises.

Bhushan (1994) documents a positive correlation between the magnitude of PEAD and his transactions costs proxies: trading volume and stock price. Ng, Rusticus, and Verdi (2007) argue that transactions costs constrain the informed trading and find a

[4] When earnings expectation is assumed to follow a seasonal random walk model, the forecast error (seasonally differenced quarterly earnings) in quarter t has positive and declining serial correlations with those at quarter t+1, t+2, and t+3, and a negative serial correlation with that of quarter t+4. Bernard and Thomas (1990) find that seasonally differenced quarterly earnings in quarter t exhibits similar positive and declining serial correlation with abnormal returns around earnings announcements in quarter t+1, t+2, t+3, and negative serial correlation with abnormal return around earnings announcement in quarter t+4.

[5] Rangan and Sloan (1998) document that the auto-correlations of seasonally differenced earnings are stronger for the quarters which are in the same fiscal year than for the quarters which are in the different fiscal year. Further, they find that the abnormal returns are more correlated with the previous quarter's seasonally differenced earnings if the previous quarter is in the same fiscal year than if the previous quarter is in a different fiscal year. Narayanamoorthy (2006) documents that accounting conservatism leads to less autocorrelations of earnings change for loss (or earnings decrease) firms than for profit (earnings increase) firms. He further finds that subsequent abnormal returns are less correlated with the previous quarter's seasonally differenced earnings if the previous quarter has loss (or earnings decrease) than if the previous quarter has profit (or earnings increase).

positive relation between their measures of transactions costs and PEAD. They further argue that post-announcement private or public value-relevant information that makes informed trading profitable moves the market price towards the fundamental value, thereby leading to the observed post-earnings announcement drift.

In summary, two explanations exist for why PEAD occurs and persists. One explanation is that investors and analysts fail to recognize fully the implications of current earnings for future earnings. Another explanation is that transactions costs prevent an immediate and complete response to announced earnings from informed trading.

2.2. Literature of Management Earnings Guidance

Management earnings guidance is the voluntary managerial disclosure which predicts earnings prior to the reporting date (King, Pownall, and Waymire 1990). Extant literature suggests that management earnings guidance serves: to correct unrealistic market expectation of earnings (Ajinkya and Gift 1984; King, Pownall, and Waymire 1990); to save the costs to investors of acquiring private information (Diamond 1985); to signal manager's ability (Trueman 1986); to reduce information asymmetry (Coller and Yohn 1997; Lennox and Park 2006)); and to reduce litigation risk (Skinner 1994).

Information content studies suggest that management earnings forecasts are informative (Patell 1976; Penman 1980; Waymire 1984; Atiase, Li, Supattarakul, and Tse 2005). Pownall and Waymire (1989) find that management earnings guidance has information content incremental to the concurrent earnings announcement[6]. Moreover, Hassell and Jennings (1986) find that management forecasts are relatively more accurate

[6] Later studies (Pownall, Wasley, and Waymire 1993; Atiase, Li, Supattarakul, and Tse 2005) find that earnings news is more informative than the concurrent news contained in management earnings guidance.

than concurrent analyst forecasts. Waymire (1986) and Jennings (1987) show that financial analysts revise their forecasts in response to management earnings guidance. Cotter, Tuna, and Wysocki (2006) find that within five days of management guidance 60% of analysts revise their forecasts. Clement, Frankel, and Miller (2003) show that even confirmatory management earnings guidance reduces the dispersion of analysts' forecasts without altering the mean consensus forecast. Taken together, prior management earnings guidance research suggests that management earnings guidance increases the transparency of firm's earnings process and provides value-relevant information.

2.3. Hypotheses Development

In this study, I examine whether management earnings guidance, a specific form of voluntary managerial disclosure, mitigates PEAD. As suggested by Soffer and Lys (1999), one possibility is that the release of information that makes the earnings process more transparent can accelerate investors' response to the implications of announced earnings for future earnings, thereby reducing PEAD. Another possibility, as proposed by Ng, Rusticus, and Verdi (2007), is that management earnings guidance can facilitate informed trading by providing value-relevant information or reducing transactions costs. Thus, management earnings guidance can mitigate the magnitude of PEAD. This leads to my first hypothesis:

> H1: Post-earnings-announcement drift is less pronounced for firm quarters with management earnings guidance than for firm quarters without management earnings guidance, ceteris paribus.

Further, I examine whether management earnings guidance mitigates PEAD by accelerating investors' response to the implication of prior earnings information for future earnings. If management earnings guidance accelerates investors' response to the implications of prior earnings information for future earnings, those firm-quarters with guidance should incorporate more serial correlation in seasonally differenced earnings in investors' earnings expectations than firm-quarters without guidance. I infer the extent to which investors incorporate past earnings information in their expectation of future earnings from stock returns. This leads to my second hypothesis:

> H2: Earnings expectation embedded in share prices more accurately reflect the serial correlation in seasonally differenced quarterly earnings for firm quarters with management earnings guidance relative to firm quarters without management earnings guidance.

Next, I perform time-series tests using specific management earnings guidance as the unit of analysis to examine the mechanism through which guidance can accelerate investors' response to the implications of prior earnings information for future earnings. Management earnings guidance can contain information that is predictable from prior earnings information but in a more transparent form. As investors revise their earnings expectations to reflect this information, investors' expectations appears to incorporate the serial correlation in seasonally differenced earnings (Soffer and Lys 1999). Management earnings guidance can also provide additional information about the firm's future earnings that is uncorrelated with past earnings information. This additional information about future earnings increases the total information available to investors and improves the accuracy of investors' expectation. I derive a model based on Soffer and Lys (1999) and examine whether management earnings guidance: 1) increases the extent to which investors incorporate prior earnings information in forming future earnings expectations;

and 2) provides information about future earnings that is uncorrelated with prior earnings information.

This leads to my third and fourth hypotheses:

> H3: The stock prices immediately after management earnings guidance reflect more serial correlation in seasonally differenced quarter earnings change than the stock prices immediately before the management earnings guidance.

> H4: Management earnings guidance provides incremental information for future earnings that is uncorrelated with prior earnings information.

I expect the mitigation effect of management earnings guidance to vary with the quality of guidance. Management can provide both quantitative, i.e. point, range, or open interval guidance, and qualitative earnings guidance. Baginski, Conrad, and Hassell (1993) find that in comparison with qualitative earnings guidance, quantitative earnings guidance provides more precise and more certain information about future earnings. Further, if PEAD is mainly due to naïve expectations for future earnings, then guidance which is ex post more accurate (compared with other guidance with regard to actual earnings) or more useful guidance (more accurate than the prevailing analyst forecasts with regard to actual earnings) should improve investors' earnings expectations more toward actual earnings. Therefore, more accurate or more useful earnings guidance is expected to mitigate the drift more. The above discussion leads to the following hypothesis:

> H5: The mitigation effect of management earnings guidance on PEAD is more pronounced for firm quarters whose guidance is of higher quality.

Chapter 3

Data and methodology

3.1 Data

I obtain the management earnings guidance data from First Call Historical Database (FCHD)'s Company-Issued-Guidance (CIG) file, which includes the management guidance data from 1992. My sample period spans from 1996 to 2006[7]. There are 78,739 annual and quarterly management forecasts for the period between June 30 of 1996, the earliest possible fiscal year end date of 1996 and May 31 of 2006, the latest possible fiscal year end date of 2005. I exclude forecasts without the valid CUSIP (loss of 287 observations) and forecasts whose currencies are not in U.S dollars (loss of 663 observations) and exclude duplicate forecasts (loss of 2,039 observations). I exclude management earnings forecasts that are made outside of a reasonable window relative to the forecast period. Specifically, I exclude annual (quarterly) forecasts which are made 390 (120) days before the end of forecasted periods (loss of 6,899 observations) and exclude forecasts made 120 days after the fiscal period end (loss of 398 observations) This reduces earnings forecasts to 68,453 forecasts (30,172 annual and 38,281 quarterly forecasts). A firm could issue more than one forecast for a given fiscal period. I retain the first forecast for fiscal periods with multiple forecasts[8]. Further, for quarters which have

[7]My sample period starts at 1996 for two reasons: 1) there are few management earnings forecasts tracked by First Call before 1996, 2) the Private Securities Litigation Reform Act (PSLR Act) is enacted on December 22, 1995. The PSLR Act protects managers against litigation from forward-looking statements if they are made in good faith. Baginski, Hassell, and Kimbrough (2002) find that legal environment affects management forecasting behavior.

[8] To retain the first forecast is to reduce the likelihood to keep so called "earnings warnings", management earnings guidance that is made after the fiscal year end but before earnings announcement date. Soffer,

both annual and quarterly forecasts, I retain only quarterly earnings forecast. This leads to 38,755 firm-quarters of 6,194 individual firms with management earnings guidance. The management earnings guidance sample selection procedure is summarized in Panel A of Table 1.

Panel B of Table 1 provides the frequency of management earnings guidance. Among the firms that are covered by First Call's detailed analyst file, the percentage of firms that issued management earnings guidance is 17.82% in year 1996 and 20.14% in year 1997. Then this percentage increases to 28.74% in 1998. This big increase is mainly due to the expanded coverage of First Call database on management earnings guidance (Anilowski, Feng, and Skinner 2006). The percentage of firms that issued management earnings guidance increases from 30.83% of year 2000 to 38.70% of year 2001. This big increase is mainly due to the effect of Regulation Fair Disclosure. Though this percentage remains stable for several years, it decreases to 32.40% in 2005. On average, only 30.77% of firms covered by First Call's detailed analyst file have ever provided management earnings guidance at least one time for the period of between 1996 and 2005. Further, for those firms that provided management guidance, the mean (median) of quarters with management guidance is 6.25 (4) out of the 41 maximum quarters during my sample period. Firms could have different existing period in my sample[9]. Therefore, for those firms that provided management guidance, I also measure the proportion of

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Thiagaranjan, and Walther (2000) show that market reactions to and the incentives of earnings preannouncement is different from regular management earnings guidance.

[9] In addition to the 40 quarters for the period between 1996:Q1 and 2005:Q4, there are 401 firm quarters belong to the first quarter of fiscal year 2006.

quarters (Proportion) with guidance during their existing periods[10]. Panel B shows the mean (median) value of Proportion is 24% (15%). It suggests that firms that have provided at least one forecast provide guidance in 24% of quarters in my sample period. As indicated in Panel B of Table 1, many firms never give management earnings guidance in my sample period. Even for those firms who provided management earnings guidance, the guidance is sporadic. Based on this evidence, I follow Cotter, Tuna, and Wysocki (2006) in restricting my sample to firms that provided at least one public management earnings guidance. I form a panel data set and employ firm-fixed effect to control for systematic unobserved firm-specific effects. This research design enables me to focus on the quarter-specific impact of management earnings guidance on PEAD.

Panel C of Table 1 shows the attributes of management earnings guidance in terms of forecast periodicity (annual versus quarterly), form of guidance (point, range, or qualitative), forecast horizon, and the percentage of earnings warning (guidance made after the fiscal period end date but before the earnings announcement date). It shows that 44% of earnings forecasts (30,172 annual earnings forecasts out of 68,453 total earnings forecasts) pertain to annual earnings while 56% of earnings forecasts pertain to quarterly earnings. For the annual guidance, 89% of them are quantitative guidance (70% of annual guidance is range guidance and 19% is point guidance). For the quarterly guidance, 82% of them are quantitative guidance (61% is range guidance and 21% is point guidance). The forecast horizon, which is the days between the guidance announcement date and pertained fiscal period end date, is 185 days on average for annual guidance and 31 days

[10] The firm's existing period is measured as the number of quarters starting from its first appearance in the First Call CIG file until May 31 of 2006.

on average for quarterly guidance. The percentage of earnings warnings is 27% for quarterly earnings guidance and 6% for annual earnings guidance.

I obtain the quarterly financial statement data from COMPUSTAT Quarterly file. Firms are required to have at least 10 consecutive quarterly data with non-missing value to calculate standardized unexpected earnings (SUE), a measure of earnings surprise from a seasonal random walk model[11]. Firms are required to have valid quarterly earnings announcement dates for the period to calculate abnormal returns for the windows of (-2, 0) and (0, +59), with day 0 as the quarterly earnings announcement date.

Stock returns and trading volume data are obtained from the Center for Research in Security Prices (CRSP). I obtain institutional ownership data from 13-f filing to the SEC, provided by CDA/ spectrum database of Thomson Financials[12]. The institutional ownership is the percentage of outstanding common shares held by institutional investors.

After obtaining the firm-quarter observations with SUE, abnormal returns, and control variables, I exclude 0.25 percent extreme observations in each tail based on the abnormal returns and control variables, namely stock price, trading volume, size, and institutional ownership, that are used in the empirical tests. I then restrict the sample to the firms that have given at least one public management earnings guidance for the fiscal period end date between June 30 of 1996 and May 31 of 2006. My final sample has

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[11] As defined in more detail in the later section, SUE is calculated as seasonally-differenced quarterly earnings scaled by market value of current fiscal quarter. SUE is further ranked to deciles based on its distribution of previous quarter and scaled to range over the interval (-0.5, 0.5).

[12] A 1978 amendment to the Securities and Exchange Act of 1934 requires all institutions with greater than $100 million of securities under management to report their holdings to the SEC. The included institutions are:1) bank, 2) insurance company, 3) investment company (mutual fund), 4) investment advisor, such as large brokerage firms, and 5) other, such as pension funds and university endowments. By filing form 13f every calendar quarter, these institutions report their holdings for all common stock that are greater than 10,000 shares or $200,000.

100,568 firm quarters covering 4,900 unique firms. Panel D of Table 1 summarizes the sample selection procedures.

Panel E of Table 1 shows the distribution of my sample across fiscal years and fiscal quarters. The percentage of firm quarters with management earnings guidance in the sample increases from 12.52% in year 1996 to 31.63% in year 2005. Especially, this percentage increases from 20.51% in year 2000 to 33.17% in year 2001. The increase is mainly attributed to the enactment of Regulation Federal Disclosure Act on October 23, 2000. Along with the increasing use of management earnings guidance, the management earnings guidance made in the form of range guidance increases from 4.47% in year 1996 to 26.67% in year 2005. Management earnings guidance in the form of point guidance stays relatively stable over the sample period. Within the fiscal year, 20.30%, 20.07%, and 20.83% of the first, second, and third quarters has the management earnings guidance. In comparison, 41.00% of the fourth quarters contain management earnings guidance. The percentage of management earnings guidance in the fourth fiscal quarter is about twice the percentage in other quarters, suggesting that it is important to control for the fourth quarter effect.

3.2 Empirical models and variable definitions

3.2.1 *Cross-sectional tests of the mitigation effect of management earnings guidance on PEAD*

To test Hypothesis 1, I compare the magnitude of PEAD between firm-quarters with management earnings guidance and firm-quarters without management earnings guidance. Using positive correlation between the first lagged SUE and abnormal returns of subsequent quarters' earnings announcement as the magnitude of PEAD[13], my first hypothesis predicts that the provision of management earnings guidance mitigates this positive correlation. I use the following model to test the first hypothesis.

$$CAR12_t\ (CAR3_t) = \alpha + \beta_1 SUE_{t-1} + \beta_2 MEG_t{*}SUE_{t-1} + \beta_3 MEG_t + \beta_4 Drift\_factor_{t-1}{*}SUE_{t-1} + \beta_5 DIH_{t-1}{*}SUE_{t-1} + \beta_6 Q4_{t-1} + \beta_7 Q4_{t-1}{*}SUE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (1)$$

Where:

$CAR3_t$ = the compounded abnormal return in the three-day window (-2, 0) relative to the earnings announcement date (day 0) in quarter t. It is calculated as the compounded raw returns over (-2, 0) less the compounded value-weighted average return over (-2, 0) for all firms in the same CRSP size decile to which the firm belongs;

$CAR12_t$ = $CAR3_t$ + $CAR3_{t+1}$ + $CAR3_{t+2}$ - $CAR3_{t+3}$, where $CAR3_t$ is defined as above. $CAR3_{t+1}$, $CAR3_{t+2}$, and $CAR3_{t+3}$ represent the three-day (-2, 0) abnormal returns around the earnings announcements in quarter t+1, t+2, and t+3 respectively;

SUE_{t-1} = the decile ranking of the standardized unexpected earnings (SUE) of quarter t-1, further converted to range between -0.5 and 0.5, where SUE is current quarter's earnings before extraordinary items (data8) minus earnings from the corresponding quarter of the last year, scaled by the market value (data14*data61) at the end of current fiscal quarter[14];

MEG_t = 1 in quarter t for which the firm provides management earnings guidance, 0 otherwise;

$Drift\_factor_{t-1}$ = the average of the firm's scores on: (1) the decile ranking of the firm's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to range between 0 and 1, (2) the binary dummy of price (BPRC), with the value of 1 if the firm's stock price is greater than $10 per share at the beginning of the fiscal year to which the quarter belongs, 0 otherwise, and (3) the decile ranking of the firm's dollar trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to range between 0 and 1;

[13] Prior research has shown that the first lagged SUE has highest positive correlation with both current SUE and three-day abnormal returns of subsequent earnings announcement dates (Bernard and Thomas 1990).

[14] Following previous studies such as Bernard and Thomas (1990) and Rangan and Sloan (1998), I use SUE decile ranks instead of the actual standardized unexpected earnings to minimize the problems associated with outliers. To avoid the hindsight bias of ranking (Holthausen 1983), I rank the current quarter's SUE based on previous quarter's SUE distribution. The initial decile rankings range from 0 to 9 are converted to range from -0.5 to 0.5 by dividing nine and subtracting 0.5.

DIH_{t-1} = the decile ranking of the percentage of common shares held by institutions (IH). IH is obtained by dividing the number of common shares of institutional investors by the number of outstanding common shares at the end of the calendar quarter prior to the earnings announcement date;

$Q4_{t-1}$ = 1 if previous quarter is the fourth quarter, 0 otherwise.

In equation (1), the positive coefficient of β_1 indicates the predictability of future abnormal returns by using lagged SUE. The economic interpretation of β_1 is the abnormal returns from a zero investment strategy of going long on the highest SUE_{t-1} decile and going short on the lowest SUE_{t-1} decile. Under H1, the provision of management earnings guidance is expected to mitigate the correlation of past earnings change with subsequent abnormal returns. Therefore, $\beta_{2,}$ the coefficient on the interaction between MEG_t dummy and SUE_{t-1} is predicted to be negative.

The control variables in model (1) are included to control for the factors that prior studies have found to affect the magnitude of PEAD. Foster, Olsen, and Shevlin (1984) find that the magnitude of PEAD is inversely correlated with the information environment of firm, proxied by the firm size. I compute the firm size (MV) for quarter t as the market capitalization as of the beginning of the fiscal year to which the quarter belongs. I rank MV to size deciles and scale size decile numbers to range between zero and one as DMV, with zero as the lowest rank of MV. Bhushan (1994) documents that lower transactions costs are associated with less magnitude of PEAD. The stock price (PRC) at the beginning of the fiscal year and trading volume (VOL) over the previous fiscal year are used to proxy for the transactions costs for the quarters in the current fiscal year[15]. PRC is classified as binary dummy of price (BPRC) based on the share price of the firm at the beginning of the fiscal year. BPRC takes the value of 1 if the price is greater than $10 and 0 otherwise. To compute VOL, I first compute each trading day's trading volume by multiplying the number of common shares traded by the closing price of that day from the CRSP. Then for each firm I sum all the trading day's trading volume for each fiscal year. I rank the VOL of the fiscal year preceding the fiscal year to which the quarter belongs to deciles (DVOL) for that quarter and then scaled to range between 0 and 1. Following Kimbrough (2005), I create a composite measure of factors that are associated with drift[16]. The Drift_factor takes the average value of the DMV, BPRC, and DVOL for each quarter. The coefficient β_4 on the interaction between $Drift\_factor_{t-1}$ and SUE_{t-1} is predicted to be negative.

Bartov, Radhakrishnan, and Krinsky (2000) document that investor sophistication, proxied by institutional ownership, mitigates PEAD. The institutional investor holding (IH) for each quarter t is the percentage of common shares held by institutional investors out of total outstanding common stocks at the end of the calendar quarter prior to the earnings announcement date. The IH of each quarter is ranked to deciles and further scaled to range between zero and one as DIH. The coefficient β_5 on the interaction between institutional ownership DIH_{t-1} and SUE_{t-1} is predicted to be negative.

[15] Chiang and Venkatesh (1988) show that the trading volume is negatively correlated with the bid-ask spread, a component of transactions costs. As a sensitive test, I follow the argument of Ng, Rusticus, and Verdi (2007) and use the quoted bid-ask spread as a more refined proxy for the transactions costs.

[16] Spearman correlations indicate a high degree of correlation among these individual factors. Therefore, using a composite measure can minimize multicollinearity problem. Nonetheless, I obtain qualitatively the same results when I incorporate them as individual factors in the model.

Rangan and Sloan (1998) find that the abnormal return is more correlated with previous quarter's SUE if the previous quarter is in the same fiscal year than if the previous quarter is in the different fiscal year. In other words, if the previous quarter (t-1) is the fourth quarter of the last year, the correlation between SUE and subsequent abnormal returns will be less than if the previous quarter is the first, second, or third fiscal quarter. The coefficient β_7 on the interaction between $Q4_{t-1}$ and SUE_{t-1} is predicted to be negative.

Firms with management earnings guidance could be systematically different from firms without management earnings guidance. Therefore, I restrict my sample to firms who have provided at least one management earnings guidance in my sample period and employ firm-fixed effects to examine the impact of management earnings guidance on the magnitude of PEAD. The firm-fixed effects are used to control for time-invariant cross-sectional differences in the firm characteristics that could be associated with both PEAD and the likelihood of providing management earnings guidance. The year-fixed effects are to control for any inter-temporal changes that might affect the abnormal returns.

Model (1) tests the mitigation effect of management earnings guidance on the PEAD in the quarter for which the guidance was provided. I further test whether the provision of management earnings guidance mitigates the drift following the earnings announcement of the quarter for which the guidance was provided. The rationale is that if management earnings guidance provides new information about future earnings that is not correlated with past earnings information, the market can accelerate the reaction to the upcoming earnings news, leading to less underreaction to it after it is announced. I use the following model to perform this additional test of the first hypothesis.

$$CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 MEG_t{*}SUE_t + \beta_3 MEG_t + \beta_4 Drift\_factor_t{*}SUE_t + \beta_5 DIH_t{*}SUE_t + \beta_6 Q4_t + \beta_7 Q4_t{*}SUE_t + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (1A)$$

Where:

$CAR60_{t+1}$= the compounded abnormal return over the interval (0, +59), where 0 is the earnings announcement date of quarter t and 59 is the number of trading days after day 0. It is calculated as the compounded raw return over (0,+59) less the compounded value-weighted average return over (0,+59) for all firms in the same CRSP size decile to which the firm belongs, based on January 1 market values;

$Q4_t$ = 1 if quarter t is the fourth quarter, 0 otherwise.

All other variables are defined as before except that they are measured in quarter t instead of quarter t-1. I expect β_1 to be positive. The coefficients β_2, β_4, β_5, and β_7 are expected to be negative.

3.3.2 *Cross-sectional tests of management earnings guidance effect on the incorporation of past earnings into earnings expectations*

My second hypothesis predicts firm quarters with management earnings guidance incorporate more autocorrelation of seasonally differenced earnings in their earnings expectations than firm quarters without management earnings guidance. Since the earnings expectations cannot be observed directly, I follow prior studies to infer information on earnings expectations from observed security price movements (Ball and Bartov 1996; Soffer and Lys 1999). The maintained assumption is that the security price is in equilibrium and only contemporaneous unanticipated earnings news affects the price. Following Bernard and Thomas (1990) and Ball and Bartov (1996), I model SUE_t as a linear function of lagged SUEs as follows.

$$SUE_t = b_0 + b_1 SUE_{t-1} + b_2 SUE_{t-2} + b_3 SUE_{t-3} + b_4 SUE_{t-4} + \varepsilon_t \quad (2)$$

Where SUE_t, SUE_{t-1}, SUE_{t-2}, SUE_{t-3}, and SUE_{t-4} are SUE in quarter t, t-1, t-2, t-3 and t-4 respectively.

If equation (2) represents the time-series process of earnings, then the component $(b_0 + b_1SUE_{t-1} + b_2SUE_{t-2} + b_3SUE_{t-3} + b_4SUE_{t-4})$ represents the persistent portion of past earnings changes and ε_t represents the white noise unanticipated earnings in the current quarter t. The implication of market efficiency is that the stock price reaction at the earnings announcement will be a function of current unanticipated earnings ε_t as follows:

$$CAR_t = \alpha + \beta(\varepsilon_t) + \omega_t \quad (3)$$

Where CAR_t is the cumulative market size-decile adjusted returns for the window (-2, 0) relative the quarter t's earnings announcement.

Substituting ε_t from equation (2) into equation (3), I obtain

$$CAR_t = (\alpha - \beta b^*_0) + \beta SUE_t - \beta b^*_1 SUE_{t-1} - \beta b^*_2 SUE_{t-2} - \beta b^*_3 SUE_{t-3} - \beta b^*_4 SUE_{t-4} + \omega_t \quad (4)$$

I use the Mishkin (1983) test to examine whether the stock prices more accurately reflect the autocorrelation of seasonally differenced earnings for firm-quarters with management earnings guidance than firm-quarters without management earnings guidance. The Mishkin (1983) test is based on rational expectations hypothesis[17] and it estimates a system of two equations using iterative weighted non-linear least square to test the null hypothesis that the market rationally prices the implication of past earnings for future earnings. In the context of current study, the Mishkin test simultaneously estimates equations (5) and (6) as follows and compares the coefficients in equations (5) and (6) using a likelihood ratio statistics.

[17] Rational expectations hypothesis implies that only unanticipated changes in earnings expectations can be correlated with the abnormal returns.

$$SUE_t = b_0 + b_1SUE_{t-1} + b_2SUE_{t-2} + b_3SUE_{t-3} + b_4SUE_{t-4} + b_5MEG_t + b_6MEG_t{*}SUE_{t-1} + b_7MEG_t{*}SUE_{t-2} + b_8MEG_t{*}SUE_{t-3} + b_9MEG_t{*}SUE_{t-4} + \varepsilon_t \quad (5)$$

$$CAR_t = \alpha + [\beta SUE_t - \beta b^*_0 - \beta b^*_1SUE_{t-1} - \beta b^*_2SUE_{t-2} - \beta b^*_3SUE_{t-3} - \beta b^*_4SUE_{t-4} - \beta b^*_5MEG_t - \beta b^*_6MEG_t{*}SUE_{t-1} - \beta b^*_7MEG_t{*}SUE_{t-2} - \beta b^*_8MEG_t{*}SUE_{t-3} - \beta b^*_9MEG_t{*}SUE_{t-4} + \omega_t] \quad (6)$$

Equation (5) is a forecasting equation in which the coefficients b_1, b_2, b_3, and b_4 are the serial correlations of the current quarter's SUE with four lagged SUEs for non-guidance firm-quarters. Instead, the coefficients b_6, b_7, b_8, and b_9 are the incremental serial correlations of the current quarter's SUE with four lagged SUEs for firm-quarters with management earnings guidance. Equation (6) is a pricing equation and the coefficients b^*_1, b^*_2, b^*_3, and b^*_4 are the serial correlations of current SUE with four lagged SUEs that are embedded in the stock price for non-guidance firm-quarters. Instead, the coefficients b^*_6, b^*_7, b^*_8, and b^*_9 are the incremental serial correlations of the current quarter's SUE with four lagged SUEs that are embedded in the stock price for firm-quarters with management earnings guidance.

Mispricing is inferred if the implied serial correlations in the price equation are systematically different from the weights in the forecasting equation. If management earnings guidance mitigates the extent of investors' ignoring the implications of prior earnings for future earnings, then firm-quarters with management earnings guidance will incorporate a higher proportion of serial correlation of the current SUEs with prior SUEs. To test H2, I examine the implied serial correlation of first lagged SUE with current SUE since the serial correlation is highest for the first lagged SUE with current SUE. Therefore, H2 predicts $(b^*_1 + b^*_6)/(b_1 + b_6) > b^*_1/b_1$.

3.3.3 Time-series test: the change of earnings expectations before and after management earnings guidance and information content of management earnings guidance

Hypothesis 3 predicts that upon the management earnings guidance, investors will incorporate more prior earnings information into the stock prices. To test this hypothesis, I compare the implied serial correlation of the current SUE with the first lagged SUE in the stock price two days before with the implied serial correlation of the current SUE with the first lagged SUE in the stock price two days after the management earnings guidance[18]. Hypothesis 4 predicts that management earnings guidance could also provide incremental earnings information, which is uncorrelated with prior earnings information.

The sample for testing hypothesis 3 and hypothesis 4 is restricted to the firm quarters with management earnings guidance. The advantage of this methodology is that I use the firm as its own control and use the stock price to infer the change of investors' earnings expectations upon management earnings guidance and information content of management earnings guidance.

I follow Soffer and Lys (1999) to infer investors' earnings expectations at a point of time from abnormal stock returns. To test hypothesis H3, I use the models that are derived in Appendix 1. Equation (7) is the forecast equation to estimate the serial correlation of seasonally differenced earnings. Equation (8) is the stock return equation to estimate the impact of management earnings guidance on the extent to which the serial correlation of seasonally differenced earnings is incorporated into investors' earnings expectations.

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[18] The selection of two days window is based on prior literature on analysts' and investors' reactions to management guidance. Using management guidance sample from 1995 to 2001, Cotter, Tuna, and Wysocki (2006) document that the majority of analysts revise their forecast revisions within two days of management earnings guidance. Ng, Tuna, and Verdi (2007) find that there is market underreaction to management earnings guidance, especially for good news guidance. Two days window allows the effect of management earnings guidance to be incorporated in the stock price. I also do the sensitive tests using one day before and one day after the management earnings guidance and have qualitatively similar results.

$$\Delta EPS_t = PRE*[b_0 + b_1*\Delta EPS_{t-1} + \varepsilon_t] + POST*[b_0 + b_1*\Delta EPS_{t-1} + \varepsilon_t] \quad (7)$$

$$CAR_t = PRE*\{(\alpha - \beta b^E_0) + \beta*\Delta EPS_t - \beta\, b^E_1*\Delta EPS_{t-1} + \omega_t\} + POST*\{[\alpha - \beta(1-\mu)* b^E_0] + \beta(1-\mu)*\Delta EPS_t - \beta(1-\mu)b^E_{1,G}*\Delta EPS_{t-1} + \omega_t\} \quad (8)$$

Where

CAR_t, = the cumulative abnormal returns (market size-decile adjusted) from the event date until the earnings announcement date of quarter t;

PRE = a dummy variable equal to 1 when the event date is two days before the announcement of management earnings guidance, 0 otherwise;

POST = a dummy variable equal to 1 when the event date is two days after the announcement of management earnings guidance, 0 otherwise;

$\Delta EPS_t = EPS_t - EPS_{t-4}$, scaled by the absolute value of EPS_{t-4};
$\Delta EPS_{t-1} = EPS_{t-1} - EPS_{t-5}$, scaled by the absolute value of EPS_{t-5};
EPS_t = Earnings per share at quarter t.

I use the Mishkin (1983) test to estimate the extent to which the serial correlation in seasonally-differenced quarterly earnings is reflected in the stock prices before and after the management earnings guidance.

In equation (7), b_1 represents the serial correlation between ΔEPS_t and ΔEPS_{t-1} from the pooled regression. The coefficients b^E_1 and $b^E_{1,G}$[19] represent the implied serial correlations of seasonally differenced earnings in investors' earnings expectations at two days before and two days after the announcement of management earnings guidance respectively. If management earnings guidance helps investors move away from perceiving quarterly earnings as a random walk model toward correct time-series model that incorporates the serial correlations of seasonally differenced earnings, then after the announcement of management earnings guidance, investors will incorporate more serial correlations of seasonally differenced earnings into the stock price. That is, I expect

[19] The implied serial correlation b^E_1 ($b^E_{1,G}$) is calculated as the negative ratio of dividing coefficient on ΔEPS_{t-1} by coefficient on ΔEPS_t for the regression estimated at two days before (two days after) management earnings guidance.

$b^E_{1,G}/b_1$ to be greater than b^E_1/b_1. Given that b_1 is the same, $b^E_{1,G}$ is expected to be higher than b^E_1 under hypothesis H3.

Hypothesis H4 examines whether management earnings guidance provides some new information about future earnings which is orthogonal to past earnings information. Equation (8) is used to test this hypothesis. If management earnings guidance provides some incremental information for future earnings in addition to the predictable information from past earnings information, then μ is expected to be between zero (management earnings guidance does not provide any additional information for quarter t's earnings other than the information which can be predicted from past earnings change) and one (management guidance provides perfect information about quarter t's earnings). Thus, hypothesis H4 predicts μ to be positive. To test H4, I compare $\beta(1 - \mu)$, the coefficient on ΔEPS_t after the management earnings guidance, with the coefficient β on ΔEPS_t before the management earnings guidance. I expect $\beta(1 - \mu)$ to be less than β in the equation (8).

3.3.4 Quality of guidance and its differential mitigation effect on PEAD

Hypothesis 5 predicts that the mitigation effect of management earnings guidance on PEAD increases in guidance quality. Guidance quality refers to guidance's relative precision, accuracy, and usefulness. The guidance is of higher quality if the guidance is more precise, ex post more accurate, and useful to analysts.

To measure the precision of guidance, I first classify firm quarters with guidance as firm quarters with either qualitative guidance or with quantitative guidance (point or range guidance)[20]. I create a separate indicator variable for qualitative guidance and one for quantitative guidance. I use the following models to test the mitigation effect of each type of guidance relative to firm quarters without guidance. The missing group in the model is the firm quarters that do not have management earnings guidance.

$$CAR12_t\ (CAR3_t) = \alpha + \beta_1 SUE_{t-1} + \beta_2 Qual_t*SUE_{t-1} + \beta_3 Quant_t*SUE_{t-1} + \beta_4 Qual_t + \beta_5 Quant_t + \beta_6 Drift\_factor_{t-1}*SUE_{t-1} + \beta_7 DIH_{t-1}*SUE_{t-1} + \beta_8 Q4_{t-1} + \beta_9 Q4_{t-1}*SUE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (9a)$$

$$CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 Qual_t*SUE_t + \beta_3 Quant_t*SUE_t + \beta_4 Qual_t + \beta_5 Quant_t + \beta_6 Drift\_factor_t*SUE_t + \beta_7 DIH_{t-1}*SUE_t + \beta_8 Q4_t + \beta_9 Q4_t*SUE_t + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (9b)$$

Where

$Quant_t$ = 1 if the management earnings guidance is in the form of point or range guidance, 0 otherwise;

$Qual_t$ = 1 if the management earnings guidance is in the form of qualitative guidance, 0 otherwise.

If quantitative management earnings guidance provides more specific information about firms' future earnings and improves investors' earnings expectations, the quantitative guidance is expected to mitigate drift. In comparison, the qualitative guidance, such as 'OK with expectation' or 'below expectation', might not provide specific information about future earnings or improve investors' earnings expectations. Thus, qualitative earnings guidance might not mitigate the drift.

For firm quarters with quantitative guidance, I also assess each firm quarter's guidance quality based on its relative accuracy and usefulness. Following Ng, Tuna, and Verdi (2007), the accuracy of guidance is measured as *Accuracy* = -1* |actual earnings - guidance|, scaled by stock price two trading days before the earnings announcement

[20] For firms providing single guidance for a fiscal quarter, the type of that firm quarter is the type of that guidance. If firms provide more than one forecast, I take the most frequent forecast in that quarter as the guidance type for that quarter. In tied situations, I keep the type of the most recent one as the guidance type for that quarter.

date[21]. The absolute value of difference between actual earnings and earnings guidance measures how accurate the guidance is ex post. Multiplying by (-1) makes *Accuracy* increase with guidance quality. Appendix 2 demonstrates how to measure the value of guidance conditional on the type of guidance. Consistent with prior studies, my untabulated results show that quarterly guidance tends to be more accurate than annual guidance. Therefore, to measure firm quarter's guidance accuracy, I only retain the quarterly guidance if there are both annual and quarterly guidance for that fiscal period. If firms provide multiple forecasts for one fiscal period, I take the average value of each forecast as the value of guidance for that fiscal period. Further, to reduce measurement error, I compare the accuracy of quarterly guidance with the median quarterly guidance accuracy and compare the accuracy of annual guidance with the median annual guidance accuracy in a given year and industry. The *Accuracy* of firm quarter's guidance is classified as a dummy variable taking the value of 1 if its accuracy is above the median, and that of 0 otherwise.

In addition to the relative accuracy of guidance, I also measure the quality of guidance depending on its relative usefulness following Williams (1996) and Hutton and Stocken (2007). A management forecast is regarded as useful if it is more accurate than the consensus analyst forecast before the guidance (Williams 1996). I compare the absolute value of the difference between actual earnings and earnings guidance (|actual earnings - guidance|) with the absolute value of difference between actual earnings and

[21] I obtained the actual earnings from the actual file of First Call. The actual earnings reported in the First Call are split-adjusted, while guidance is original data. Therefore, I adjusted the guidance by dividing the guidance by the stock-split factor. In comparison with adjusting actual earnings back to their original data, adjusting guidance has less potential of the bias that could be induced by rounding the adjusted number to the two-decimal place.

prevailing analyst forecast (|actual earnings – consensus analyst forecast|) before the guidance. The forecast is classified as useful if the |actual earnings - guidance| < |actual earnings – consensus analyst forecast|. Firms could provide multiple forecasts for a fiscal period. Therefore, I follow Hutton and Stocken (2007) to calculate the ratio of usefulness as follows:

$$\frac{\text{Number of useful forecasts}}{\text{Total number of management earnings forecasts issued}}$$

To reduce measurement error, I create a dummy variable *Usefulness* taking the value of 1 if the ratio in that firm quarter is higher than the median value of the ratio for the firms in the same SIC 2-digit industry in a given year and that of 0 otherwise.

I use the following models to test whether the mitigation effect of management earnings guidance on PEAD varies with the quality of guidance:

$$CAR12_t\ (CAR3_t) = \alpha + \beta_1 SUE_{t-1} + \beta_2 MEG_t{*}SUE_{t-1} + \beta_3 Quality_t{*}MEG_t{*}SUE_{t-1} + \beta_4 MEG_t + \beta_5 Quality_t + \beta_6 Drift\_factor_{t-1}{*}SUE_{t-1} + \beta_7 DIH_{t-1}{*}SUE_{t-1} + \beta_8 Q4_{t-1} + \beta_9 Q4_{t-1}{*}SUE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (10a)$$

$$CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 MEG_t{*}SUE_t + \beta_3 Quality_t{*}MEG_t{*}SUE_t + \beta_4 MEG_t + \beta_5 Quality_t + \beta_6 Drift\_factor_t{*}SUE_t + \beta_7 DIH_t{*}SUE_t + \beta_8 Q4_t + \beta_9 Q4_t{*}SUE_t + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (10b)$$

Where Quality refers to the relative *Accuracy* or *Usefulness* as defined above.

If high quality of management earnings guidance has more impact on mitigating PEAD, then the coefficient β_3 is predicted to be negative under the hypothesis H5.

Chapter 4

Empirical results

4.1 Descriptive statistics

Table 2 presents the descriptive statistics for the variables used in my analysis. The SUE_t, SUE_{t-1}, $SUE_{t-2,}$ SUE_{t-3}, and SUE_{t-4} reported in Table 2 are unranked SUEs. The mean and median of SUE_t is about 0 and 0.002. The mean of $CAR3_t$ is 0.006 and the mean of $CAR60_t$ is -0.001, suggesting that firms in the sample on average outperform the firms surrounding earnings announcements but underperform after the announcements. The institutional investor holdings (IH) has the mean value of 47% and the median value of 48%. The firm market capitalization has the mean value of $2,417 millions and median value of $389 million, suggesting it is skewed to the right. The trading volume and stock price are also skewed to the right. The skewness suggests the existence of a small number of firms with very large size, trading volume, and high stock price. The mean and median of Drift_factor are about 0.6 and 0.7 respectively, suggesting firms in the sample are relatively large and liquid firms.

4.2 Correlations

Table 3 presents the Pearson and Spearman correlation coefficients for variables used in the analysis. Consistent with prior studies, SUE_t has declining positive correlations with SUE_{t-1}, SUE_{t-2}, SUE_{t-3} (0.384, 0.220, 0.077) and negative correlation with SUE_{t-4} (-0.194). The $CAR12_t$ and $CAR3_t$ are positively correlated with SUE_{t-1}. The $CAR60_{t+1}$ is positively correlated with SUE_t. These positive correlations between past earnings information and subsequent abnormal returns suggest the existence of PEAD in the sample. The provision of management earnings guidance is positively associated with firm size, trading volume, stock price, the institutional ownership and management earnings guidance is more likely to be provided in the fourth quarter. The Spearman correlation coefficients are very high among firm size, trading volume, and stock price, justifying the use of a composite variable, Drift_factor, in the regression test.

4.3 Test of Hypothesis 1

Table 4 presents the estimate of model (1) using $CAR12_t$ and $CAR3_t$ as alternative dependent variables. The estimates are similar in the sign and magnitude for both dependent variables. Therefore, I focus on the interpretation of the findings using $CAR12_t$ as the dependent variable. All coefficients are in the unit of percent. The coefficient on the lagged earnings surprise, SUE_{t-1}, is significantly positive with the value of 2.51. It indicates that the magnitude of drift is 2.51% for twelve days surrounding four quarters' earnings announcement dates when firm quarters with drift_factor of 0 (small and high transactions costs firms), low institutional ownership, preceding quarter not being the fourth quarter of the last year, and no management earnings guidance. The coefficient on the interaction term $Drift\_factor_{t-1}*SUE_{t-1}$ is significantly negative with the value of -2.24. This is consistent with the previous finding that big and actively traded firms incur less drift. The coefficient on $DIH_{t-1}*SUE_{t-1}$ is negative as expected but not statistically significant. The coefficient on $Q4_{t-1}*SUE_{t-1}$ is significantly negative, which is consistent with the finding of Rangan and Sloan (1998) that the magnitude of PEAD is less when the preceding quarter is in a different fiscal year. Moreover, the coefficient on the interaction term MEG_t*SUE_{t-1} is significantly negative with the value of -0.87, which is economically significant. These results suggest that provision of management earnings guidance mitigates the drift. For the small and high transaction costs firms, the provision of management earnings guidance mitigates drift by 34.7%[22]. This is consistent with Hypothesis 1 that the magnitude of PEAD is significantly smaller for the firm quarter with management earnings guidance.

Table 5 presents the estimate of model (1A) using $CAR60_{t+1}$ as the dependent variable. The coefficient on SUE_t is significantly positive with the value of 15.42. It indicates that the magnitude of drift is 15.42% for sixty days after quarters' earnings announcements when the firm-quarter has a drift_factor of 0 (small and high transaction cost firms), low institutional ownership, current quarter not being fourth quarter, and no management earnings guidance. The coefficient on the interaction term between MEG_t and SUE_t is significantly negative with the value of -2.18. This suggests that provision of management earnings guidance mitigates the drift following the quarter for which the management earnings guidance was provided. For the small and high transaction costs firms, the provision of management earnings guidance mitigates drift by 14.1%. The coefficient on the interaction term $Drift\_factor_{t-1}*SUE_{t-1}$ is significantly negative with the value of -9.64. The coefficient on DIH_t*SUE_t is significantly negative as expected with the value of 4.66. This is consistent with Bartov, Radhakrishnan, and Krinsky's (2000) finding that investor sophistication mitigates drift. Consistent with Rangan and Sloan (1998), the coefficient on $Q4_t*SUE_t$ is significantly negative. This test provides additional evidence that the provision of management earnings guidance mitigates PEAD. Further, it suggests that management earnings guidance can not only mitigate PEAD in

[22](0.87/2.51)*100% =34.7%.

the current quarter for which the guidance was provided, but also mitigate PEAD in the following quarter.

4.4 Test of Hypothesis 2

Table 6 presents the results from jointly estimating equations (5) and (6) for the sample. I first run the test without distinguishing between guidance and non-guidance firm quarters. Results for this test indicate that on average market underestimates the implication of past SUEs for current SUE. Specifically, the serial correlation between the first lagged SUE and with the current SUE is 0.342, while the implied serial correlation from the abnormal returns is 0.118. The difference is statistically significant with the constraint likelihood ratio of 92.35. The market on average only incorporates about 34.5% (0.118/0.342) of the autocorrelation of SUEs in the stock price prior to the earnings announcement of quarter t. Then I run the test and distinguish between guidance and non-guidance firm quarters. For non-guidance firm quarters, b_1, the serial correlation between the first lagged SUE_{t-1} and SUE_t is 0.335. The incremental correlation for guidance firm quarters, b_6, is 0.024 and is statistically significant. More important as shown in the last column, the implied serial correlation for non-guidance firm quarters, b^*_1, is only 0.072. In contrast, the implied incremental serial correlation for guidance firm quarters, b^*_6, is 0.204, which is statistically different from 0. To test hypothesis 2, I compare the ratio of $(b^*_1 + b^*_6)$ to $(b_1 + b_6)$ with that of b^*_1 *to* b_1. My results indicate that $(b^*_1 + b^*_6)/(b_1 + b_6) = 0.768$ and $b^*_1/b_1 = 0.215$ and reject $(b^*_1 + b^*_6)/(b_1 + b_6) = b^*_1/b_1$ at $p < 0.001$ with constraint likelihood ratio of 11.26. This result suggest that the degree to which investors' earnings expectations incorporate the implications of prior earnings for future earnings is statistically higher for firm-quarters with management earnings guidance than for firm-quarters without management earnings guidance.

4.5 Tests of Hypotheses 3 and 4

In testing H3 and H4, I perform the time-series tests on individual management earnings guidance. Annual guidance tends to have a very long guidance horizon (the mean and median are 185 and 170 days respectively). Guidance made after the fiscal year end tends more likely to be earnings warnings. Therefore, I restrict my sample to quarterly guidance that made before the fiscal year end. My sample size for testing H3 and H4 is 42,984 quarterly management earnings guidance. To test H3, I examine the direct and immediate impact of management earnings guidance on the extent to which investors incorporate predictable past earnings information in their earnings expectations. Table 7 presents the results of testing H3. The time-series autocorrelation coefficient b_1 is 0.397. The implied serial correlation two days before management earnings guidance, $b^E{}_1$, is 0.123, and the implied serial correlation two days after guidance, $b^E{}_{1,G}$, is 0.204. The results indicate that on average investors' earnings expectations incorporate about 31.9% (0.123/0.397) of predictable earnings change from first lagged seasonally differenced earnings before management earnings guidance, compared to 50% (0.20/0.397) after guidance. This increase in the extent of incorporating predictable past information is consistent with the prediction of H3. However, the increase is not statistically significant ($p = 0.29$). The lack of significance might be due to delayed reactions to management earnings guidance as documented in Ng, Tuna, and Verdi (2007). This might also explain why firms often issue guidance multiple times to align investors' earnings expectations.

To test H4, I estimate equation (8) and compare $\beta(1 - \mu)$, the coefficient on ΔEPS_t after the management earnings guidance, with the coefficient β on ΔEPS_t before the management earnings guidance. Table 8 shows that β is 0.086 and $\beta(1 - \mu)$ is 0.038. The difference between β and $\beta(1 - \mu)$ is 0.048 and is statistically significant. The implied μ is 0.56, which is between zero (management earnings guidance does not provide any additional information for quarter t's earnings other than that which can be predicted from past earnings change) and one (management guidance provides perfect information about quarter t's earnings). This result supports H4 and suggests that management earnings guidance provides incremental information about future earnings that cannot be predicted from past earnings information.

4.6 Tests of Hypothesis 5

In section 2, I hypothesize that the mitigation effect of management earnings guidance on PEAD increases in guidance quality. I measure guidance quality in three ways: guidance precision, guidance accuracy, and guidance usefulness.

Table 9 shows the results of testing H5. Panel A shows the results using $CAR12_t$ and $CAR3_t$ as the dependent variables and guidance precision as the interest variable. Panel B shows the result using $CAR60_{t+1}$ as the dependent variable and guidance precision as the interest variable. The missing group in the model is the firm quarters that do not have the guidance. Therefore, the coefficients on Qual*SUE captures the incremental effect of qualitative guidance on the drift relative to no guidance, while the coefficients on Quant*SUE captures the incremental effect of quantitative guidance on the drift relative to no guidance. The coefficients on the $Qual_t*SUE_{t-1}$ are -0.37 and 0.24 for the model with $CAR12_t$ and $CAR3_t$ respectively, and they are not statistically significant. The coefficient on the $Qual_t*SUE_t$ is -0.56 and is not statistically significant for the model with $CAR60_{t+1}$. In comparison, the coefficients on the $Quant_t*SUE_{t-1}$ are -0.42 and -0.48 for the model with $CAR3_t$ and $CAR12_t$, respectively, and they are statistically significant at 0.05 level. The coefficient on the $Quant_t*SUE_t$ is -2.58 and is statistically significant at 0.01 level for the model with $CAR60_{t+1}$. These results suggest that compared with firm-quarters without guidance, firm-quarters with qualitative guidance do not have less drift but firm quarters with quantitative guidance do have less drift[23].

Panel C shows the results using $CAR12_t$ and $CAR3_t$ as the dependent variables and using guidance *Accuracy* and *Usefulness* as interest variables. Panel D shows the result using $CAR60_{t+1}$ as the dependent variable and using guidance accuracy and usefulness as interest variables. When using *Usefulness* to proxy guidance quality, the coefficients on MEG*SUE are negative but not significant for all three test windows: $CAR3_t$, $CAR12_t$, and $CAR60_{t+1}$. These results suggest that less useful guidance with regard to analyst forecast does not mitigate the drift. The coefficients on Quality*MEG*SUE captures the incremental effect of more useful guidance in mitigating the drift. The coefficient on Quality*MEG*SUE is -0.70 and statistically significant at 0.05 level for the model with $CAR3_t$. The coefficient on Quality*MEG*SUE is negative with the value of -0.38 but not significant for the model with $CAR12_t$. The coefficient on Quality*MEG*SUE is -4.35 and significant at 0.01 level for the model with $CAR60_{t+1}$.

[23] I further classify the quantitative guidance to point and range guidance. Within quantitative earnings guidance, point guidance provides less but higher precise earnings information than range guidance. Due to the differential information content and uncertainty resolution effect, the impact of management earnings guidance on the reduction of PEAD is expected to vary with the form of management earnings guidance. The coefficients on Range*SUE are negative and significant at 0.05 level for all three test windows. The coefficients on Point*SUE are significant for $CAR60_{t+1}$but not for the other two test windows.

Overall, the results suggest that in general ex post more useful guidance mitigates drift more than less useful guidance.

When using the *accuracy* as the proxy for the guidance quality, the coefficients on MEG*SUE are negative but not significant for both models using $CAR12_t$ and $CAR3_t$ as dependent variables and is only marginal significant (with t-value of 1.77) for the model using $CAR60_{t+1}$ as the dependent variable, suggesting that low-quality guidance does not mitigate the drift. The coefficients on Quality*MEG*SUE captures the incremental effect of high accuracy guidance in mitigating the drift. They are negative and statistically significant at 0.05 level for both models using $CAR3_t$ and $CAR60_{t+1}$ as dependent variables but not for the model using $CAR12_t$ as the dependent variable, suggesting that in general ex post more accurate guidance mitigates drift more than less accurate guidance.

I also test whether past guidance accuracy or usefulness affects current guidance's mitigation effect on the drift. Past guidance accuracy (usefulness) is measured as the average accuracy (usefulness) ratio in the previous eight quarters. Prior guidance accuracy or usefulness could increase the credibility of the current guidance, thereby leading investors and analysts react more quickly to the information contained in the guidance (Ng, Tuna, and Verdi 2007; Williams 1996). The present study is not about how quick investors react to the information contained in the guidance. Instead it examines how the provision of management earnings guidance improves investors' earnings expectations before the earnings announcement. Therefore, it allows investors enough time to fully react to the information contained in the guidance. Untabulated results indicate that there is no incremental effect for guidance which has more accurate or more useful guidance in the prior periods. This finding suggests that management earnings guidance might mitigate the post-earnings announcement drift primarily through providing more information about the upcoming quarter's earnings. As a result, only current guidance accuracy or usefulness matters.

4.7 Robustness tests

4.7.1 Partition samples to Pre- and Post- Regulation Fair Disclosure

The Regulation Fair Disclosure (Reg FD) was enacted on October 23, 2000 by the Securities and Exchange Commission. Reg FD prohibits selective disclosure of material information unless it is also immediately disclosed to the public. The Reg FD has had a significant impact on firms' voluntary disclosure behavior. Prior to the enactment of Reg FD, management could provide private disclosure to analysts or institutional shareholders through conference calls, private management earnings guidance, and other channels[24]. After the enactment of Reg FD, many firms who provided private guidance before chose to either disclose publicly or chose to be silent (Wang 2007). Therefore, for those firm quarters that don't have guidance according to First Call database, there is the potential of misclassification problems for the periods before the enactment of Reg FD. That is, some firm quarters might have private guidance but in my study they are treated as non-guidance firm quarters. However, this misclassification works against finding evidence supporting my main hypothesis. To test the robustness of my results, I partition the sample to Pre- and Post-Reg FD subsamples and repeat my main tests for both Pre- and Post-Reg FD subsamples.

[24] Though this private disclosure might serve its purpose by conveying firms' information but not risk disclosing propriety information to competitors, it can also damage investor confidence because the selective disclosure might be used as a commodity of management to gain favor from analysts or institutions , who can profit at the expense of investing public (Levitt 1998).

Panel A of Table 10 presents the results of testing H1 for Pre- and Post-Reg FD subsamples. For the Pre-Reg FD subsample, the coefficient estimates on MEG*SUE_{t-1} are insignificantly different from 0 for when dependent variable is either $CAR12_t$ or $CAR3_t$. For the Post-Reg FD subsample, the coefficient estimates on MEG*SUE_{t1} are negative and significant when dependent variable is either $CAR12_t$ or $CAR3_t$. The results show that the mitigation effect of management earnings guidance occurs in the Post-Reg FD period but not in Pre-Reg FD period. The potential explanation for this finding is that firms could provide private guidance in the period before the enactment date of Regulation Fair Disclosure (Wang 2007) but these firm quarters are misclassified as firm quarters without guidance.

Panel A of Table 11 shows the results of testing H2 using models (5) and (6) for both Pre- and Post-Reg FD subsamples. The ratio of b^*_1 *to* b_1 reflects the proportion of the serial correlation of SUE_t with SUE_{t-1} (the implication of past earnings for future earnings) that is incorporated in investors earnings expectations for firm quarters with no guidance. The ratio of $(b^*_1 + b^*_6)$ to $(b_1 + b_6)$ captures the proportion of the serial correlation of SUE_t with SUE_{t-1} that is incorporated in investors earnings expectations for firm quarters with guidance. For the Pre-Reg FD subsample, $(b^*_1 + b^*_6)/ (b_1 + b_6) = b^*_1 /b_1$ cannot be rejected at traditional significance level (with p = 0.3116 with constraint likelihood ratio of 1.00). This result suggest that for the Pre-Reg FD subsample, the degree to which investors' earnings expectations incorporate the implications of prior earnings for future earnings is not statistically higher for firm-quarters with management earnings guidance than for firm-quarters without guidance. In comparison, for the Post-Reg FD subsample, $(b^*_1 + b^*_6)/ (b_1 + b_6)$ is higher than b^*_1 /b_1 and $(b^*_1 + b^*_6)/ (b_1 + b_6) =$

b^{*}_{1} /b_1 can be rejected at $p < 0.0001$ with a constraint likelihood ratio of 11.44. This result suggests that for the Post-Reg FD subsample, the degree to which investors' earnings expectations incorporate the implications of prior earnings for future earnings is statistically higher for firm-quarters with management earnings guidance than for firm-quarters without management earnings guidance. This finding is consistent with the results in Panel A of Table 10 that suggest the mitigation effect of management earnings guidance occurs in the Post-Reg FD period but not in the Pre-Reg FD period.

4.7.2 Partition the samples to Fourth quarters and Non-fourth quarters

Prior studies find that the information content of fourth quarter's earnings is different from that of interim-quarter's earnings. On the one hand, fourth quarter's earnings should be more reliable because it is subject to external auditing. On the other hand, fourth-quarter's earnings suffers from more estimation errors due to the settling up of estimation errors incurred in the first, second, and third quarters (Collins, Hopwood, McKeown 1984). Salamon and Stober (1994) document that stock price response coefficient of fourth-quarter earnings announcement is smaller than those of interim earnings announcements. Though I have controlled the fourth quarter effect in my main tests according to the findings of Rangan and Sloan (1998), I partition the sample to the fourth quarters and the non-fourth quarters subsamples on the basis of the quarter to which the SUE used in the model belongs. I perform separate tests for the fourth quarters and the non-fourth quarters.

Panel B of Table 10 shows the results of testing H1 using the model (1) for both Fourth-quarters and Non-fourth quarters subsamples. For the subsample with fourth quarters, the coefficient estimates on MEG*SUE_{t-1} are negative but insignificantly different from 0 when dependent variable is either $CAR12_t$ or $CAR3_t$. For the subsample with non-fourth quarters, the coefficient estimates on $MEG*SUE_{t-1}$ are negative and significant when dependent variables is either $CAR12_t$ or $CAR3_t$. These results suggest that management earnings guidance mitigates the drift when the preceding quarter belongs to non-fourth fiscal quarters but does not mitigate the drift when the preceding quarter is the fourth fiscal quarter. One possible explanation for this finding is that the implication of the fourth fiscal quarter's earnings for the earnings of next quarter, which is the first fiscal quarter of next year, is less than the implication of the earnings of non-fourth fiscal quarters for next quarter's earnings. As a result, the drift itself will be less following the fourth quarter if the drift arises because investors ignore the implication of past earnings for future earnings (Rangan and Sloan 1998). Therefore, the mitigation effect of guidance on drift is less profound when preceding quarter of guidance is fourth fiscal quarter than other fiscal quarters. In fact, the coefficient estimates on SUE_{t-1}, which captures the drift magnitude, are much smaller for the fourth quarters subsample than those for non-fourth quarters subsample. For example, when $CAR12_t$ is the dependent variable, the coefficient on SUE_{t-1} is 3.05 for the non-fourth quarters subsample and is 1.38 for the fourth quarters subsample. This finding provides evidence that the less drift is not due to the cross-quarter difference in the drift, but rather is due to the provision of management earnings guidance.

Panel B of Table 11 shows the results of testing H2 using models (5) and (6) for both Fourth-quarters and Non-fourth quarters. The results indicate that for both Fourth-quarters and Non-fourth quarters subsamples, $(b^*_1 + b^*_6)/(b_1 + b_6) = b^*_1 / b_1$ can be rejected at $P < 0.0001$ and $p < 0.005$ respectively. This finding suggests that for both subsamples, the degree to which investors' earnings expectations incorporate the implications of prior earnings for future earnings is statistically higher for firm-quarters with management earnings guidance than for firm-quarters without management earnings guidance. Taken the results of Panel B of Table 10 and Panel B of Table 11 together, it suggests that management earnings guidance can improve investors' earnings expectations but not necessary has significant marginal effect in mitigating the drift when the drift itself is low.

4.7.3 Partition the sample to subsamples based on firm size, trading volume, drift factor, and institutional ownership

Further, I expect the effect of management earnings guidance in mitigating the drift and helping investors to incorporate prior earnings information into earnings expectations is more pronounced for small firms with high transactions costs than for large and actively traded firms. To test that, I partition firm-quarters to subsamples based on the median value of size, the trading volume, drift factor, and institutional ownership respectively. For example, the firm quarters are classified into large size subsample if the size of that firm quarter is larger than the median of size of that quarter. Otherwise they are classified into small size subsample.

Panel C through panel F of Table 10 present the results of testing H1 for each subsample. The results show that the mitigation effect of management earnings guidance on the drift s exists for the subsamples with small firm size, low trading volume, low drift factor, or low institutional ownership, but not for the subsamples with large firm size, high trading volume, high drift factor, or high institutional ownership.

Panel C through panel F of Table 11 present the results of testing H2 for each subsample. The results show that the effect of management earnings guidance in helping investors incorporating more prior earnings information into their earnings expectations exists for the subsamples with small firm size, low trading volume, low drift factor, or low institutional ownership, but not for subsamples with large firm size, high trading volume, high drift factor, or high institutional ownership. For example, for the subsample with big firm size, the time-series autocorrelation between the first lagged SUE and the current SUE (0.33 for b_1) is not different from the autocorrelation implicit in investors' expectation (0.36 for b^*_1) two days before the earnings announcement. This is consistent with Kimbrough (2005) who also finds that drift exists for only small and less actively traded firms.

4.7.4 Including the firms that have not ever given the guidance during my sample period

The sample that I used for my main tests includes only firms that have given at least one management forecast in the sample period. To test the robustness of my results, I include no guidance firms and perform my main tests. There could have systematic difference between firms that have provided guidance (thereafter are referred to as guidance firms) and firms that have not ever provided any guidance (thereafter are referred to as no-guidance firms) in my sample period. Panel A of Table 12 shows that guidance firms are significantly larger in size, have higher stock prices, higher trading volume, and higher institutional ownership than no guidance firms. Further, no-guidance firms tend to have lower performance in both earnings and stock returns. Moreover, Panel B of Table 12 shows that no-guidance firms tend to incur larger drift than guidance firms.

Panel C and Panel D of Table 12 show the results of testing H1 using this full sample. In particular, Panel C presents the coefficient estimates of model (1) using

$CAR12_t$ and $CAR3_t$ as alternative dependent variables. The coefficients on SUE_{t-1} are significantly positive with the value of 2.33 and 1.20 respectively. The coefficients on the interaction term MEG_t*SUE_{t-1} are -0.91 and -0.32 and statistically significant at 0.05 and 0.10 level respectively. These results suggest that the magnitude of drift is significantly smaller for firm quarters with management earnings guidance than firm quarters with no guidance. Panel D presents the coefficient estimates of model (1A) using $CAR60_{t+1}$ as the dependent variable. The coefficient estimate on SUE_t is significantly positive with the value of 14.61. The coefficient estimate on MEG*SUE_t is significantly negative with the value of -2.65. The results of Panel C and Panel D are qualitatively similar to the results that I obtained using only guidance firms, confirming that provision of management earnings guidance can not only mitigate the drift in the quarter for which the guidance was provided, but also mitigate the drift in the following quarter.

Table 13 shows the result of testing H2 from jointly estimating equations (5) and (6) using the full sample. I compare the ratio of $(b^*_1 + b^*_6)$ to $(b_1 + b_6)$ with that of b^*_1 / b_1. My results indicate that $(b^*_1 + b^*_6) / (b_1 + b_6)$ is higher than b^*_1 / b_1 and reject $(b^*_1 + b^*_6) / (b_1 + b_6) = b^*_1 / b_1$ at $p < 0.001$ with a constraint likelihood ratio of 12.45. The results are qualitatively similar to the results that I obtained using only guidance firms, confirming that the degree to which investors' earnings expectations incorporate the implications of prior earnings for future earnings is statistically higher for firm-quarters with management earnings guidance than for firm-quarters without management earnings guidance.

4.8 Additional tests: alternative measures of earnings surprises as analyst forecast errors

My previous tests follow the traditional approach using a time-series model to estimate the earnings surprises during the earnings announcements and examine whether management earnings guidance helps to accelerate investors' response to these earnings surprises and their implications for future earnings, thereby mitigating the magnitude of PEAD. Recent studies also document the phenomenon of PEAD using analyst forecast errors as the measure of earnings surprises, suggesting investors underreact to the earnings information contained in analysts' forecast errors (Livnat and Mendenhall 2006; Doyle, Lundholm, and Soliman 2007). Livnat and Mendenhall (2006) find that a hedge return in the subsequent quarter after the earnings announcement based on analyst forecast errors is statistically and economically higher than a hedge return based on time-series forecast errors. Doyle, Lundholm, and Soliman (2007) find a positive relation between current analyst forecast errors and subsequent long-term abnormal returns (one, two, and three-year). Consistent with the findings of Livnat and Mendenhall (2006), they find that one-, two-, and three-year hedge returns based on analyst forecast errors are statistically and economically higher than those based on time-series forecast errors.

Prior studies find that analysts underreact to the earnings information contained in prior analysts' forecast errors. For instance, Mendenhall (1991) finds that analysts' forecast errors in consecutive quarters are positively serial correlated. Abarbanell and Bernard (1992) provide empirical evidence that the analyst underreaction partially but not completely contributes to the PEAD. However, Shane and Brous (2001) argue that Abarbanell and Bernard (1992) underestimate the initial underreaction of analysts to the information contained in the prior analyst forecast errors earnings because they ignore the corrective role of the non-earnings announcement information in improving analysts' forecast[25]. In other words, the autocorrelation of analyst forecast errors could be higher in the absence of other non-earnings announcement information released in between the analysts' forecasts. Management earnings guidance represents a specific source of non-earnings announcement information and I empirically examine whether it mitigates the post-earnings announcement drift.

I measure forecast errors using the I/B/E/S detail files. The detail files are used because they contain the original data and do not have the bias induced by rounding split-adjusted earnings per share numbers in IBES summary files (Diether, Malloy, and Scherbina 2002; Payne and Thomas 2003)[26]. I measure the forecast errors (FE) as (actual earnings – consensus analyst forecast), scaled by the stock price at the end of fiscal quarter. The analyst forecast consensus is calculated by taking the median value of the last forecast of each analyst during the 90 days period before the earnings announcement[27]. To reduce the impact of outliers, similar to the earnings surprise measure based on the time-series model, I rank the forecast errors to the decile as Standardized Forecast Errors (SFE) and further convert it to the range of (-0.5, +0.5). To avoid the look-ahead bias (Holthausen 1983), I ranked the current quarter's forecast errors based on the previous quarter's forecast errors distribution.

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[25] This argument is similar to that of Soffer and Lys (1999). In refuting Ball and Bartov's (1996) conclusions on investors' rationality about time-series property of quarterly earnings, Soffer and Lys argue that non-earnings information might play a facilitating role in improving investors' earnings expectations.

[26] This bias is especially relevant in my study since firms that have more subsequent splits could have artificially lower forecast errors. Further, if these firms also tend to have more positive abnormal returns (Thomas 2003), the measurement bias of forecast errors induced by rounding split-adjusted earnings per share numbers could induce a mechanical relation between existing earnings surprises and subsequent abnormal returns.

[27] If a stock split occurs during this 90 days period, the analyst forecast is adjusted to the comparable level as to the earnings announcement date by timing stock split factors of earnings announcement and dividing by the stock split factors of forecast date.

The sample of this test spans from 1996 to 2005. The final sample has 65,539 firm quarters. First, I examine the autocorrelations of SFE and compare them with those of SUE, standardized unexpected earnings based on a seasonal random walk model. Panel A of Table 14 shows the autocorrelations of SFE and SUE respectively. Similar to the autocorrelations of SUE, there are positive and declining serial correlations between the current quarter's SFE and the first, second, and third lag of SFEs. However, the magnitude of correlations of the current quarter's SFE with the first lag of SFE is only about one-half of that of SUE. Moreover, the correlation between the current quarter's SFE and the fourth lag of SFE is positive. This is different from negative correlation between the current quarter's SUE and the fourth lag of SUE. However, this finding is consistent with the findings of Abarbanall and Bernard (1992) and Livnat and Mendenhall (2006). In fact, the autocorrelations of SFE in my sample (0.228, 0.161, 0.132, and 0.120) are very similar to those (0.234, 0.156, 0.127, and 0.117) of Livnat and Mendenhall (2006).

I further compare the magnitude of drift based on SFE with that of drift based on SUE. Panel B of Table 14 shows that the drift phenomenon occurs when either analyst forecast errors or seasonal differenced quarterly earnings are used to measure earnings surprises on the earnings announcement date. Moreover, the drift magnitude based on SFE is higher than that based on SUE. The magnitude of drift for the 3-day window is 0.71% using SFE and 0.45% using SUE. For the 60-day window, the magnitude of drift is 10.27% based on SFE compared with 5.42% based on SUE. The fact that the drift magnitude based on SFE is about twice much as that based on SUE is surprising given the earlier findings that serial correlation of consecutive SFEs is only about half of that of consecutive SUEs. However, it is consistent with findings of Doyle, Lundholm, and Soliman (2007) that one-year, two-year, and three-year abnormal returns based on SFE is much higher than those based on SUE[28].

Following Rangan and Sloan (1998), I examine whether there is inter-temporal (cross-quarter) difference in SFE autocorrelations, and further examine whether investors systematically ignore this inter-temporal difference[29]. I also replicate Rangan and Sloan's test as the benchmark. The following models are estimated to examine these questions.

$SFE_t = a_k + b_k *SFE_{t-1} + c_k *DUM_k + d_k *(DUM_k*SFE_{t-1}) + e_t$; K = 1, 2, 3 (11a)

$SUE_t = a_k + b_k *SUE_{t-1} + c_k *DUM_k + d_k *(DUM_k*SUE_{t-1}) + e_t$; K = 1, 2, 3. (11b)

Where DUM_k = 1 when quarter t and quarter t-k are from the different fiscal year, 0 otherwise.

$CAR_t = b_0 + b_1*SFE_{t-1} + b_2*DUM + b_3*(DUM*SFE_{t-1}) + e_t$; (12a)

$CAR_t = b_0 + b_1*SUE_{t-1} + b_2*DUM + b_3*(DUM*SUE_{t-1}) + e_t$; (12b)

Where DUM = 1when quarter t and quarter t-1 are from the different fiscal year, 0 otherwise.

All other variables are as defined before.

Panel C of Table 14 presents the results of estimating models (11a) and (11b). The correlation between SFE of the current quarter and the first lag SFE is 0.248 if these two quarters belong to the same fiscal year. The correlation is 0.083 less if they belong to

[28] Doyle, Lundholm, and Soliman (2007) explained their findings by arguing that the drift phenomenon based on SFE is relatively new while the drift phenomenon based on SUE has been well publicized since it was documented about 40 years ago. In fact, Ke and Rmalingegowda (2005) document that institutional investors exploited the post-earnings announcement drift in their trading strategy.

[29] Rangan and Sloan (1998) document that the serial correlation coefficients of SUEs are larger when SUEs are in the same fiscal year than when they are in different fiscal years, and the drift is less if the previous quarter is the fourth quarter rather than if it is the first, second, or third quarter. Whether this phenomenon occurs to earnings surprises based on analyst forecast errors is important and relevant in my study since the guidance is more likely to be provided in the fourth quarter.

different fiscal years. This difference is statistically significant, indicating that there is inter-temporal difference in the SFE autocorrelations. In comparison, the correlation between SUE of the current quarter and the first lag SUE is 0.452 if these two quarters belong to the same fiscal year, and it is 0.162 less if they belong to different fiscal years.

Panel D of Table 14 presents the results of estimating models (12a) and (12b) respectively. Consistent with Rangan and Sloan's (1998) findings, there is a cross-quarter variation in abnormal returns on PEAD strategy based on SUE. Specifically, the drift based on the previous quarter's SUE is less (0.458% less for three-day window and 1.456% for 60-day window) if the previous quarter is the fourth quarter than if it is the first, second, or third quarter. The drift based on SFE is significantly less (1.862%) if the previous quarter is the fourth fiscal than if the previous quarter is first, second, or third fiscal quarter when the drift is measured during 60-day period after the previous quarter's earnings announcement. However, when the drift is measured in the three-day period starting two days before the next quarter's earnings announcement, this difference is negative (-0.25%) but not significant. Overall, the above results suggest it is important to control for the fourth quarter effect.

To examine the impact of management earnings guidance on the PEAD based on analyst forecast errors, I first examine whether management earnings guidance can mitigate the serial correlations of SFEs. Specifically, I extend Shane and Brous (2001) to examine whether management earnings guidance, one specific non-earnings announcement information, can help mitigate analysts' underreaction to prior earnings news. I use the following model to perform the test.

$$SFE_t = b_0 + b_1SFE_{t-1} + b_2MEG_t + b_3MEG_t*SFE_{t-1} + b_4Drift\_factor_{t-1}*SFE_{t-1} + \beta_5DIH_{t-1}*SFE_{t-1} + \beta_6Q4_{t-1} + \beta_7Q4_{t-1}*SFE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed-effect} + \varepsilon_t \quad (13)$$

Table 15 presents the results of estimating model (13). The coefficient on SFE_{t-1} is positive, confirming the findings of prior studies that analysts underreact to the information contained in prior forecast errors. The coefficient on $MEG*SFE_{t-1}$ is significantly negative, suggesting that firm quarters with management earnings guidance have less analysts' underreaction to information contained in prior forecast errors relative to firm quarters without guidance.

Next, I use the following models to examine whether provision of management earnings guidance can mitigate the drift based on SFE.

$$CAR12_t\ (CAR3_t) = \alpha + \beta_1SFE_{t-1} + \beta_2MEG_t*SFE_{t-1} + \beta_3MEG_t + \beta_4Drift\_factor_{t-1}*SFE_{t-1} + \beta_5DIH_{t-1}*SFE_{t-1} + \beta_6Q4_{t-1} + \beta_7Q4_{t-1}*SFE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed effect} + e_t \quad (14a)$$

$$CAR60_{t+1} = \alpha + \beta_1SFE_t + \beta_2MEG_t*SFE_t + \beta_3MEG_t + \beta_4Drift\_factor_t*SFE_t + \beta_5DIH_t*SFE_t + \beta_6Q4_t + \beta_7Q4_t*SFE_t + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \quad (14b)$$

Panel A of Table 16 presents the results of testing mitigation effect of management earnings guidance on the post-earnings announcement drift based on forecast errors. The dependent variables in equation (14a) are $CAR3_t$ and $CAR12_t$. The coefficients on the SFE are significantly positive, confirming previously documented PEAD following analyst forecast errors. Moreover, the coefficients on the MEG*SFE are negative and significant at 0.05 level, providing evidence that the provision of management earnings guidance can mitigate the drift even when the earnings innovation is measured as the analyst forecast errors. All the control variables have the expected signs. The dependent variable in equation (14b) is $CAR60_{t+1}$, the drift measured in the 60-day window following the earnings announcement date of the quarter for which the guidance was provided. Panel B of Table 16 presents the coefficient estimates from the pooled regressions of the equation (14b). The coefficient β_2 (-0.86) on MEG*SFE is negative but not significant, suggesting that the mitigation effect of management earnings guidance on drift based on forecast errors does not persist in the following quarter after controlling for firm characteristics, investors' sophistication, and fourth quarter effect.

4.9 Additional tests: controlling for conference calls

Management earnings guidance represents one channel of corporate voluntary disclosure. Firms could also use other voluntary disclosure channels such as press release, conference calls separately or along with management earnings guidance. Kimbrough (2005) examines how the initiation of conference calls affects firm's information environment, and he finds that comparing those in Pre-initiation period, both analyst underreaction and price underreaction to the earnings news are less in the Post-initiation period. However, Kimbrough's study is silent about whether a specific conference call accelerates analysts' and investors' response to the implication of announced earnings for future earnings. Nonetheless, to test the robustness of my results, I explicitly control for the possible effect of conference calls on the drift and to test my H1 using the following models.

$$CAR12_t\ (CAR3_t) = \alpha + \beta_1 SUE_{t-1} + \beta_2 MEG_t{*}SUE_{t-1} + \beta_3 MEG_t + \beta_4 CC_t{*}SUE_{t-1} + \beta_5 CC_t + \beta_6 Drift\_factor_{t-1}{*}SUE_{t-1} + \beta_7 DIH_{t-1}{*}SUE_{t-1} + \beta_8 Q4_{t-1} + \beta_9 Q4_{t-1}{*}SUE_{t-1} + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \qquad (15a)$$

$$CAR60_{t+1}. = \alpha + \beta_1 SUE_t + \beta_2 MEG_t{*}SUE_t + \beta_3 MEG_t + \beta_4 CC_t{*}SUE_t + \beta_5 CC_t + \beta_6 Drift\_factor_t{*}SUE_t + \beta_7 DIH_t{*}SUE_t + \beta_8 Q4_t + \beta_9 Q4_t{*}SUE_t + \text{firm-fixed-effect} + \text{year-fixed-effect} + e_t \qquad (15b)$$

where CC_t takes the value of 1 if there is a conference call made in that fiscal quarter and 0 otherwise.

The correlation between CC and MEG is 0.16 and statistically significant. There are 45,587 management earnings guidance made in the period between 1996 and 2003. Among them, 10,645 have simultaneous conference calls. Further analysis suggests that there are more conference calls than the management earnings guidance. The possible explanation is that the coverage of management earnings guidance is not complete. For instance, Chuk, Matsumoto, and Miller (2008) compare the coverage of CIG file with the hand-collected guidance for a total 400 firm-years (they randomly select 25 firms from each size quintile in 1997, 1999, 2001, and 2003) and they find that 60.4% of hand collected EPS forecasts can be matched with CIG and that only 27% of all guidance can be matched with CIG.

Table 17 presents the results of estimating models (15a) and (15b) for the sample period between 1996 and 2003. The coefficient on SUE is positive and significant as before. The coefficients on CC*SUE are positive instead of negative in all three models and they are statistically significant at 0.05 or 0.10 level, suggesting provision of a conference call itself does not mitigate drift. In comparison, the coefficients on MEG*SUE remain negative and statistically significant for all three models. Moreover, the mitigation effect of management earnings guidance on PEAD seems to be stronger after controlling for conference calls. For instance, the coefficient on MEG*SUE for the model with CAR12 as dependent variable is -1.47 after controlling for the provision of conference calls and is -0.87 before controlling for provision of conference calls.

Chapter 5

Conclusion

PEAD, the predictability of abnormal returns following earnings announcements, not only poses a big threat to market efficiency theory (Kothari 2001) but also causes firm misevaluation and resource allocation inefficiency. This study examines whether voluntary disclosure in the form of management earnings guidance mitigates PEAD. I further examine what is the causal channel through which it mitigates PEAD and whether the mitigation effect on PEAD is sensitive to the quality of management earnings guidance. First, I find management earnings guidance mitigates PEAD in both the quarter for which the guidance was provided and in the following quarter. Second, I find guidance improves the extent to which investors incorporate prior earnings information into their earnings expectations. Third, I find that guidance also provides information about future earnings which is uncorrelated with prior earnings information, suggesting earnings guidance improves the accuracy of investors' earnings expectations. Finally, I find the mitigation effect of guidance on PEAD increases with guidance quality in terms of guidance precision, accuracy and usefulness of current guidance.

This study contributes to the literature on both PEAD and voluntary disclosure. First, this study provides evidence on the effectiveness of voluntary disclosure in alleviating the accounting anomaly of PEAD. This study extends Soffer and Lys (1999) and provides direct evidence whether information other than announced earnings can speed the incorporation of prior earnings information into investors' earnings expectations. Therefore, this study contributes to the reconciliation between the findings of Ball and Bartov (1996) and Soffer and Lys (1999). The finding that management earnings guidance improves future earnings expectations by providing incremental new information that can not predicted from past earnings, in conjunction with the finding of Coller and Yohn (1997) that such guidance reduces information asymmetry, suggests that guidance could facilitate informed trading, thereby mitigating PEAD.

Second, this study also contributes to the literature on the role of voluntary disclosure in the capital markets. Recent management earnings guidance studies mainly focus on management's self-interest incentives for providing management earnings guidance, such as insider trading and managing market's expectations. Prior voluntary disclosure literature focuses on the benefits mainly accruing to the firm from lower costs of capital, lower litigation risk, and lower open-market share repurchase prices. In contrast, this study provides empirical evidence on the role of management earnings guidance, a specific type of voluntary disclosure, in mitigating the market anomaly of PEAD. Thus, the empirical evidence that providing management earnings guidance can increase price efficiency and this benefit varies with the quality of the guidance have direct implications for both managers and regulators.

Third, this study provides evidence on the intertemporal impact of management earnings guidance. Prior research on the benefits of the issuance of management earnings guidance are mainly short-window event studies that measure the impact of earnings guidance immediately after its issuance(Hirst, Koonce, and Venkataraman 2008). This study provides evidence on the impact of management earnings guidance for the period following its issuance and for the period after the announcement of guided earnings.

Appendix 1: Models to Test the Information Content of Management Earnings Guidance

In this Appendix, I describe the Soffer and Lys (1999) model which serves as the foundation for my empirical test of H3 and H4. Soffer and Lys (1999) model the serial correlation of seasonally differenced earnings as follows.

$$\Delta EPS_t = b_0 + b_1 * \Delta EPS_{t-1} + \varepsilon_t \quad \text{(A1)}$$

Where $\Delta EPS_t = EPS_t - EPS_{t-4}$
$\Delta EPS_{t-1} = EPS_{t-1} - EPS_{t-5}$
EPS_t = Earnings per share at quarter t.

In an efficient market, investors' earnings expectations should incorporate the serial correlation of seasonally differenced earnings. Therefore, earnings expectations after the earnings announcement at quarter t-1 and before management earning guidance can be modeled as:

$$E[\Delta EPS_t | \Delta EPS_{t-1}] = E[(b_0 + b_1 * \Delta EPS_{t-1} + \varepsilon_t) | \Delta EPS_{t-1}]$$

$$= E[b_0 | \Delta EPS_{t-1}] + E[b_1 | \Delta EPS_{t-1}] * \Delta EPS_{t-1}$$

$$= b^E_0 + b^E_1 * \Delta EPS_{t-1} \quad \text{(A2)}$$

The unexpected earnings (UE_t) at the quarter t earnings announcement is:

$$UE_t = \Delta EPS_t - E[\Delta EPS_t | \Delta EPS_{t-1}]$$

$$= \Delta EPS_t - b^E_0 - b^E_1 * \Delta EPS_{t-1} \quad \text{(A3)}$$

Therefore, market efficiency implies that before management earnings guidance, the association between subsequent stock return and unexpected earnings is:

$$CAR_{t,pre} = \alpha + \beta * (UE_t) + \omega_t$$

$$= \alpha + \beta\{\Delta EPS_t - b^E_0 - b^E_1 * \Delta EPS_{t-1}\} + \omega_t$$

$$= \{\alpha - \beta b^E_0\} + \beta * \Delta EPS_t - \beta b^E_1 * \Delta EPS_{t-1} + \omega_t \quad \text{(A4)}$$

Where

$CAR_{t,pre}$= the cumulative abnormal returns (market size-decile adjusted) from two days before management earnings guidance until quarter t earnings announcement.

In equation (A4), b^E_1 is the serial correlation between past and current seasonally differenced earnings that is embedded in the stock price before management earnings guidance. Next, I model how management earnings guidance affects investors' earnings expectations. Similar to Equation (A2), the earnings expectations after the earnings announcement of quarter t-1 and after the issuance of management earnings guidance can be modeled as:

$$E[\Delta EPS_t|\Delta EPS_{t-1},G] = E[b_0|\Delta EPS_{t-1},G] + E[b_1|\Delta EPS_{t-1},G]*\Delta EPS_{t-1}$$
$$= b^E_{0,G} + b^E_{1,G}*\Delta EPS_{t-1} \quad (A5)$$

Equation (A5) assumes that management earnings guidance helps investors incorporate past earnings information to update their earnings expectations about future earnings. However, management earnings guidance might also provide some new information about future earnings that cannot be predicted from past earnings information. To explicitly model both of these two channels, I parameterize the information about next earnings surprise that is known to investors after management earnings guidance but is unrelated to prior earnings information. Therefore, I expand Equation (A5) as follows:

$$E[\Delta EPS_t|\Delta EPS_{t-1},G] = \{E[b_0|\Delta EP_{t-1},G] + E[b_1|\Delta EPS_{t-1},G]*\Delta EPS_{t-1}\}$$
$$+ \mu*\{\Delta EPS_t - (E[b_0|\Delta EPS_{t-1} G] + E[b_1|\Delta EPS_{t-1}, G]*\Delta EPS_{t-1})\}$$
$$= \{b^E_{0,G} + b^E_{1,G}*\Delta EPS_{t-1}\} + \mu*\{\Delta EPS_t - (b^E_{0,G}+ b^E_{1,G}*\Delta EPS_{t-1})\} \quad (A6)$$

In equation (A6), the first component, $\{b^E_{0,G} + b^E_{1,G}*\Delta EPS_{t-1}\}$, is the implication of past earnings for current quarterly earnings, and the second component, $\mu*\{\Delta EPS_t - (b^E_{0,G}+ b^E_{1,G}*\Delta EPS_{t-1})\}$, is the information about future earnings that is orthogonal to past earnings information. The coefficient μ measures the extent to which information about the quarter t's earnings that is uncorrelated with prior earnings information. It is predicted to be between zero (if management earnings guidance does not provide any additional information for quarter t's earnings other than that can be predicted from prior earnings information) and one (if management guidance provides perfect information about quarter t's earnings).

Analogous to equation (A3), the unexpected earnings ($UE_{t,G}$) at the quarter t earnings announcement based on investors' earnings expectations after management earnings guidance is

$UE_{t,G} = \Delta EPS_t - E[\Delta EPS_t | \Delta EPS_{t-1,} G]$

$$= \Delta EPS_t - \{b^E_{0,G} + b^E_{1,G} * \Delta EPS_{t-1}\} - \mu * \{\Delta EPS_t - (b^E_{0,G} + b^E_{1,G} * \Delta EPS_{t-1})\} \quad (A7)$$

Moreover, after management earnings guidance, the association between subsequent stock return and unexpected earnings is:

$CAR_{t,post} = \alpha + \beta * (UE_{t,G}) + \omega_t$,

$$CAR_{t,post} = \{\alpha - \beta(1-\mu) b^E_{0,G}\} + \beta(1-\mu) * \Delta EPS_t - \beta(1-\mu) b^E_{1,G} * \Delta EPS_{t-1} + \omega_t \quad (A8)$$

Where

$CAR_{t,,post}$ = the cumulative abnormal returns (market size-decile adjusted) from two days after management earnings guidance until quarter t earnings announcement;

In equation (A8), $b^E_{1,G}$ is the serial correlation between past and current seasonally differenced earnings that is embedded in the stock price after management earnings guidance.

The equations (A1) and (A4) can be estimated to test the extent to which investors' earnings expectation reflects the implication of past earnings for current earnings before management earnings guidance. Similarly, equations (A1) and (A8) can be estimated to test the extent to which investors' earnings expectations reflect the implication of past earnings for current earnings after management earnings guidance. To implicitly compare the intertemporal change of magnitude of incorporating past earnings change for current earnings due to management earnings guidance, I combine (A1), (A4), and (A8) and form the following simultaneous equations:

$$\Delta EPS_t = PRE*[b_0 + b_1*\Delta EPS_{t-1} + \varepsilon_t] + POST*[b_0 + b_1*\Delta EPS_{t-1} + \varepsilon_t] \qquad (A9)$$

$$CAR_t = PRE*\{(\alpha - \beta b^E_0) + \beta*\Delta EPS_t - \beta b^E_1*\Delta EPS_{t-1} + \omega_t\} + POST*\{[\alpha - \beta(1-\mu)*b^E_0] + \beta(1-\mu)*\Delta EPS_t - \beta(1-\mu)b^E_{1,G}*\Delta EPS_{t-1} + \omega_t\} \qquad (A10)$$

Where

$CAR_{t,}$= $CAR_{t,pre}$ ($CAR_{t,post}$) depending on whether a observation is before or after the management earnings guidance;

PRE = a dummy variable equal to 1 when $CAR_t = CAR_{t,pre}$, 0 otherwise;

POST = a dummy variable equal to1 when $CAR_t = CAR_{t,post}$, 0 otherwise.

Equation (A9) is the forecasting equation to estimate the serial correlation of seasonal differenced earnings. Equation (A10) is the pricing equation to estimate the impact of management earnings guidance on the extent to which the serial correlation of past seasonally differenced earnings with current seasonally differenced earnings is incorporated into investors' earnings expectations.

I use Mishkin's (1983) non-linear simultaneous regression approach to estimate b^E_1 and $b^E_{1,G}$, which are the serial correlations of past seasonally differenced earnings with current seasonally differenced earnings that are reflected in the stock prices before and after management earnings guidance respectively. The Mishkin (1983) test is based on rational expectations hypothesis and uses a recursive system of two equations to test whether the market rationally prices the implication of past earnings for future earnings. Specially, the test compares the coefficients in the equations (A9) and (A10), which are estimated simultaneously using the maximum likelihood ratio test. Instead of testing b1 = b^E_1 and $b_1 = b^E_{1,G}$, which is a test of market inefficiency before and after management earnings guidance, my main interest for hypothesis H3 is to compare $b^E_{1,G}/b_1$ and b^E_{1}/b_1, which is the test of market inefficiency mitigation that can be attributed to management earnings guidance.

Appendix 2: Guidance Classification and Measurement

I classify management earnings forecast into quantitative and qualitative forecasts based on the variable cigcodeq in the First Call Company issue guidance (CIG) file. Quantitative forecasts include both point forecasts and range forecasts.

Point forecasts (must have one numerical estimate):

A. About $X.

F. Comfortable with $X.

Z. Break even.

Range forecasts (must have two numerical estimates):

B. Between $X and $Y.

G. Low end of $X and $Y.

H. High end of $X and $Y.

All other forecasts are classified as qualitative forecasts.

For quantitative guidance, I measure the forecast value of guidance following prior studies. The value of point guidance is the value of est_1 as reported in the First Call CIG file. The value of range guidance is the mean of est_1 and est_2 that are reported in the First Call CIG file.

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Table 1 Sample Selection Procedures and Descriptive Information

Panel A: Details of Management Earnings Guidance Firm-quarters Construction

	Annual	Quarterly	Total
Observations on the First Call CIG database for the period between 06/30/1996 and 05/31/2006	35,204	43,535	78,739
Drop observations without valid Cusip	(139)	(148)	(287)
Drop observations for which currency is not US dollars	(398)	(265)	(663)
Drop duplicate management earnings guidance	(1194)	(845)	(2039)
Total sample of management earnings guidance on First Call	33,473	42,277	75,750
Drop guidance made 390 days before fiscal period end for annual guidance and 120 days for quarterly guidance	(3224)	(3675)	(6899)
Drop guidance made 120 days after fiscal period end	(77)	(321)	(398)
Final number of valid management earnings guidance	30,172	38,281	68,453
Number of management earnings forecasts after retaining the first guidance	11,959	31,424	43,383
Number of firm quarters after retaining first quarterly guidance when a fiscal period has both annual and quarterly guidance	7,331	31,424	38,755
Total number of firms in the final guidance sample			6,194

Panel B: The Frequency of Management Earning Guidance

For the firms covered by the First Call: The percentage is the ratio of the number of firms that provide guidance over the number of firms with analyst forecast covered in First Call analyst detail file.

1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average
17.82%	20.14%	28.74%	29.74%	30.83%	38.70%	37.73%	38.14%	37.53%	32.40%	30.77%

For the firms that have given at least one guidance for the period between June 20, 1996 and May 31, 2006: Frequency is the number of quarters for which guidance firms have provided guidance in the sample period. Proportion is the percentage of quarters with guidance for the period starting from the first date the firm appears in the First Call CIG file until May 31, 2006.

# of Firms		Mean	Std Dev	Q1	Median	Q3	Min	Max	**Max. Firm-Qtrs or percentage**
6194	Frequency	6.25	6.48	2	4	9	1	36	**41**
	Proportion	24%	23%	7%	15%	33%	2%	100%	**100%**

Panel C: The Attributes of Management Earnings Guidance

	Annual	Quarterly	Total
Observations on the First Call CIG database for the period between 06/30/1996 and 05/31/2006	35,204	43,535	78,739
Drop observations without valid Cusip	(139)	(148)	(287)
Drop observations for which currency is not US dollars	(398)	(265)	(663)
Drop duplicate management earnings guidance	(1194)	(845)	(2039)
Total sample of management earnings guidance on First Call	33,473	42,277	75,750
Drop guidance made 390 days before fiscal period end for annual guidance and 120 days for quarterly guidance	(3224)	(3675)	(6899)
Drop guidance made 120 days after fiscal period end	(77)	(321)	(398)
Final number of valid management earnings guidance	30,172	38,281	68,453
Number of management earnings forecasts after retaining the first guidance	11,959	31,424	43,383
Number of firm quarters after retaining first quarterly guidance when a fiscal period has both annual and quarterly guidance	7,331	31,424	38,755
Total number of firms in the final guidance sample			6,194

Horizon = the days between the MEG announcement date and the pertained fiscal period end date.
Warn = 0 if the MEG was made before the fiscal period end date; 1 if it was made after the fiscal period end date but before the earnings announce date.
Qual, point, and range refer to the qualitative, point, and range form of management earnings guidance.

Panel D: Sample for Testing the Impact of Management Earnings Guidance on PEAD

	Firms	Firm-Quarters
Firm quarters with quarter end between 06/30/1996 and 05/31/2006 that have data available on Compustat to calculate SUE and that are also covered by CRSP	10,772	221,270
Trimming of extreme returns and control variables (at 0.25% of each tail)	10,692	215,012
Have no missing data for $CAR3_t$, $CAR12_t$, and $CAR60_{t+1}$	9,052	171,060
Have no missing data for institutional holding, price, trading volume, and size	**8,423**	**146,599**
Firms that have never given at least one management guidance for the firm quarters with quarter end between 06/30/1996 and 05/31/2006	3,523	46,031
Firms that have given at least one management guidance for the firm quarters with quarter end between 06/30/1996 and 05/31/2006	**4,900**	**100,568**

Panel E: Observation Distribution and the Percentage of Management Earnings Guidance and its Form across Fiscal Years and Fiscal Quarters

		Percentage of observation			
Fiscal year	Obs by year	MEG	Qualitative	Point	Range
1996	5,502	12.52	3.00	4.85	4.47
1997	9,052	11.82	3.41	4.70	3.71
1998	9,851	17.69	6.34	6.04	5.31
1999	10,293	18.86	7.52	5.28	6.06
2000	10,721	20.51	6.16	5.74	8.62
2001	11,135	33.17	5.51	7.72	19.94
2002	11,324	32.96	3.33	6.71	22.92
2003	11,200	32.12	2.71	5.31	24.09
2004	10,935	34.78	2.34	4.99	27.45
2005	10,154	31.63	1.07	3.89	26.67
2006	401	31.67	1.75	4.74	25.09
Total	100,568	25.65%	4.18%	5.59%	15.89%

		Percentage of observation			
Fiscal quarter	Obs by quarter	MEG	Qualitative	Point	Range
1	24,242	20.30	3.17	4.23	12.89
2	25,219	20.07	3.07	4.28	12.72
3	25,496	20.83	3.29	4.40	13.15
4	25,621	41.00	7.10	9.34	24.56
Total	100,568	25.65%	4.18%	5.59%	15.89%

Table 2 Descriptive Statistics for Variables in the Analysis

Variable	N	Mean	Std Dev	Minimum	First Quartile	Median	Third Quartile	Maximum
$CAR3_t$	100,568	0.006	0.069	-0.317	-0.027	0.002	0.035	0.474
$CAR12_t$	100,568	0.012	0.141	-0.632	-0.061	0.007	0.078	0.804
$CAR60_{t+1}$	100,568	0.000	0.258	-0.879	-0.141	-0.015	0.112	1.927
SUE_t	100,568	0.000	0.138	-4.804	-0.005	0.002	0.007	6.040
SUE_{t-1}	100,568	0.001	0.127	-4.099	-0.005	0.002	0.007	5.822
SUE_{t-2}	100,568	0.002	0.124	-3.827	-0.005	0.002	0.007	5.498
SUE_{t-3}	100,568	0.002	0.120	-3.051	-0.005	0.002	0.007	5.390
SUE_{t-4}	100,568	0.002	0.114	-2.590	-0.005	0.002	0.007	4.302
MEG_t	100,568	0.257	0.437	0.000	0.000	0.000	1.000	1.000
$Drift\_factor_t$	100,568	0.613	0.313	0.000	0.333	0.704	0.889	1.000
MV_t	100,568	2445.48	7859.98	0.86	105.87	394.51	1434.11	151415.18
VOL_t	100,568	3327.67	9558.94	0.30	87.13	418.26	2025.70	132026.77
PRC_t	100,568	17.20	15.26	0.13	6.72	13.62	23.54	466.00
IH_t	100,568	0.475	0.261	0.000	0.254	0.488	0.692	0.982
$Q4_t$	100,568	0.255	0.436	0.000	0.000	0.000	1.000	1.000

$CAR3_t$ = the compounded abnormal return in the three-day window (-2, 0) relative to the earnings announcement date (day 0) in quarter t. It is calculated as the compounded raw returns over (-2, 0) less the compounded value-weighted average return over (-2, 0) for all firms in the same CRSP size decile to which the firm belongs;

$CAR12_t = CAR3_t + CAR3_{t+1} + CAR3_{t+2} - CAR3_{t+3}$;

$CAR60_t$ = the compounded abnormal return in the window (0, 59) relative to the earnings announcement;

SUE_t = the decile ranking of the standardized unexpected earnings (SUE) of quarter t, further converted to range between -0.5 and 0.5, where SUE is quarter t's earnings before extraordinary items (data8) minus earnings from the corresponding quarter of the last year(quarter t-4), scaled by the market value (data14*data61) at the end of quarter t;

MEG_t = 1 in quarter t for which the firm provides management earnings guidance, 0 otherwise;

$Drift\_factor_t$ = the average of the firm's scores on: (1) the decile ranking of the firm's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to range between 0 and 1, (2) the binary dummy of price (BPRC), which equals 1 if the firm's stock price is greater than $10 per share at the beginning of the fiscal year to which the quarter belongs, 0 otherwise, and (3) the decile ranking of the firm's dollar trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to range between 0 and 1;

DIH_t = the decile ranking of the percentage of outstanding common shares held by institutional holders (IH). IH is computed by dividing the number of common shares held by institutional holders by the number of outstanding common shares at the end of the calendar quarter prior to the earnings announcement date;

$Q4_t$ = 1 if quarter t is the fourth quarter, 0 otherwise.

Table 3 Correlation Matrix

	$CAR3_t$	$CAR12_t$	$CAR60_{t+1}$	SUE_t	SUE_{t-1}	SUE_{t-2}	SUE_{t-3}	SUE_{t-4}	MEG_t	$Drift\_factor_t$	MV_t	VOL_t	PRC_t	IH_t	$Q4_t$
$CAR3_t$	1.000	0.471	0.161	0.134	0.036	0.016	0.005	-0.011	-0.012	-0.028	-0.022	-0.017	-0.042	-0.012	0.003
$CAR12_t$	0.495	1.000	0.108	0.085	0.028	0.002	-0.005	-0.011	-0.008	-0.042	-0.038	-0.027	-0.057	-0.027	0.017
$CAR60_{t+1}$	0.169	0.118	1.000	0.097	0.014	0.009	0.001	0.005	0.033	0.055	0.085	0.063	0.009	0.082	0.046
SUE_t	0.133	0.087	**0.092**	1.000	0.388	0.225	0.083	-0.180	-0.073	-0.077	-0.053	-0.077	-0.095	-0.014	0.007
SUE_{t-1}	**0.032**	**0.024**	0.012	**0.384**	1.000	0.390	0.225	0.080	-0.020	-0.055	-0.036	-0.072	-0.059	-0.004	0.003
SUE_{t-2}	0.010	-0.002	0.005	**0.220**	0.386	1.000	0.392	0.225	-0.006	-0.028	-0.015	-0.058	-0.019	0.005	0.014
SUE_{t-3}	-0.003	-0.009	-0.005	**0.077**	0.221	0.388	1.000	0.393	-0.004	-0.004	0.001	-0.035	0.012	0.010	-0.023
SUE_{t-4}	-0.018	-0.017	-0.005	**-0.194**	0.074	0.220	0.389	1.000	0.008	0.010	0.009	-0.017	0.026	0.011	0.009
MEG_t	-0.016	-0.011	0.021	-0.072	-0.018	-0.004	-0.001	0.009	1.000	0.204	0.207	0.240	0.172	0.239	0.206
$Drift\_factor_t$	-0.053	-0.055	0.008	-0.074	-0.051	-0.021	0.006	0.022	**0.203**	1.000	**0.925**	**0.868**	**0.850**	**0.599**	-0.004
MV_t	-0.018	-0.019	0.001	-0.012	-0.010	-0.007	-0.006	-0.006	**0.083**	0.336	1.000	**0.885**	**0.766**	**0.608**	-0.004
VOL_t	-0.012	-0.015	0.002	-0.026	-0.025	-0.019	-0.011	-0.005	**0.128**	0.357	0.719	1.000	**0.637**	**0.626**	-0.011
PRC_t	-0.050	-0.052	-0.042	-0.066	-0.036	-0.005	0.017	0.025	**0.138**	0.662	0.378	0.344	1.000	**0.514**	-0.004
IH_t	-0.035	-0.038	0.039	-0.012	-0.001	0.007	0.013	0.014	**0.240**	0.612	0.169	0.226	0.402	1.000	0.008
$Q4_t$	0.001	0.011	0.033	0.006	0.002	0.013	-0.018	0.007	**0.206**	-0.003	-0.002	-0.007	-0.005	0.008	1.000

Pearson Correlation is below and Spearman Correlation is above the Diagonal.
The absolute value of correlation coefficient above 0.008 is significant at 0.01 level.
The absolute value of correlation coefficient above 0.006 is significant at 0.05 level.
The absolute value of correlation coefficient above 0.005 is significant at 0.10 level.

Table 4 Test of H1: The Impact of Management Earnings Guidance on PEAD in the Quarter for which the Guidance was Provided

Model: $CAR12_t$ ($CAR3_t$) = $\alpha + \beta_1 SUE_{t-1} + \beta_2 MEG_t{*}SUE_{t-1} + \beta_3 MEG_t + \beta_4 Drift\_factor_{t-1}{*}SUE_{t-1} + \beta_5 DIH_{t-1}{*}SUE_{t-1} + \beta_6 Q4_{t-1} + \beta_7 Q4_{t-1}{*}SUE_{t-1}$ + firm-fixed-effect + year-fixed-effect + e_t (1)

	Pred sign	$CAR12_t$ OLS regression	$CAR3_t$ OLS regression
SUE_{t-1}	+	2.51 (6.73)***	1.55 (8.41)***
MEG_t*SUE_{t-1}	**-**	**-0.87** **(-2.21)****	**-0.35** **(-1.81)***
MEG_t	?	-0.32 (-2.71)***	-0.26 (-4.34)***
$Drift\_factor_t$*SUE_{t-1}	-	-2.24 (-3.39)***	-1.69 (-5.19)***
DIH_{t-1}*SUE_{t-1}	-	-0.66 (-0.89)	-0.11 (-0.3)
$Q4_{t-1}$	?	-0.01 (-0.07)	0.21 (4.04)***
$Q4_{t-1}$ *SUE_{t-1}	-	-0.72 (-2.06)**	-0.35 (-2.01)**
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N		98,758	98,758
Adj. R Square		0.074	0.068

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$CAR3_t$ = the compounded abnormal return in the three-day window (-2, 0) relative to the earnings announcement date (day 0) in quarter t. It is calculated as the compounded raw returns over (-2, 0) less the compounded value-weighted average return over (-2, 0) for all firms in the same CRSP size decile to which the firm belongs;

$CAR12_t$ = $CAR3_t + CAR3_{t+1} + CAR3_{t+2} - CAR3_{t+3}$;

SUE_{t-1} = the decile ranking of the standardized unexpected earnings (SUE) of quarter t-1, further converted to range between -0.5 and 0.5, where SUE of quarter t-1 is quarter t-1's earnings before extraordinary items minus earnings from the corresponding quarter of the last year(quarter t-5) scaled by the market value at the end of quarter t-1;

MEG_t = 1 in quarter t for which the firm provides management earnings guidance, 0 otherwise;

$Drift\_factor_{t-1}$ = the average of the firm's scores on: (1) the decile ranking of the firm's market capitalization, scaled to range between 0 and 1, (2) the binary dummy of price (BPRC), which equals 1 if the firm's stock price is greater than \$10 per share, 0 otherwise, and (3) the decile ranking of the firm's dollar trading volume scaled to range between 0 and 1;

DIH_{t-1} = the decile ranking of the percentage of outstanding common shares held by institutions;

$Q4_{t-1}$ = 1 if previous quarter is the fourth quarter, 0 otherwise.

Table 5 Additional Test of H1: The Impact of Management Earnings Guidance on PEAD in the Quarter Following the Quarter for which the Guidance was Provided

Model: $CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 MEG_t{*}SUE_t + \beta_3 MEG_t + \beta_4 Drift\_factor_t{*}SUE_t + \beta_5 DIH_t{*}SUE_t + \beta_6 Q4_t + \beta_7 Q4_t{*}SUE_t$ + firm-fixed-effect + year-fixed-effect + e_t (1A)

	Pred sign	$CAR60_{t+1}$ OLS regression
SUE_t	+	15.42 (22.78)***
MEG_t*SUE_t	**-**	**-2.18** **(-3.09)*****
MEG_t	?	-0.29 (-1.3)
$Drift\_factor_t$*SUE_t	-	-9.64 (-8.12)***
DIH_t*SUE_t	-	-4.66 (-3.5)***
$Q4_t$	?	1.98 (10.38)***
$Q4_t$ *SUE_t	-	-2.59 (-4.13)**
Firm fixed effect		Yes
Year fixed effect		Yes
N		100,568
Adj. R Square		0.082

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$CAR60_{t+1}$= the compounded abnormal return over the interval 0-59, where 0 is the earnings announcement date of quarter t, and 59 is the number of trading days elapsed from day 0. It is calculated as the compounded raw return over (0, +59) less the compounded value-weighted average return over (0. +59) for all firms in the same CRSP size decile to which the firm belongs, based on January 1 market values;

$Q4_t$ = 1 if quarter t is the fourth quarter, 0 otherwise.

Table 6 Test of H2: The Extent to which Investors' Earnings Expectations Incorporate Prior Earnings Implication in Firm Quarters with Guidance vs. Firm Quarters without Guidance

$$SUE_t = b_0 + b_1SUE_{t-1} + b_2SUE_{t-2} + b_3SUE_{t-3} + b_4SUE_{t-4} + b_5MEG_t + b_6MEG_t*SUE_{t-1} + b_7MEG_t*SUE_{t-2} + b_8MEG_t*SUE_{t-3} + b_9MEG_t*SUE_{t-4} + \varepsilon_t \quad (5)$$

$$CAR_t = \alpha + [\beta SUE_t - \beta b^*_0 - \beta b^*_1SUE_{t-1} - \beta b^*_2SUE_{t-2} - \beta b^*_3SUE_{t-3} - \beta b^*_4SUE_{t-4} - \beta b^*_5MEG_t - \beta b^*_6MEG_t*SUE_{t-1} - \beta b^*_7MEG_t*SUE_{t-2} - \beta b^*_8MEG_t*SUE_{t-3} - \beta b^*_9MEG_t*SUE_{t-4} + \omega_t \quad (6)$$

	Time series auto-regressive coefficients	Pooled Sample	Guidance vs No Guidance	Implied auto-regressive coefficients	Pooled Sample	Guidance vs No Guidance
Intercept	**b_0**	0.004 (5.22)***	0.015 (15.32)***	**b_0^***	-0.151 (-21.22)***	-0.158 (-19.27)***
SUE_{t_1}	**b_1**	0.342 (107.61)***	0.335 (93.28)***	**b_1^***	0.118 (4.98)***	0.072 (2.68)***
SUE_{t_2}	**b_2**	0.126 (37.41)***	0.130 (34.34)***	**b_2^***	0.108 (4.39)***	0.112 (4.06)***
SUE_{t_3}	**b_3**	0.058 (17.23)***	0.060 (15.85)***	**b_3^***	0.084 (3.39)***	0.080 (2.88)***
SUE_{t_4}	**b_4**	-0.272 (-85.19)***	-0.266 (-73.3)***	**b_4^***	-0.146 (-6.22)***	-0.110 (-4.11)***
MEG_t	**b_5**		-0.040 (-20.97)***	**b_5^***		0.028 (1.99)**
$MEG_t*SUE_{t\_1}$	**b_6**		0.024 (3.12)***	**b_6^***		0.204 (3.66)***
$MEG_t*SUE_{t\_2}$	**b_7**		-0.019 (-2.29)**	**b_7^***		-0.025 (-0.42)
$MEG_t*SUE_{t\_3}$	**b_8**		-0.009 (-1.10)	**b_8^***		0.020 (0.32)
$MEG_t*SUE_{t\_4}$	**b_9**		-0.026 (-3.40)**	**b_9^***		-0.157 (-2.82)***
N		93,175	93,175		93,175	93,175

Market efficiency tests for the sample:

Equality of autoregressive coefficients across equations for the sample:

reject $b_1 = b_1*$ at p <.0001 with constraint likelihood ratio of 92.35.

Market efficiency tests for Guidance vs Non-Guidance firm quarters:

Equality of autoregressive coefficients across equations for non-guidance firm quarters:

reject $b_1 = b_1*$ at p <.0001 with constraint likelihood ratio of 98.93.

Equality of autoregressive coefficients across equations for guidance firm quarters:

reject $(b_1+b_6) = (b_1* +b_6*)$ at p = 0.0933 with constraint likelihood ratio of 2.82.

Difference in market efficiency ratios in Guidance vs Non-Guidance firm quarters:

reject $(b_1* + b_6*)/(b_1 + b_6) = b_1*/b_1$ at p < 0.001 with constraint likelihood ratio of 11.26.

Table 7 Test of H3: The Information Content of Management Earnings Guidance: Past Earnings Information?

Models: $\Delta EPS_t = PRE*[b_0 + b_1*\Delta EPS_{t-1} + b_1*\Delta EPS_{t-2} + b_1*\Delta EPS_{t-3} + b_1*\Delta EPS_{t-4} + \varepsilon_t] + POST*[b_0 + b_1*\Delta EPS_{t-1} + b_2*\Delta EPS_{t-1} + b_3*\Delta EPS_{t-1} + b_4*\Delta EPS_{t-1} + \varepsilon_t]$ (7)

$CAR_t = PRE*\{(\alpha - \beta b^E{}_0) + \beta*\Delta EPS_t - \beta\, b^E{}_1*\Delta EPS_{t-1} - \beta\, b^E{}_2*\Delta EPS_{t-2} - \beta\, b^E{}_3*\Delta EPS_{t-3} - \beta\, b^E{}_4*\Delta EPS_{t-4} + \omega_t\} + POST*\{[\alpha - \beta(1-\mu)*b^E{}_0] + \beta(1-\mu)*\Delta EPS_t - \beta(1-\mu)b^E{}_{1,G}*\Delta EPS_{t-1} - \beta(1-\mu)b^E{}_{2,G}*\Delta EPS_{t-2} - \beta(1-\mu)b^E{}_{3,G}*\Delta EPS_{t-3} - \beta(1-\mu)b^E{}_{4,G}*\Delta EPS_{t-4} + \omega_t\}$ (8)

	Time series auto-regressive coefficients		Implied auto-regressive coefficients			
			Pre-Guidance		Post-Guidance	
	ΔEPS_t		CAR_{pre}		CAR_{post}	
Intercept	**b_0**	0.023 (5.51)***	**$b^E{}_0$**	0.132 (7.02)***	**$b^E{}_{0,G}$**	-0.326 (-6.74)***
ΔEPS_{t-1}	**b_1**	0.397 (58.57)***	**$b^E{}_1$**	0.123 (3.98)***	**$b^E{}_{1,G}$**	0.204 (2.95)***
ΔEPS_{t-2}	**b_2**	0.112 (15.25)***	**$b^E{}_2$**	0.212 (6.49)***	**$b^E{}_{2,G}$**	0.159 (2.16)**
ΔEPS_{t-3}	**b_3**	0.037 (4.99)***	**$b^E{}_3$**	0.102 (3.12)***	**$b^E{}_{3,G}$**	0.093 (1.25)
ΔEPS_{t-4}	**b_4**	-0.271 (-39.26)***	**$b^E{}_4$**	-0.308 (-10.13)***	**$b^E{}_{4,G}$**	-0.491 (-6.95)***
N	42,984					

Can not reject $b^E{}_1 = b^E{}_{1,G}$ (constraint likelihood ratio of 1.10 with p-value of 0.29)

CAR_t= the compounded abnormal returns (market size-decile adjusted) from the event date until the earnings announcement date of quarter t;

PRE = a dummy variable equal to 1 when the event date is two days before the announcement of management earnings guidance, 0 otherwise;

POST = a dummy variable equal to 1 when the event date is two days after the announcement of management earnings guidance, 0 otherwise;

$\Delta EPS_t = EPS_t - EPS_{t-4}$, scaled by the absolute value of EPS_{t-4};
$\Delta EPS_{t-1} = EPS_{t-1} - EPS_{t-5}$, scaled by the absolute value of EPS_{t-4};
EPS_t = Earnings per share at quarter t.

Table 8 Test of H4: The Information Content of Management Earnings Guidance: Future Earnings Information?

Model: $CAR_t = PRE*\{(\alpha - \beta b^E_0) + \beta*\Delta EPS_t - \beta\, b^E_1*\Delta EPS_{t-1} - \beta\, b^E_2*\Delta EPS_{t-2} - \beta\, b^E_3*\Delta EPS_{t-3} - \beta\, b^E_4*\Delta EPS_{t-4} + \omega_t\} + POST*\{[\alpha - \beta(1-\mu)*b^E_0] + \beta(1-\mu)*\Delta EPS_t - \beta(1-\mu)b^E_{1,G}*\Delta EPS_{t-1} - \beta(1-\mu)b^E_{2,G}*\Delta EPS_{t-2} - \beta(1-\mu)b^E_{3,G}*\Delta EPS_{t-3} - \beta(1-\mu)b^E_{4,G}*\Delta EPS_{t-4} + \omega_t\}$ (8)

	Pre-Guidance	Post-Guidance	Difference between
	CAR_{pre}	CAR_{post}	Pre- and Post-Guidance
Intercept	-0.011 (-7.13)***	0.012 (7.74)***	0.024 (10.51)***
ΔEPS_t	0.086 (33.3)***	0.038 (14.67)***	-0.048 (-13.18)***
ΔEPS_{t-1}	-0.011 (-3.84)***	-0.008 (-2.79)***	0.003 (0.74)
ΔEPS_{t-2}	-0.018 (-6.49)***	-0.006 (-2.15)**	0.012 (3.07)***
ΔEPS_{t-3}	-0.009 (-3.13)***	-0.004 (-1.25)	0.005 (1.32)
ΔEPS_{t-4}	0.027 (9.8)***	0.019 (6.87)***	-0.008 (-2.07)**
N	42,984		
Adj. R square	0.0346		

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

CAR_t = the compounded abnormal returns (market size-decile adjusted) from the event date until the earnings announcement date of quarter t;

PRE = a dummy variable equal to 1 when the event date is two days before the announcement of management earnings guidance, 0 otherwise;

POST = a dummy variable equal to 1 when the event date is two days after the announcement of management earnings guidance, 0 otherwise;

$\Delta EPS_t = EPS_t - EPS_{t-4}$, scaled by the absolute value of EPS_{t-4};
$\Delta EPS_{t-1} = EPS_{t-1} - EPS_{t-5}$, scaled by the absolute value of EPS_{t-4};
EPS_t = Earnings per share at quarter t.

Table 9 Test of H5: Management Earnings Guidance Quality and its Differential Mitigation Effect on PEAD

Panel A: In the Quarter for which the Guidance was Provided and Guidance Quality is Measured as the Guidance Precision

Model: $CAR12_t$ ($CAR3_t$) $= \alpha + \beta_1 SUE_{t-1} + \beta_2 Qual_t{*}SUE_{t-1} + \beta_3 Quant_t{*}SUE_{t-1} + \beta_4 Qual_t + \beta_5 Quant_t + \beta_6 Drift\_factor_{t-1}{*}SUE_{t-1} + \beta_7 DIH_{t-1}{*}SUE_{t-1} + \beta_8 Q4_{t-1} + \beta_9 Q4_{t-1}{*}SUE_{t-1}$ + firm-fixed-effect + year-fixed-effect + e_t (9a)

	Pred sign	$CAR12_t$ OLS regression	$CAR3_t$ OLS regression
SUE	+	2.52 (6.72)***	1.52 (8.22)***
Qual_SUE	-	-0.37 (-0.46)	0.24 (0.60)
Quant_SUE	-	-0.42 (-2.29)**	-0.48 (-2.26)**
$Drift\_factor_t{*}SUE_{t-1}$	-	-2.22 (-3.35)***	-1.69 (-5.18)***
$DIH_{t-1}{*}SUE_{t-1}$	-	-0.70 (-0.94)	-0.07 (-0.19)
$Q4_{t-1}$	?	-0.01 (-0.08)	0.21 (4.04)***
$Q4_{t-1}$ $*SUE_{t-1}$	+	-0.70 (-1.99)**	-0.33 (-1.93)*
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N Adj. R Square		98,358 0.075	98,358 0.069

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$Quant_t$ = 1 if the management earnings guidance is in the form of point or range guidance, 0 otherwise;
$Qual_t$ = 1 if the management earnings guidance is in the form of qualitative guidance, 0 otherwise.

Panel B: Following the Quarter for which the Guidance was Provided and Guidance Quality is Measured as the Guidance Precision

Model: $CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 Qual_t*SUE_t + \beta_3 Quant_t*SUE_t + \beta_4 Qual_t + \beta_5 Quant_t + \beta_6 Drift\_factor_t*SUE_t + \beta_7 DIH_{t-1}*SUE_t + \beta_8 Q4_t + \beta_9 Q4_t*SUE_t$ + firm-fixed-effect+ year-fixed-effect+ e_t (9b)

	Pred sign	$CAR60_{t+1}$ OLS regression
SUE	+	15.32 (22.54)***
Qual_SUE	-	-0.56 (-0.40)
Quant_SUE	-	-2.58 (-3.36)***
$Drift\_factor_t$*SUEt	-	-9.63 (-8.09)***
DIH_t*SUE_t	-	-4.59 (-3.43)***
$Q4_t$	?	1.99 (10.40)***
$Q4_t *SUE_t$	+	-2.53 (-4.02)***
Firm fixed effect		Yes
Year fixed effect		Yes
N Adj. R Square		100,167 0.082

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$Quant_t$ = 1 if the management earnings guidance is in the form of point or range guidance, 0 otherwise;
$Qual_t$ = 1 if the management earnings guidance is in the form of qualitative guidance, 0 otherwise.

Panel C: In the Quarter for which the Guidance was Provided and Guidance Quality is Measured as the Guidance Usefulness and Accuracy

Model: $CAR12_t$ ($CAR3_t$) $=\alpha + \beta_1 SUE_{t-1} + \beta_2 MEG_t * SUE_{t-1} + \beta_3 Quality_t * MEG_t * SUE_{t-1} + \beta_4 MEG_t + \beta_5 Quality_t + \beta_6 Drift\_factor_{t-1} * SUE_{t-1} + \beta_7 DIH_{t-1} * SUE_{t-1} + \beta_8 Q4_{t-1} + \beta_9 Q4_{t-1} * SUE_{t-1}$ + firm-fixed-effect + year-fixed-effect + e_t (10a)

	Pred sign	Usefulness		Accuracy	
		$CAR12_t$	$CAR3_t$	$CAR12_t$	$CAR3_t$
SUE_{t-1}	+	2.52 (6.72)***	1.51 (8.2)***	2.51 (6.69)***	1.50 (8.14)***
Quality		-0.31 (-1.68)*	-0.39 (-4.38)***	-0.73 (-3.79)***	-0.52 (-5.49)***
MEG_t	?	-0.19 (-1.35)	-0.09 (-1.31)	-0.04 (-0.31)	-0.05 (-0.78)
MEG_t*SUE_{t-1}	-	-0.72 (-1.49)	-0.07 (-0.28)	-0.68 (--1.52)	-0.10 (-0.47)
Quality*MEG_t*SUE_{t-1}	-	-0.38 (-0.56)	-0.70 (-2.12)**	-0.56 (-0.75)	-0.78 (-2.10)**
$Drift\_factor_t$*SUE_{t-1}	-	-2.21 (-3.30)***	-1.66 (-5.17)***	-2.19 (-3.30)***	-1.65 (-5.03)***
DIH_{t-1}*SUE_{t-1}	-	-0.71 (-0.96)	-0.08 (-0.12)	-0.71 (-0.95)	-0.08 (-0.23)
$Q4_{t-1}$	?	-0.01 (-0.05)	0.21 (4.09)***	-0.01 (-0.06)	0.21 (4.04)***
$Q4_{t-1}$ *SUE_{t-1}	-	-0.70 (-1.99)*	-0.33 (-1.74)*	-0.71 (-2.01)**	-0.34 (-1.94)*
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N		98,358	98,358	98,358	98,358
Adj. R Square		0.075	0.069	0.075	0.069

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Usefulness = 1 if the ratio of number of useful forecasts over the total number of management earnings forecast issued for that quarter is higher than the average ratio for the firms in the same SIC 2-digit industry in a given year, and 0 otherwise. The guidance is deemed useful if the |actual earnings - guidance| < |actual earnings – consensus analyst forecast|.

Accuracy = 1 the accuracy of that firm quarter's guidance, measured as -1* |actual earnings - guidance|, scaled by stock price two trading days before the earnings announcement date, is above the median of guidance accuracy for a given year and SIC 2-digit industry, 0 otherwise.

Panel D: Following the Quarter for which the Guidance was Provided and Guidance Quality is Measured as the Guidance Usefulness and Accuracy

Model: $CAR60_{t+1} = \alpha + \beta_1 SUE_t + \beta_2 MEG_t*SUE_t + \beta_3 Quality_t*MEG_t*SUE_t + \beta_4 MEG_t + \beta_5 Quality_t + \beta_6 Drift\_factor_t*SUE_t + \beta_7 DIH_t*SUE_t + \beta_8 Q4_t + \beta_9 Q4_t*SUE_t$ + firm-fixed-effect + year-fixed-effect + e_t (10b)

	Pred sign	Usefulness $CAR60_t$	Accuracy $CAR60_t$
SUE_t	+	15.23 (22.40)***	15.24 (22.41)***
Quality		-0.45 (-1.34)	-3.36 (-9.61)***
MEG_t	?	-0.13 (-0.49)	0.99 (3.81)***
MEG_t*SUE_t	-	-0.47 (-0.55)	-1.31 (--1.66)*
Quality*MEG_t*SUE_t	-	-4.35 (-3.70)***	-3.32 (-2.56)**
$Drift\_factor_t$*SUE_t	-	-9.53 (-8.00)***	-9.53 (-7.99)***
DIH_t*SUE_t	-	-4.48 (-3.35)***	-4.54 (-3.40)***
$Q4_t$	?	1.98 (10.36)***	1.95 (10.21)***
$Q4_t$ *SUE_t	-	-2.56 (-4.08)***	-2.46 (-3.92)***
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N Adj. R Square		100,167 0.082	100,167 0.082

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Usefulness = 1 if the ratio of number of useful forecasts over the total number of management earnings forecast issued for that quarter is higher than the average ratio for the firms in the same SIC 2-digit industry in a given year, and 0 otherwise. The guidance is deemed useful if the |actual earnings - guidance| < |actual earnings – consensus analyst forecast|.

Accuracy = 1 the accuracy of that firm quarter's guidance, measured as -1* |actual earnings - guidance|, scaled by stock price two trading days before the earnings announcement date, is above the median of guidance accuracy for a given year and SIC 2-digit industry, 0 otherwise.

Table 10 Using Subsamples to Test H1: The Impact of Management Earnings Guidance on PEAD in the Quarter for which the Guidance was Provided

Panel A: Partition the Sample to Pre and Post Reg FD Subsamples

	Pred sign	$CAR12_t$		$CAR3_t$	
		Pre_Reg	Post_Reg	Pre_Reg	Post_Reg
SUE_{t-1}	+	1.97 (3.15)***	2.58 (5.42)***	1.61 (5.31)***	1.37 (5.71)***
MEG_t*SUE_{t-1}	**-**	**-1.02 (-1.33)**	**-0.98 (-2.13)****	**0.18 (0.48)**	**-0.66 (-2.84)****
MEG_t	?	-0.35 (-1.54)	-0.10 (-0.66)	-0.29 (-2.67)***	-0.12 (-1.54)
$Drift\_factor_t$*SUE_{t-1}	-	-2.82 (-2.50)**	-1.14 (-1.37)	-2.58 (-4.72)**	-0.94 (-2.25)**
DIH_{t-1}*SUE_{t-1}	-	-0.72 (-0.59)	-1.61 (-1.67)*	0.00 0.00	-0.49 (-1.01)
$Q4_{t-1}$	?	-0.07 (-0.38)	0.03 (0.25)	0.23 (2.69)***	0.17 (2.69)***
$Q4_{t-1}$ *SUE_{t-1}	-	-0.35 (-0.59)**	-0.99 (-2.34)**	-0.24 (-0.83)	-0.40 (-1.86)*
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N Adj. R Square		42,143 0.122	56,615 0.098	56,615 0.114	56,615 0.088

Panel B: Partition the Sample to Fourth quarter and Non-fourth Quarter Subsamples Based on Whether the SUE_{t-1} is in the Fourth Quarter or Not

	Pred sign	$CAR12_t$		$CAR3_t$	
		Fourth quarters	Non-fourth quarters	Fourth quarters	Non-fourth quarters
SUE_{t-1}	+	1.38 (1.95)*	3.05 (7.14)***	1.25 (3.58)***	1.73 (8.21)***
MEG_t*SUE_{t-1}	**-**	**-0.54 (-0.63)**	**-0.95 (-2.09)****	**-0.34 (-0.80)**	**-0.41 (-1.81)***
MEG_t	?	-0.73 (-2.50)**	-0.28 (-2.07)**	-0.28 (-1.95)*	-0.26 (-3.96)***
$Drift\_factor_t$*SUE_{t-1}	-	-1.03 (-0.78)	-2.89 (-3.71)***	-1.18 (-1.82)*	-1.95 (-5.10)***
DIH_{t-1}*SUE_{t-1}	-	-0.51 (-0.34)	-0.90 (-1.03)	-0.39 (-0.53)	-0.13 (-0.31)
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N Adj. R Square		23,722 0.226	75,036 0.090	23,722 0.226	75,036 0.085

Panel C: Partition the Sample to Large and Small Size Subsamples Based on the Sample Median Value of Size

	Pred sign	$CAR12_t$		$CAR3_t$	
		Large	Small	Large	Small
SUE_{t-1}	+	-0.41	2.57	0.33	1.60
		(-0.31)	(5.15)***	(0.50)	(6.51)***
MEG_t*SUE_{t-1}	**-**	**-0.02**	**-1.73**	**0.21**	**-0.91**
		(-0.05)	**(-2.75)*** **	**(0.88)**	**(-2.93)*** **
MEG_t	?	-0.09	-0.53	-0.23	-0.24
		(-0.69)	(-2.48)**	(-3.46)***	(-2.29)**
$Drift\_factor_t$*SUE_{t-1}	-	-0.39	-1.34	-0.79	-1.57
		(-0.27)	(-1.11)	(-1.10)**	(-2.65)***
DIH_{t-1}*SUE_{t-1}	-	0.04	-0.74	-0.10	0.02
		(0.04)	(-0.7)	(-0.18)	(0.03)
$Q4_{t-1}$	?	-0.02	0.03	0.20	0.24
		(-0.13)	(0.16)	(3.23)***	(2.77)***
$Q4_{t-1}$ *SUE_{t-1}	-	0.46	-1.11	0.37	-0.52
		(0.94)	(-2.22)**	(1.51)	(-2.13)**
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N		49,536	49,222	49,536	49,222
Adj. R Square		0.097	0.091	0.086	0.082

Panel D: Partition the Sample to High and Low Trading Volume Subsamples Based on the Sample Median Value of Dollar Trading Volume

	Pred sign	$CAR12_t$		$CAR3_t$	
		High trading Volume	Low trading Volume	High trading Volume	Low trading Volume
SUE_{t-1}	+	-0.73	2.63	0.00	1.64
		(-0.66)	(5.44)***	(0.00)	(6.9)***
MEG_t*SUE_{t-1}	**-**	**-0.70**	**-1.08**	**0.18**	**-1.03**
		(-1.40)	**(-1.71)***	**(0.74)**	**(-3.33)*** **
MEG_t	?	-0.17	-0.37	-0.25	-0.18
		(-1.17)	(-1.78)*	(-3.53)***	(-1.82)*
$Drift\_factor_t$*SUE_{t-1}	-	-0.17	-2.42	-0.79	-1.84
		(-0.14)	(-2.16)**	(-1.28)	(-3.35)***
DIH_{t-1}*SUE_{t-1}	-	0.46	-0.78	0.38	-0.17
		(0.39)	(-0.76)	(0.66)	(-0.33)
$Q4_{t-1}$	?	0.05	-0.03	0.23	0.21
		(0.40)	(-0.19)	(3.47)***	(2.59)***
$Q4_{t-1}$ *SUE_{t-1}	-	0.62	-1.08	0.23	-0.46
		(1.22)	(-2.21)**	(0.92)	(-1.93)*
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N		49,572	49,186	49,572	49,186
Adj. R Square		0.103	0.095	0.090	0.089

Panel E: Partition the Sample to High and Low Drift Factor Subsamples Based on the Sample Median Value of Drift Factor

	Pred sign	$CAR12_t$		$CAR3_t$	
		High Drift factor	Low Drift factor	High Drift factor	Low Drift factor
SUE_{t-1}	+	2.66 (1.17)	2.50 (4.98)***	1.86 (1.66)*	1.61 (6.52)***
MEG_t*SUE_{t-1}	**-**	**-0.55** **(-1.12)**	**-1.15** **(-1.85)***	**-0.13** **(-0.55)**	**-0.55** **(-1.78)***
MEG_t	?	-0.07 (-0.49)	-0.50 (-2.31)**	-0.19 (-2.82)***	-0.27 (-2.53)**
$Drift\_factor_t$*SUE_{t-1}	-	-2.64 (-1.01)	-3.46 (-2.57)**	-1.99 (-1.53)	-2.77 (-4.17)***
DIH_{t-1}*SUE_{t-1}	-	-1.22 (-1.04)	0.17 (0.17)	-0.51 (-0.88)	0.37 (0.72)
$Q4_{t-1}$	?	0.06 (0.49)	-0.05 (-0.27)	0.19 (3.12)***	0.22 (2.68)***
$Q4_{t-1}$ *SUE_{t-1}	-	1.13 (2.23)**	-1.17 (-2.39)**	0.48 (1.92)*	-0.49 (-2.04)**
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N Adj. R Square		49,618 0.113	49,140 0.099	49,618 0.099	49,140 0.089

Panel F: Partition the Sample to High and Low Institutional Ownership Subsamples Based on the Sample Median Value of Institutional Ownership

	Pred sign	$CAR12_t$		$CAR3_t$	
		High Institutional	Low Institutional	High Institutional	Low Institutional ownership
SUE_{t-1}	+	-1.00 (-0.57)	2.21 (4.14)***	-0.03 (-0.03)	1.42 (5.39)***
MEG_t*SUE_{t-1}	**-**	**-0.07** **(-0.14)**	**-1.88** **(-2.94)*****	**-0.27** **(-1.11)**	**-0.51** **(-1.60)**
MEG_t	?	-0.15 (-1.08)	-0.35 (-1.66)*	-0.27 (-3.82)***	-0.13 (-1.22)
$Drift\_factor_t$*SUE_{t-1}	-	-1.91 (-1.99)**	-1.65 (-1.74)*	-1.36 (-2.88)**	-1.50 (-3.21)***
DIH_{t-1}*SUE_{t-1}	-	2.24 (1.07)	0.45 (0.33)	1.17 (1.14)	0.16 (0.24)
$Q4_{t-1}$	?	0.08 (0.63)	-0.11 (-0.68)	0.27 (4.06)***	0.15 (1.85)*
$Q4_{t-1}$ *SUE_{t-1}	-	0.08 (0.17)	-1.23 (-2.44)**	-0.06 (-0.27)	-0.41 (-1.64)
Firm fixed effect		Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes
N Adj. R Square		49,757 0.092	49,001 0.103	49,757 0.083	49,001 0.093

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Table 11 Using Subsamples to Test H2: The Extent to which Investors' Earnings Expectations Incorporate Prior Earnings Implication in Firm Quarters with Guidance vs. Firm Quarters without Guidance

Panel A: Partition the Sample to Pre and Post Reg FD Subsamples

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		Pre Reg FD	Post Reg FD		Pre Reg FD	Post Reg FD
Intercept	$\mathbf{b_0}$	0.02 (14.49)***	0.01 (7.39)***	$\mathbf{b_0}^*$	-0.18 (-14.61)***	-0.13 (-11.91)***
SUE_{t_1}	$\mathbf{b_1}$	0.36 (66.85)***	0.32 (65.63)***	$\mathbf{b_1}^*$	0.12 (3.23)***	0.03 (0.91)
SUE_{t_2}	$\mathbf{b_2}$	0.12 (21.81)***	0.14 (26.46)***	$\mathbf{b_2}^*$	0.12 (3.14)***	0.10 (2.66)***
SUE_{t_3}	$\mathbf{b_3}$	0.07 (12.48)***	0.05 (10.17)***	$\mathbf{b_3}^*$	0.08 (2.02)**	0.08 (2.13)**
SUE_{t_4}	$\mathbf{b_4}$	-0.27 (-93.56)***	-0.27 (-53.84)***	$\mathbf{b_4}^*$	-0.13 (-3.37)***	-0.10 (-2.58)***
MEG_t	$\mathbf{b_5}$	-0.03 (-18.02)***	-0.02 (-18.02)***	$\mathbf{b_5}^*$	-0.05 (-2.01)**	0.03 (1.84)*
MEG_t*SUE_{t_1}	$\mathbf{b_6}$	0.02 (1.17)	0.03 (3.69)***	$\mathbf{b_6}^*$	0.11 (1.09)	0.26 (3.71)***
MEG_t*SUE_{t_2}	$\mathbf{b_7}$	0.00 (0.12)	-0.03 (-2.84)**	$\mathbf{b_7}^*$	-0.06 (-0.55)	0.00 (-0.04)
MEG_t*SUE_{t_3}	$\mathbf{b_8}$	-0.02 (-1.51)	0.00 (0.11)	$\mathbf{b_8}^*$	0.04 (0.40)	0.01 (0.17)
MEG_t*SUE_{t_4}	$\mathbf{b_9}$	-0.03 (-2.03)**	-0.02 (-2.62)***	$\mathbf{b_9}^*$	-0.08 (-0.78)	-0.20 (-2.83)***
N		38,634	54,541		38,634	54,541

Equality of autoregressive coefficients across equations for the Pre Reg FD subsample:
reject $b_1 =$ b1* at $p < 0.0001$ with constraint likelihood ratio of 36.96.

Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for the Pre Reg FD subsample:
can not reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p < 0.3116$ with constraint likelihood ratio of 1.00.

Equality of autoregressive coefficients across equations for the Post Reg FD subsample:
reject $b_1 =$ b1* at $p < 0.0001$ with constraint likelihood ratio of 61.68.

Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for the Post Reg FD subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p < 0.001$ with constraint likelihood ratio of 11.44.

Panel B: Partition the Sample to Fourth Quarter and Non-fourth Quarter Subsamples based on whether the SUE_{t-1} is in the Fourth Quarter or not

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		Fourth quarter	Non-fourth quarter		Fourth quarter	Non-fourth quarter
Intercept	$\mathbf{b_0}$	0.00 (-0.51)	0.02 (17.53)***	$\mathbf{b_0}^*$	-0.16 (-9.39)***	-0.15 (-15.22)***
SUE_{t_1}	$\mathbf{b_1}$	0.23 (39.33)***	0.38 (86.28)***	$\mathbf{b_1}^*$	0.07 (-0.51)	0.07 (2.11)**
SUE_{t_2}	$\mathbf{b_2}$	0.13 (20.32)***	0.13 (27.83)***	$\mathbf{b_2}^*$	0.11 (1.87)*	0.11 (3.33)***
SUE_{t_3}	$\mathbf{b_3}$	0.06 (9.41)***	0.06 (13.47)***	$\mathbf{b_3}^*$	0.14 (-0.34)	0.06 (1.73)*
SUE_{t_4}	$\mathbf{b_4}$	-0.27 (-36.55)***	-0.26 (-63.91)***	$\mathbf{b_4}^*$	-0.21 (-0.78)	-0.08 (-2.68)***
MEG_t	$\mathbf{b_5}$	-0.04 (-10.07)***	-0.04 (-19.14)***	$\mathbf{b_5}^*$	0.00 (-0.08)	0.03 (1.97)**
$MEG_t*SUE_{t\_1}$	$\mathbf{b_6}$	0.03 (1.91)*	0.01 (0.35)	$\mathbf{b_6}^*$	0.19 (3.02)***	0.20 (2.98)***
$MEG_t*SUE_{t\_2}$	$\mathbf{b_7}$	-0.04 (-2.32)**	-0.01 (-1.46)	$\mathbf{b_7}^*$	-0.08 (-0.66)	-0.01 (-0.16)
$MEG_t*SUE_{t\_3}$	$\mathbf{b_8}$	-0.05 (-2.76)***	0.00 (-0.08)	$\mathbf{b_8}^*$	-0.10 (1.57)	0.05 (0.72)
$MEG_t*SUE_{t\_4}$	$\mathbf{b_9}$	0.01 (0.37)	-0.03 (-3.79)***	$\mathbf{b_9}^*$	0.15 (-2.49)**	-0.22 (-3.56)***
N		22,492	70,683		22,492	70,683

Equality of autoregressive coefficients across equations for fourth quarter subsample:
reject $b_1 =$ b1* at $p < 0.0001$ with constraint likelihood ratio of 14.96.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for fourth quarter subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p = 0.0589$ with constraint likelihood ratio of 3.57

Equality of autoregressive coefficients across equations for non-fourth quarter subsample:
reject $b_1 =$ b1* at $p < 0.0001$ with constraint likelihood ratio of 87.65.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for non-fourth quarter subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p = 0.0051$ with constraint likelihood ratio of 7.84.

Panel C: Partition the Sample to Large and Small Size Subsamples

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		Large size	Small size		Large size	small size
Intercept	b_0	0.01 (7.47)***	0.02 (13.11)***	b_0^*	-0.16 (-9.31)***	-0.17 (-16.18)***
SUE_{t_1}	b_1	0.33 (61.50)***	0.34 (68.03)***	b_1^*	0.36 (5.45)***	0.02 (0.79)
SUE_{t_2}	b_2	0.13 (22.68)***	0.13 (25.12)***	b_2^*	0.00 (-0.03)	0.14 (4.53)***
SUE_{t_3}	b_3	0.08 (14.37)***	0.05 (9.67)***	b_3^*	0.15 (2.14)**	0.05 (1.72)*
SUE_{t_4}	b_4	-0.27 (-49.44)***	-0.26 (-52.84)***	b_4^*	-0.25 (-3.81)***	-0.09 (-3.00)***
MEG_t	b_5	-0.03 (-15.50)***	-0.05 (-13.79)***	b_5^*	0.06 (2.46)**	-0.03 (-1.59)
$MEG_t*SUE_{t\_1}$	b_6	0.01 (1.09)	0.04 (3.34)***	b_6^*	-0.09 (-0.78)	0.26 (3.53)***
$MEG_t*SUE_{t\_2}$	b_7	0.01 (0.54)	-0.05 (-3.54)***	b_7^*	0.01 (0.04)	-0.02 (-0.21)
$MEG_t*SUE_{t\_3}$	b_8	-0.04 (-3.69)***	0.01 (0.69)	b_8^*	0.24 (1.89)*	-0.10 (-1.24)
$MEG_t*SUE_{t\_4}$	b_9	-0.02 (-2.47)**	-0.03 (-2.09)**	b_9^*	-0.19 (-1.63)	-0.08 (-1.08)
N		47,275	45,900		47,275	45,900

Equality of autoregressive coefficients across equations for the large size sample:
can not reject $b_1 =$ b1* at $p < 0.7395$ with constraint likelihood ratio of 0.11.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for large size subsample:
can not reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p < 0.3785$ with constraint likelihood ratio of 0.78.

Equality of autoregressive coefficients across equations for the small size subsample:
reject $b_1 =$ b1* at $p < 0.0001$ with constraint likelihood ratio of 107.95.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for small size subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at $p < 0.001$ with constraint likelihood ratio of 11.39.

Panel D: Partition the Sample to High and Low Trading Volume Subsamples

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		High Trading vol	Low Trading vol		High Trading vol	Low Trading vol
Intercept	$\mathbf{b_0}$	0.01 (5.88)***	0.02 (14.74)***	$\mathbf{b_0}^*$	-0.19 (-10.38)***	-0.15 (-15.49)***
SUE_{t_1}	$\mathbf{b_1}$	0.35 (63.66)***	0.33 (67.04)***	$\mathbf{b_1}^*$	0.24 (3.87)***	0.04 (1.21)
SUE_{t_2}	$\mathbf{b_2}$	0.14 (23.70)***	0.13 (25.54)***	$\mathbf{b_2}^*$	-0.02 (-0.29)	0.15 (5.05)***
SUE_{t_3}	$\mathbf{b_3}$	0.07 (12.66)***	0.05 (10.37)***	$\mathbf{b_3}^*$	0.19 (2.79)***	0.05 (1.54)
SUE_{t_4}	$\mathbf{b_4}$	-0.29 (-52.15)***	-0.25 (-51.75)***	$\mathbf{b_4}^*$	-0.18 (-2.73)***	-0.09 (-3.30)***
MEG_t	$\mathbf{b_5}$	-0.04 (-16.54)***	-0.04 (-16.54)***	$\mathbf{b_5}^*$	0.08 (3.00)***	-0.04 (-2.06)**
$MEG_t*SUE_{t\_1}$	$\mathbf{b_6}$	0.01 (0.59)	0.04 (3.17)*	$\mathbf{b_6}^*$	0.00 (-0.04)	0.27 (3.79)***
$MEG_t*SUE_{t\_2}$	$\mathbf{b_7}$	-0.01 (-1.13)	-0.03 (-2.53)**	$\mathbf{b_7}^*$	0.07 (0.60)	-0.03 (-0.42)
$MEG_t*SUE_{t\_3}$	$\mathbf{b_8}$	-0.03 (-3.12)***	0.01 (0.89)	$\mathbf{b_8}^*$	0.07 (0.60)	-0.04 (-0.49)
$MEG_t*SUE_{t\_4}$	$\mathbf{b_9}$	-0.02 (-1.92)*	-0.02 (-1.35)	$\mathbf{b_9}^*$	-0.20 (-1.78)*	-0.08 (-1.15)
N		47,092	46,083		47,092	46,083

Equality of autoregressive coefficients across equations for high trading volume subsample:
can not reject $b_1 =$ b1* at p =0.0982 with constraint likelihood ratio of 2.73.

Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for high volume subsample:
can not reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at p =0.9559 with constraint likelihood ratio of 0.

Equality of autoregressive coefficients across equations for low trading volume subsample:
reject $b_1 =$ b1* at $p < 0.001$ with constraint likelihood ratio of 103.45.

Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for low volume subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at p = 0.0003 with constraint likelihood ratio of 13.21.

Panel E. Partition the Sample to High and Low Drift Factor Subsamples

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		High drift factor	Low drift factor		High drift factor	Low drift factor
Intercept	$\mathbf{b_0}$	0.00 (3.61)***	0.02 (15.74)***	$\mathbf{b_0}^*$	-0.12 (-7.32)***	-0.19 (-17.15)***
SUE_{t_1}	$\mathbf{b_1}$	0.34 (61.96)***	0.33 (67.55)***	$\mathbf{b_1}^*$	0.26 (4.00)***	0.05 (1.55)
SUE_{t_2}	$\mathbf{b_2}$	0.14 (23.24)***	0.13 (24.77)***	$\mathbf{b_2}^*$	0.01 (0.16)	0.14 (4.36)***
SUE_{t_3}	$\mathbf{b_3}$	0.09 (14.68)***	0.05 (9.68)***	$\mathbf{b_3}^*$	0.03 (0.41)	0.08 (2.55)**
SUE_{t_4}	$\mathbf{b_4}$	-0.27 (-48.96)***	-0.26 (-53.04)***	$\mathbf{b_4}^*$	-0.25 (-3.78)***	-0.09 (-3.05)***
MEG_t	$\mathbf{b_5}$	-0.03 (-16.54)***	-0.04 (-11.07)***	$\mathbf{b_5}^*$	0.02 (0.79)	-0.02 (-0.72)
$MEG_t*SUE_{t\_1}$	$\mathbf{b_6}$	0.02 (1.97)*	0.02 (2.04)**	$\mathbf{b_6}^*$	0.12 (1.06)	0.18 (2.41)**
$MEG_t*SUE_{t\_2}$	$\mathbf{b_7}$	-0.01 (-1.31)	-0.03 (-2.25)**	$\mathbf{b_7}^*$	-0.09 (-0.70)	0.04 (0.48)
$MEG_t*SUE_{t\_3}$	$\mathbf{b_8}$	-0.03 (-3.08)***	0.00 (-0.02)	$\mathbf{b_8}^*$	0.28 (2.21)**	-0.09 (-1.09)
$MEG_t*SUE_{t\_4}$	$\mathbf{b_9}$	-0.03 (-2.70)**	-0.02 (-1.71)*	$\mathbf{b_9}^*$	-0.16 (-1.36)	-0.10 (-1.39)
N		47,157	46,018		47,157	46,018

Equality of autoregressive coefficients across equations for high drift factor subsample:
can not reject $b_1 =$ b1* at $p < 0.2226$ with constraint likelihood ratio of 1.49.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for high drift factor subsample:
can not reject $(b_1* + b_6*)/(b_1 + b_6) = b_1*/b_1$ at $p < 0.3915$ with constraint likelihood ratio of 0.73.

Equality of autoregressive coefficients across equations for low drift factor subsample:
reject $b_1 =$ b1* at $p < 0.001$ with constraint likelihood ratio of 88.40.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for low drift factor subsample:
reject $(b_1* + b_6*)/(b_1 + b_6) = b_1*/b_1$ at $p = 0.0226$ with constraint likelihood ratio of 5.2.

Panel F: Partition the Sample to High and Low Institutional Ownership Subsamples

	Time series auto-regressive coefficients	Guidance vs No Guidance		Implied auto-regressive coefficients	Guidance vs No Guidance	
		High Inst Pct	Low Inst Pct		High Inst Pct	Low Inst Pct
Intercept	b_0	0.01 (11.57)***	0.01 (10.12)***	b_0^*	-0.18 (-11.02)***	-0.15 (-15.46)***
SUE_{t_1}	b_1	0.34 (62.39)***	0.34 (67.91)***	b_1^*	0.18 (3.29)***	0.05 (1.50)
SUE_{t_2}	b_2	0.14 (24.89)***	0.12 (23.84)***	b_2^*	0.09 (1.50)	0.12 (3.78)***
SUE_{t_3}	b_3	0.07 (11.99)***	0.06 (10.68)***	b_3^*	0.17 (2.83)***	0.05 (1.46)
SUE_{t_4}	b_4	-0.26 (-47.74)***	-0.27 (-54.22)***	b_4^*	-0.20 (-3.50)***	-0.09 (-3.06)***
MEG_t	b_5	-0.04 (-17.90)***	-0.04 (-16.54)***	b_5^*	0.09 (3.73)***	-0.06 (-2.76)***
$MEG_t*SUE_{t\_1}$	b_6	0.03 (3.24)***	0.01 (1.13)	b_6^*	0.15 (1.50)	0.17 (2.23)**
$MEG_t*SUE_{t\_2}$	b_7	-0.01 (-0.68)	-0.04 (-3.34)***	b_7^*	0.04 (0.35)	-0.08 (-1.00)
$MEG_t*SUE_{t\_3}$	b_8	-0.02 (-1.96)*	0.00 (0.08)	b_8^*	-0.10 (-0.89)	0.09 (1.03)
$MEG_t*SUE_{t\_4}$	b_9	-0.03 (-3.60)***	-0.02 (-1.65)*	b_9^*	-0.11 (-1.08)	-0.14 (-1.93)*
N		47,893	45,282		47,893	45,282

Equality of autoregressive coefficients across equations for high institutional ownership subsample:
reject $b_1 =$ b1* at p =0.0068 with constraint likelihood ratio of 7.33.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for high institutional ownership subsample:
can not reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at p =0.2273 with constraint likelihood ratio of 1.46.

Equality of autoregressive coefficients across equations for low institutional ownership subsample:
reject $b_1 =$ b1* at $p < 0.001$ with constraint likelihood ratio of 91.88.
Difference in market efficiency ratios between Guidance and Non-Guidance firm quarters for low institutional ownership subsample:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at p = 0.0327 with constraint likelihood ratio of 4.56.

Table 12 Using the Full Sample with Both Guidance Firms and Non-guidance Firms to test H1: The Impact of Management Earnings Guidance on PEAD

Panel A: Comparison of Guidance Firms and Non-Guidance Firms

Variables	n	Guidance Mean [Median]	n	Non-Gudiance Mean [Median]	Test of Difference Mean [Median]
MV	100568	2445	46031	652.5	1793.9***
		394.5		82.73	[311.9]***
VOL	100568	3328	46031	656.2	2671.4***
		418.3		34.52	[383.7]***
PRC	100568	17.20	46031	14.52	2.678***
		13.62		10.00	[3.620]***
IH	100568	0.475	46031	0.232	0.243***
		0.488		0.160	[0.327]***
CAR3	100568	0.006	46031	0.003	0.003***
		0.002		-0.001	[0.003]***
CAR12	100568	0.012	46031	0.006	0.006***
		0.007		0.001	[0.005]***
CAR60	100568	0.000	46031	-0.034	0.034***
		-0.015		-0.040	[0.024]***
SUE	100568	0.004	46031	-0.006	0.01***
		0.056		-0.056	[0.111]***

Panel B: Comparison of Autocorrelations of SUE and Drift Magnitude between Guidance Firms and Non-Guidance Firms

Variables	SUE_t	$CAR12_t$	$CAR3_t$	$CAR60_t$
Intercept	-0.004	0.588	0.254	-3.341
	(-3.26)***	(8.86)***	(7.81)***	(-27.98)***
SUE_{t-1}	0.361	1.838	0.844	10.864
	(84.72)***	(8.31)***	(7.81)***	(27.52)***
Guide*SUE_{t-1}	**0.025**	**-0.659**	**-0.086**	**-2.638**
	(4.81)* **	**(-2.44)** **	**(-0.65)**	**(-5.45)*** **
Guide	0.006	0.573	0.328	3.285
	(3.95)***	(7.15)***	(8.37)***	(22.78)***
N	143,063	143,063	143,063	146,559
Adj. R Square	0.142	0.001	0.002	0.015

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Guide = 1 if the firms have given at least one guidance during the sample period, 0 otherwise.

Panel C: The Impact of Guidance on PEAD in the Quarter for which the Guidance was Provided

	Pred sign	$CAR12_t$ OLS regression	$CAR3_t$ OLS regression
SUE_{t-1}	+	2.33 (8.65)***	1.20 (9.07)***
MEG_t*SUE_{t-1}	**-**	**-0.91** **(-2.39)****	**-0.32** **(-1.70)***
MEG_t	?	-0.36 (-3.02)***	-0.27 (-4.71)***
$Drift\_factor_t$*SUE_{t-1}	-	-2.05 (-3.72)***	-1.49 (-5.49)***
DIH_{t-1}*SUE_{t-1}	-	-0.42 (-0.71)	0.18 (0.63)
$Q4_{t-1}$	?	-0.10 (-1.1)	0.14 (3.20)***
$Q4_{t-1}$ *SUE_{t-1}	-	-0.96 (-3.35)***	-0.42 (-2.95)***
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N Adj. R Square		143,603 0.085	143,603 0.079

Panel D: The impact of Guidance on PEAD following the Quarter for which the Guidance was Provided

	Pred sign	$CAR60_{t+1}$ OLS regression
SUE_t	+	14.61 (30.08)***
MEG_t*SUE_t	**-**	**-2.65** **(-3.95)*****
MEG_t	?	-0.30 (-1.35)
$Drift\_factor_t$*SUE_t	-	-9.61 (-9.80)***
DIH_t*SUE_t	-	-3.36 (-3.17)***
$Q4_t$	?	1.83 (11.73)***
$Q4_t$ *SUE_t	-	-2.00 (-3.94)***
Firm fixed effect		Yes
Year fixed effect		Yes
N Adj. R Square		146,599 0.105

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Table 13 Using the Full Sample with Both Guidance Firms and Non-guidance Firms to test H2: The Extent to which Investors' Earnings Expectations Incorporate Prior Earnings Implication in Firm Quarters with Guidance vs. Firm Quarters without Guidance

	Time series auto-regressive coefficients	Guidance vs No Guidance	Implied auto-regressive coefficients	Guidance vs No Guidance
Intercept	b_0	0.01 (10.19)***	b_0^*	-0.12 (-20.82)***
SUE_{t_1}	b_1	0.33 (115.47)***	b_1^*	0.09 (4.73)***
SUE_{t_2}	b_2	0.13 (43.48)***	b_2^*	0.11 (5.62)***
SUE_{t_3}	b_3	0.06 (19.81)***	b_3^*	0.04 (2.08)**
SUE_{t_4}	b_4	-0.27 (-93.56)***	b_4^*	-0.12 (-6.38)***
MEG_t	b_5	-0.03 (-18.02)***	b_5^*	0.00 (-0.34)
MEG_t*SUE_{t_1}	b_6	0.03 (3.80)***	b_6^*	0.19 (3.84)***
MEG_t*SUE_{t_2}	b_7	-0.02 (-2.47)**	b_7^*	-0.02 (-0.45)
MEG_t*SUE_{t_3}	b_8	-0.01 (-1.10)	b_8^*	0.05 -0.98
MEG_t*SUE_{t_4}	b_9	-0.02 (-2.97)***	b_9^*	-0.15 (-2.94)***
N		134,139		134,139

Market efficiency tests for Guidance vs Non-Guidance firm quarters:
Equality of autoregressive coefficients across euqations for non-guidance firm quarters:
reject $b_1 = b_1^*$ at p <.0001 with constraint likelihood ratio of 153.64.

Equality of autoregressive coefficients across euqations for guidance firm quarters:
reject $(b_1+b_6) = (b_1^* + b_6^*)$ at p = 0.0936 with constraint likelihood ratio of 2.81.

Difference in market efficiency ratios in Guidance vs Non-Guidance firm quarters:
reject $(b_1^* + b_6^*)/(b_1 + b_6) = b_1^*/b_1$ at p < 0.001 with constraint likelihood ratio of 12.45.

Table 14 Time Series Properties of Standardized Forecast Errors (SFE) and Standardized Unexpected Earnings (SUE) and the Properties of PEAD based on SFE and SUE

Panel A. Autocorrelation properties of SFE and SUE

Coefficient Estimate	SFE				SUE			
	K =1	K= 2	K=3	K=4	K =1	K= 2	K=3	K=4
b_k	0.228	0.161	0.132	0.120	0.406	0.235	0.082	0.187
	(59.85)***	(39.08)***	(30.84)***	(28.29)***	(112.38)***	(60.34)***	(20.45)***	(-46.38)***
Adjusted R^2	0.052	0.026	0.017	0.014	0.162	0.054	0.007	0.034
No. of observations	65,539	57,959	56,442	55,303	65,429	64,173	62,933	61,705

The left panel reports coefficients when earnings surprises are based on analyst forecast errors. The right panel reports coefficients when earnings surprises are seasonally differenced earnings. The coefficients are estimated from the following pooled regressions:

$SFE_t = a_k + b_k * SFE_{t-k} + e_t$
$SUE_t = a_k + b_k * SUE_{t-k} + e_t$
Where SFE_t = the decile ranking of the analyst forecast errors of quarter t, further converted to range between -0.5 and 0.5, where forecast error is current quarter's actual earnings minus consensus analyst forecast, scaled by the stock price at the end of current fiscal quarter;
K = 1, 2, 3, and 4

Panel B. Drift Based on SFE and SUE.

	3-day		60-day	
Coefficient Estimate	SFE	SUE	SFE	SUE
b_0	0.43	0.45	-0.08	0.13
	(18.10)***	(18.77)***	(-0.92)	(1.54)
b_1	0.71	0.45	10.27	5.42
	(8.59)***	(5.00)***	(34.61)***	(16.60)***
Adjusted R^2	0.0011	0.0004	0.0179	0.0042
No. of observations	65,539	65,429	65,539	65,539

The left panel reports coefficients when the compounded abnormal return is measured over a 3-day interval. The right panel reports coefficients when the compounded abnormal return is measured over a 60-day interval. The coefficients are estimated from the following pooled regressions:

$CAR_t = b_0 + b_1 * SFE_{t-1} + e_t$
$CAR_t = b_0 + b_1 * SUE_{t-1} + e_t$

Where CAR_t = the compounded abnormal return over a 3-day interval starting two days before quarter t's earnings announcement or compounded abnormal returns over the interval 0-59, where 0 is the earnings announcement date and 59 is the number of trading days after day 0.

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

Table 14 (Continued)

Panel C. Cross-quarter Autocorrelations of SFE and SUE

Coefficient Estimate	SFE			SUE		
	K =1	K= 2	K=3	K =1	K= 2	K=3
b_k	0.248	0.180	0.135	0.452	0.280	0.119
	(56.67)***	(30.70)***	(15.41)***	(106.39)***	(47.12)***	(11.90)***
d_k	-0.083	-0.036	-0.006	-0.162	-0.079	-0.435
	(-9.29)***	(-4.34)***	(-0.56)	(-20.19)***	(-10.11)***	(-3.99)***
Adjusted R^2	0.053	0.026	0.017	0.168	0.055	0.007
No. of observations	65,539	57,959	56,442	65,429	64,173	62,933

The left panel reports coefficients when earnings surprises are based on analyst forecast errors. The right panel reports coefficients when earnings surprises are seasonally differenced earnings. The coefficients are estimated from the following pooled regressions:

$SFE_t = a_k + b_k *SFE_{t-1} + c_k *DUM_k + d_k *(DUM_k*SFE_{t-1}) + e_t$; K = 1, 2, 3 (11a)
$SUE_t = a_k + b_k *SUE_{t-1} + c_k *DUM_k + d_k *(DUM_k*SUE_{t-1}) + e_t$; K = 1, 2, 3 (11b)

Where DUM_k = 1 when quarter t and quarter t-k are from the different fiscal year, 0 otherwise.

Panel D: The Cross-quarter Drift Magnitude based on SFE and SFE

Coefficient Estimate	SFE		SUE	
	3-day	60-day	3-day	60-day
b0	0.368	-0.583	0.384	-0.377
	(13.55)***	(-5.98)***	(14.14)***	(-3.84)***
b1	0.760	10.654	0.579	5.777
	(8.07)***	(31.64)***	(5.42)***	(15.24)***
b2	0.259	2.229	0.255	2.241
	(4.64)***	(10.88)***	(4.6)***	(10.9)***
b3	-0.250	-1.862	-0.458	-1.456
	(-1.3)	(-2.62)***	(-2.27)**	(-1.96)*
Adjusted R^2	0.001	0.020	0.001	0.006
No. of observations	65,539	65,539	65,429	65,539

The left panel reports coefficients when the compounded abnormal return is measured over a 3-day interval. The right panel reports coefficients when the compounded abnormal return is measured over a 60-day interval. The coefficients are estimated from the following pooled regressions:

$CAR_t = b_0 + b_1*SFE_{t-1} + b_2*DUM + b_3*(DUM*SFE_{t-1}) + e_t$; (12a)
$CAR_t = b_0 + b_1*SUE_{t-1} + b_2*DUM + b_3*(DUM*SUE_{t-1}) + e_t$; (12b)

Where DUM = 1when quarter t and quarter t-1 are from the different fiscal year, 0 otherwise.

Table 15 The Impact of Management Earnings Guidance on the Serial Correlations of SFE

Model: $SFE_t = b_0 + b_1SFE_{t-1} + b_2MEG_t + b_3MEG_t*SFE_{t-1} + b_4Drift\_factor_{t-1}*SFE_{t-1} + \beta_5DIH_{t-1}*SFE_{t-1} + \beta_6Q4_{t-1} + \beta_7Q4_{t-1}*SFE_{t-1}$ + firm-fixed-effect +year-fixed-effect + ε_t (13)

	SFE_t
Intercept	0.017 (0.62)
SFE_{t-1}	0.231 (26.90)***
MEG	-0.003 (-1.16)
$MEG*SFE_{t-1}$	-0.036 (-4.16)***
$Drift\_factor* SFE_{t-1}$	0.018 (1.25)
$DIH* SFE_{t-1}$	0.013 (0.98)
$Q4_{t-1}* SFE_{t-1}$	-0.084 (-9.38)***
$Q4_{t-1}$	0.019 (7.17)***
Industry fixed effect	Yes
Year fixed effect	Yes
N Adj. R Square	65,539 0.063

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

SFE_t = the decile ranking of the forecast errors of quarter t, further converted to range between -0.5 and 0.5, where forecast error is current quarter's actual earnings minus consensus analyst forecast, scaled by the stock price at the end of current fiscal quarter;

MEG_t = 1 in quarter t for which the firm provides management earnings guidance, 0 otherwise;

$Drift\_factor_{t-1}$ = the average of the firm's scores on: (1) the decile ranking of the firm's market capitalization, scaled to range between 0 and 1, (2) the binary dummy of price (BPRC), which equals 1 if the firm's stock price is greater than $10 per share, 0 otherwise, and (3) the decile ranking of the firm's dollar trading volume scaled to range between 0 and 1;

DIH_{t-1} = the decile ranking of the percentage of outstanding common shares held by institutional holders;

$Q4_{t-1}$ = 1 if previous quarter is the fourth quarter, 0 otherwise.

Table 16 The Mitigation Effect of Management Earnings Guidance on PEAD based on SFE

Panel A: In the Quarter for which the Guidance was Provided

Model: $CAR12_t$ ($CAR3_t$) $=\alpha + \beta_1 SFE_{t-1} + \beta_2 MEG_t * SFE_{t-1} + \beta_3 MEG_t + \beta_4 Drift\_factor_{t-1} * SFE_{t-1} + \beta_5 DIH_{t-1} * SFE_{t-1} + \beta_6 Q4_{t-1} + \beta_7 Q4_{t-1} * SFE_{t-1}$ + firm-fixed-effect + year-fixed-effect + e_t (14a)

	Pred sign	$CAR12_t$ OLS regression	$CAR3_t$ OLS regression
SFE_{t-1}	+	2.46 (5.44)***	1.01 (5.07)***
MEG_t*SFE_{t-1}	**-**	**-0.89** **(-2.05)****	**-0.45** **(-2.30)****
MEG_t	?	-0.26 (-1.96)**	-0.30 (-4.83)***
$Drift\_factor_t*SFE_{t-1}$	-	-1.43 (-1.90)*	-0.58 (-1.72)*
$DIH_{t-1}*SFE_{t-1}$	-	-1.73 (-2.45)**	-0.58 (-1.81)*
$Q4_{t-1}$	?	0.05 -0.39	0.25 (4.39)***
$Q4_{t-1}$ *SFE_{t-1}	-	0.46 (1.04)	-0.26 (-1.32)
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N Adj. R Square		61,548 0.099	65,539 0.090

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$CAR3_t$ = the compounded abnormal return in the three-day window (-2, 0) relative to the earnings announcement date (day 0) in quarter t. It is calculated as the compounded raw returns over (-2, 0) less the compounded value-weighted average return over (-2, 0) for all firms in the same CRSP size decile to which the firm belongs;

$CAR12_t = CAR3_t + CAR3_{t+1} + CAR3_{t+2} - CAR3_{t+3}$;

SFE_{t-1} = the decile ranking of the forecast errors of quarter t-1, further converted to range between -0.5 and 0.5, where forecast error is current quarter's actual earnings minus consensus analyst forecast, scaled by the stock price at the end of current fiscal quarter;

MEG_t = 1 in quarter t for which the firm provides management earnings guidance, 0 otherwise;

$Drift\_factor_{t-1}$ = the average of the firm's scores on: (1) the decile ranking of the firm's market capitalization, scaled to range between 0 and 1, (2) the binary dummy of price (BPRC), which equals 1 if the firm's stock price is greater than $10 per share, 0 otherwise, and (3) the decile ranking of the firm's dollar trading volume scaled to range between 0 and 1;

DIH_{t-1} = the decile ranking of the percentage of outstanding common shares held by institutional holders;

$Q4_{t-1}$ = 1 if previous quarter is the fourth quarter, 0 otherwise.

Panel B: Following the Quarter for which the Guidance was Provided

Model: $CAR60_{t+1} = \alpha + \beta_1 SFE_t + \beta_2 MEG_t{*}SFE_t + \beta_3 MEG_t + \beta_4 Drift\_factor_t{*}SFE_t + \beta_5 DIH_t{*}SFE_t + \beta_6 Q4_t + \beta_7 Q4_t{*}SFE_t$ + firm-fixed-effect + year-fixed-effect + e_t (14b)

	Pred sign	$CAR60_{t+1}$ OLS regression
SFE_t	+	9.90 (13.8)***
MEG_t*SFE_t	**-**	**-0.86** **(-1.18)**
MEG_t	?	0.46 (2.00)**
$Drift\_factor_t$*SFE_t	-	0.28 (0.23)
DIH_t*SFE_t	-	1.03 (0.90)
$Q4_t$	?	1.99 (9.35)***
$Q4_t$ *SFE_t	-	-1.17 (-1.56)
Firm fixed effect		Yes
Year fixed effect		Yes
N		65,539
Adj. R Square		0.109

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

$CAR60_{t+1}$= the compounded abnormal return over the interval 0-59, where 0 is the earnings announcement date of quarter t and 59 is the number of trading days after day 0. It is calculated as the compounded raw return over (0, +59) less the compounded value-weighted average return over (0. +59) for all firms in the same CRSP size decile to which the firm belongs, based on January 1 market values;

$Q4_t$ = 1 if quarter t is the fourth quarter, 0 otherwise.

Table 17 Control for Conference Calls

$CAR12_t$ ($CAR3_t$) = α + $\beta_1 SUE_{t-1}$ + $\beta_2 MEG_t * SUE_{t-1}$ + $\beta_3 MEG_t$ + $\beta_4 CC_t * SUE_{t-1}$ + $\beta_5 CC_t$ + $\beta_6 Drift\_factor_{t-1} * SUE_{t-1}$ + $\beta_7 DIH_{t-1} * SUE_{t-1}$ + $\beta_8 Q4_{t-1}$ + $\beta_9 Q4_{t-1} * SUE_{t-1}$ + firm-fixed-effect + year-fixed-effect + e_t (15a)

$CAR60_{t+1}$.= α + $\beta_1 SUE_t$ + $\beta_2 MEG_t * SUE_t$ + $\beta_3 MEG_t$ + $\beta_4 CC_t * SUE_t$ + $\beta_5 CC_t$ + $\beta_6 Drift\_factor_t * SUE_t$ + $\beta_7 DIH_t * SUE_t$ + $\beta_8 Q4_t$ + $\beta_9 Q4_t * SUE_t$ + firm-fixed-effect + year-fixed-effect + e_t (15b)

Panel A: In the Quarter for which the Guidance was provided

	Pred sign	$CAR12_t$ OLS regression	$CAR3_t$ OLS regression
SUE_{t-1}	+	1.97 (4.43)***	1.55 (7.07)***
MEG_t*SUE_{t-1}	**-**	**-1.47 (-3.05)****	**-0.43 (-1.82)****
MEG_t	?	-0.32 (-2.27)**	-0.25 (-3.62)***
CC_t*SUE_{t-1}	**-**	**0.68 (1.67)***	**0.55 (2.74)*****
CC_t	?	-0.40 (-2.84)***	-0.23 (-3.33)***
$Drift\_factor_t$*SUE_{t-1}	-	-1.76 (-2.22**	-1.89 (-4.82)***
DIH_{t-1}*SUE_{t-1}	-	-1.01 (-1.14)	-0.39 (-0.90)
$Q4_{t-1}$	?	0.00 (0.04)	0.22 (3.59)***
$Q4_{t-1}$ *SUE_{t-1}	-	-0.63 (-1.5)	-0.12 (-0.59)
Firm fixed effect		Yes	Yes
Year fixed effect		Yes	Yes
N Adj. R Square		77,424 0.086	77,424 0.079

Panel B: Following the Quarter for which the Guidance was provided

	Pred sign	$CAR60_{t+1}$ OLS regression
SUE_t	+	14.91 (18.28)***
MEG_t*SUE_t	**-**	**-2.75 (-3.17)*****
MEG_t	?	-0.10 (-0.38)
CC_t*SUE_t	**-**	**1.47 (1.97)****
CC_t	?	-0.41 (-1.59)***
$Drift\_factor_t$*SUE_t	-	-10.15 (-7.05)***
DIH_t*SUE_t	-	-5.91 (-3.67)***
$Q4_t$	?	2.13 (9.41)***
$Q4_t$ *SUE_t	-	-2.16 (-2.89)***
Firm fixed effect		Yes
Year fixed effect		Yes
N Adj. R Square		79,058 0.091

***, **,* indicate two-tailed significance at the p-value of < 0.01, 0.05, and 0.10, respectively.

CC_t = 1 if there is a conference call made in fiscal quarter t and 0 otherwise.

VITA

Changjiang Wang was born on September 2, 1971 in Erzhou city, Hubei province, of People's Republic of China. He graduated with a Bachelor's degree in Food Science and Technology from Hubei Polytechnic University (now known as Hubei University of Technology) in 1992. He graduated with a Master's degree in Accounting from Texas Tech University in 2004. He will receive his Ph.D. in Accounting from the University of Missouri-Columbia in August 2008. He will join the faculty of the College of Business at Florida International University as an Assistant Professor of Accounting in the fall of 2008.