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Meeting or Beating Analysts' Forecasts: Empirical Evidence of Firm's Characteristics, and Persistence Patterns*

TAE H. CHOI**
KDI School of Public Policy and Management
Seoul, Korea

Abstract

Focusing on the MBE (meeting or beating analysts' forecast) phenomenon, this study primarily investigates the way market responds to a firm's repeated MBE and to its first failure to meet analysts' forecast after a long string of MBE. The paper also asks whether the market's reaction to the MBE patterns has changed after the regulatory reform including the Sarbanes-Oxley Act and investigates the properties of habitual MBE firms. The results show the market rewards persistent MBE firms and that it seems to efficiently interpret a systematic portion of earnings surprise for habitual beaters. They also document that the post-SOX stock market premium to MBE has not completely diminished and that MBE patterns are strongly associated with firm characteristics.

Keywords: Analysts' forecasts, earnings management, forecast management, Sarbanes-Oxley Act, firm characteristics

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** Associate Professor, KDI School of Public Policy and Management, 207-43 Chungnyang, Dongdaemun, Seoul 130-868, Korea (Tel.: 82-2-3299-1221; fax: 82-2-3299-1240; E-mail address: TChoi@kdischool.ac.kr)

INTRODUCTION

The 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. This kind of behavior implies questions as to the reliability of the information offered by the companies and also raises doubts concerning their real performance.[1] Furthermore, it highlights the need to understand better the patterns which can be observed in the firms' behavior, its changes in response to new regulatory reforms such as the passing of the SOX, and the connection to firms' specific features. Due to the practical nature of these issues and their strong influence on major financial and investment decisions, the study and its results are aimed to be used not only by academics but also practitioners involved in financial markets.

In view of the accounting scandals in the early 2000s and subsequent changes in regulatory environment, the study looks into the phenomenon of MBE from several viewpoints. Investigating the MBE pattern and its association with earnings response coefficient, the study examines market response to the MBE repetition and the way the market reacts to the firm's first failure to MBE. Apart from that, the paper also investigates firms' characteristics and their relationship to the MBE patterns and briefly examines the post-SOX changes in comparison to the previous period.

In the face of stiffened global competition, managers find themselves under more pressure to meet or beat analysts' forecast than in the past, and thus often resort to improper behavior to avoid disappointing market's expectations.[2] Prior articles in the

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1) For example, Fox (1991) and Fox (2002) provided anecdotal evidence of earnings management to avoid market disappointment conducted through write-offs. In relation to the same topic, Kahn (2001) reported: "… GE never seems to have had a loss in one division that wasn't happily offset by a gain in another; it never seems to have encountered a windfall profit that wasn't smoothed away by a "one time" restructuring charge.

2) In this context, SEC chairman 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

financial press report that accounting scandals at previously respected corporations including Enron, Worldcom, Tyco, Adelphia, and Arthur Andersen were often caused by 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 as achieving repeated MBE is very difficult.[3)]

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, has become one of the important incentives for them to engage in earnings management (Brown 1999, 2001; Brown and Caylor 2005; DeFond and Park 1997; DeGeorge, Patel, and Zeckhauser 1999; Lopez and Rees 2002; Matsumoto 1999; Payne and Robb 2000). In line with considerable anecdotal evidence in the popular press speaking of downward guidance of analysts' forecasts as a means of MBE, Cohen (1991) posits that managers engage in forecast management. Articles and media also often speak of so-called 'earnings game' between company managers as information providers and analysts or investors as information users. While company managers motivated to MBE may resort to

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Wall Street earnings projections in order to grow market capitalization and increase the value of stock."

3) 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.

earnings management or downward guidance, analysts aware of various techniques used for this purpose incorporate this knowledge in their forecasts. In view of that, it is extremely difficult to meet or beat analysts' forecasts repeatedly as analysts may refuse to follow managers' downward guidance and raise earnings projections.[4] The way managers engage in expectations management has been investigated by a number of researches (Bartov, Givoly, and Hayn 2002; Brown and Higgins 2005; Burgstahler and Eames 1999, 2006; Matsumoto 1999). It is also interesting to note that even though investors are aware of earnings manipulation by managers (companies), they do not pay considerable attention to this issue as long as the company meets or beats expectations[5]. Fox (1997) suggests that that one of the possible reasons for the popularity of firms beating expectations despite the likelihood of earnings management may be the easy predictability of earnings of such companies. Another explanation might be the increasing focus on earnings as the key number to evaluate company's performance by the market (Graham, 2005; Habib, 2007).

Despite a plethora of studies related to MBE, there has been relatively little research on whether the market rewards the firms that exceed the expectations with prior history of beating them (Kasznik and McNichols 2002; Lopez and Rees 2002). Considering such research background, this study examines the phenomenon of MBE in several contexts.

First, as market's systematic response to MBE has not yet been discussed in this form, the study investigates the way market reacts to MBE repetition and asks whether the market penalizes a firm's first failure to meet analysts' forecasts after a long series of MBE. Table 1 presents the case of Cisco Systems, which in February 2001

4) In relation to this issue, Cohen (1991) says: "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"."

5) Investors' attitude can be illustrated by quoting a Boston Chicken CFO Mart Stephens, who said about his company: "a byproduct of where we are with the structure is that we have a public entity with an earnings complexion that is attractive" and he also adds: "It's like a sausage. I love the product; just don't show me how it's made." (Fox, 1997).

Table 1. Example: Persistence Pattern and Earnings Surprise of CISCO Systems

	EAD	*QT*	eps^a	eps^f	*es*	R_t		
						EAD_{-1}	EAD_0	EAD_{+1}
Miss	05/08/1997	4	0.55*	0.55	0.000	0.023	0.004	-0.019
1	04/11/1997	1	0.59	0.58	0.010	0.033	-0.015	0.024
2	03/02/1998	2	0.43	0.42	0.010	0.014	-0.015	0.025
3	05/05/1998	3	0.45	0.44	0.010	0.018	-0.018	0.032
4	04/08/1998	4	0.48	0.47	0.010	0.008	-0.035	0.039
5	04/11/1998	1	0.34	0.33	0.010	-0.020	0.035	0.034
6	02/02/1999	2	0.36	0.35	0.010	0.031	-0.023	-0.011
7	11/05/1999	3	0.38	0.37	0.010	0.007	0.024	0.061
8	10/08/1999	4	0.21	0.2	0.010	-0.039	-0.018	0.071
9	09/11/1999	1	0.24	0.23	0.010	0.026	-0.014	0.071
10	08/02/2000	2	0.25	0.24	0.010	0.034	0.005	0.024
11	09/05/2000	3	0.14	0.13	0.010	-0.074	0.000	-0.068
12	08/08/2000	4	0.16	0.15	0.010	0.010	-0.011	0.035
13	06/11/2000	1	0.18	0.17	0.010	0.018	-0.029	0.029
Miss	06/02/2001	2	0.18	0.19	-0.010	-0.026	0.034	-0.131
Meet	08/05/2001	3	0.03	0.03	0.000	-0.020	0.059	-0.061
1	07/08/2001	4	0.02	0.02	0.000	-0.025	-0.014	-0.066
2	05/11/2001	1	0.04	0.02	0.020	-0.023	0.037	0.032
3	06/02/2002	2	0.09	0.05	0.040	0.010	0.021	-0.083
4	07/05/2002	3	0.11	0.09	0.020	-0.019	0.015	0.244

Notes to table 1:
EAD = earnings announcement date;
EAD_{-1} = one day prior earnings announcement;
EAD_{+1} = one day after earnings announcement;
QT = fiscal quarter;
t denotes day;
eps^a = actual earnings per share;
eps^f = forecasted earnings per share;
es = earnings surprise = $eps^a - eps^f$;
R_t = raw return at EAD_t;
* = analysts' forecast is met after rounding up the number to the nearest cent.

missed the analysts' forecast by a penny for the first time in more than three years, resulting in a 13% tumble in its market price in the next two days. Cisco Systems can serve as an example of many cases that 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 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.

Second, 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. Koh et al. (2007) documented that in the post scandals period managers tend to meet or beat analysts' forecasts less often and that the stock market premium to small MBE has disappeared. He also showed that while investors are skeptical about MBE firms and the expectation management has increased, managers continue to be concerned with MBE. Apart from conventional arguments, in contrast to Koh et al. (2007), I found that even though the stock market premium to MBE has decreased in the post-SOX period, it has not completely diminished.

Third, the study investigates the properties of firms repeatedly MBE and the association of these properties with the security market. While 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), we examine the relationship between firms' characteristics and the security market by asking whether habitual MBE firms are rewarded by the market. The effects of MBE patterns[6] on related factors are captured by the differences in the earnings response coefficients (henceforth ERC), which are, according to previous studies (Collins and Kothari 1989; Easton and Zmijewski 1989; Kormendi and Lipe 1987), a decreasing function of risk and an increasing function of earnings persistence.

Last, I focus on the relations between firms' characteristics and MBE patterns. Prior studies document that MBE companies show different characteristics relative to companies reporting negative earnings surprises (Matsumoto 2002). In view of that, an MBE pattern can be systematically related to firms' characteristics including the estimate of cost-of-capital, industry membership,

6) By MBE pattern I mean an uninterrupted repetition of MBE for several consecutive periods.

book-to-market ratio, long-term growth, 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 pattern 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 even though in the post-SOX period the stock market premium to MBE has decreased, it continues to exist. The findings also show that similarly to a pre-SOX period, after SOX came into effect the premium on both systematic earnings surprise and unsystematic earnings surprise is stronger for habitual MBE firms.

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

RESEARCH DESIGN

The study first uses the earnings response coefficient (ERC) to

identify MBE related factors, and investigates the ERC association with the MBE patterns. After that, the findings are used to ascertain 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 constructed on 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 MBE q consecutive quarters, the firm is assigned to portfolio P_q.[7] The observations of MBE for more than ten consecutive quarters are included in the portfolio P_{10}.[8]

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 (the same analysis was also conducted using a five-day as well as a nine-day window). For each observation, the earnings variable is defined as actual earnings, eps_{jt}^{a}. Earnings surprise (es_{jt}) is measured as the actual earnings per share (eps_{jt}^{a}) less the most recent mean forecast (eps_{jt}^{f}) prior to the earnings announcement of the quarter from the I/B/E/S database.[9]

Consistent with prior studies, I hypothesize that if market interprets persistent MBE as a positive signal about firm specific risk, growth, and/or persistence, the ERCs will show a significant positive association with the pattern. Supposing the persistent MBE pattern is a proxy inversely related to uncertainty, firms with persistent MBE will have higher ERCs.[10] Similarly, if the

7) For example, if a firm had met or beaten analysts' forecasts seven 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.

8) I also conducted the analysis using various periods. The result was qualitatively similar.

9) Results are qualitatively similar when I/B/E/S median estimates are used.

10) Imhoff and Lobo (1992) found that firms with relatively less *ex ante* uncertainty

market expects a higher growth rate for firms that MBE, growth rates for habitual MBE firms should increase with MBE repetition. Finally, since future cash flows can be regarded as a function of future earnings, the persistence of current earnings surprise will affect expected future earnings and revise the expectation of future dividends, and ERC will thus be positively correlated with the persistence of earnings surprise. If MBE is a proxy for the persistence of earnings surprises, habitual beaters will have higher ERCs. MBE firms may have lower uncertainty in future cash flows as they are more likely to MBE repeatedly, so I also expect a negative association between the MBE pattern and firms' systematic risk. In summary, if the MBE pattern is a proxy for these factors, the ERCs are a function of the MBE pattern.

The basic hypothesis of the first regression (regression equation 1) 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 MBE. Similarly, if MBE is correlated with growth and/or persistence, the price response would be stronger for firms that MBE. 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 (Atiase 1985; Atiase, Bamber, and Tse 1987). Beginning-of-year asset-to-book ratio (*FLV*) is also accounted for to control for the financial leverage of the company (Atiase, Platt, and Tse 2004).

Anecdotal evidence shows that the market efficiently expects earnings surprise for firms with persistent MBE and punishes the firms showing systematic behavior.[11)] For example, knowing that CISCO systems continued to beat earnings estimates by one penny for 13 quarters, the market was able to anticipate the pattern. In

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in earnings have large earnings response coefficients.

11) For example, Vicker (1999) noted: "Microsoft, which has also beaten 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."

such cases, the market systematically expects the firms to beat by one penny in the next quarter as well. 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 four quarters.[12] The slope coefficient β_q explains the different reactions to the same degree of earnings surprise. If the market does not discount the systematic component of earnings surprise, the coefficients on es^{sys} should be significantly positive. In such case, I predict that $\beta_2 < \beta_3 < \cdots < \beta_9 < \beta_{10}$ (where $\beta_1 + \beta_q$ represents the ERC for the systematic component of earnings surprise for portfolio P_q) and that the coefficients will be statistically significant from zero.[13] If the coefficients are insignificant or negative, the results will suggest the market discounts the systematic behavior of persistent MBE. In addition, the earnings response coefficients on es^{unsys} will 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 $\gamma_1 + \gamma_q$ represents the ERC for the unsystematic component of earnings surprise for portfolio P_q).

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

R_{jt} is raw return accumulated over the window surrounding

12) Lopez and Rees (2002) used the median unexpected earnings for the past four 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.

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

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 at time$_t$

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

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

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

LMV_{jt} is logarithm of market value for firm$_j$ at time$_t$;

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

MB_{jt} is ratio of market to the book value of common equity for firm$_j$ at time$_t$.

d_q is a dummy variable for portfolio P_q

On the basis of the above, I examine whether and how severely the market penalizes firms when the MBE pattern is broken if ERCs reveal increasing patterns in regression 2. 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. On the other hand, it is well known that many firms preannounce bad news before an earnings announcement when they know they will not be able to meet 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.

$$\begin{aligned} CAR_{jt+1} = {} & \alpha_1 + \sum_{q=2}^{10} \alpha_P * d_q + \beta_1 * es^{sys}_{jt+1} + \sum_{q=2}^{10} \beta_q * d_q es^{sys}_{jt+1} \\ & + \gamma_1 * es^{unsys}_{jt+1} + \sum_{q=2}^{10} \gamma_q * d_q * es^{unsys}_{jt+1} \\ & + \delta_1 * LMV_{jt+1} + \delta_2 * FLV_{jt+1} + \delta_3 * MB_{jt+1} + \varepsilon_{jt+1} \end{aligned} \qquad (2)$$

R_{jt+1} is raw return accumulated over the window surrounding the date of earnings release for firm$_j$ at time$_{t+1}$;
R_{mt+1} is value-weighted market return accumulated over the window surrounding the announcement date at time$_{t+1}$
CAR_{jt+1} $R_{jt+1} - R_{mt+1}$;
es^{sys}: systematic earnings surprise
= mean of earnings surprise for the past four quarters;
es^{unsys}: unsystematic earnings surprise
= earnings surprise - mean of earnings surprise for the past four 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$_j$ at time$_{t+1}$.
d_q is a dummy variable for portfolio P_q

I also examine the degree to which the market's reaction to MBE has changed after the accounting scandals of the early 2000s and the subsequent introduction of a new regulatory environment including the Sarbanes-Oxley Act[14] (regression equation 3). An enhanced regulatory environment is likely to have militated the managers' discretionary behavior towards the reliance on earnings and forecasts management. If companies' propensity for behavior avoiding missing earnings expectation dissipated in the post-scandal period due to enhanced scrutiny on earnings and forecasts management, the market would become less skeptical of firms showing the MBE pattern. 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 tightened accounting regulation and enhanced market transparency, the market's premium placed on the coefficients $es^{syspost}$ and $es^{unsyspost}$ would be insignificant.

$$CAR_{jt} = \alpha_1 + \alpha_2 * Post + \beta_1 * es_{jt}^{sys} + \beta_2 * es_{jt}^{syspost}$$

14) 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.

$$+\gamma_1 * es_{jt}^{unsys} + \gamma_2 * es_{jt}^{unsyspost} \quad (3)$$
$$+\delta_1 * LMV_{jt} + \delta_2 * FLV_{jt} + \delta_3 * MB_{jt} + \varepsilon_{jt}$$

$es^{syspost}$: systematic earnings surprise in post-SOX
= mean of earnings surprise for the past four quarters;
$es^{unsyspost}$: unsystematic earnings surprise in post-SOX
= earnings surprise - mean of earnings surprise for the past four quarters.

DATA, SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

Several different databases were used to obtain data necessary for this research. First, Compustat research files served as a source of earnings per share (earnings per share excluding extraordinary items), book value, total assets, and number of shares. The earnings announcement dates were taken from the Compustat Quarterly file. The data from Compustat cover the years 1984 through 2007. Second, stock returns, market returns, and prices were taken from 2007 CRSP Daily return file and the information available from CRSP was also used in computing market adjusted return. The data recorded one day after the day of earnings announcement were used. Third, earnings per share and analysts' forecasts were culled from the 2007 I/B/E/S database. When the analysts' forecast data follow the fully diluted basis (I/B/E/S uses either a primary or fully diluted basis for reporting analysts' forecasts), I/B/E/S dilution factors are used to convert the data to the primary basis. Besides that, other information such as the number of shares outstanding, long term debt, trading volume, returns, prices, book value as well as earnings needed for the computation of risk characteristics were drawn from both CRSP and Compustat data.

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

Table 2. Descriptive Statistics: Mean for Each Year

Year	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:

N: number of observations;

t denotes years;

es: earnings surprise measured as the actual earnings per share (eps_t^a) less the most recent mean forecast (eps_t^f) prior to the earnings announcement of the quarter from the I/B/E/S database ($eps_t^a - eps_t^f$);

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 calculated as cumulative return less the cumulative equally weighted market return over the selected window;

$CAR_{-1\sim+1}$ market adjusted return calculated over a three-day window beginning one day before the announcement day and ending one day after earnings announcement;

$CAR_{-3\sim+1}$ market adjusted return calculated over a five-day window beginning three days before the announcement day and ending one day after earnings announcement;

$CAR_{-7\sim+1}$ market adjusted return calculated over a nine-day window beginning seven days before the announcement day and ending one day after earnings announcement;

P_{t-1} beginning-of-period price per share.

also eliminated. After necessary modifications, a total of 94,296 quarterly 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 an 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 generally increasing pattern from the late 1990s to the early 2000s.[15] It is also apparent that in comparison to the 1990s, the ES in the 1980s were greater, which is a finding consistent with recent studies. The same development can be also observed looking at the mean ES showing general decrease.

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 ten 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.

All figures illustrating the findings support the hypothesis that managers engage in earnings and/or forecast management to ensure consecutive MBE. Figure 1 displays a histogram showing distribution of ES, by which it is scaled to form equal-width partitions. 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 an 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.

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15) 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.

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:

ERC: earnings Response Coefficient;

N: number of observations;

t denotes years;

es: earnings surprise measured as the actual earnings per share (eps_t^a) less the most recent mean forecast (eps_t^f) prior to the earnings announcement of the quarter from the I/B/E/S database ($eps_t^a - eps_t^f$);

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 calculated as cumulative return less the cumulative equally weighted market return over the selected window;

$CAR_{-1\sim+1}$ market adjusted return calculated over a three-day window beginning one day before the announcement day and ending one day after earnings announcement;

$CAR_{-3\sim+1}$ market adjusted return calculated over a five-day window beginning three days before the announcement day and ending one day after earnings announcement;

$CAR_{-7\sim+1}$ market adjusted return calculated over a nine-day window beginning seven days before the announcement day and ending one day after earnings announcement;

P_{t-1} beginning-of-period price per share.

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) and DeGeorge, Patel, and Zeckhauser (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 forecasts 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.[16)]

The phenomenon of unusually high frequency of small MBE is more pronounced as P_q increases. About quarter of P_{10} belongs 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 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.[17)] 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, Patel, and Zeckhauser 1999).

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

16) The association between firm characteristics and MBE pattern is documented by Table 7.

17) Not tabulated.

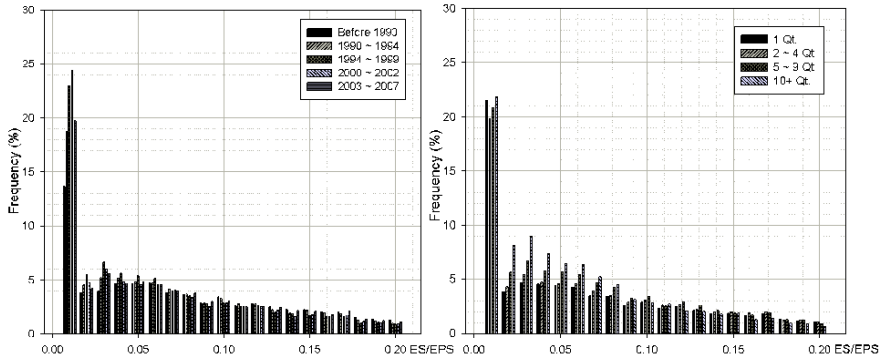

Figure 1.

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.

EMPIRICAL RESULTS

Earnings Response Coefficients

Divided into two parts, the following section summarizes the results of the study. The first subsection is dedicated to the earnings response coefficients and related issues, accompanied by the findings concerning the comparison of the pre-SOX and post-SOX period. The second subpart deals with the topic of firms' characteristics following the division into five main categories.

Earnings response coefficients were used to test the association between risk and MBE patterns. I expected ERCs to increase with a firm's MBE pattern, and the firms with a greater tendency for MBE to have larger coefficients than those less likely 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—three days, five days, and nine days, market reaction to the unsystematic portion of the earnings surprise is captured by es^{unsys}.[18] The increasing pattern of ERC may imply decreasing pattern of firms specific risk,[19] 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 a smaller MBE tendency.

Anecdotal evidence suggests that 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 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_{10}.[20]

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

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18) The research was also conducted using other measuring windows. The results were qualitatively similar.

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

20) I also examined ERC without splitting unexpected earnings into a systematic component of unexpected earnings and an unsystematic component of unexpected earnings. Apart from providing the evidence supporting the above expectations, the untabulated findings also reveal monotonic increase of the estimated slope coefficient (three-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 result was caused by the stronger effect placed on the coefficients of unsystematic earnings surprises.

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

This table presents the results of the regression testing 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	0.0191						
t	-10.26	-0.92	0.16							

and Rees (2002), who showed that firms with a historical tendency for MBE have larger ERCs.[21] Nevertheless, it also seems that it is

21) 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 earnings and/or forecast management. Not tabulated.

Table 4. Continued

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}
a_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:

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

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 at time$_t$

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

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

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

LMV_{jt} is logarithm of market value for firm$_j$ at time$_t$;

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

MB_{jt} is ratio of market to the book value of common equity for firm$_j$ at time$_t$.

d_q is a dummy variable for portfolio P_q

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.

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

This table presents the result of the regression testing 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						
	-6.3	-1.07	1.04							

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.[22] Despite that, for firms with a greater tendency

22) For example, Soffer, Thiagarajan, and Walther (1997) found that the majority of preannouncements are regarded as bad news. For example, on August 29, 2001,

Table 5. Continued

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}
a_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:

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

R_{jt+1} is raw return accumulated over the window surrounding the date of earnings release for firm$_j$ at time$_{t+1}$;

R_{mt+1} is value-weighted market return accumulated over the window surrounding the announcement date at time$_{t+1}$

CAR_{jt+1} $R_{jt+1} - R_{mt+1}$;

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

es^{unsys}: unsystematic earnings surprise
= earnings surprise - mean of earnings surprise for the past four 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$_j$ at time$_{t+1}$.

d_q is a dummy variable for portfolio P_q

for MBE the reaction of the market is different. In general, the increasing estimated slope coefficients accompanying repeated

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.

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

This table presents the results of the regression testing 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
$es^{unsyspost}$	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:

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

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 at time$_t$;

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

Post dummy variable, equals 1 for the post-sox period.

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

$es^{syspost}$: systematic earnings surprise in post-SOX period
= mean of earnings surprise for the past four quarters;

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

$es^{unsyspost}$: unsystematic earnings surprise in post-SOX period
= earnings surprise - mean of earnings surprise for the past four quarters.

LMV_{jt} is logarithm of market value for firm$_j$ at time$_t$;

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

MB_{jt} is ratio of market to the book value of common equity for firm$_j$ at time$_t$.

MBE achievements 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 larger 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 group. The persistent MBE subsample includes the firms that have successfully achieved MBE at least four consecutive quarters.[23] Apart from other conventional findings, the results summarized in table 6 reveal that even though in the post-SOX period the stock market premium to MBE has decreased, it has not diminished completely. While in the pre-SOX group the premium on systematic earnings surprise for habitual beaters was 1.160, and the premium on unsystematic earnings surprise was 2.218, in the post-SOX period it stood at 0.718 and 1.917 respectively. As for firms that achieved consecutive MBE four times or less, in the post-SOX period the premium on systematic earnings surprise dropped to 0.389 from 0.983 pre-SOX, and the premium on unsystematic earnings surprise decreased to 0.398 from 0.922 pre-SOX. This comparison not only shows that the premium in the post-SOX period still exists, but it also implies that the market continues to reward persistent MBE firms, since for habitual MBE firms the premium is higher than for those with a shorter series of consecutive MBE.

Firm Characteristics

Despite numerous studies which deal with the phenomenon of MBE and suggest 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

23) I also used longer periods for the persistent MBE subsample. The result was qualitatively similar.

Table 7. Descriptive Statistics: Firm Characteristics

Portf-olio	*Mk. Cap.*	*Avg. Vol.*	*Disp.*	*Std. Ret.*	*Turn.*	*LTG*	*Momen-tum*	*Beta*	*D/B*	*P/B*	*Tobin's q*
P_1	375	1,420	12.357	0.025	0.068	0.145	0.053	0.973	0.337	1.882	1.358
P_2	483	1,793	11.905	0.025	0.074	0.145	0.122	0.957	0.336	2.012	1.426
P_3	582	2,293	11.429	0.024	0.082	0.150	0.170	0.944	0.326	2.145	1.491
P_4	693	2,810	11.719	0.024	0.093	0.150	0.161	0.934	0.325	2.264	1.563
P_5	823	3,498	10.951	0.024	0.105	0.150	0.165	0.923	0.318	2.393	1.633
P_6	950	4,536	10.647	0.024	0.121	0.150	0.157	0.913	0.315	2.492	1.679
P_7	1,080	5,547	10.000	0.024	0.134	0.150	0.139	0.907	0.308	2.607	1.725
P_8	1,231	6,531	10.316	0.024	0.145	0.150	0.136	0.909	0.303	2.700	1.796
P_9	1,348	7,377	9.722	0.024	0.151	0.150	0.141	0.893	0.310	2.745	1.812
P_{10}	2,178	15,265	7.941	0.023	0.200	0.150	0.118	0.852	0.322	3.053	1.948

Notes to table 7:

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, calculated over the previous year;

Turn: average daily turnover, calculated over the previous year

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

LTG: long-term growth;

Momentum: prior six-month-momentum;

Beta: five-year rolling beta;

D/B: long-term debt-to-book ratio;

P/B: price-to-book ratio;

Tobin's q: $\textit{Tobin's q ratio} = \frac{\text{Liability} + \text{Market Value of Equity}}{\text{Total Assets}}$

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 firms 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.

Following the division into six different categories (liquidity and information, earnings variability, leverage, market volatility, other pricing anomalies, and equity valuation), the analysis related to the investigated characteristics listed in table 7 accompanied by the 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, Teoh, and Wysocki 2000), analysts' forecasts for large firms (*Mk. Cap*) were expected to be pessimistically biased, similarly to the firms with long strings of uninterrupted MBE. Brown (1999) 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 shows 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.

The results in the first two columns of table 7 document that the firms with persistent MBE are large in size (*Mk. Cap*), and 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 showing that the above outlined expectations 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, Frankel, and Miller 2000) document a 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, a negative association between *Disp* and P_q was anticipated in this study.

This expectation is partially confirmed by the third column of table 7, which displays a lower dispersion of analysts' forecast

for P_{10} when compared to P_1 firms. Furthermore, the results also suggest that Disp gradually decreases with an MBE repetition. Table 8 indicates that a negative correlation between *Disp* and P_q exists. Since the patterns in this variable are apparent, the findings related to this category provide sufficient evidence to sustain the hypothesis than managers of firms with lower forecast dispersion are more strongly motivated to MBE.

The third group comprises characteristics regarding **leverage**. In this category, the study focuses on a debt-to-book (*D/B*) ratio. While the level of risk represented by financial leverage increases with the amount of debt in the capital structure of a firm, the amount of long-term debt increases with a 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* and P_q was expected. The expectations are confirmed by the findings in table 8.

As far as the 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 a negative correlation between *Beta*, *Std. Ret* and P_q. Again, the data in table 8 show the existence of this kind of association.

The next category of firms' characteristics examined in the study deals with other pricing anomalies. This group is represented by four different variables, price-to-book ratio (*P/B*), analysts' forecast of long term growth (*LTG*), average daily turnover for the previous year (*Turn*), and price momentum (*Momentum*). The previous literature claims the existence of a stronger incentive to MBE on the part of growth firms due to a much greater negative price response to earnings disappointment of growth (high *P/B*) stocks (Skinner and Sloan 2002). In addition to that, growth firms also display a stronger tendency to report small positive earnings surprise, as suggested by Brown (2001). Referring to these findings, growth firms should exhibit a stronger motivation to avoid earnings disappointment. In line with that, I also hypothesized there would be a positive association between *P/B* and P_q. Both expectations were confirmed, as shown by the results in table 8. The findings

Table 8. Correlation Analysis among the Variables Representing Firm Characteristics

	P_q	*Mk. Cap.*	*Avg. Vol.*	*Disp.*	*Std. Ret.*	*Turn.*	*LTG*	*Momen.*	*Beta*	*D/B*	P/B
Mk. Cap.	0.278										
Avg. Vol.	0.286	0.882									
Disp.	-0.080	-0.268	-0.114								
Std. Ret.	-0.051	-0.470	-0.199	0.000							
Turn.	0.256	0.569	0.802	-0.019	-0.039						
LTG	0.066	-0.214	-0.007	0.457	0.547	0.208					
Momen.	0.154	0.059	-0.013	0.063	0.071	0.038	0.093				
Beta	-0.083	-0.174	-0.037	0.291	0.366	-0.061	0.206	-0.091			
D/B	-0.022	0.154	0.052	-0.208	-0.273	-0.070	-0.356	-0.046	-0.154		
P/B	0.213	0.364	0.375	0.045	0.011	0.386	0.349	0.262	-0.118	-0.117	
Tobin's q	0.189	0.263	0.326	0.162	0.136	0.386	0.473	0.248	-0.021	-0.406	0.863

Notes to table 8:
The triangular matrix reports Spearman correlations. The correlations are statistically significant at 1% level.

Mk. Cap.: market capitalization in millions;
P_q portfolio *q*;
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, calculated over the previous year;
Turn: average daily turnover, calculated over the previous year

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

LTG: long-term growth;
Momentum: prior six-month momentum;
Beta: five-year rolling beta;
D/B: long-term debt-to-book ratio;
P/B: price-to-book ratio;

Tobin's q: $\textit{Tobin's q ratio} = \frac{\text{Liability} + \text{Market Value of Equity}}{\text{Total Assets}}$

provide evidence of a significant increase in *P/B* with consecutive MBE, as well as growth firms' having a 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 a 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 being apparent, the above expectations were confirmed by the analysis. To conclude this part, momentum of the prior six months (*Momentum*) was analyzed. I anticipated *Momentum* and P_q to be positively associated, as confirmed by the evidence presented in table 8. 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.

The last category is related to **equity valuation**. Tobin's *q* represents a proxy for firms' equity valuation. It is apparent that the increase of *Tobin's q* with higher P_q implies the market rewards associated with the MBE pattern.

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 show that while *Mk. Cap*, *LTG*, *Avg. Vol*, *Turn*, *P/B*, and *Momentum* are positively correlated with the length of firms' consecutive MBE, a negative association between MBE pattern and *Disp*, *Std. Ret*, *D/B*, and *Beta* has been found.

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 expectations conditional on a 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. 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 a long history of MBE.

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.

Apart from other conventional findings, I further document that even though the stock market premium to MBE has decreased in the post-SOX period, it still prevails. The results also show and that the market continues to reward habitual MBE firms in comparison to companies with shorter strings of MBE.

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 towards negative earnings surprise than towards 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 a 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, Teoh, and Wysocki (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.

Dealing with different aspects of MBE, this study helps to shed light on various issues related to this phenomenon and its association with firms' characteristics, and also helps to ascertain the nature of the changes which happened in the financial markets after the SOX came into effect. I hope that apart from increasing our understanding of present financial environment, it can provide some guidance not only to the further researchers, but also practitioners operating in the financial markets. In the present world, where valid and reliable information is one of the key factors providing a competitive edge, businessmen are turning their attention to analyses and research papers on an increasing scale in hope to find answers or clues helping them solve the most pressing issues. This and other similar studies thus can help bridge the gap between academia and the business world and can serve as a tool to make sound investment decisions.

Future research extending this study in several suggested directions would be 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. Furthermore, since the cost of capital represents a key factor in valuation of companies' stock in the stock exchange, it would be interesting to investigate the relationships between an MBE pattern and cost of capital. 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. As we can see from the example 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 resulting in complete disruption of the pattern, after their first shortfall firms seem to lose their original justification for maintaining the pattern. It shows that following an initial earnings shortfall, most firms engaging in MBE purposefully abandon their efforts to consistently beat analysts' estimates by a small margin. Without further research, we can only speculate as to the causes leading to the change of firms' behavior and the evolution of companies' performance after the MBE pattern is first broken.

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