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Abstract

Prior articles in the financial press report that accounting scandals at previously respected corporations including Enron, Worldcom, Tyco, Adelphia, and Arthur Anderson were often caused by the phenomenon of meeting or beating analysts' forecasts (henceforth MBE). Motivated by the recent changes in the financial markets, this study investigates the effects of firms' tendency for MBE on various issues. Specifically, it examines the properties of habitual MBE firms and the association of these properties with the security market. It also seeks to ascertain whether the market penalizes a firm's first failure to meet forecasts after a long series of successful MBE, and tests whether the market's reaction to the MBE patterns has changed after the regulatory reform including the Sarbanes-Oxley Act. I found that the market rewards the firms with persistent MBE by providing higher ERCs, and that it seems to efficiently interpret a systematic portion of earnings surprise as a firm continues to achieve MBE. Apart from other conventional findings, I also document that the stock market premium to MBE has not diminished in the post-SOX period, as the study provides evidence that the premium on both systemic earnings surprise and unsystematic earnings surprise is post-SOX stronger. Finally, the results indicate that MBE patterns are strongly associated with various firm characteristics.

Key words: Analysts' forecasts, earnings management, forecast management, expectation management, forecast bias, forecast dispersion, financial reporting incentives, market reward, firm characteristics

JEL classification: G12, G14, M40, M41

1 Introduction

This study is motivated by anecdotal evidence that firms often cave into pressure to achieve MBE by managing their earnings and the market's expectations through spinning earnings forecasts they provide to analysts. In the face of stiffened global competition, managers find themselves under more pressure to meet analysts' forecast than in the past, and thus often resort to improper behavior to avoid disappointing market's expectations.[1]

Prior articles in the financial press report that accounting scandals at previously respected corporations including Enron, Worldcom, Tyco, Adelphia, and Arthur Anderson were often caused by the the MBE phenomenon. The accounting scandals have only served to heighten public awareness of financial issues, bringing them further into the market participants' consciousness. Increasing pressure to enhance transparency and trustworthiness of reported financial results finally led to changes in the regulatory environment. Most prominent of the resulting reforms was the Sarbanes-Oxley Act passed in 2002. Yet, despite considerable effort of various regulatory institutions to improve the climate prevailing in the financial markets, earnings and forecasts management are believed to persist on an unacceptably large scale.

Since the prevalence of earnings and/or forecast management is not directly observable, I use the systematic patterns of MBE as a proxy for evidence of earnings management and/or firm-provided guidance of analysts' forecasts. The underlying assumption is that firms exhibiting repeated success in MBE are more likely to have engaged in earnings and/or forecast management to exceed the market's expectation of earnings. The reason is that despite the managers' strong effort to realize consecutive MBE on account of the fact that analysts may raise earning projections for firms with persistent MBE pattern, common practice shows it is extremely difficult to achieve MBE repeatedly without expectation management.[2] Charan and Colvin (2001) observed that only about 5% of the S&P 500 companies have successfully met or beaten Wall Street's consensus earnings forecast every quarter for the past five years.

Existing literature dealing with the MBE documents that since the early 1990's the number of firms persistently achieving MBE has been growing. Previous studies have provided evidence that managers' desire to exceed the market expectations, or, conversely, reduce negative earnings surprises,

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[1] In this context, SEC chairman Levitt Levitt (1998) also made the following remarks regarding the associated punishment for the missing forecasts:

> I recently read of one major U.S. company that failed to meet its so-called "number" by one penny, and lost more than six percent of its stock value in one day.... This is the pattern earnings management creates: companies try to meet or beat Wall Street earnings projections in order to grow market capitalization and increase the value of stock options....

[2] Cohen (1991) noted the difficulty of meeting or beating analysts' forecasts for multiple periods: "But low-balling may not work forever. That's the conclusion that some analysts draw from the case of AST Research Inc. For more than five quarters, several analysts and money managers say, the Irvine, Calif., computer maker consistently led them to believe it would earn at least five cents a share less than the actual results. But for this year's first quarter, analysts lifted their projections, running far ahead of the company's "guidance"."

has become one of the important incentives for them to engage in earnings management (DeFond and Park, 1997; Brown, 1999; DeGeorge et al., 1999; Matsumoto, 1999; Payne and Robb, 2000; Brown, 2001; Lopez and Rees, 2002; Brown and Caylor, 2005). While Cohen (1991) posits that managers engage in forecast management, considerable anecdotal evidence in the popular press also speaks of downward guidance of analysts's forecasts as a means of achieving MBE. At the same time, the way managers engage in expectations management has also been investigated by other researches (Burgstahler and Eames, 1999; Matsumoto, 1999; Bartov et al., 2002; Brown and Higgins, 2005; Burgstahler and Eames, 2006).

Despite a plethora of studies related to the MBE, there has been relatively little research on whether the market rewards the firms that exceed the expectation with prior history of beating expectations (Kasznik and McNichols, 2002; Lopez and Rees, 2002). Considering such MBE research background, this study looks into the phenomenon of MBE in several contexts. First, it examines the properties of firms repeatedly achieving MBE and the association of these properties with the security market. The relationship between firms' characteristics and the security market is investigated by asking whether habitual MBE firms are rewarded by the market. The effects of MBE patterns on related factors are captured by the differences in the earnings response coefficients (henceforth ERC), which are, according to previous studies, (Kormendi and Lipe, 1987; Collins and Kothari, 1989; Easton and Zmijewski, 1989) a decreasing function of risk and an increasing function of earnings persistence.

Prior literature provides evidence that the market adjusts analysts' forecasts on the basis of a company's historical tendency of MBE (Lopez and Rees, 2002). Apart from that, a number of articles in the financial press recounts how the market anticipates and discounts systematic MBE patterns by acting according to a firm's whisper numbers instead of the analysts' estimate. Google, which saw its share price fall by 12% in after-hours trading on January 31, 2006, can serve as an example. The reason for suffering such a loss of value was that although the search engine's quarterly earnings met analysts's estimates, they fell short of whisper numbers (Mullaney, 2006).[3] Should firms continue to engage in earnings management and the practise of forecast guidance, the importance of whisper numbers in the minds of investors will eclipse the importance given to predictions made by analysts, since investors will view them as compromised.

Second, the study investigates whether the market penalizes a firm's first failure to meet analysts' forecasts after a long series of successful MBE. As presented in Table 1, in February 2001, for

[3]For example, Hill (1999) commented concerning the market's interpretation of a systematic pattern of earnings surprise: "A company reports quarterly earnings that beat the First Call estimate, but the company's stock goes down. Why? More often than not, it's because the earnings fell short of the "whisper number".... Fast-growing technology companies like Microsoft (Nasdaq: MSFT) and Cisco Systems (Nasdaq: CSCO) almost always beat the consensus estimates (and usually by more than a penny) and so are regularly saddled with whisper numbers.... Determining a whisper number may be as simple as gathering consensus earnings data and calculating an unweighted average of the difference between the consensus estimates and the actual earnings numbers for each of the last four quarters....For selected companies, First Call has developed a history-based (rather than an insider-based) adjusted estimate called HISPER (Historical SurPrise-based EaRnings)...."

example, Cisco Systems missed the analysts' forecast by a penny for the first time in more than three years, leading to a 13% tumble in its market price in the next two days. This is just one of many cases where the market price of stock fell significantly after a company missed analysts' forecasts by a few cents. It follows that managers have a strong incentive to take actions to ensure to maintain their MBE patterns. Hence, the ERCs are estimated when the firms miss analysts' forecasts for the first time. In addition, I also look into how the market premium assigned to the MBE firms dissipates after the first earnings shock.

Third, I test whether the market's reaction to the patterns of MBE has changed after the regulatory reform including the Sarbanes-Oxley Act. In doing so, I further split the persistent MBE firms into a pre-SOX and a post-SOX sample. Apart from conventional arguments, I found that the stock market premium to MBE has not diminished in the post-SOX period. Last, I focus on the relations between firms' characteristics and MBE patterns. Prior studies document that MBE companies show difference characteristics relative to companies reporting negative earnings surprises (Matsumoto, 2002). In view of that, an MBE pattern can be systematically related to firm characteristics including the estimate of cost-of-capital, industry membership, book-to-market ratio, LTG, or the dispersion in analysts' earnings forecasts. A model identifying firms with a predilection for earnings misrepresentation would serve as a tool to warn investors to consider the possibility of earnings or forecast management in their assessments of such firms. Identifying precisely what characteristics are indicative of earnings and forecast management is an important first step in creating such a model. Thus, conducting research into MBE patterns together with other related factors and identification of shared characteristics of firms that have achieved long strings of MBE is one of the important aims of the study.

Consistent with anecdotal evidence, I found that the market seems to efficiently interpret a systematic portion of earnings surprise as a firm persistently achieves MBE. After controlling for the systematic portion of earnings surprise, earnings response coefficients are higher for such firms. I also document that ERCs to the unsystematic portion of earnings surprise are almost monotonically increasing with the length of time of successful MBE and that firms with long MBE pattern are penalized more severely when they first miss market expectations.

From the inter-period comparison of a pre-SOX and a post-SOX subsample, I found that, apart from other results, the stock market premium to MBE has not diminished in the post-SOX period. The findings prove that the premium on both systemic earnings surprise and unsystematic earnings surprise is stronger than it was before SOX came into effect.

Finally, a strong association between the patterns of MBE and firm characteristics has been detected. Market capitalization, long-term growth, debt-to-book, average dollar volume for the previous year, average daily turnover for the previous year, standard deviation of daily return, and momentum are positively associated with the length of time of MBE. Conversely, dispersion of analysts' forecasts, debt-to-equity, book-to-price, and beta are negatively associated with the

patterns.

2 Research Design

2.1 Earnings Response Coefficients

This part of the paper is dedicated to the earnings response coefficient. After using ERC to identify MBE related factors, the study investigates its association with the MBE patterns to find out whether the market rewards the firms with repeated MBE.

Based on their history of MBE, ERCs and risk characteristics are provided for portfolios of stocks, which are constructed of the basis of the number of quarters for which earnings surprises (es_{jt}, earnings surprise of a company j at time t) are greater or equal to zero, and serve to determine whether the ERCs and other characteristics are associated with the length of MBE repetition. If a firm achieves MBE q consecutive quarters, the firm is assigned to portfolio P_q.[4] The observations of MBE for more than 10 consecutive quarters are included in the portfolio P_10.[5]

To estimate ERCs, the three-day market adjusted returns surrounding the earnings announcements are regressed on the earnings surprises. I calculate three-day raw and market adjusted returns around the quarterly earnings announcement date. The market adjusted return is the cumulative return less the cumulative equally weighted market return over the three-day window. For each observation, the earnings variable is defined as actual earnings, eps^a_{jt}. Earnings surprise (es_{jt}) is measured as the actual earnings per share (eps^a_{jt}) less the most recent mean forecast (eps^f_{jt}) prior to the earnings announcement of the quarter from the I/B/E/S database.[6]

Consistent with prior studies, I hypothesize that ERCs are strongly related to the firm specific risk, growth, and/or persistence. If the market interprets persistent MBE as a positive signal about these firm characteristics, the ERCs will show significant positive association with the pattern. I also expect firms systematic risk to be negatively associated with the MBE pattern, as MBE firms may have lower uncertainty in future cash flows due to their higher likelihood of MBE. If the persistent MBE pattern is a proxy inversely related to uncertainty, firms with persistent MBE will have higher ERCs.[7] Similarly, if expected dividends are a function of future earnings, the growth of future abnormal earnings will affect expected future earnings and revise the expectation for them.

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[4]For example, if a firm had met or beaten analysts' forecasts 7 consecutive quarters at the end of the fourth quarter in 1995, the observation is included in the portfolio P_7, even though the firm may or may not have met or beaten analysts' forecasts again in the next quarter. The argument behind this manner of construction is that *ex ante* the market did not know whether or not the firms included in the portfolio would meet or beat analysts' forecasts again in the next quarter.

[5]I also conducted the analysis using various periods. The result was qualitatively similar.

[6]Results are qualitatively similar when I/B/E/S median estimates are used.

[7]Similarly, Imhoff and Lobo (1992) found that firms with relatively less *ex ante* uncertainty in earnings have large earnings response coefficients.

Then, the ERC is positively correlated with the expected growth rate. If the market expects a higher growth rate for firms that meet or beat consecutive analysts' forecasts, persistent MBE firms will have higher expected growth rates and a higher ERC. Likewise, if future cash flows are a function of future earnings, the persistence of current earnings surprise will affect expected future earnings and revise the expectation of future dividends. The ERC is then positively correlated with the persistence of earnings surprise. If MBE is a proxy for the persistence of earnings surprises, the firms with persistent MBE will have higher ERCs. In summary, if the MBE pattern is a proxy for these factors, the ERCs are a function of the pattern.

The basic hypothesis of the first regression is that the difference in ERCs between partitions is driven by a different response to earnings news. It should be noted that this regression equation tests whether the market revises its expectations based on how many times a firm achieves MBE. Non-negative earnings surprises are likely to persistently repeat for firms with a historical tendency to report them. If MBE is associated with a proxy of risk, the market may react more strongly to the same level of earnings surprise with continuous MBE since the risk would decrease as the firms persistently achieve MBE. Similarly, if MBE is correlated with growth and/or persistence, the price response would be stronger for firms with persistent MBE. Large firms and small firms may have different tendencies in the timeliness of reporting component of earnings (Atiase, 1985; Atiase et al., 1987). Prior studies report that restructuring companies have higher financial leverage (Atiase et al., 2004). Both, the size effects and the expected growth of companies are controlled for by including market value (MV) and beginning-of-quarter market-to-book ratio (MB), respectively. Beginning-of-year asset-to-book ratio (FLV) is also accounted for to control for the financial leverage of the company. Anecdotal evidence shows that the market efficiently expects earnings surprise for firms with persistent MBE and punishes the firms showing systematic behavior. [8] For example, knowing that CISCO systems continued to beat earnings estimates by one penny for 13 quarters, the market might have anticipated the pattern. In such case, the market systematically expects the firms to beat by one penny in the next quarter. To test whether the market sees through the systematic amount of beating based on the past pattern of a firm, I split unexpected earnings into a systematic component of unexpected earnings and an unsystematic component of unexpected earnings. I defined the systematic component of unexpected earnings as es^{sys}, i.e. the mean of earnings surprise for the past 4 quarters.[9] The slope coefficient β_q explains the different reactions to the same degree of earnings surprise. If the market doses not discount the systematic component of earnings surprise, the coefficients on es^{sys} should be significantly positive. In such

[8] For example, Vicker 1999 noted: "Microsoft, which has also beat the Street's earnings estimates in every one of the last 12 quarters, rallies 75% of the time in the week before it reports profits. But once earnings are out, the stock is down about half of the time."

[9] Lopez and Rees (2002) used the median unexpected earnings for the past 4 quarters as a proxy. For robustness of the result, I also used various variables for the systematic portion of earnings surprise including last earnings surprise. The result was qualitatively very similar.

case, I predict that $\beta_2 < \beta_3 < \cdots < \beta_9 < \beta_{10}$ (where $\beta_1 + \beta_q$ represents the ERC for portfolio P_q) and that the coefficients are statistically significant from zero. [10] If the coefficients are insignificant or negative, the result would suggest the market discounts the systematic behavior of persistent MBE. In addition, the earnings response coefficients on es^{unsys} would show an increasing pattern as firms persistently meet or beat analysts' forecasts. Should the coefficients on es^{unsys} exhibit a rising pattern, it would suggest the market reward for the earnings surprise after controlling for the anticipated systematic portion of earnings surprise is greater for firms with persistent MBE. In such case, I predict that $\gamma_2 < \gamma_3 < \cdots < \gamma_9 < \gamma_{10}$ (where $\gamma_1 + \gamma_q$).

$$CAR_{jt} = \alpha_1 + \sum_{q=2}^{10} \alpha_P \cdot d_q + \beta_1 \cdot es_{jt}^{sys} + \sum_{q=2}^{10} \beta_q \cdot d_q \cdot es_{jt}^{sys} + \gamma_1 \cdot es_{jt}^{unsys} + \sum_{q=2}^{10} \gamma_q \cdot d_q \cdot es_{jt}^{unsys} + \delta_1 \cdot LMV_{jt} + \delta_2 \cdot FLV_{jt} + \delta_3 \cdot MB_{jt} + \varepsilon_{jt} \quad (1)$$

R_{jt} is raw return accumulated over the window surrounding the date of earnings release for firm$_j$ at time$_t$;

R_{mt} is value-weighted market return accumulated over the window surrounding the announcement date;

CAR_{jt} $R_{jt} - R_{mt}$;

es^{sys} : systematic earnings surprise

= mean of earnings surprise for the Past 4 quarters;

es^{unsys} : unsystematic earnings surprise

= Earnings Surprise - mean of earnings surprise for the Past 4 quarters;

LMV_{jt-1} is logarithm of market value for firm$_j$ at time$_{t-1}$;

FLV_{jt-1} is ratio of total assets to the book value of common equity for firm$_j$ at time$_{t-1}$;

MB_{jt-1} is ratio of market to the book value of common equity for firm$_i$ at time$_{t-1}$.

On the basis of the result above, I examine whether the market penalizes firms when the MBE pattern is broken if ERCs reveal increasing patterns in regression (1). In other words, ERCs are estimated when the firms miss analysts' forecasts for the first time. If the market's rewards are systematically associated with the patterns, the premium will dissipate after the pattern of MBE is broken conditional on the news of missing analysts' forecasts being unexpected by the market. In such a case, I predict that ERCs will show increasing patterns for the firms portfolios and the coefficients will be statistically significant. Conversely, it is well known that many firms preannounce bad news before an earnings announcement when they know they will not be able to meet

[10] I include year dummy variables to control for the year effects. The results are qualitatively very similar with or without year dummy variables.

analysts' forecasts. More often than not, the bad news is incorporated in the price around the preannouncement date. If the market has foresight of the bad news before the date of the earnings announcement, the pattern of incremental ERCs may not appear.

$$CAR_{jt+1} = \alpha_1 + \sum_{q=2}^{10} \alpha_P \cdot d_q + \beta_1 \cdot es^{sys}_{jt+1} + \gamma_1 \cdot es^{unsys}_{jt+1} + \sum_{q=2}^{10} \gamma_q \cdot d_q \cdot es^{unsys}_{jt+1} + \delta_1 \cdot LMV_{jt+1} + \delta_2 \cdot FLV_{jt+1} + \delta_3 \cdot MB_{jt+1} + \varepsilon_{jt+1} \quad (2)$$

es^{sys} : systematic earnings surprise

= mean of earnings surprise for the Past 4 quarters;

es^{unsys} : unsystematic earnings surprise

= Earnings Surprise - mean of earnings surprise for the Past 4 quarters.

I also examine the degree to which the market's reaction to MBE has changed after accounting scandals and subsequent introduction of new regulatory environment including the Sarbanes-Oxley Act.[11] Enhanced regulatory environment is likely to have militated the managers' discretionary behavior to the reliance on earnings and forecasts management. If companies' propensity to behavior avoiding missing earnings expectation dissipated in the post-scandal period due to enhanced scrutiny on earnings and forecasts management, the market would be less skeptical of firms showing the MBE pattern in that period. In other words, the premium assigned to MBE pattern would be stronger. In such case, the coefficients on $es^{syspost}$ and $es^{unsyspost}$ would be significantly positive. Conversely, if the market participants became more skeptical of the patterns of MBE due to the tightened accounting regulation and the enhance market transparency, the market's premium placed on the coefficients $es^{syspost}$ and $es^{unsyspost}$ would be insignificant.

$$CAR_{jt} = \alpha_1 + \alpha_2 \cdot Post + \beta_1 \cdot es^{sys}_{jt} + \beta_2 \cdot es^{syspost}_{jt} + \gamma_1 \cdot es^{unsys}_{jt} + \gamma_2 \cdot es^{unsyspost}_{jt} + \delta_1 \cdot LMV_{jt} + \delta_2 \cdot FLV_{jt} + \delta_3 \cdot MB_{jt} + \varepsilon_{jt+1}. \quad (3)$$

$es^{syspost}$: systematic earnings surprise in post SOX

= mean of earnings surprise for the Past 4 quarters;

$es^{unsyspost}$: unsystematic earnings surprise in post SOX

= Earnings Surprise - mean of earnings surprise for the Past 4 quarters.

[11] This subsample includes the firms which managed to meet or beat analysts' forecasts at least 4 consecutive quarters. I also conducted the same analysis extending the MBE period. The result was qualitatively similar.

3 Data, Sample Selection and Descriptive Statistics

The data necessary to conduct the research comes from several different sources. Covering the years 1984-2007, book value, total assets, number of shares as well as the earnings announcement date were obtained from Compustat quarterly file. Other information such as stock returns, market returns and prices (recorded one day after the day of earnings announcement) was taken from the 2007 CRSP daily return file, which was also used for the computation of market adjusted return. Besides that, the number of shares, long term debt, trading volume, returns, prices, book value as well as earnings needed for the computation of risk characteristics were drawn from CRSP and Compustat data, and the 2007 I/B/E/S served as a source of earnings per share and analysts' forecasts.

Before employed in the study, all per share variables were adjusted for stock splits and stock dividends using Compustat Adjustment factors, and additional data requirements were also imposed to compute earnings response coefficient. Extreme values of earnings surprise and abnormal returns, which might become a potential source of distortions, were removed from the sample. The top and bottom one percentile of observations based on abnormal returns as well as the top one percentile based upon earnings surprise were treated in the same way, and thus were also eliminated. After necessary modifications, the total of ?? observations was achieved. Descriptive statistics of the variables used for the estimation of the earnings response coefficient are summarized in Table 2. Covering over 24 years, the number of observations shows monotonic increase from 196 in 1984 to 4,053 observations recorded in 2007. Looking at Table 2 more closely, we can notice temporal changes of earnings surprises (ES). While monotonically decreasing in the 1980s, during the 1990s ES were relatively stable, with increasing pattern from the late 1990s ???.[12] It is also apparent that in comparison to the 2000s, the ES in the 1980s were greater, a finding, which is consistent with recent studies. The same development can be also observed looking at the mean ES dropping from a high of 0.0790 in 1984 to a low of 0.0315 in 1997 (2007 observation!).

Descriptive statistics for portfolio P_q can be found in Table 3 comprising the data of all MBE realizing firms. The observations are divided into groups according to the number of times the firms achieved consecutive MBE; firms which realize MBE more than 10 consecutive times are included in portfolio P_{10}. As a firm continues to MBE, we can observe the pattern of decreasing mean ES as well as market adjusted returns, in contrast to which abnormal earnings show increase.

The hypothesis that managers engage in earnings and/or forecast management to ensure consecutive MBE can be confirmed by visual inspection of all figures illustrating the findings. Figure 1 displays a histogram showing distribution of ES, by which it is scaled to form equal-width parti-

[12] Kothari (2000) notes that decline in analysts' optimism is due to: (1) analysts' learning from past biases; (2) incentive change; and (3) use of data in recent research that has better quality and suffers less from survivor biases or selection biases. Conversely, Richardson et al. (2000) find that the bias has recently turned from optimism to pessimism.

tions. Looking at the graph, it is apparent that small positive errors are more frequent than the large ones; a tendency, which becomes more pronounced with increasing P_q pattern. One possible line of interpretation is that managers prefer to achieve or slightly beat analysts' forecast rather than exceed the forecasted number by a significant amount. This reasoning is supported by the finding that about 45% of observations in P_{10} belong to the interval with the smallest positive ES. However, the same observation can be also interpreted in an alternative way suggesting that with persistent MBE analysts increase their expectations due to the increased optimism about the firm's future business results.

Paying close attention to the incentives managers have to achieve analysts' forecast, Payne and Robb (2000) and Matsumoto (2002) arrived at the conclusion that reported earnings and/or forecasts may be manipulated by managers in an attempt to achieve small positive earnings surprises to sustain persistent MBE, also supported by the results of Burgstahler and Eames (1999); DeGeorge et al. (1999). On the other hand, Richardson et al. (2000) and Matsumoto (2002) also suggest that firms with greater incentives to avoid earnings disappointment tend to receive pessimistic forecast more frequently than others, the most important factors influencing forecast pessimism being issuance of new equity, growth, market-to-book ratios, size, profit, and litigation risk. The association between firm characteristics and MBE pattern is documented by Table **??**. In line with the previous statements, the table shows that the above mentioned factors are of higher importance to habitual MBE firms due to their stronger motivation to avoid earnings disappointment.

The phenomenon of unusually high frequency of small MBE is more pronounced as P_q increases. About quarter of P_{10} belong to the smallest group suggesting that managers prefer to reach or slightly exceed analysts' forecasts, especially when they have met or beaten analysts' forecasts for multiple periods. An alternative interpretation is that as a firm continues to MBE, analysts become more optimistic and increase their earnings expectations for firms that repeatedly achieve MBE. Cohen (1991) noted the difficulty of meeting or beating analysts' forecasts for multiple periods; analysts seem to increase earnings expectations for firms with a greater tendency for MBE. The unusually high frequency of small positive earnings surprises for firms that repeatedly achieve MBE can be regarded as an evidence of earnings and/or forecast management. Payne and Robb (2000) and Matsumoto (2002) examine the incentives for managers to achieve earnings figures given in analysts' forecasts. For example, the conditional probability of MBE in the next period given a firm's MBE in the current period monotonically increases from a low of 26.1% in P_2 to a high of 75.4% in P_9 in 1990's. [13] In other words, 75.4% of firms in P_8 will continue to meet or beat analysts' forecasts in the next period. These results suggest that managers may manipulate reported earnings and/or analysts' forecasts in such a way as to generate small positive surprises in order to continue the MBE pattern (Burgstahler and Eames, 1999; DeGeorge et al., 1999).

[13] Not tabulated.

The left graph of Figure 1 shows a histogram of the earnings surprise variable scaled by earnings. The observations are sorted on the earnings surprise to form equal-width partitions. The graph suggests that large positive earnings surprises declined over the 1990's, and that small positive errors are more frequent than large positive errors. Interestingly, while the proportion of small positive errors increased in the pre-SOX period, in the post-SOX period it has decreased. This finding may be consistent with the argument that managers' propensity to earnings or forecasts management to achieve small MBE is less salient in the post-scandal period since regulators have increased scrutiny on the transparency of such behavior.

4 Empirical Result

This part of the paper summarizes the most important results of the study. The findings concerning earnings response coefficients and related issues are provided first, followed by a subpart dedicated to firms characteristics.

4.1 Earnings response coefficients

Earnings response coefficients were used to test the association between risk and MBE patterns. I expected ERCs would increase with a firm's MBE pattern and that the firms with a greater tendency for MBE would have larger coefficients than those less prone to MBE. Moreover, I also asked whether the market is efficient in recognition of systematic behavior of habitual MBE firms. The results from Regression (1) for portfolio P_q, which were used to examine this issue, are summarized in Table 4. The table provides evidence that the market rewards firms with persistent MBE. While the ERCs are estimated using three different windows - 3 days, 5 days, and 8 days, market reaction to the unsystematic portion of the earnings surprise is captured by es^{unsys}. [14] The increasing pattern of ERC may imply decreasing pattern of firms specific risk, [15] which can be interpreted as a stronger reaction of the market to the earnings surprise for firms with a greater tendency for MBE in comparison to the firms with smaller MBE tendency.

According to anecdotal evidence, an efficient market systematically discounts the expected portions of earnings surprise (Pulliam, 1999; Vickers, 1999). According to my hypothesis, most slope coefficients on the systematic portion should not be significantly different from zero. In line with that, Table 4 documents that the coefficient on the systematic components of earnings surprise are generally insignificant and consistently smaller than those on the unsystematic components. This finding indicates that the market is able to estimate the earnings surprise for MBE firms efficiently. Panel A of Table 4 shows that the earnings response coefficients increase in the predicted direction

[14] The research was also conducted using other measuring windows. The results were qualitatively similar.

[15] Kasznik and McNichols (2002) also argue that the market reward could reflect lower cost of capital.

with the length of persistent MBE, as the estimated slope coefficient on es^{unsys} monotonically increases from the low of 0.937 for P_1 up to a high of 4.662 (0.937+3.731) in P_9. [16]

The above findings along with the results of regression equations (1) allow me to conclude that the ERCs increase with the MBE patterns. This notion is further supported by overall findings of the whole study and is consistent with the conclusions of Lopez and Rees (2002), who proved that firms with a historical tendency for MBE have larger ERCs. [17] Nevertheless, it also seems that it is the strong reward of the market embedded in the coefficients on the unsystematic components of earnings surprise, which implies the significant pattern in Table 4. This indicates that the market undoubtedly predicts MBE persistence and efficiently reacts to the earnings surprise according to the anticipation.

The ERCs in the situation of firm's first failure to meet analysts' forecast can be found in Table 5. It is usual that companies try to preempt a large earnings disappointment by preannouncing the bad news. In such a case, the market responds to the bad news by price adjustment around the date that the information is revealed leading to a weaker reaction when the actual earnings are finally announced.[18] Despite that, for firms with greater tendency for MBE the reaction of the market is different. In general, the increasing estimated slope coefficients accompanying repeated MBE achievement show that the firms with long MBE pattern are penalized more severely when they first miss market expectations. Table 5 provides evidence that the coefficients on the systematic components of earnings surprise are consistently smaller and less significant than those on the unsystematic ones. Finally, anecdotal evidence shows that in the post-scandal period stock market premium to the small MBE has disappeared, and the premium attached on beating estimates by a lager amount has diminished (Koh et al., 2007). Thus, to test whether the market's reaction to persistent MBE has been affected by the major shift in the regulatory system, I split the persistent MBE sample into a pre-SOX and a post-SOX. The persistent MBE subsample includes the firms that have successfully achieved MBE at least 4 consecutive quarters. [19] Apart from other conven-

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[16] I also examined ERC without splitting unexpected earnings into a systematic component of unexpected earnings and an unsystematic component of unexpected earnings using the following regression. $CAR_{jt} = \alpha_1 + \sum_{q=2}^{10} \alpha_P \cdot d_q + \beta_1 \cdot es_{jt} + \sum_{q=2}^{10} \beta_q \cdot d_q \cdot es_{jt} + \gamma_1 \cdot LMV_{jt} + \gamma_2 \cdot FLV_{jt} + \gamma_3 \cdot MB_{jt} + \varepsilon_{jt}$. Apart from providing the evidence supporting the above expectations, the untabulated findings also reveal monotonic increase of the estimated slope coefficient (3 day window surrounding earnings announcement day) from the low of 0.739 in P_1 to 2.798 (0.739+2.059) in P_{10}. I speculate that the results was caused by the stronger effect placed on the coefficients of unsystematic earnings surprises.

[17] As a supplemental analysis, I examined firms repeatedly missing analysts' forecasts. It is hard to persistently miss expectations since bad news is frequently preannounced before the earnings announcement date. About 85% of firms do not repeatedly miss analysts' forecasts for more than two consecutive quarters. Brown (1999) found that when a loss is reported, managers are indifferent to MBE. The result shows that investors do not seem to care about persistently missing analysts' forecasts – unsurprising considering the fact that bad news is frequently released weeks before an earnings announcement date. It provides further evidence that firms prefer to realize MBE by the earnings and/or forecast management. Not tabulated.

[18] For example, Soffer et al. (1997) found that the majority of the preannouncements are regarded as bad news. For example, on August 29, 2001, Sun Microsystems Inc. warned that it would probably miss analysts' forecasts in its first quarter, and lost 18 percent of its value within the next two days.

[19] I also used longer periods for the persistent MBE subsample. The result was qualitatively similar.

tional findings, the results summarized in Table 6 reveal that the stock market premium to MBE has not diminished in the post-SOX period. Conversely, the premium on both systemic earnings surprise (0.389 vs. 0.718) and unsystematic earnings surprise (0.398 vs. 1.917) is stronger post-SOX. If corporations' propensity to the earnings or forecasts management decreased after SOX came into effect, the market would be less skeptical of the MBE patterns. In such case, it would mean that the market rewards the firms persistently beating analysts forecasts without raising the question about the quality of earnings surprises.

4.2 Firm Characteristics

Despite numerous studies dealing with the phenomenon of MBE proving the penalization of firms missing market expectations, so far little is known about the characteristics of habitual MBE firms. Consequently, one of the aims of this study is to examine MBE firms' characteristics, which are viewed as proxies for firm specific risk, growth, and/or persistence, and shed light on the way ERCs and MBE patterns are associated through them. Furthermore, this analysis also helps to reveal more about the firms' motivation for persistent MBE achievement. For this purpose, I compare the characteristics of firm which repeatedly achieve MBE to those which do not. In addition to that, I also analyze the differences between MBE firms with longer and shorter patterns. The characteristics measured using categories similar to those in Gebhardt et al. (2001) are summarized in Table 7. The list of investigated characteristics divided into 5 different categories (liquidity and information, earnings variability, leverage, market volatility, and other pricing anomalies) accompanied by the related hypotheses and research findings is provided below.

As for the characteristics related to *liquidity and information*, in this study they are represented by two variables - market capitalization (**Mk. Cap**) and dollar trading volume (**Avg. Vol**). Based upon other existing studies (Bhushan, 1989; Brown, 1999; Richardson et al., 2000), it is logical to expect analysts' forecasts for large firms (**Mk. Cap**) to be pessimistically biased, similarly to the firms with long strings of uninterrupted MBE. Brown (1999) also documents that while habitual MBE firms are not only large in size, they even grow with additional MBE achievement. At the same time, he also proved the existence of optimistic bias on the side of small firms. If these statements hold, a positive relation between liquidity variables and the number of times of consecutive MBE should be found. Furthermore, there should be lower likelihood of smaller firms achieving persistent MBE and the same pattern for dollar trading volume (**Avg. Vol**) and the size variable should be detected.

As the results in the first two columns of Table 7 document, firms with persistent MBE are large in size (**Mk. Cap**), which continues to grow with each additional success at achieving MBE. Moreover, the variable of dollar trading volume also displays positive correlation with P_q, thus showing the same evolution as the size variable. Apart from proving that the expectations outlined above materialized, these results also imply that larger firms have higher propensity to MBE and provide

relatively more information to the market participants.

In terms of the group of *earnings variability* characteristics, the variable of dispersion of analysts' forecast (**Disp**) measuring the earnings variability was subjected to closer study. Previous studies (Clement et al. (2000)) document negative association between the dispersion of analysts' forecast and the magnitude of stock market response. Besides that, they also provide evidence of managers' stronger incentive to MBE by increasing income in the situation of low dispersion of analysts' forecast (Payne and Robb (2000)). In view of these findings, negative association between **Disp** and P_q was anticipated in this study.

This expectation is partially confirmed by the third column of Table 7 displaying lower dispersion of analysts' forecast for P_{10} when compared to P_1 firms. Furthermore, the results also suggest that **Disp** gradually decreases with MBE repetition. However, in contradiction to these findings, Table 8 seems to indicate that no correlation between **Disp** and P_q exists. Since the patterns in this variable are less pronounced, this fact is more difficult to explain and needs to be examined in more detail by other studies. The findings related to this category also fail to provide sufficient evidence to sustain the hypothesis than managers of firms with lower forecast dispersion are more strongly motivated to MBE.

The third group of characteristics comprises those concerning *leverage*. In this category, the study focuses on a debt-to-book (**D/B**) and debt-to-market (**D/E**) ratio. While the level of risk represented by financial leverage increases with with the amount of debt in the capital structure of a firm, the amount of long-term debt increases with consecutive MBE achievement on the account of the fact that an MBE company grows in size due to MBE repetition. Hence, a significant negative association between **D/B**, **D/E**and P_q was expected. The evidence confirming this expectation can be found in Table 8; the findings related to the risk associated with financial leverage are summarized in Table 7.

As far as variables capturing specific risk related to *market volatility* are concerned, the capital pricing model (**Beta**) and standard deviation of daily returns (**Std. Ret**) were employed. Using the 60-month return prior to the quarterly earnings announcement, I first computed **Beta** followed by **Std. Ret** computed over the previous year. Persistent MBE implies lower firm specific growth and less volatile returns of habitual MBE firms, which led me to expect negative correlation between **Beta**, **Std. Ret** and P_q. Again, the data in Table 8 prove the existence of this kind of association. The last category of firms' characteristics examined in the study deals with *other pricing anomalies*. This group is represented by four different variables, book-to-price ratio (**B/P**), analysts' forecast of long term growth (**LTG**), average daily turnover for the previous year (**Turn**), and price momentum (**Momentum**). Previous literature claims the existence of stronger incentive to MBE on the side of growth firms due to a much greater negative price response to earnings disappointment of growth (low B/P) stocks (Skinner and Sloan, 2002). In addition to that, growth firms also display stronger tendency to report small positive earnings surprise, as

suggested by Brown (2001). Referring to these findings, growth firms should exhibit stronger motivation to avoid earnings disappointment. In line with that, I also hypothesized there would be negative association between **B/P** and P_q. Both expectations proved to be true, as confirmed by the results in Table 8. The findings provide evidence of significant decrease in **B/P** with consecutive MBE, as well as of the growth firms' stronger motivation to avoid failing to meet market expectations. The next variable, **LTG**, was also used as a proxy for a 'growth' stock. Confirmed by the study, I expected **LTG** to be positively correlated with P_q, which is consistent with the notion of growth firms having stronger motivation to avoid earnings disappointment. As to **Turn**, I anticipated the variable to show positive association with P_q, implied by the expectation that firms that consistently MBE will have a higher turnover ratio. The patterns for these variables are not apparent, even though the above expectations are proved by the results of the analysis. To conclude this part, momentum of the prior six months (**Momentum**)was analyzed. Contrary to Gebhardt et al. (2001) documenting negative correlation between price momentum and expected cost of capital, I anticipated **Momentum** and P_q to be positively associated, as confirmed by the evidence presented in Table 8. It is apparent that on average **Momentum** increases with higher P_q, and from the beginning of the pattern the evolution of the variable also indicates higher momentum of firms with longer strings of consecutive MBE .

Overall, the findings allow me to say that the expectations regarding firms' characteristics are to large extent confirmed by the research. In summary, the results prove that while **Mk. Cap**, **LTG**, **Avg. Vol**, **Turn** and **Momentum** are positively correlated with the length of firms' consecutive MBE, negative association between MBE pattern and **Std. Ret**, **D/B**, **D/E**, **B/P**, and **Beta** has been found.

5 Concluding Remarks

Though a plethora of studies documents evidence of earnings and/or forecast management, relatively little attention has been paid to how the market rewards the firms that exceed the expectations with prior history of beating them. Helping to fill this gap, this paper provides extends research in the area of earnings and forecast management by identifying shared characteristics of firms that have achieved long strings of earnings statements either meeting or beating quarterly analysts forecasts (a.k.a. habitual meeters or beaters). Such companies have enjoyed systematic patterns of market rewards associated with the MBE. Given that the market penalizes missing analysts' forecasts and rewards successful attempts to meet or beat them, the increasing tendency to achieve MBE is a rational response by managers. Perhaps surprisingly, the characteristics of habitual MBE firms and their association with concomitant market reactions have rarely been examined.

This paper provides compelling evidence that ERCs are positively associated with the length of time of MBE after controlling for the systematic portions of earnings surprise. Consistent with

anecdotal evidence, I found that the market seems to anticipate earnings surprise for habitual beaters. After controlling for the systematic portion of earnings surprise, earnings response coefficients are higher for firms that have the historical trend.

In addition, I find significant evidence relating ERCs and the patterns of MBE after the original pattern is broken. The increasing estimated slope coefficients accompanying repeated MBE achievement imply that the firms with long MBE patterns are penalized more severely when they first miss market expectations.

Furthermore, apart from other conventional findings, I document that the stock market premium to MBE has not diminished in the post-SOX period. On the contrary, in the post-SOX period the premium on both systemic earnings surprise and unsystematic earnings surprise is stronger.

I also examined the relation between MBE patterns and various firm characteristics that have been suggested as risk proxies and tried to discern any patterns in their behavior. Several characteristics exhibited a systematic relationship to the patterns. The results also include shortfalls which have important implications in so far as they help explain the association between firms' incentives to MBE and the market's reactions to earnings surprises. Skinner and Sloan (2002) show that the market price reaction is more negative toward negative earnings surprise than toward positive earnings surprises. Hence, high growth firms in particular want to avoid negative earning surprises. Findings related to firm characteristics may have implications for earnings and/or forecast management. If the characteristics of firms indicate an incentive of managers to avoid earnings shortfall, managers will have higher tendency to persistently engage in earnings and/or forecast management. Thus, the firms will be less likely to show earnings disappointment and to suffer from negative market price reactions. Many recent studies report that firms engage in earnings and/or forecast management for various reasons. For example, Richardson et al. (2000) found that pessimistic forecasts are more prevalent for firms with the highest incentives to avoid earnings disappointment. Forecast pessimism is more common for firms that are about to issue new equity, have higher growth and higher market-to-book ratios, and are larger and more profitable.

Future research extending this study in several suggested directions would prove very beneficial. To begin with, it remains unclear how firms have succeeded in the "numbers game" against analysts, and various methods of earnings and/or forecast management employed by firms deserve further attention.

Another worthwhile study would be one that investigates the degree to which MBE patterns are attributable to earnings or forecast management. What is clear is that MBE patterns are significantly associated with each firm's risk characteristics; however, the causality of the association remains ambiguous. In this regard, it would be beneficial if future research looked into earnings performance over a longer interval and, in particular focused on the performance of a firm once it has suffered its first earnings shortfall. We can take the intriguing case of CISCO, a company that had continued to beat analysts' earnings estimates by exactly a penny for thirteen quarters

in a row until it finally missed the expectation for February 2001, as an example. In the aftermath of this event, CISCO no longer manifested its pattern of consistently beating its estimate by one penny. For some, as yet, unaccountable reason, CISCO's original justification for maintaining its pattern of beating its earnings forecasts by a small margin (instead of a large margin which would prompt analysts to raise their estimate for the next period thereby making it harder for CISCO to meet the number) no longer held water. And yet, CISCO's story is not atypical. In fact, following an initial earnings shortfall, most firms engaging in MBE purposefully abandon their efforts to consistently beat analysts' estimates by a small margin.

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Table 1: Example: CISCO Systems

	EAD	**QT**	eps^a	eps^f	es	R_t		
						$\mathbf{EAD}_{-1}$	$\mathbf{EAD}_0$	$\mathbf{EAD}_{+1}$
Miss	**8/5/1997**	**4**	**0.55***	**0.55**	**0.000**	**0.023**	**0.004**	**-0.019**
1	**11/4/1997**	**1**	**0.59**	**0.58**	**0.010**	**0.033**	**-0.015**	**0.024**
2	**2/3/1998**	**2**	**0.43**	**0.42**	**0.010**	**0.014**	**-0.015**	**0.025**
3	**5/5/1998**	**3**	**0.45**	**0.44**	**0.010**	**0.018**	**-0.018**	**0.032**
4	**8/4/1998**	**4**	**0.48**	**0.47**	**0.010**	**0.008**	**-0.035**	**0.039**
5	**11/4/1998**	**1**	**0.34**	**0.33**	**0.010**	**-0.020**	**0.035**	**0.034**
6	**2/2/1999**	**2**	**0.36**	**0.35**	**0.010**	**0.031**	**-0.023**	**-0.011**
7	**5/11/1999**	**3**	**0.38**	**0.37**	**0.010**	**0.007**	**0.024**	**0.061**
8	**8/10/1999**	**4**	**0.21**	**0.2**	**0.010**	**-0.039**	**-0.018**	**0.071**
9	**11/9/1999**	**1**	**0.24**	**0.23**	**0.010**	**0.026**	**-0.014**	**0.071**
10	**2/8/2000**	**2**	**0.25**	**0.24**	**0.010**	**0.034**	**0.005**	**0.024**
11	**5/9/2000**	**3**	**0.14**	**0.13**	**0.010**	**-0.074**	**0.000**	**-0.068**
12	**8/8/2000**	**4**	**0.16**	**0.15**	**0.010**	**0.010**	**-0.011**	**0.035**
13	**11/6/2000**	**1**	**0.18**	**0.17**	**0.010**	**0.018**	**-0.029**	**0.029**
Miss	**2/6/2001**	**2**	**0.18**	**0.19**	**-0.010**	**-0.026**	**0.034**	**-0.131**
Meet	**5/8/2001**	**3**	**0.03**	**0.03**	**0.000**	**-0.020**	**0.059**	**-0.061**
1	**8/7/2001**	**4**	**0.02**	**0.02**	**0.000**	**-0.025**	**-0.014**	**-0.066**
2	**11/5/2001**	**1**	**0.04**	**0.02**	**0.020**	**-0.023**	**0.037**	**0.032**
3	**2/6/2002**	**2**	**0.09**	**0.05**	**0.040**	**0.010**	**0.021**	**-0.083**
4	**5/7/2002**	**3**	**0.11**	**0.09**	**0.020**	**-0.019**	**0.015**	**0.244**

Notes:

$EAD =$ **Earnings Announcement Date**;
$QT =$ **Fiscal quarter**;
$eps^a =$ **Actual earnings per share**;
$eps^f =$ **Forecasted earnings per share**;
$es =$ **Earnings surprise** $= eps^a - eps^f$;
$R_t =$ **Raw return at** $\mathbf{EAD}_t$;
$* =$ **Meet after rounding up to the nearest cent**.

Table 2: Descriptive Statistics: Mean for Each Year

Portfolio	N	es_t	$\frac{es_t}{P_{t-1}}$	$\frac{es_t^{sys}}{P_{t-1}}$	$\frac{es_t^{unsys}}{P_{t-1}}$	$CAR_{-1\sim+1}$	$CAR_{-3\sim+1}$	$CAR_{-7\sim+1}$
1984	**196**	**0.0790**	**0.0065**	**-0.0129**	**0.0196**	**0.0105**	**0.0179**	**0.0152**
1985	**1,358**	**0.0727**	**0.0057**	**-0.0160**	**0.0216**	**0.0073**	**0.0105**	**0.0127**
1986	**1,787**	**0.0600**	**0.0044**	**-0.0099**	**0.0143**	**0.0109**	**0.0131**	**0.0162**
1987	**1,977**	**0.0647**	**0.0042**	**-0.0084**	**0.0126**	**0.0111**	**0.0122**	**0.0132**
1988	**2,041**	**0.0636**	**0.0046**	**-0.0070**	**0.0116**	**0.0114**	**0.0136**	**0.0160**
1989	**2,044**	**0.0520**	**0.0040**	**-0.0050**	**0.0090**	**0.0103**	**0.0115**	**0.0136**
1990	**2,183**	**0.0409**	**0.0038**	**-0.0068**	**0.0105**	**0.0166**	**0.0202**	**0.0230**
1991	**2,416**	**0.0398**	**0.0036**	**-0.0039**	**0.0075**	**0.0164**	**0.0208**	**0.0285**
1992	**2,809**	**0.0366**	**0.0031**	**-0.0036**	**0.0068**	**0.0166**	**0.0207**	**0.0240**
1993	**3,673**	**0.0385**	**0.0027**	**-0.0028**	**0.0055**	**0.0136**	**0.0160**	**0.0194**
1994	**4,602**	**0.0359**	**0.0028**	**-0.0022**	**0.0050**	**0.0116**	**0.0144**	**0.0150**
1995	**4,845**	**0.0351**	**0.0025**	**-0.0023**	**0.0047**	**0.0113**	**0.0148**	**0.0174**
1996	**5,438**	**0.0319**	**0.0023**	**-0.0023**	**0.0046**	**0.0139**	**0.0170**	**0.0183**
1997	**5,932**	**0.0315**	**0.0022**	**-0.0021**	**0.0042**	**0.0128**	**0.0162**	**0.0184**
1998	**5,693**	**0.0354**	**0.0022**	**-0.0022**	**0.0044**	**0.0122**	**0.0170**	**0.0177**
1999	**5,927**	**0.0394**	**0.0026**	**-0.0025**	**0.0050**	**0.0153**	**0.0222**	**0.0290**
2000	**5,118**	**0.0427**	**0.0026**	**-0.0018**	**0.0044**	**0.0165**	**0.0198**	**0.0262**
2001	**4,649**	**0.0402**	**0.0029**	**-0.0029**	**0.0057**	**0.0145**	**0.0170**	**0.0217**
2002	**5,227**	**0.0971**	**0.0029**	**-0.0020**	**0.0049**	**0.0130**	**0.0155**	**0.0191**
2003	**5,328**	**0.1108**	**0.0027**	**-0.0011**	**0.0038**	**0.0145**	**0.0169**	**0.0208**
2004	**5,605**	**0.1124**	**0.0024**	**-0.0007**	**0.0031**	**0.0136**	**0.0142**	**0.0134**
2005	**5,735**	**0.0544**	**0.0027**	**-0.0009**	**0.0035**	**0.0153**	**0.0163**	**0.0192**
2006	**5,660**	**0.0584**	**0.0027**	**-0.0012**	**0.0039**	**0.0155**	**0.0171**	**0.0188**
2007	**4,053**	**0.1434**	**0.0027**	**-0.0014**	**0.0041**	**0.0167**	**0.0150**	**0.0122**

Notes to Table 2:

es : **is earnings surprise** $= eps^a_{jt} - eps^f_{jt}$;

es^{sys} : **systematic earnings surprise**
= mean of earnings surprise for the past 4 quarters;

es^{unsys} : **unsystematic earnings surprise**
= earnings surprise - mean of earnings surprise for the past 4 quarters;

CAR : **market adjusted return** $= R_{jt} - R_{mt}$;

R_{jt} : **raw return**;

R_{mt} : **value-weighted market return**.

Table 3: Descriptive Statistics: ERC

Portfolio	N	es_t	$\frac{es_t}{P_{t-1}}$	$\frac{es_t^{sys}}{P_{t-1}}$	$\frac{es_t^{unsys}}{P_{t-1}}$	$CAR_{-1\sim+1}$	$CAR_{-3\sim+1}$	$CAR_{-7\sim+1}$
P_1	**31,273**	**0.0694**	**0.0036**	**-0.0089**	**0.0125**	**0.0156**	**0.0180**	**0.0208**
P_2	**17,932**	**0.0630**	**0.0032**	**-0.0017**	**0.0048**	**0.0132**	**0.0162**	**0.0193**
P_3	**11,524**	**0.0623**	**0.0028**	**-0.0002**	**0.0030**	**0.0130**	**0.0161**	**0.0180**
P_4	**7,773**	**0.0741**	**0.0026**	**0.0010**	**0.0017**	**0.0140**	**0.0172**	**0.0206**
P_5	**5,679**	**0.0405**	**0.0024**	**0.0026**	**-0.0002**	**0.0132**	**0.0156**	**0.0184**
P_6	**4,276**	**0.0380**	**0.0021**	**0.0023**	**-0.0002**	**0.0137**	**0.0169**	**0.0192**
P_7	**3,181**	**0.0344**	**0.0018**	**0.0021**	**-0.0003**	**0.0120**	**0.0156**	**0.0187**
P_8	**2,419**	**0.0328**	**0.0017**	**0.0018**	**-0.0002**	**0.0127**	**0.0143**	**0.0147**
P_9	**1,899**	**0.0373**	**0.0017**	**0.0018**	**0.0000**	**0.0131**	**0.0153**	**0.0174**
P_{10}	**8,340**	**0.0308**	**0.0013**	**0.0013**	**-0.0001**	**0.0118**	**0.0139**	**0.0162**

Notes to Table 3:

es : **is earnings surprise** $= eps_{jt}^{a} - eps_{jt}^{f}$;

es^{sys} : **systematic earnings surprise**
= mean of earnings surprise for the past 4 quarters;

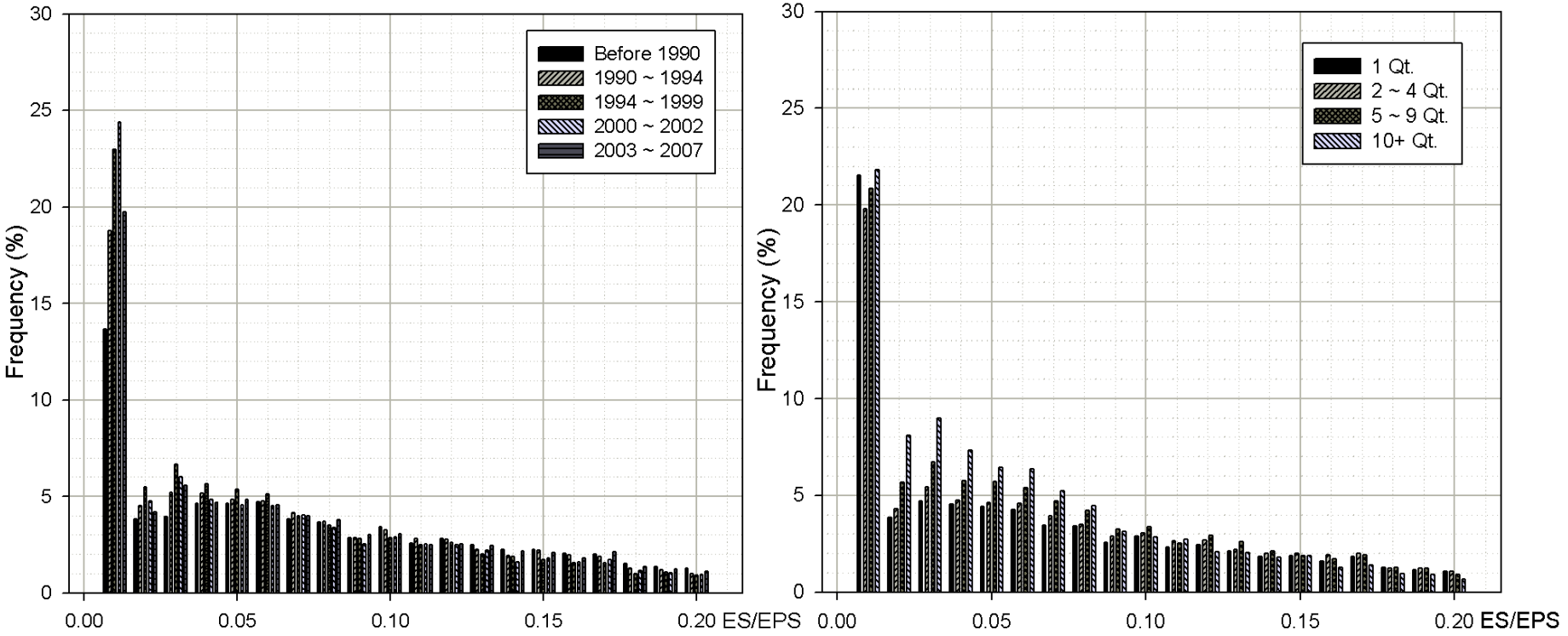
es^{unsys} : **unsystematic earnings surprise**
= earnings surprise - mean of earnings surprise for the past 4 quarters;

CAR : **market adjusted return** $= R_{jt} - R_{mt}$;

R_{jt} : **raw return**;

R_{mt} : **value-weighted market return**.

Figure 1: Distribution of Earnings Surprise



Notes to Figure 1:
The figure shows the histogram of the last earnings surprises deflated by reported earnings per share ($\frac{\text{Reported earnings - Mean analysts' forecasts}}{\text{Reported earnings}}$). The histogram widths are 0.01. For example, the first interval to the right of zero contains all analysts' forecasts deflated by reported earnings between 0 and 0.01. The vertical bar shows the relative frequency of observations in each interval ($\frac{\text{Number of observations in the interval}}{\text{Total observations}}$).

Table 4: Result of Regressions Abnormal Return on Earnings Surprise: Last Earnings Surprise

This table presents the regression result that tests firms' meeting or beating analysts' forecasts q consecutive quarters.

Panel A: $EAD_t^{-1\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.019**	**-0.003**	**-0.004**	**-0.003**	**-0.002**	**-0.002**	**-0.003**	**-0.003**	**-0.002**	**-0.003**
t	**19.98**	**-4.31**	**-5.28**	**-3.61**	**-2.07**	**-1.53**	**-2.52**	**-1.79**	**-1.07**	**-3.15**
β_q	**0.996**	**0.203**	**0.855**	**0.776**	**0.346**	**0.405**	**0.914**	**0.783**	**0.715**	**1.072**
t	**13.74**	**1.50**	**4.82**	**3.57**	**1.45**	**1.34**	**2.40**	**1.74**	**1.39**	**3.40**
γ_q	**0.937**	**0.271**	**0.814**	**0.955**	**1.398**	**2.695**	**2.227**	**2.743**	**3.105**	**3.731**
t	**13.70**	**2.20**	**5.34**	**5.30**	**5.42**	**7.49**	**5.43**	**5.66**	**5.41**	**10.46**
	LMV	FLV	MV	$Adj.R^2$						
	-0.001	**0.000**	**0.000**	**0.016**						
t	**-6.60**	**-0.38**	**-0.40**							

Panel B: $EAD_t^{-3\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.025**	**-0.003**	**-0.004**	**-0.002**	**-0.003**	**-0.001**	**-0.004**	**-0.002**	**-0.002**	**-0.002**
t	**23.21**	**-3.64**	**-4.03**	**-1.84**	**-2.27**	**-1.01**	**-2.53**	**-1.33**	**-0.84**	**-1.78**
β_q	**1.295**	**0.350**	**0.563**	**0.491**	**0.599**	**0.550**	**1.848**	**0.527**	**0.967**	**1.039**
t	**16.11**	**2.33**	**2.85**	**2.05**	**2.25**	**1.64**	**4.38**	**1.06**	**1.69**	**2.98**
γ_q	**1.228**	**0.399**	**0.694**	**0.894**	**1.461**	**2.618**	**3.014**	**2.412**	**2.605**	**3.674**
t	**16.19**	**2.89**	**4.09**	**4.48**	**5.09**	**6.53**	**6.62**	**4.51**	**4.07**	**9.32**
	LMV	FLV	MV	$Adj.R^2$						
-0.002	**0.000**	**0.000**	**0.000**	**0.0191**						
-10.26	**-0.92**	**0.16**								

Panel C: $EAD_t^{-7\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.030**	**-0.003**	**-0.004**	**-0.001**	**-0.002**	**-0.001**	**-0.003**	**-0.004**	**-0.001**	**-0.002**
t	**23.63**	**-3.26**	**-3.99**	**-1.10**	**-1.10**	**-0.68**	**-1.95**	**-1.83**	**-0.61**	**-1.51**
β_q	**1.549**	**0.379**	**0.647**	**0.826**	**-0.205**	**0.723**	**2.183**	**0.430**	**0.220**	**1.565**
t	**16.21**	**2.13**	**2.79**	**2.92**	**-0.64**	**1.90**	**4.39**	**0.72**	**0.33**	**3.77**
γ_q	**1.466**	**0.434**	**0.776**	**0.910**	**1.299**	**2.230**	**3.393**	**2.778**	**3.034**	**3.923**
t	**16.32**	**2.68**	**3.85**	**3.86**	**3.80**	**4.73**	**6.32**	**4.36**	**4.02**	**8.41**
	LMV	FLV	MV	$Adj.R^2$						
	-0.002	**0.000**	**0.000**	**0.0185**						
t	**-11.73**	**-2.21**	**1.47**							

Notes to Table 4:

$$CAR_{jt} = \alpha_1 + \sum_{q=2}^{10} \alpha_P \cdot d_q + \beta_1 \cdot es_{jt}^{sys} + \gamma_1 \cdot es_{jt}^{unsys} + \sum_{q=2}^{10} \gamma_q \cdot d_q \cdot es_{jt}^{unsys} + \delta_1 \cdot LMV_{jt} + \delta_2 \cdot FLV_{jt} + \delta_3 \cdot MB_{jt} + \varepsilon_{jt}. \quad (1)$$

Table 5: Result of Regressions Abnormal Return on Earnings Surprise: First Earnings Shock

This table presents the regression result that tests firms' first missing analysts' forecasts after meeting or beating analysts' forecasts q consecutive quarters.

Panel A: $EAD_{t+1}^{-1\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.005**	**0.001**	**0.002**	**0.003**	**0.004**	**0.002**	**0.002**	**0.003**	**0.001**	**0.003**
t	**5.16**	**0.93**	**3.05**	**2.94**	**3.60**	**1.73**	**1.12**	**1.58**	**0.74**	**3.38**
β_q	**0.226**	**0.460**	**0.122**	**0.844**	**1.055**	**0.358**	**1.918**	**2.383**	**2.607**	**1.428**
t	**11.36**	**6.89**	**1.55**	**4.79**	**4.26**	**1.19**	**5.34**	**4.73**	**4.07**	**3.92**
γ_q	**0.262**	**0.472**	**0.373**	**0.904**	**1.477**	**0.801**	**1.407**	**2.786**	**2.740**	**2.867**
t	**13.73**	**8.59**	**5.99**	**8.81**	**9.44**	**4.96**	**6.23**	**8.91**	**6.82**	**12.05**
	LMV	FLV	MV	$Adj.R^2$						
	-0.001	**0.000**	**0.000**	**0.0160**						
t	**-3.61**	**1.70**	**-2.08**							

Panel B: $EAD_{t+1}^{-3\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.010**	**0.001**	**0.003**	**0.003**	**0.004**	**0.002**	**0.001**	**0.002**	**0.002**	**0.004**
t	**8.80**	**0.81**	**3.65**	**2.88**	**3.26**	**1.50**	**0.67**	**1.09**	**1.03**	**3.62**
β_q	**0.281**	**0.512**	**0.059**	**1.012**	**1.323**	**1.283**	**2.530**	**3.176**	**2.829**	**1.567**
t	**12.55**	**6.8**	**0.68**	**5.16**	**4.84**	**3.8**	**6.07**	**5.65**	**3.99**	**3.88**
γ_q	**0.325**	**0.624**	**0.391**	**0.853**	**1.679**	**1.180**	**1.930**	**3.192**	**2.891**	**3.245**
t	**15.25**	**9.5**	**5.94**	**7.49**	**9.82**	**6.61**	**7.24**	**8.96**	**6.48**	**12.28**
	LMV	FLV	MV	$Adj.R^2$						
	-0.001	**0.000**	**0.000**	**0.0180**						
t	**-6.3**	**-1.07**	**1.04**							

Panel C: $EAD_{t+1}^{-7\sim+1}$

	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
α_q	**0.012**	**0.002**	**0.004**	**0.003**	**0.005**	**0.003**	**0.001**	**0.003**	**0.003**	**0.005**
t	**9.59**	**1.76**	**3.77**	**2.33**	**3.48**	**1.89**	**0.69**	**1.34**	**1.14**	**4.25**
β_q	**0.329**	**0.569**	**0.102**	**1.355**	**1.765**	**1.490**	**2.727**	**3.289**	**3.058**	**1.841**
t	**12.39**	**6.69**	**0.99**	**5.85**	**5.49**	**3.75**	**5.83**	**4.99**	**3.63**	**3.86**
γ_q	**0.380**	**0.549**	**0.595**	**1.051**	**1.867**	**1.201**	**2.107**	**3.415**	**3.360**	**3.713**
t	**14.88**	**7.65**	**7.04**	**7.75**	**9.26**	**5.70**	**7.17**	**8.24**	**6.43**	**11.90**
	LMV	FLV	MV	$Adj.R^2$						
	-0.001	**0.000**	**0.000**	**0.0171**						
t	**-7.57**	**-1.43**	**1.22**							

Notes to Table 5:

$$CAR_{jt+1} = \alpha_1 + \sum_{q=2}^{10} \alpha_P \cdot d_q + \beta_1 \cdot es_{jt+1}^{sys} + \gamma_1 \cdot es_{jt+1}^{unsys} + \sum_{q=2}^{10} \gamma_q \cdot d_q \cdot es_{jt+1}^{unsys} + \delta_1 \cdot LMV_{jt+1} + \delta_2 \cdot FLV_{jt+1} + \delta_3 \cdot MB_{jt+1} + \varepsilon_{jt+1}. \quad (2)$$

Table 6: Result of Regressions Abnormal Return on Earnings Surprise: Before and After the SOX

This table presents the regression result that tests the market reaction to earnings surprise before and after the accounting scandal period.

Variable	$q \leq 4$		$q > 4$	
	Coefficient	**t-stat.**	**Coefficient**	**t-stat.**
Intercept	**0.014**	**14.37**	**0.020**	**10.65**
Post	**0.001**	**2.21**	**0.001**	**0.68**
es^{sys}	**0.983**	**18.84**	**1.160**	**8.10**
$es^{syspost}$	**0.389**	**3.65**	**0.718**	**2.73**
es^{unsys}	**0.922**	**18.84**	**2.218**	**13.98**
$es_{post}^{unsyspost}$	**0.398**	**4.01**	**1.917**	**6.62**
LMV	**0.000**	**-3.14**	**-0.001**	**-5.40**
FLV	**0.000**	**0.56**	**0.000**	**-2.42**
MB	**0.000**	**-1.90**	**0.000**	**2.57**
R^2	**0.0103**		**0.0211**	

Notes to Table 6:

$$CAR_{jt} = \alpha_1 + \alpha_2 \cdot Post + \beta_1 \cdot es_{jt}^{sys} + \beta_2 \cdot es_{jt}^{syspost} + \gamma_1 \cdot es_{jt}^{unsys} + \gamma_2 \cdot es_{jt}^{unsyspost} + \delta_1 \cdot LMV_{jt} + \delta_2 \cdot FLV_{jt} + \delta_3 \cdot MB_{jt} + \varepsilon_{jt+1}. \quad (3)$$

Table 7: Descriptive Statistics: Firm Characteristics

	Mk. Cap.	Avg. Vol	Disp.	Std. Ret	Turn.	LTG	Momentum	Beta	DB	DE	EP	BP
P_1	**2,459**	**11,781**	**24.565**	**0.029**	**0.136**	**16.089**	**0.053**	**1.0350**	**0.723**	**1.820**	**0.012**	**8.637**
P_2	**3,037**	**14,244**	**26.633**	**0.029**	**0.147**	**15.977**	**0.139**	**1.0200**	**0.614**	**0.427**	**0.013**	**0.550**
P_3	**3,609**	**16,885**	**26.751**	**0.028**	**0.160**	**16.148**	**0.195**	**1.0080**	**0.659**	**0.398**	**0.014**	**0.519**
P_4	**4,248**	**19,705**	**31.212**	**0.028**	**0.176**	**16.396**	**0.188**	**0.9976**	**0.555**	**0.365**	**0.013**	**0.491**
P_5	**4,616**	**22,054**	**29.930**	**0.027**	**0.191**	**16.452**	**0.188**	**0.9889**	**0.204**	**0.349**	**0.014**	**0.472**
P_6	**5,094**	**24,510**	**25.857**	**0.027**	**0.218**	**16.815**	**0.179**	**0.9852**	**0.897**	**0.332**	**0.014**	**0.446**
P_7	**5,701**	**28,115**	**24.415**	**0.027**	**0.237**	**16.897**	**0.164**	**0.9756**	**0.727**	**0.323**	**0.015**	**0.424**
P_8	**6,543**	**32,869**	**24.512**	**0.027**	**0.259**	**16.864**	**0.155**	**0.9695**	**0.847**	**0.317**	**0.015**	**0.410**
P_9	**7,527**	**37,082**	**23.090**	**0.026**	**0.267**	**16.798**	**0.147**	**0.9634**	**0.400**	**0.309**	**0.015**	**0.405**
P_{10}	**10,444**	**55,751**	**20.475**	**0.025**	**0.322**	**16.684**	**0.126**	**0.9238**	**0.665**	**0.286**	**0.014**	**0.372**

Notes to Table 7:

Where:

Mk. Cap.: market capitalization in millions;

Avg. Vol.: average $ volume previous year is calculated over the previous year;

Disp.: dispersion of analysts' forecasts $= \frac{\text{Standard Deviations of Analysts' Forecasts}}{\text{Consensus Median Forecasts}}$;

Std. Ret.: standard deviation of daily returns is calculated over the previous year;

Turn: average daily turnover is calculated over the previous year

$= \frac{\text{average \$ volume}}{\text{average number of shares}}$;

LTD: long-term debt;

Momentum: prior 6 month momentum;

Beta: Five-year rolling beta;

DB: long-term debt-to-book ratio;

DE: long-term debt-to-market value of equity ratio;

BP: book-to-market ratio.

Table 8: Correlation Analysis among the Variables Representing Firm Characteristics

	P_q	Mk. Cap.	Avg. Vol.	Disp.	Std. Ret.	Turn.	LTG	Momen.	Beta	DB	DE	EP	BP
P_q		0.278	0.286	0.002 *	-0.051	0.256	0.066	0.154	-0.083	-0.022	-0.086	0.001 *	-0.210
Mk. Cap.	0.130		0.882	-0.153	-0.470	0.569	-0.214	0.059	-0.174	0.154	0.037	-0.031	-0.367
Avg. Vol.	0.142	0.738		-0.077	-0.199	0.802	-0.007 *	-0.013	-0.037	0.052	-0.061	-0.143	-0.380
Disp.	-0.006*	-0.017	0.001 *		0.278	0.018	0.350	0.094	0.140	-0.164	-0.176	-0.140	-0.104
Std. Ret.	-0.076	-0.123	-0.024	0.046		-0.039	0.547	0.071	0.366	-0.273	-0.238	-0.284	-0.030
Turn.	0.133	0.118	0.267	0.019	0.094		0.208	0.038	-0.061	-0.070	-0.179	-0.133	-0.378
LTG	0.027	-0.050	0.034	0.071	0.477	0.200		0.093	0.206	-0.356	-0.425	-0.381	-0.349
Momen.	0.086	0.000 *	-0.015	0.022	0.104	0.050	0.077		-0.091	-0.046	-0.110	-0.093	-0.265
Beta	-0.060	-0.051	0.020	0.019	0.428	0.010	0.204	-0.077		-0.154	-0.099	-0.171	0.105
DB	-0.002 *	0.004 *	0.002 *	-0.005 *	-0.006 *	-0.002 *	-0.012	-0.003 *	-0.003		0.893	0.211	0.188 *
DE	-0.003 *	-0.001 *	0.000 *	-0.001 *	0.000 *	-0.001 *	-0.003 *	-0.001 *	-0.001	0.000		0.282 *	0.396 *
EP	0.035	0.004 *	-0.010	0.010	-0.300	-0.017	-0.206	0.059	-0.238	0.002 *	-0.001 *		0.351
BP	-0.003 *	-0.001 *	0.000 *	-0.001 *	0.000 *	-0.001*	-0.002 *	-0.001 *	-0.001 *	0.000 *	1.000	-0.001	

Notes to Table 8:
Spearman correlations are reported in the upper triangular matrix; Pearson correlations are reported in the lower triangular matrix.
The correlations are statistically significant at 1% level except that $*$ indicates that the correlation is insignificant at 5% level.

Where:

Mk. Cap.: market capitalization in millions;

Avg. Vol.: average \$ volume previous year is calculated over the previous year;

Disp.: dispersion of analysts' forecasts $= \dfrac{\text{Standard Deviations of Analysts' Forecasts}}{\text{Consensus Median Forecasts}}$;

Std. Ret.: standard deviation of daily returns, calculated over the previous year;

Turn: average daily turnover, calculated over the previous year

$= \dfrac{\text{average \$ volume}}{\text{average number of shares}}$;

LTD: long-term debt;

Momentum: prior 6 month momentum;

Beta: Five-year rolling beta;

DB: long-term debt-to-book ratio;

DE: long-term debt-to-market value of equity ratio;

BP: book-to-market ratio.

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