

The Information Content of Earnings Following Restatements

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January 24, 2005

I would like to thank the members of my dissertation committee for their valuable guidance and support: Jana Raedy and Ed Maydew (co-chairs), John Hand, Wayne Landsman, and Mark Lang. I also thank Leonce Barger, Robert Bushman, Zhonglan Dai, Brad Lindsey, Chris Petrovits, Kevin Raedy, and workshop participants at the University of North Carolina for helpful suggestions. The financial support of the Deloitte Foundation is gratefully acknowledged.

ABSTRACT

This paper examines the information content of earnings following restatements of prior period earnings. Results indicate that the information content of earnings announcements declines in periods following a restatement. However, the results also indicate that the loss of information content following restatements is temporary. In particular, the earnings response coefficients for earnings announcements surrounding a restatement exhibit a U-shaped pattern in which they return to pre-restatement levels over an average of two quarters, suggesting that the market's concern regarding subsequently reported earnings is transitory. The extent to which the earnings of restatement firms suffer a loss of information content varies across several dimensions. Specifically, the loss of information content is greater for firms that restate earnings to correct revenue recognition errors than it is for other types of restatements. There is no difference between cash flow and accrual information in terms of their loss of information content. Overall, the evidence presented in this paper is consistent with a short-term decline in investor confidence regarding financial reporting following restatements, but that recovery typically takes place within two quarters.

1. Introduction

This paper examines the information content of earnings following restatements. Thousands of restatements have been announced in the last decade, ranging from well-known incidents involving firms such as WorldCom, Qwest, and Tyco, to hundreds of less noteworthy restatements. In response to the market-wide increase in earnings restatements, regulators have expressed specific concerns about the reliability of corporate financial statements and the effect of the large number of restatements on investor confidence in our financial reporting system. The Chairman of the SEC cited the “rise in restatements and the broader damage to investor confidence” along with the ineffectiveness of existing regulatory measures as motivating factors for new regulations imposed by the Sarbanes-Oxley Act of 2002.¹ Additional concern regarding the effect of restatements is expressed in the General Accounting Office’s special report for the US Senate on the rising incidence and market consequences of restatements (GAO, 2002). The GAO report formally documented that “a number of well-publicized announcements about financial statement restatements have raised concerns about the credibility of accounting practices and the quality of corporate financial disclosure and oversight in the United States” (p. 1). These statements imply that regulators suspect that investors are wary of reported information following restatements. As noted by the Chief Accountant of the SEC in a speech relating the rise in earnings restatements to the need for unbiased financial reports, “All participants in today’s capital markets have an obligation to honor and protect investors’ rights. Faith, trust, and confidence are the lifeblood that makes the markets work.”²

Concern regarding the prevalence of earnings restatements is not limited to statements expressed by the SEC and other regulatory officials. Analysts have also demonstrated concern about the impact of restatements on the market’s assessment of the quality of reported financial information. In an article describing the involvement of government in enacting regulatory reforms following the occurrence of earnings restatements and other fraudulent activity, a senior strategist from Morgan Stanley stated, “Investors don’t have confidence that the corporate numbers game will end soon. We need a restoration of trust from every entity” (Borrus, 2002). With respect to restatements announced by individual firms, analysts have often commented

¹ Remarks before the Economic Club of New York by Chairman Harvey L. Pitt, June 26, 2002.

² Remarks to the SEC Institute by Chief Accountant Lynn Turner, June 21, 2001.

about the potentially damaging effect of the restatement on the credibility of financial information. For example, following the announcement of the need to restate fiscal 1999 earnings by McKesson HBOC, Inc. in May, 1999, an analyst for Merrill Lynch commented, “this clearly raises the question about whether any number can be trusted at HBOC” (Abate, 1999).

Though there is extensive anecdotal evidence suggesting apprehension about the quality of financial reporting associated with firms that have issued earnings restatements, there is little in the way of systematic empirical evidence regarding the information content of earnings following a restatement. Extant restatement research has primarily focused on the immediate consequences of the restatement announcement, including significant loss of market value following the restatement announcement (Anderson and Yohn, 2002; Wu, 2002; Palmrose et al., 2004), filing of class-action lawsuits against the firm (Palmrose and Scholz, 2004), turnover of management (Desai et al., 2004) and outside members of the board of directors (Srinivasan, 2004), and an increase in the cost of equity capital (Hribar and Jenkins, 2004). Whether restatements have lasting impacts on the information content of earnings remains an open question in the literature.

I measure the information content of earnings using the earnings response coefficient (ERC) to quarterly earnings announcements in a standard earnings-return relation framework. The sample used is based on the restatement database published by the GAO in its study of restatements issued to the US Senate. In addition to examining the severity and duration of changes in the information content of earnings, I examine cross-sectional variation of these effects across characteristics of restatements. Specifically, I test for differential impacts on the information content of earnings for firms that issue restatements caused by revenue recognition errors and for firms that experience a severe negative stock price reaction at the restatement announcement date. This paper also decomposes earnings into its two components, cash flow and accruals, to analyze whether the information content of accruals and cash flows are differentially affected following a restatement announcement.

The primary results indicate that the information content of earnings declines following a restatement. However, the U-shaped pattern of the price response to earnings information over time indicates that investors regain confidence in earnings news within a short period (on average two quarters) following the restatement announcement. Thus, the market’s concern regarding subsequently reported earnings appears to be transitory. Additional tests based on

subsamples of restatements indicate that the decrease in the information content of earnings is more pronounced for firms that issued restatements to correct revenue recognition problems. These results suggest that investors are most suspicious of the quality of post-restatement information for this group of firms. Finally, results from the test of the incremental information content of accruals do not indicate that the market views accruals to be significantly less informative following a restatement.

The remainder of the paper is organized as follows: Section 2 provides a review of the literature related to the research questions examined in this paper; hypothesis development is described in section 3. Section 4 outlines the research design and sample selection, and the empirical results are presented in section 5. Conclusions follow in section 6.

2. Related Literature

The hypotheses tested in this study are related to several lines of research, in particular research examining earnings restatements and the information content of earnings. Related research in these two specific areas is summarized below.

2.1. Restatement Research

Early papers in the area of earnings restatements provided evidence regarding characteristics of restating firms. Kinney and McDaniel (1989) found that firms that corrected previously reported quarterly earnings were smaller, less profitable, had higher debt, and were slower growing relative to comparable firms in their industry. DeFond and Jiambalvo (1991) studied firms that made corrections of earnings overstatement errors and found that such firms had diffuse ownership and lower growth in earnings and were less likely to have audit committees.

More recent work on restatements documents the fact that the number of firms restating previously issued financial statements has increased dramatically since the mid-1990s (GAO, 2002; Wu, 2002). As the number of restatements has increased and the business press has paid more attention to this phenomenon, researchers have examined the immediate capital market consequences of restatement announcements. The short-term market reaction to a restatement announcement is well documented in the literature. The immediate cumulative abnormal return

(CAR) reported in existing studies has been found to range from – 9.2% (Palmrose et al., 2004) to – 11% (Wu, 2002) for short-term windows surrounding the restatement announcement date.³

Other papers examining earnings restatements have studied firm- and restatement-specific determinants of short-term market reactions to restatement announcements. Wu (2002) finds that the market's negative reaction is increasing in the magnitude of the restatement, and it is more negative for firms admitting fraud and for restatements relating to errors in a firm's policy of revenue recognition. Palmrose et al. (2004) find a positive relation between the magnitude of the CAR and both the magnitude of the earnings restatement and the severity of the negative implications of the restatement regarding management's integrity and competence. The results of these studies suggest that, at least in the short term, investors' reactions differ based on various firm- and restatement-specific characteristics.

Recent restatement research has also examined firm-level consequences suffered immediately following the restatement event. Palmrose et al. (2004) find that restatement firms experience diminished economic prospects (as measured by a downward revision in earnings forecasts) and increased risk/uncertainty (as measured by an increase in analyst forecast dispersion) following a restatement. Consistent with this, Hribar and Jenkins (2004) find that restatements lead to decreases in expected future earnings and increases in a firm's cost of equity capital. Srinivasan (2004) finds that outside directors suffer high turnover and labor market penalties following restatements, and Palmrose and Scholz (2004) find that the incidence of lawsuits filed against restating firms following the restatement event is high.⁴

Anderson and Yohn (2002) and Wu (2002) provide initial evidence that addresses the question of whether the information content of earnings news changes following restatements. These studies test whether the ERC is different for restatement firms over short periods after the restatement announcement and both papers find a decrease in the response coefficient for the first quarters' (Anderson and Yohn, 2002) or first two quarters' (Wu, 2002) earnings disclosure immediately following the restatement. The present study provides an extension to this work in

³ The GAO report cumulated short-term returns and found that, over the five-and-a-half-year period covered in their analysis, publicly traded companies that restated prior-period results cumulatively lost more than \$100 billion in market capitalization surrounding restatement announcements.

⁴ These papers focus on short-term effects following a restatement announcement. Palmrose et al. (2004) measure dispersion in analyst earnings forecasts 45 days after the restatement announcement, and Hribar and Jenkins (2004) measure the cost of capital at various points up to five months following a firm's restatement announcement. The tests conducted in this paper study the information content of earnings information in both the short term and long term after a restatement, with the long-term examination extending several years after a firm's restatement.

that the long-term duration of changes in the information content of earnings is examined. While it is not practicable to think that the market would discount subsequently reported earnings news from restatement firms for a long period of time (i.e., several years), market regulators and analysts have suspected that restatement firms suffer financial reporting credibility problems that could persist for a longer period. This paper also differs in that it examines cross-sectional variation in the information content of earnings for specific characteristics of restatements. Finally, this study differs from other work in that the research design incorporated in this paper controls for confounding influences that could affect measurement of the stock price response to earnings, which is not included in the other papers. This is important in isolating, to the best extent possible, the effect of the market's assessment of earnings quality on changes in the information content of earnings.

Research documenting consequences of restatements provides evidence that firms do indeed suffer losses following a restatement announcement. However, the literature thus far has not addressed the question of whether investors are wary of information disseminated from firms that have issued inaccurate reports in the long-term. This paper contributes to the restatement research area by providing empirical results regarding this question, with a particular focus on whether the information content of future earnings signals is compromised by earnings restatements.

2.2. *The Information Content of Earnings*

There is a widely developed literature that studies various factors that affect the information content of earnings (Kothari, 2001). Within this large area of research is a subset of papers that find that earnings uncertainty has a systematic effect on the information content of earnings news. While the general term "earnings uncertainty" consists of two components, namely, uncertainty regarding firm value and uncertainty regarding the process generating the earnings signal, work in this area suggests that the presence of each type of uncertainty has a systematic effect on the market's response to earnings news following an uncertainty-inducing event. It is this subset of research examining the information content of earnings news that relates to the research questions examined in this paper.

Holthausen and Verrechia (1988) use a two-period setting to model the variance of stock price response to new information as a function of uncertainty regarding the future cash flows of

the firm and the level of information precision. Their model shows that following each information release, the variance of stock price response to information is increasing in the uncertainty regarding the future cash flows of the firm and is decreasing in the noise of the information disclosed. Teoh and Wong (1993) and Collins and Salatka (1993) develop one-period models adapted from Holthausen and Verrechia (1988) to express the relation between the market's beliefs regarding the precision of earnings information and the stock price response to such information. The one-period models are the basis of the model proposed in section 3 of this paper.⁵

Several papers find a systematic relation between uncertainty and the stock price reaction to earnings news when investors are posited to have uncertainty as to the quality of information being presented. Collins and DeAngelo (1990) examine the effect of earnings uncertainty on the stock price reaction to earnings announcements induced by proxy contests. Their paper documents that the information content of earnings announcements increases with investors' uncertainty regarding firm value during the proxy contest and decreases after a proxy-contest-induced management change when investors have uncertainty regarding the quality of information released. Elliott and Hanna (1996) investigate the stock price response to earnings for a sample of firms that have a high incidence of large write-offs included in accounting earnings. They find that the stock price response to earnings news is dampened in the presence of large write-offs, and they conclude that this occurs because of the high level of noise in the accounting earnings numbers relative to the actual economic earnings for their sample. Collins and Salatka (1993) examine the relative levels of stock price response to earnings news under two different GAAP regimes in order to determine which produces earnings that are more strongly related to price changes. They posit that a large, positive relation between earnings news and price is indicative of highly informative (i.e., less noisy) earnings news. This paper is complementary to these papers in that it studies a distinct setting in which it is likely that uncertainty regarding the quality of information exists.

⁵ In related work, Lang (1991) incorporates uncertainty regarding the time-series process governing earnings into a linear model of stock price reaction to earnings news in the presence of uncertainty regarding the future cash flows of the firm. However, his model does not incorporate the effect of precision of information as in Holthausen and Verrechia (1988), which is the focus of this paper.

3. Hypothesis Development

Teoh and Wong (1993) and Collins and Salatka (1993) develop models that provide a useful framework for thinking about the effect of a firm's financial reporting process on the stock price response to the disclosure of new earnings information. Both are one-period models of the relation between the market's assessment of the precision of an earnings announcement and the stock price response to that signal.⁶ These models are based on a modified version of the Holthausen and Verrechia (1988) model relating the release of earnings information to changes in price. The following illustration of the stock price response to an earnings announcement is based on these one-period models and is presented here to elucidate development of the hypotheses in this paper.

Consider a single-period model with an earnings announcement released by a firm at time $t = 1$. The value of the firm is a random variable, $\tilde{\mu}$, and is normally distributed with mean m and variance v . The earnings signal distributed at time $t = 1$ is x , which communicates the true value of the firm plus noise: $\tilde{\chi} = \tilde{\mu} + \tilde{\varepsilon}$, where $\tilde{\varepsilon}$ is normally distributed with mean 0 and variance η .⁷ At time $t = 0$, the price of the firm can be expressed as:

$$P_0 = E[\tilde{\mu}] = m \quad (1)$$

Of course, underlying this expression is the basic relation that price is a function of the discounted future cash flows of the firm, where the value of the firm is a function of its future cash flows. At time $t = 1$, when the earnings announcement is released, the price of the firm is equal to the market's expectation of firm value, conditional on the information contained in the

⁶ Teoh and Wong (1993) use their model to test whether the stock price response to earnings announcements is stronger for firms that are audited by Big Eight auditors than for firms that are audited by smaller auditors. Collins and Salatka (1993) use their model to examine whether the stock price response to earnings announcements was different under two different Statement of Financial Accounting Standards relating to foreign currency accounting (SFAS No. 8 and SFAS No. 52). The characterizations of each of the models are quite similar, and both are adaptable to the restatement setting examined in this paper.

⁷ GAAP allows for some level of subjective estimation of accounting earnings through the use of tools such as accruals and reserves. Accruals and reserves are designed to provide investors with better information regarding the economic earnings of a firm relative to cash flow information alone. Estimates that are not conservative or are not applied in accordance with GAAP can be thought of as the level of noise in earnings. This is similar to the concept of noise explained by Holthausen and Verrechia (1988) as the portion of the earnings signal that has no information content.

announcement:

$$P_1 = E [\tilde{\mu} \mid \tilde{\chi} = \chi] = m + \frac{\nu}{\nu + \eta} [x - m] \quad (2)$$

Therefore, the change in price from time zero to the time of the earnings announcement can be expressed as:

$$P_1 - P_0 = \frac{\nu}{\nu + \eta} [x - m] \quad (3)$$

Since x represents actual earnings and m represents the market's expectation of earnings, $[x - m]$ is a measure of the surprise in the earnings released at the time of the announcement.

Accordingly, the coefficient on earnings surprise is:

$$ERC = \frac{\nu}{\nu + \eta} \quad (4)$$

The ERC is a measure of the market's assessment of the information content of an earnings announcement (i.e., a relatively high ERC indicates that the market views the earnings announcement as containing informative news, and a low ERC reflects the perception of a lack of informative news in the announcement). The relevant feature of equation (4) for this paper is that the ERC is a function of the variance of beliefs about the amount of noise in the earnings signal (η). Differentiating the ERC with respect to the variance of beliefs about the amount of noise in the earnings signal yields:

$$\frac{\partial ERC}{\partial \eta} = - \frac{\nu}{(\nu + \eta)^2} < 0 \quad (4a)$$

Equation (4a) provides the foundation for the hypotheses examined in this paper. It shows that, for a given level of uncertainty about the value of the firm (ν), the amount of price change associated with earnings surprise is negatively related to the perceived noise in the information signal (η). In this way, the perceived level of noise in the earnings signal (η) is inversely related to investors' assessment of earnings quality. This relation suggests that if the market is skeptical of the quality of a firm's accounting and reporting process, the response coefficient on earnings will be dampened because of uncertainty regarding the quality of the information

contained in the announcement. The ERC will be lower as the market judges these earnings to be less informative about the future cash flows of the firm because of suspicion that the earnings number contains a large amount of noise. This characterization of the effect of the market's assessment of reporting quality on the information content of earnings is useful in the context of this study given the concern expressed by market regulators and analysts regarding the market's lack of confidence in financial reporting following restatements.

Based on the relation expressed in equation (4a), the first hypothesis, stated in alternative form, is as follows:

H1: The information content of earnings decreases following an earnings restatement.

A large body of literature on the time-series and cross-sectional properties of earnings response coefficients documents various characteristics that affect measurement of the price-earnings relation.⁸ Significant variables identified in this research are incorporated into the research design used in this paper and are discussed in detail in section 4.1.

In addition to examining the long-term pattern of the information content of earnings following a restatement announcement for restatements as a whole, this paper also examines whether the relation between earnings news and price is different for certain groups of restatements. One element that restatements have in common is that they are all admissions that previously reported information was not prepared in accordance with GAAP. However, there is substantial cross-sectional variation across the range of reasons for restatement as well as variation in the market's reaction to the restatement event. Hypotheses 1a and 1b are designed to test for changes in the information content of post-restatement earnings news for these specific groups.

Firms restate prior-period earnings for a variety of reasons, ranging from the reversal of false sales that were intentionally recorded to correction of mathematical errors caused by a defect in computer software. It is likely that different reasons for restatements cause systematic differences in the information content of earnings following the restatement. For example, one cause for restatements that is likely to induce a different reaction relative to others is revenue recognition errors. Palmrose et al. (2004) provide evidence of significantly lower abnormal

⁸ See Kothari (2001) for a comprehensive review of this work. Influential characteristics are described briefly in the research design description in section 4.

returns at the restatement announcement date for firms issuing restatements due to revenue recognition problems relative to other reasons. Ertimur et al. (2003) decompose earnings news into revenues and expenses and study differential market reactions to the two components. They find that the market values revenue surprises more highly than expense surprises, which they attribute to revenues having greater persistence and a lower amount of noise versus expenses. I hypothesize that the information content of earnings will be lower following a restatement if corrections of revenue recognition errors are seen as evidence of more egregious problems, either because revenues are more persistent than expenses or because manipulation of revenues is more difficult to detect. Therefore, hypothesis 1a, stated more formally, is as follows:

H1a: The information content of earnings decreases more following a restatement made to correct revenue recognition problems than for other reasons for restatements.

Extant research has found that the market's reaction to restatement announcements is quite severe. Cumulative abnormal returns surrounding the restatement announcement date have been found to range from -9.2% (Palmrose et al., 2004) to -11% (Wu, 2002). It is likely that firms that suffer the most negative price drop at the time of the restatement announcement are those that have more severe problems underlying the restatement event, and are those for which the market has the greatest overall concern. Accordingly, I hypothesize that the information content of subsequently released earnings will be lower for these firms. Therefore, hypothesis 1b, stated in alternative form, is as follows:

H1b: The information content of earnings decreases more following a restatement when the stock price reaction at the restatement announcement date is more severe than when the market reaction is smaller.

The last hypothesis in this paper involves the decomposition of earnings into its two components: accruals and cash flows. The role of accrual accounting is to provide additional information regarding a firm's performance beyond information contained in cash flows. The view that accruals improve the ability to measure firm performance is expressed by the FASB. *Statement of Financial Accounting Concepts No. 1* (1978, paragraph 44) states, "Information about enterprise earnings and its components measured by accrual accounting generally provides a better indication of enterprise performance than does information about current cash receipts and payments." While empirical research provides evidence of the important role of accrual-

earnings announcement belongs to quarter t and is zero otherwise. UE_{it} is the unexpected quarterly earnings for firm i at quarter t 's announcement date, scaled by price as of the end of the quarter for which earnings are announced, where expected earnings is based on the median of analyst forecasts outstanding within 60 days prior to the day before the earnings announcement.¹⁰ Firm-level data and earnings report dates are collected from Compustat, price and stock return data are obtained from CRSP, and realized earnings and earnings forecasts are collected from I/B/E/S.¹¹

The direction of the post-restatement ERCs from equation (5) is examined to determine whether the information content of earnings changes surrounding restatements. The prediction is that if investors believe that restatement firms report earnings information that is a noisy representation of the firm's economic performance (e.g., weaknesses in the processes governing earnings that caused the restatement have not been corrected), then the ERC for post-restatement earnings announcements will be lower than the ERC for earnings announcements prior to the restatement. The hypothesized sign of each of the regression variables is noted above, where the coefficient on the interaction term should be negative if the post-restatement earnings announcements have lower information content. The coefficient on UE is expected to be positive based on the well-documented positive relation between earnings surprise and changes in price.

Data for each firm-restatement observation is included in the analysis for the quarters surrounding the restatement, including the quarterly earnings announcement prior to the restatement and up to four quarterly earnings announcements thereafter for which data are available. The ERC for the quarterly earnings announcement prior to the restatement ($t = 0$) is

causes the market to revise its expectations of future cash flows as reflected in price (Collins and Kothari, 1989). However, since the independent variable UE is measured using information from a longer window of time than the three-day measurement period of the dependent variable UR , there is error in measuring expected earnings, since most of the earnings forecasts are made before the day prior to the earnings announcement. This measurement error is mitigated if an additional independent variable that is correlated with the measurement error in unexpected earnings but uncorrelated with the dependent variable is included in the regression. Following Easton and Zmijewski (1989), the stock return for each firm measured from the day of the earliest analyst forecast through two days before each earnings announcement was included in supplemental tests of equations (6) and (7) (results not reported). The coefficient on the stock return variable was negative, indicating that the variable was useful in reducing measurement error in UE . Inferences from the results of regressions including this control variable were unaltered from those reported in the paper.

¹⁰ Hereafter, subscripts on the regression variables are suppressed in the text of the paper for expositional convenience.

¹¹ Realized earnings reported by I/B/E/S are unrestated earnings and thus represent the earnings amount that the market would have received at each quarterly earnings announcement.

the base quarter against which each post-restatement earnings announcement's response coefficient is compared. The analysis is extended over a one-year period following the restatement announcement, with the coefficient on the interaction of earnings surprise and the time indicator variable ($UE*QTR$) measuring the pattern of the response coefficient over time. The time-series analysis is incorporated into the research design to assess the duration of changes in the information content of earnings surrounding a restatement.

Equation (5) does not address the potential effects of factors that have been found by other research to influence the earnings-return relation. The persistence and predictability of earnings patterns, as well as various firm-level characteristics (e.g., growth, risk, and size), have been found to systematically affect the relation between unexpected returns and earnings surprises at announcement dates. Inclusion of these controls is standard in tests of the earnings-return relation (Kothari, 2001). Therefore, control variables are added to equation (5) (as in Subramanyam and Wild, 1996; Raedy and Rock, 2003; and Blouin et al., 2003, among others) to test the following:

$$UR_{it} = \alpha_1 + \sum_{t=1}^4 \alpha_{2,t} QTR_{it} + \beta_1 UE_{it} + \sum_{t=1}^4 \beta_{2,t} [UE_{it}*QTR_{it}] + \beta_3 NONLINEAR_{it} + \sum_{k=4}^8 \beta_k CONTROLS_{it} + \sum_{k=9}^{13} \beta_k [UE_{it}*CONTROLS_{it}] + \varepsilon_{it} \quad (6)$$

(+)
(-)
(-)

where $CONTROLS_{it} = \{PREDICT_{it} + PERSIST_{it} + MTB_{it} + BETA_{it} + SIZE_{it}\}$

(-)
(+)
(+)
(-)
(?)

The variables UR , QTR , and UE are as defined previously. The additional variables and their predicted signs are as follows:

- $NONLINEAR$ is defined as $UE*|UE|$ and is a control for the nonlinear association within the price-earnings relation that has been documented by other research (Freeman and Tse, 1989; Subramanyam, 1996; Lipe et al., 1998). Inclusion of the nonlinearity control variable is based on the idea that extreme values of unexpected earnings are less value relevant; thus, the coefficient on this variable is expected to be negative.

- *PREDICT* is a control for the predictability of earnings patterns and is defined as the average of the absolute values of *UE* over the two-year period prior to the earnings announcement. Lipe (1990) finds that firms with more predictable earnings patterns have higher earnings response coefficients and that there is a negative relation between unexpected returns and the predictability of earnings. Therefore, it is expected that the coefficient on *PREDICT*, when interacted with *UE*, will be negative.
- *PERSIST* is a control for earnings persistence and is defined as the autoregressive coefficient from Foster's (1977) model estimated over the two-year period prior to the restatement announcement. This control variable is included based on evidence that there is a positive relation between earnings response coefficients and earnings persistence (Kormendi and Lipe, 1987; Easton and Zmijewski, 1989). It is expected that the coefficient on *PERSIST*, when interacted with *UE*, will be positive.
- *MTB* is a control for growth and is defined as the market-to-book-value ratio as of the end of the quarter for which the earnings announcement is made. Collins and Kothari (1989) find a positive relation between earnings response coefficients and growth. Therefore, it is expected that the coefficient on *MTB* interacted with *UE* will be positive.
- *BETA* is a control for risk and is defined as the market-model beta estimated over the year prior to the restatement announcement ending two days prior to the announcement date. This variable is included based on evidence that there is a negative relation between earnings response coefficients and a security's level of systematic risk (Collins and Kothari, 1989; Easton and Zmijewski, 1989). It is expected that the coefficient on this variable will be negative when interacted with *UE*.
- *SIZE* is a proxy for firm size and is defined as the market value of equity, in millions of dollars, as of the quarter for which the earnings announcement is

made. While Easton and Zmijewski (1989) suggest a positive relation between earnings response coefficients and firm size, no prediction is made as to the direction of this control variable, since size is likely to be highly correlated with other firm-level characteristics.

Coefficient estimates that represent changes in the ERC surrounding the restatement event (e.g., $\sum_{t=1}^4 \beta_{2,t}$) are of interest in the test of equation (6), and the predictions are the same as for equation (5). If investors believe that information released following a restatement is a noisy representation of the firm's economic performance, then the ERC for the post-restatement quarterly earnings announcements should be relatively lower than the ERC for the quarterly earnings announcement made prior to the restatement.

4.2. Information Content of Earnings: Subsample Analyses

A similar research design is utilized to test whether the change in the information content of earnings varies across different subsets of firms (hypotheses 1a and 1b). In particular, the following regression is used in these tests:

$$\begin{aligned}
 UR_{it} = & \alpha_1 + \alpha_2 SUB_i + \alpha_3 RESTAT_{it} + \beta_1 UE_{it} + \beta_2 [UE_{it} * RESTAT_{it}] + \\
 & \hspace{15em} (+) \hspace{15em} (-) \\
 & \beta_3 [SUB_i * RESTAT_{it}] + \beta_4 [UE_{it} * SUB_i * RESTAT_{it}] + \beta_5 NONLINEAR_{it} + \\
 & \hspace{3em} (?) \hspace{10em} (-) \hspace{10em} (-) \\
 & \sum_{k=6}^{12} \beta_k CONTROLS_{it} + \sum_{k=13}^{19} \beta_k [UE_{it} * CONTROLS_{it}] + \varepsilon_{it} \hspace{10em} (7)
 \end{aligned}$$

where *UE*, *NONLINEAR*, and *CONTROLS* are as described previously. *SUB* is an indicator variable equal to 1 if the observation belongs to a particular subgroup (i.e., the observation represents a restatement to correct revenue recognition errors or a firm that experienced a large negative CAR at the restatement announcement date) and zero otherwise. *RESTAT* is an indicator variable equal to 1 if the earnings announcement belongs to the post-restatement period and zero otherwise. According to hypotheses 1a and 1b, the coefficient on the interaction term *UE*SUB*RESTAT* should be negative if the market assesses earnings from these firms to have lower information content relative to other restatement firms. Consistent with hypothesis 1, the

coefficient on the interaction between *UE* and *RESTAT* should be negative, whereas no prediction is made as to the sign of the interaction between *SUB* and *RESTAT*.

4.3. *Incremental Information Content of Accruals*

I examine the incremental information content of accruals surrounding the restatement announcement to determine whether accruals are informative to the market for firms that have experienced financial reporting failure. Following Rayburn (1986), an association methodology is employed to assess the ability of accrual and cash flow data to explain changes in price over the quarters surrounding the restatement announcement. The incremental information content research design is appropriate for assessing whether one accounting measure provides incremental information beyond that provided by another (Biddle et al., 1995). If accruals have a smaller association with security returns following a restatement, then it is questionable that the accrual adjustment process results in an earnings value that the market deems useful for restatement firms.

The following regression is estimated for each firm-restatement observation for the two quarters immediately surrounding the restatement announcement:

$$UR_{it} = \alpha_1 + \alpha_2 QTR_{it} + \beta_1 UACC_{it} + \beta_2 UCF_{it} + \beta_3 [UACC_{it} * QTR_{it}] + \beta_4 [UCF_{it} * QTR_{it}] + \varepsilon_{i,t} \quad (8)$$

(-)
(+)
(?)
(?)

where *UR* is the cumulative abnormal return for the quarter for which earnings are being announced, *UACC* is unexpected quarterly accruals, and *UCF* is unexpected cash flows. As before, $t = 0$ for the quarter prior to the restatement and $t = 1$ for the quarter following the restatement. Cash flow is defined as net cash flows from operations, and accruals comprises the difference between earnings before extraordinary items and cash flow, all on a per-share basis. Expected signs on coefficients for which predictions are made are noted above. Consistent with Rayburn (1986), the coefficient on *UACC* (*UCF*) is expected to be negative (positive). The sum of the coefficients on *UACC* and the accrual interaction term (*UACC*QTR*) is of particular interest, and it should be lower than the coefficient on *UACC* alone if the incremental information content of accruals decreases following a restatement. No prediction is made regarding change in the incremental information content of cash flow over the two quarters. Expected accruals and expected cash flows are based on a seasonal random walk, since proxies

for these expectations are not widely available.¹² *UACC* and *UCF* are deflated by price at the end of the quarter for which earnings are being announced to control for scale differences (Christie, 1987).

4.4. *Sample*

The GAO report provides a comprehensive list of firms that issued earnings restatements between January, 1997 and June, 2002. This database is the basis for the sample used in this paper. According to the GAO report, restatements were identified through a search of press releases and other media coverage using Lexis-Nexis. The restatements included in the database are those resulting from “aggressive” accounting practices, intentional and unintentional misuse of facts applied to financial statements, oversight or misuse of accounting rules, and fraud (GAO, 2002, p. 76). The database excludes restatements resulting from normal corporate activity (e.g., mergers and acquisitions) or presentation issues (e.g., changes in business segment definitions).¹³ The firm name and restatement announcement date were collected from this database.

All observations in the GAO database were cross-checked against the original press releases announcing the restatements using Lexis-Nexis. The reason for restatement, amount of restatement, and reporting periods affected by the restatement were gathered from the restatement press release or the restated financial statements.¹⁴ Sample attrition is described in table 1. Of the original 919 observations from the GAO database, 28 firms were not included in the sample because no evidence of restatement was found, either in a press release or in the company’s financial statements. Further, 16 observations were omitted because they represented foreign firms, and 337 firms were omitted due to missing data from CRSP and Compustat. Finally, 281 of the original firms were not included in the sample because they either were not covered by I/B/E/S or were missing relevant information regarding analyst forecasts from

¹² Cash flow forecasts for the relevant quarters surrounding the restatement are available for only 6 firms in the sample.

¹³ As a general rule, the database does not include restatements due to changes in accounting policy (e.g., change from FIFO to LIFO accounting). However, the database does include restatements following the issuance of SAB 101, since SEC officials considered restatements following the issuance of this accounting guidance necessary to correct a previous misstatement of financial reports. See GAO, 2002, p. 76. Restatements prompted by adoption of SAB 101 are included in the technical restatement category in this paper.

¹⁴ The GAO database classifies each restatement into one of thirteen categories based on the reason for the restatement. These classifications were not used in this study after discovering several discrepancies between the GAO categorization and the restatement announcement press releases. Rather, data was hand-collected and the observations were classified into 10 categories according to the reason for restatement. For most observations, the GAO reason for restatement and the reason identified from the hand-collection process are the same.

I/B/E/S.¹⁵ The final sample comprises 207 firms that restated previously issued financial information.¹⁶

5. Empirical Results

5.1. Descriptive Statistics

Descriptive statistics for the sample are provided in tables 2 and 3. Table 2 contains descriptive statistics regarding the firms in the sample, and table 3 contains information regarding characteristics of the underlying restatements. Details of the technical reporting guidelines for restatements under GAAP and according to the SEC's filing requirements are included in the appendix.

Overall, the restatement firms in the sample are large. As shown in panel A of table 2, the mean (median) market value of equity for the sample is \$6,505.5 million (\$1,157.7 million). Although the mean is driven upward by a few very large observations, the median size is larger than the size of firms used in other restatement research (Palmrose and Scholz, 2004; Wu, 2002). However, the size characteristics for the sample firms are in line with a statement made in the GAO report (2002) that the number of large firms as a percentage of all firms that restate has increased in recent years. The average market-to-book ratio for firms in the sample is 3.63, and the average beta is 1.03. The sample firms are widely available on the major trading exchanges, as over 80% are traded on NYSE, AMEX, or Nasdaq (not tabulated).

The mean UE (UR) for the sample is -0.003 (-0.009) (table 2, panel A). The fact that mean UE is negative shows that the actual earnings are less than expected earnings on average, and the negative unexpected return shows that the restatement firms earn lower returns than the

¹⁵ The requirement that firms have analyst forecast information available on I/B/E/S (for calculation of the market's expectation of earnings) is a severe restriction, as it results in the loss of over one half of the potential sample. However, it is necessary to estimate earnings using analyst expectations (rather than a seasonal random-walk model, for example) due to the likelihood that a restatement firm's information environment is changing surrounding the time of the restatement, and thus the expectation of earnings four quarters ago is no longer a suitable proxy. Results of analyses conducted on a sample of 488 restatement firms with expected earnings defined using a seasonal random-walk model were qualitatively similar to those presented in the paper.

¹⁶ The final sample of 207 firms is used as a base sample for all analyses in this paper. Analyses for different quarterly earnings announcements following the restatement announcement have fewer observations than the original 207, as firm data are missing for those quarters from CRSP, Compustat, and I/B/E/S. All 207 observations are included in the analyses to avoid survivorship bias. Sensitivity tests show that the primary results are unaltered when the surviving firms and those firms with missing post-restatement data are analyzed separately.

market for the three-day period surrounding the earnings announcements.¹⁷ The mean value of *PREDICT* (*PERSIST*) for the sample is 0.016 (0.388). The mean value for *PERSIST* corresponds closely to the value for persistence reported by Easton and Zmijewski (1989) in their ERC tests. The mean value of *NONLINEAR* is -0.001 , and the small values and narrow distribution of this variable make sense given that it is defined as $UE*|UE|$. Statistics for *STDRET* and *COSTCAP*, two additional control variables that are discussed in greater detail later in the paper, are reported in the last two rows of the table. The mean value of *STDRET* is 0.041 and the mean implied cost of equity capital is 14.9%. The descriptive statistics regarding *COSTCAP* are similar to those reported by Hribar and Jenkins (2004) for their sample of restatement firms. The industry composition of the sample is reported in table 2, panel B. The largest concentration of firms is in manufacturing, with 39% of the sample; the second largest group is the services sector, with 29% of the sample. There is representation from a wide variety of industries and there is no reason to think that industry effects would bias the results.

The observations in the sample are classified into ten groups based on the reason for restatement: revenue recognition; adjustment of expenses; adjustment to the basis of assets or investments; inventory-related; acquisition- or merger-related; technical restatement; restatement due to unspecified errors (with fraud or intent to deceive implied); restatement due to unspecified errors (with no fraud or intent to deceive implied); restatement in response to SEC guidance; and other. The distribution of restatements, by year and type of restatement is reported in table 3, panel A. The predominant reason for restatements in the sample is technical, with adjustment of expenses and correction of revenue recognition errors comprising the second- and third-largest categories, respectively. The number of restatements is increasing nearly monotonically during the sample period, with the greatest number (59 restatements) announced during 2001.¹⁸ The number of restatements and distribution of restatements over time is similar to that documented

¹⁷ It is likely that the information environment for the sample firms changes substantially following the restatement event. Restatement firms likely recognize that they will be subject to higher levels of scrutiny following a restatement and thus provide more detailed disclosures regarding financial operations to analysts prior to releasing post-restatement quarterly earnings. Thus, it is possible that the earnings surprise at the time of these announcements will be very small. To test for this possibility, I analyzed differences in the mean and median *UE* for all quarters surrounding the restatement announcement. Results indicate that neither the mean nor median earnings surprise is significantly different following the restatement relative to before the restatement (results not tabulated).

¹⁸ The spike in restatement activity during years 1999 and 2001 for the sample is related to firms' restating of previously issued reports in response to new GAAP or specific guidance issued by the SEC. The majority of SEC guidance restatements in 1999 were in response to a new interpretation of the reporting of acquired in-process research and development, and the large number of technical restatements in 2001 was in response to SAB 101.

in other restatement research (Wu, 2002). As noted in panel B of table 3, most of the observations for the final sample represent distinct firms. However, there are 18 firms included that issued two separate restatements during the time period.

Panel C of table 3 compares restatement statistics across the ten categories. The duration of the restatement is measured as the number of quarters restated, and the average duration is 5.15 quarters for the total sample. Restatements that are caused by unspecified errors with fraud or intent to deceive implied have the longest duration, with a mean of 7.5 quarters. The amount of restatement is calculated as the difference between originally reported net income less restated net income, summed across all restated periods. The amount of restatement varies widely across the 207 observations in the sample, with a mean (median) restatement amount for the sample of $-\$27.07$ ($-\$2.20$) million. The distribution of the amount of restatement for the overall sample is highly skewed to the left by some influential observations; also the top quarter of the sample comprises restatements that either did not change net income or resulted in an increase in previously reported net income.

The mean restatement amount is negative across all categories of restatements, while the median is equal to zero for the technical group and is positive ($\$4.40$ million) for the SEC guidance group. The average restatement percentage reflects the amount of the restatement as a percentage of the firm's total assets at the end of the quarter prior to the restatement announcement, and the mean value for the overall sample is -0.83% . The average cumulative abnormal return (CAR) for a three-day period surrounding the restatement announcement date is -7.58% for the sample, which is slightly lower than results found in other restatement research. However, when the technical restatements (the group with the smallest average CAR) are removed from the sample, the mean CAR is -9.23% (not tabulated). Note that the categories with the most negative CAR at the announcement date are miscellaneous errors with fraud implied, revenue recognition, and adjustment of expenses.

5.2. *Information Content of Earnings*

Hypothesis 1 posits that the information content of earnings announcements decreases following a restatement announcement. As described in section 4.1, I use an ERC model (both with and without control variables) to compare the information content of earnings announcements surrounding a restatement. Table 4 reports results for tests conducted over a

five-quarter time period surrounding the restatement.¹⁹ The restatement announcement occurred between the pre-restatement earnings release and the earnings announcement for quarter 1 for all observations. Note that the 878 observations utilized for this analysis represent up to five consecutive quarterly earnings announcements for each restatement observation: the earnings announcement for the quarter prior to the restatement as well as up to four quarterly earnings announcements following the restatement.²⁰

The coefficients of interest from the regression are those on the time indicator variable interacted with unexpected earnings ($UE*QTR$). The individual coefficient estimates are reported in the upper half of the table, with the summation of relevant variables for interpretation of the ERC for each quarterly earnings announcement surrounding the restatement reported in the lower half of the table.²¹ Consistent with predictions, the coefficient on UE (for equation (5)) for the earnings release prior to the restatement is significantly positive (coefficient = 2.037), and is negative for each of the four quarters following the restatement. In particular, the coefficient on $UE*QTR$ (- 1.479) is significantly negative for only the first quarterly earnings announcement and is not significantly different from zero thereafter.

The summation of relevant coefficients in the lower half of the table provides a measure of the pattern in the information content of earnings for a five-quarter period surrounding the restatement. Results from the regression without controls (equation (5)) show that the coefficient on the interaction term is significantly lower than the base quarter for only the first quarterly earnings announcement following the restatement announcement (p-value = 0.0092). Furthermore, the ERC for the quarterly earnings announcement following the restatement is not statistically different from zero. These results suggest that the information content of the first earnings report following the restatement is significantly lower than the information content of earnings prior to the restatement, and that it is much smaller immediately afterwards given that

¹⁹ These analyses (and all subsequently reported ERC tests) were also conducted for eight quarterly earnings announcements following the restatement announcement (for which sufficient time-series data were available). Patterns for the fifth through eighth quarterly announcements were similar to those reported for the fourth quarter and are not included for brevity. The value of unexpected earnings (UE) is winsorized at the 1% level to control for outliers in all analyses.

²⁰ Coverage of some of the firms in the sample is not available following the restatement date because of bankruptcy, delisting, etc. Thus, not all firms are included for the full post-restatement period. Robustness checks as to sensitivity of the results confirm that the results reported are robust to both the firms for which data are (and are not) available following the restatement event.

²¹ The t-statistics and significance levels are reported using White (1980) heteroskedasticity-adjusted standard errors.

the response coefficient is not different from zero. As soon as the second quarterly earnings release following the restatement, the market's assessment of the information content of earnings is strong and is not significantly different from the quarter prior to the restatement. The ERC continues to get larger over time as additional quarterly earnings are released following the restatement. As expected, the ERC is positive and statistically significant in all quarters, confirming the positive relation between unexpected returns and earnings news.

This same pattern holds for both the individual coefficient estimates and the summations when the control variables are added to the model (equation (6) in table 4). The ERCs (the sum of the coefficient estimates as reported in the lower half of the table) are greater in this specification than in the regression without controls, but the general pattern remains the same. The ERC for the quarterly earnings announcement immediately following the restatement is significantly lower than the ERC for the earnings announcement prior to the restatement (p -value = 0.007), but the ERCs are not significantly different for the second through fourth quarterly earnings releases following the restatement.²² The results from the regression with controls indicate that factors such as the persistence or predictability of earnings patterns, and firm-level characteristics, such as growth, risk, and size, did not direct the significant effects found in equation (5). In general, results for the control variables (not tabulated) have the predicted sign, with the coefficient on *NONLINEAR* being negative and significant at the 0.01 level.²³ Overall, the evidence presented in table 4 is reflective of a decrease in the information content of earnings news following restatements. However, the decline is short-lived, as the information content of earnings rebounds quickly to pre-restatement levels within two quarters following a restatement. Results from this regression are presented graphically in figure 1, which depicts the U-shaped pattern of the information content of earnings over time.²⁴

²² Given that the median of the analyst forecasts made within a 60-day window is used as a proxy for the market's expectation of earnings, it is possible that forecasts used in this calculation for the quarter following the restatement are comprised of forecasts made before and after the restatement announcement, depending on the timing of the restatement and the surrounding earnings announcements. As a sensitivity check to ensure that this analysis is capturing the effect of forecasts made following the restatement as earnings expectations, those forecasts made before the restatement was announced (but that fell within the 60-day window) were removed from the set of forecasts used to calculate the market's expectation of earnings for quarter 1. Results from this sensitivity check were qualitatively unaltered from those reported in the paper.

²³ None of the coefficient estimates for the control variables when interacted with *UE* are significant at conventional levels.

²⁴ Figure 1 is based on the coefficient estimates from table 4 (equation (6)), where the analysis extends from the quarterly earnings announcement prior to the restatement through four quarterly earnings announcements thereafter. In additional tests, this analysis was extended back to three quarters prior to the restatement in order to measure a

While these results are consistent with a decrease in the information content of earnings following a restatement, the analysis using equation (6) fails to incorporate additional effects on measurement of the ERC. As expressed in equation (4), the ERC is a function of the variance of beliefs about the amount of noise in the earnings signal (η), as well as uncertainty about the underlying value of the firm (v). Holding η constant, an increase in uncertainty about firm value would induce a higher ERC. The positive relation is intuitive in that information distributed by a firm when there is a high level of uncertainty would likely be viewed as useful in resolving such uncertainty, thereby resulting in a larger response coefficient. Given that a restatement is a direct admission that previously reported information was not accurate and that the restatement alters the firm's earnings history, it is likely that the restatement induces uncertainty regarding the value of the firm.

To get an idea of whether the market experiences a change in uncertainty regarding firm value for the sample, I employ dispersion in analysts' forecasts of earnings as a proxy for such uncertainty. If a firm's announcement of its restatement of prior period earnings causes an increase in uncertainty regarding firm value, then analysts' forecasts of future earnings should exhibit greater dispersion (e.g., Palmrose et al., 2004).²⁵

I conducted both univariate and multivariate tests of analyst forecast dispersion surrounding restatement announcements. The sample for these tests includes all firms for which sufficient data were available to calculate the standard deviation of outstanding forecasts: a total of 135 firms for the univariate test and 270 observations for the multivariate analysis. Analyst forecast dispersion is measured as the standard deviation of annual earnings-per-share forecasts that are outstanding within 60 days prior to or following a restatement announcement, scaled by

longer pre-restatement pattern of the information content of earnings. Results from this analysis (not reported) indicate that the ERC is steady and consistent over the three pre-restatement quarterly earnings announcements and then drops significantly for the first quarterly announcement following the restatement. The pattern from the extended time period is similar to that presented in figure 1, which provides reassurance that use of the base quarter prior to the restatement is not driving the results presented in the paper. This affirms the consistent pattern of change in the information content of earnings over time for restatement firms.

²⁵ Analyst forecast dispersion is used as a proxy for uncertainty regarding firm value to provide a comparison with results from other restatement research (Palmrose et al., 2004). However, a weakness of using forecast dispersion as a proxy variable is that earnings forecasts could also exhibit greater variation because of uncertainty regarding the credibility of financial reporting. Thus, this variable may not accurately capture the effect of uncertainty regarding firm value. Another variable that could potentially be used as a proxy for uncertainty regarding firm value is implied volatility from option prices. For example, Ederington and Lee (1996) use the implied standard deviation from option closing prices as a measure of the market's uncertainty regarding a security's future price. I plan to explore the possible use of an option price-based measure as a proxy for firm value uncertainty in further work on this paper.

stock price (Imhoff and Lobo, 1992; Irani and Karamanou, 2003). The mean and median forecast dispersion surrounding a restatement announcement are reported in panel A of table 5. The differences in the mean (median) values are significant at the 0.01 (0.10) level.²⁶

While the univariate results in panel A of table 5 suggest that analysts have greater uncertainty regarding firm value following a restatement announcement, the analysis fails to consider other characteristics that prior research (Lang and Lundholm, 1996; Brown, 2001; Irani and Karamanou, 2003) has found to influence analyst forecast dispersion. These additional factors include firm size, incidence of losses reported in a prior period, volatility of a firm's earnings, and volatility of a firm's returns. The multivariate analysis includes these controls.

The coefficient on the *RESTAT* indicator variable in the multivariate analysis is positive and significant (panel B, table 5), indicating that dispersion is greater following a restatement announcement. The direction of the coefficient estimates on most of the control variables is as predicted, with a majority of the variables showing a significantly positive correlation with forecast dispersion.²⁷ The adjusted R² value of 0.1192 is similar to results reported by other research that examines factors affecting forecast dispersion. Overall, the results reported in table 5 support the notion that investors exhibit greater uncertainty regarding firm value following restatements. Thus, it is necessary to control for this effect in the ERC model.

A second potentially influential factor that has not been considered in the analysis thus far is the effect of changes in a firm's cost of capital surrounding the restatement. Hribar and Jenkins (2004) find that the cost of capital increases following a restatement announcement for firms that restate previously reported earnings. Given that a valuation model where the price of a firm is equal to its discounted expected future cash flows is the basis for the underlying relation between earnings innovations and change in price as expressed in section 3, it is possible that the ERC could be relatively lower following a restatement announcement because the firm's cost of equity (i.e., the discount rate) has increased and not because the information content of post-restatement earnings is lower.

The implied cost of equity was estimated for each firm in the sample surrounding the restatement announcement following the methodology employed in Hribar and Jenkins (2004) to

²⁶ The dispersion values are winsorized at the 1% level to control for outliers.

²⁷ Additional results (not tabulated) indicate that the forecast horizon (measured as the number of days between the forecast date and fiscal year-end) and the number of analysts following a firm are not significant in explaining dispersion in the multivariate analysis. Inclusion of these factors does not affect inferences drawn from the other regression variables as reported in table 5.

determine whether the firms in the sample experienced changes in the cost of capital surrounding the restatement announcement.²⁸ As in their paper, the cost of equity capital was estimated following Gode and Mohanram's (2002) implementation of the Ohlson and Juettner-Nauroth (2004) model as follows:

$$P_t = \frac{FY1}{r_e} + \frac{FY2 + r_e DIV1 - (1 + r_e)FY1}{r_e(r_e - g)} \quad (9)$$

where *FY1* and *FY2* are analyst forecasts of one-year-ahead and two-year-ahead ahead earnings per share and *DIV1* represents actual dividends per share for the year prior to the restatement announcement. Growth (*g*) is equal to the risk-free interest rate (based on the ten-year US Treasury Note rate) less 3% (Gode and Mohanram, 2002). Analyst forecasts were collected from I/B/E/S, dividend information was collected from Compustat, and US Treasury Note rates were collected from the US Treasury website.²⁹ The average daily prices and analyst forecasts outstanding within 60 days prior to (following) the restatement announcement were used to compute expected future earnings and the cost of equity capital before (after) the restatement.

Descriptive statistics regarding estimates of the implied cost of equity capital are reported in panel C of table 5. Consistent with the findings in Hribar and Jenkins (2004), the cost of capital increases significantly following a restatement. The mean (median) estimate of the cost of capital before a restatement is 14.9% (11.2%), and is 18.5% (12.9%) after the restatement. As in Hribar and Jenkins (2004), change in cost of capital surrounding the restatement is also expressed in relative terms to standardize changes across firms, with the percentage change equal to post-restatement cost of capital less pre-restatement cost of capital, divided by pre-restatement cost of capital. These results suggest that it is also necessary to incorporate the cost of capital into the ERC model in order to accurately assess whether changes in the market's assessment of

²⁸ Hribar and Jenkins (2004) calculate the implied cost of equity using three different models that are based on varying relations between current price and expected future earnings and growth rates. Their finding of an increase in the cost of equity capital following a restatement is robust across all three estimation methods. The model used in this paper to estimate the cost of equity capital was selected based on availability of data and simplicity of assumptions that must be made about future growth rates of the firm, as well as for comparability with evidence found by Hribar and Jenkins (2004) for their sample of restatement firms. As the focus of the cost-of-capital estimation is on short-window changes comparing the same firm over time, any problems associated with firm-specific estimation assumptions or measurement error are mitigated because the same assumptions and methodology are used in estimating the cost of capital both prior to and following the restatement.

²⁹ See <http://www.treas.gov>.

noise in reported earnings is causing the decrease in the response coefficient following the restatement.

I also estimated the ERC model with additional controls included for the level of uncertainty about firm value and the cost of capital (table 6). Specifically, *COSTCAP* is included to consider the effect of the cost of capital, and *STDRET* is a proxy variable incorporating the level of uncertainty regarding firm value. *STDRET* is measured as the standard deviation of stock returns for the 25 trading days before each quarterly earnings announcement.³⁰ The upper half of the table reports the coefficient estimates individually, and the bottom half reports summation of relevant coefficients for interpretation of the ERC for each quarter surrounding the restatement. The same pattern of change in the information content of earnings seen in table 4 is evident in table 6. In particular, the coefficient on the ERC (3.823) for the quarterly earnings announcement following the restatement is significantly lower than the ERC (5.863) for the earnings announcement immediately prior to the restatement announcement (p-value for difference = 0.0063). None of the ERCs for the other post-restatement quarters is significantly different from the base quarter. In general, the coefficients on the control variables are not significant, with the exception of *NONLINEAR* and *STDRET*. The coefficient on *UE*STDRET* is significantly positive (p-value = 0.0144, not tabulated), and confirms the positive relation between earnings surprise and uncertainty regarding firm value, as predicted by equation (4). Overall, these results suggest that neither changes in the cost of capital, nor changes in the market's level of uncertainty regarding firm value, are driving the primary results reported in table 4.

5.3. *Subsample Analyses*

Hypotheses 1a and 1b propose that the information content of earnings news will be systematically lower following a restatement for various subgroups: firms that restate to correct

³⁰ Dispersion of analyst forecasts of earnings per share was utilized to demonstrate changes in uncertainty about firm value surrounding a restatement (Table 5). Earnings forecast dispersion was the variable used in that test to ensure comparability of changes in dispersion with other restatement-related research (Palmrose et al., 2004). However, a disadvantage of using forecast dispersion as a control variable here is that sufficient data to calculate the standard deviation of forecasts are not available for all firms in the sample, so inclusion of this variable would result in a significant loss of observations (approximately 35%). A different variable that is significantly correlated with forecast dispersion and is widely available for all sample firms would be better suited to use as a control for the market's level of uncertainty about firm value. Prior research has found volatility to be positively correlated with forecast dispersion (Ajinkya and Gift, 1985; Jiang et al., 2004), and the correlation between the two variables is also significant for this sample. For the 135 observations that have both forecast dispersion and volatility of returns information, the Pearson correlation between volatility and dispersion is 0.38 (p-value < 0.0001).

revenue recognition errors and firms that experience a significantly negative abnormal return at the restatement announcement date. I test these hypotheses using equation (7), where the time periods are limited to the quarterly earnings announcements immediately before and immediately following the restatement since the results presented in section 5.2 suggest that these are the periods when changes in investors' assessment of earnings quality are taking place. Restricting the analyses to these periods provides the most powerful setting available.

Results show that the ERC for the quarterly earnings announcement immediately following the restatement for the 40-observation sample of revenue recognition restatements is significantly lower than the ERC for the quarterly announcement for firms restating for other reasons (table 7, panel A). The ERC for the earnings release following the restatement for the revenue restatement observations is equal to 2.493 and is equal to 6.024 for all other categories of restatements. The F-statistic for the difference between the values is 5.36 and has a one-tailed p-value of 0.011 (not tabulated). This result supports the notion that the information content of earnings is lower for firms that admitted to problems with their accounting for revenue than for other reasons for restatements.³¹

Firms in the severe market reaction group include those for which the three-day CAR at the restatement announcement date is below the median (-3.98%) of the entire sample. For these firms, the ERC for the quarterly earnings announcement immediately following the restatement is higher than the ERC for the low CAR firms (table 7, panel B). The ERC for the earnings announcement immediately following the restatement for the high CAR observations is equal to 5.55 and is equal to 4.46 for the low CAR observations. However, the difference is not significant at conventional levels. Thus, there is not enough evidence to suggest that the market views the immediate post-restatement earnings news as relatively less informative for firms that experienced a large drop in stock price around the restatement announcement date.

5.4. *Information Content of Accruals*

Hypothesis 2 posits that the incremental information content of accruals decreases following a restatement announcement. Though research has found that accrual information has

³¹ This result of a significantly lower ERC for firms that restated to correct revenue recognition problems is in contrast to the result of no significant difference found by Anderson and Yohn (2002) for their revenue recognition restatement sample. However, the research design utilized in this paper is different from theirs in that it controls for confounding influences on measurement of the response coefficient, which likely causes the results from the test in their paper to be different from those presented in this paper.

a significant association with price (Rayburn, 1986; Dechow, 1994), this may not be the case for firms that have admitted to noncredible reporting. To test this hypothesis, I examined the incremental information content of accruals for the two quarterly earnings announcements surrounding the restatement. Relevant information necessary to calculate accrual and cash flow variables was missing for 16 of the firms in the original sample, resulting in a sample of 191 firms for the test of this hypothesis. Results from this analysis are reported in table 8.

As measured in the quarter before the restatement, the coefficient on *UACC* is significant (p-value = 0.0285). This suggests that given the information available in cash flow, information contained in accruals is incrementally informative for change in price over the quarter. On the other hand, in the quarter after the restatement, the coefficient on *UACC* (the summation of $\beta_1 + \beta_3$) is no longer significant. Though the incremental information content is not statistically lower across time, (one-tailed p-value for difference across quarters = 0.1413), the decrease in significance for the accrual variable indicates that the information contained in accruals is not incrementally informative to the market beyond cash flow information following a restatement. Accruals would not be considered to be useful if the market were skeptical of the quality of such information following a restatement. These results are weakly consistent with hypothesis 2, but they are not strong enough to reject the null hypothesis that accruals are less informative following a restatement announcement.

5.5. *Additional Analyses*

Results presented in section 5.2 are generally consistent with the view that firms only suffer a short-term loss in the information content of earnings news following a restatement announcement, as the information content of subsequent earnings news returns to pre-restatement levels within two quarters following the restatement announcement. Given this finding, it seems plausible that these firms might intentionally provide signals to the market that they have made efforts to improve their financial reporting systems after the restatement has occurred. Efforts undertaken to improve governance or increase the financial transparency of the firm would signal to the market that the firm has a higher-quality reporting structure in place relative to before the restatement. If the market believes that restatement firms have better reporting practices after the restatement, then the information content of earnings would not necessarily be lower following the restatement.

Restatement firms could express their commitment to higher-quality reporting by firing top management or the executives responsible for reporting errors, replacing the auditor that reviewed the misreported financial statements with a new auditor, and directly stating that the firm has a commitment to high-quality reporting (e.g., in a press release following the restatement).³² Data regarding changes in audit firms following the restatement were examined for the sample to determine whether a relation exists between changes in governance and the information content of post-restatement earnings. It is hypothesized that there will be a positive association between change in the firm's auditor and the information content of earnings. Since the pre-restatement auditor had reviewed the invalid financial statements and allowed them to be reported as truth to the market, this auditor would be viewed as being of low quality for having permitted the erroneous reporting. Thus a switch in auditor could serve as a signal to the market of the firm's commitment to high-quality financial reporting going forward.

Auditor information was collected from Compustat for a three-year window for each firm, spanning the year prior to the restatement announcement through two years after it. Inconsistencies in a firm's auditor from year to year were investigated by matching this information to audit-firm changes reported on Form 8-K, and the auditor switch date was noted. In the event that this information could not be located in SEC filings, the information was obtained from press releases found on Lexis-Nexis.³³

Of the entire sample of firm-restatement observations, 33 firms (15.94%) experienced a change in auditor during the two-year period after the restatement announcement (table 9, panel A).³⁴ The number of auditor-firm changes across the entire Compustat population for the same

³² Research examining governance changes following a restatement includes Srinivasan (2004) and Desai et al. (2004). Srinivasan (2004) examines board of director turnover for firms that have issued restatements and finds that there is a high level of turnover following a restatement. He also finds that directors from restatement firms suffer labor market penalties following the restatement. Desai et al. (2004) examine management turnover after a restatement. Their results provide evidence of high turnover, with management being less than fully successful in securing employment following a restatement.

³³ Coopers and Lybrand, LLP (C&L) merged with PriceWaterhouse, LLP (PW) in 1997 to form PriceWaterhouseCoopers, LLP (PWC). As Compustat does not distinguish notation between PW and PWC, a firm that used C&L as its auditor in 1996 and continued to use the same firm (which is coded as PWC in 1997 and beyond) would appear to have an inconsistency in audit firm, when in fact there was no switch. These inconsistencies were not counted as auditor switches in this paper.

³⁴ Forty-six firms (22.22%) actually experienced a change in auditor during this period. However, 13 of these auditor-change observations occurred during the spring of 2002, with companies changing from Arthur Andersen, LLP (AA) to another firm. As AA was under indictment for alleged obstruction of justice relating to their involvement with Enron Corporation, these 13 companies were likely forced to hire a new auditor for reasons unrelated to providing signals of high reporting quality. In fact, many of these companies noted their respect for high-quality services provided by AA in press releases regarding their switch. Accordingly, these 13 changes were

time period is provided as a comparison. The rate of auditor change is much higher for the restatement sample than for the nonrestatement population. The timing of audit-firm switches for the firms that have issued restatements is also of interest (table 9, panel B). In particular, three firms changed auditors in the quarter following the restatement announcement, and a total of 24 firms switched auditors within the first year following the restatement. The mean (median) number of days between the auditor-switch announcement and the restatement announcement date was 258 (184) days (not tabulated). It is notable that the number of firms changing auditors following the restatement is slowly increasing over the two-year period, but is not concentrated in the time immediately following the restatement announcement. If firms were interested in providing a signal to the market that they were switching audit firms to ensure higher-quality reporting, then one would expect firms to change auditors shortly after the restatement announcement.

Multivariate analysis of whether the change in audit firm is associated with relatively high levels of the earnings response coefficient was also conducted (results not tabulated). The results do not provide evidence of a significant difference for these firms. Across all four post-restatement quarterly earnings announcements, the change in ERC is not significantly different for firms that changed auditors during this period relative to firms that did not. Given that the number of firms that announced changes in their auditor was quite low in each quarter, the low power of this test likely biases against finding results.³⁵

5.6. *Robustness of Results and Sensitivity Checks*

One potential influence is the 18 firms for which there are two restatements included in the sample. Firms that announce more than one restatement within a relatively short period of time may be seen as being more problematic or having lower-quality reporting, and severe post-restatement reactions for these firms could influence the results for the overall sample. However,

not classified as auditor switches for results that are reported in the paper. Sensitivity tests (not tabulated) demonstrate that the results reported in the paper are unaltered when AA-related auditor changes are classified as auditor switches.

³⁵ Given the high rate of management turnover found by Desai et al. (2004) for their sample of restatement firms, I plan to collect data on management turnover for my sample and conduct an extension of the auditor-change analysis described in this section. If I find a large number of observations with turnover following the restatement, I will have more power to detect relations between governance changes and changes in the information content of earnings news.

the results of sensitivity tests with multiple-restatement firms removed indicate that firms with more than one restatement in the sample are not unduly influencing the results.

Secondly, a supplemental test was performed to analyze whether the information content of earnings is different for groups of firms for which the market exhibited high levels of concern regarding financial reporting quality following a restatement. The subsample test associated with hypothesis 1b was based on the idea that the firms for which the stock price decline was greatest at the time of the restatement announcement were those for which the market had the greatest concern following the restatement announcement. However, another variable that could indicate market concern over particular restatements is the filing of class-action lawsuits following the announcement (e.g., Palmrose and Scholz, 2004). Given that it is likely that lawsuits are filed for the most egregious restatements, it is hypothesized that earnings from firms suffering from lawsuits following a restatement would have lower information versus earnings distributed from firms that did not experience lawsuits.

The incidence of class-action lawsuits filed against firms included in the sample was collected from press releases that were issued within a 30-day window following each restatement announcement. Of the sample firms, 19% were subject to class-action lawsuits following the restatement announcement. Using an analysis similar to that for the other subsamples as described in section 5.3, the information content of earnings for the quarterly earnings announcement following the restatement was compared for the firms that suffered from lawsuits relative to the nonlawsuit restatement firms (results not tabulated). Surprisingly, the information content of earnings was significantly higher for firms that suffered from lawsuits following the restatement versus those that did not experience lawsuits. This result is in contrast with expectations, but it is consistent with the auditor-switch results reported in the previous section in that the information content of post-restatement earnings increases following the restatement, regardless of firm-specific consequences or actions taken by firms. Again, this result provides evidence that the decrease in the market's confidence regarding subsequently reported earnings from restatement firms is short-lived and unrelated to firm- or restatement-specific characteristics.

6. Conclusion

The number of firms issuing earnings restatements has increased remarkably in the last decade, and this phenomenon has caused concern among market regulators and analysts that investors are suspicious of financial disclosure. Specifically, the SEC has speculated that the rise in restatements has triggered an overriding sense of a lack of trust in financial reporting. This paper provides an analysis of this issue by examining whether the information content of earnings is relatively different following a restatement, where the stock price response to earnings news following a restatement is hypothesized to be lower if the market believes post-restatement earnings news are of lower quality relative to earnings released prior to the restatement. The primary focus of this paper is measuring the magnitude and duration of changes in the information content of earnings following restatements, as the allegations regarding investors having decreased confidence in reported earnings indicate that such problems are considerable and ongoing.

Results from the paper demonstrate that investors perceive post-restatement earnings news to have relatively less information content following an earnings restatement. However, the pattern of the information content of earnings rebounds quickly to pre-restatement levels following a restatement. Specifically, the earnings response coefficients for quarterly earnings announcements surrounding restatements exhibit a U-shaped pattern in which they return to pre-restatement levels over an average of two quarters, suggesting that the market's concern regarding subsequently reported earnings following restatements is only transitory.

Furthermore, the subsample analyses demonstrate that there is cross-sectional variation in the market's assessment of the information content of earnings following a restatement. Evidence from these tests suggests that the decrease in the information content of earnings is more pervasive for firms that corrected errors of revenue recognition. However, stronger patterns were not evident for the group of firms that experienced the most severe market reaction at the time of the restatement. While the evidence overall is consistent with investors discounting reported information following a restatement, this is not a consequence for all firms that issue restatements.

This paper contributes to our understanding of consequences suffered by firms that restate historical results by examining changes in the information content of earnings following a restatement, which is a potentially dramatic outcome of restatements not previously addressed by the literature. Evidence presented in this paper suggests that the information content of earnings

is indeed compromised, albeit temporarily, by an earnings restatement. Inferences drawn from this study are important for policy makers and market regulators in that the results do not indicate that firms that issue restatements suffer severe and ongoing credibility problems.

Appendix:

Restatement Reporting Requirements

The GAAP authoritative literature that covers restatements includes APB 20, SFAS 16, and APB 9. APB 20, “Accounting Changes”, defines a prior period “error” (APB 20 ¶13) and states that the correction of an error is to be reported as a prior period adjustment (APB 20 ¶36) in the period in which the error is discovered and corrected (APB 20 ¶37). Paragraph 37 states that the nature of the error and the effect of its corrections on income before extraordinary items, net income, and the related per share amounts should be disclosed. This paragraph also states that financial statements of subsequent periods need not repeat the disclosure. APB 20 ¶36 states that a materiality threshold should be applied in determining when correction is necessary. SFAS 16, “Prior Period Adjustments”, also states that correction of an error from a prior period is to be recorded as a prior period adjustment (SFAS 16 ¶11). APB 9, “Reporting the Results of Operations I – Net Income and the Treatment of Extraordinary Items and Prior Period Adjustments II – Computations and Reporting of Earnings per Share”, describes the disclosure requirements for prior period adjustments and restatements of reported net income (APB 9 ¶26). When financial statements for only a single period are presented, disclosure should indicate the effects of the restatement on the balance of retained earnings at the beginning of the period and on the net income of the immediately preceding period. When financial statements for more than one period are presented, the disclosure should include the effects for each of the periods included in the adjustments. The resulting effects (both gross and net of applicable income tax) on the net income of prior periods should be disclosed.

In terms of requirements for filing amended financial statements with the SEC, there is no requirement for a company to file Form 10-K/A or 10-Q/A if a restatement of prior period financial statements is issued. While many companies choose to file these amendments to annual or quarterly filings, other companies declare the effects of the restatement as part of the current filing (this is the procedure referenced above under GAAP). While not in effect for the sample utilized in this paper, the recent passage of SEC Rule 33-8400, Additional Form 8-K Disclosure Requirements and Acceleration of Filing Date, requires that a company that issues a restatement of prior results file Form 8-K within four days of the discovery of the restatement describing the effects of the restatement (Item 4.02). Before this law was passed, there were no filing requirements under SEC guidelines to record a restatement of previously issued results.

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FIGURE 1
The Information Content of Earnings News Over Time

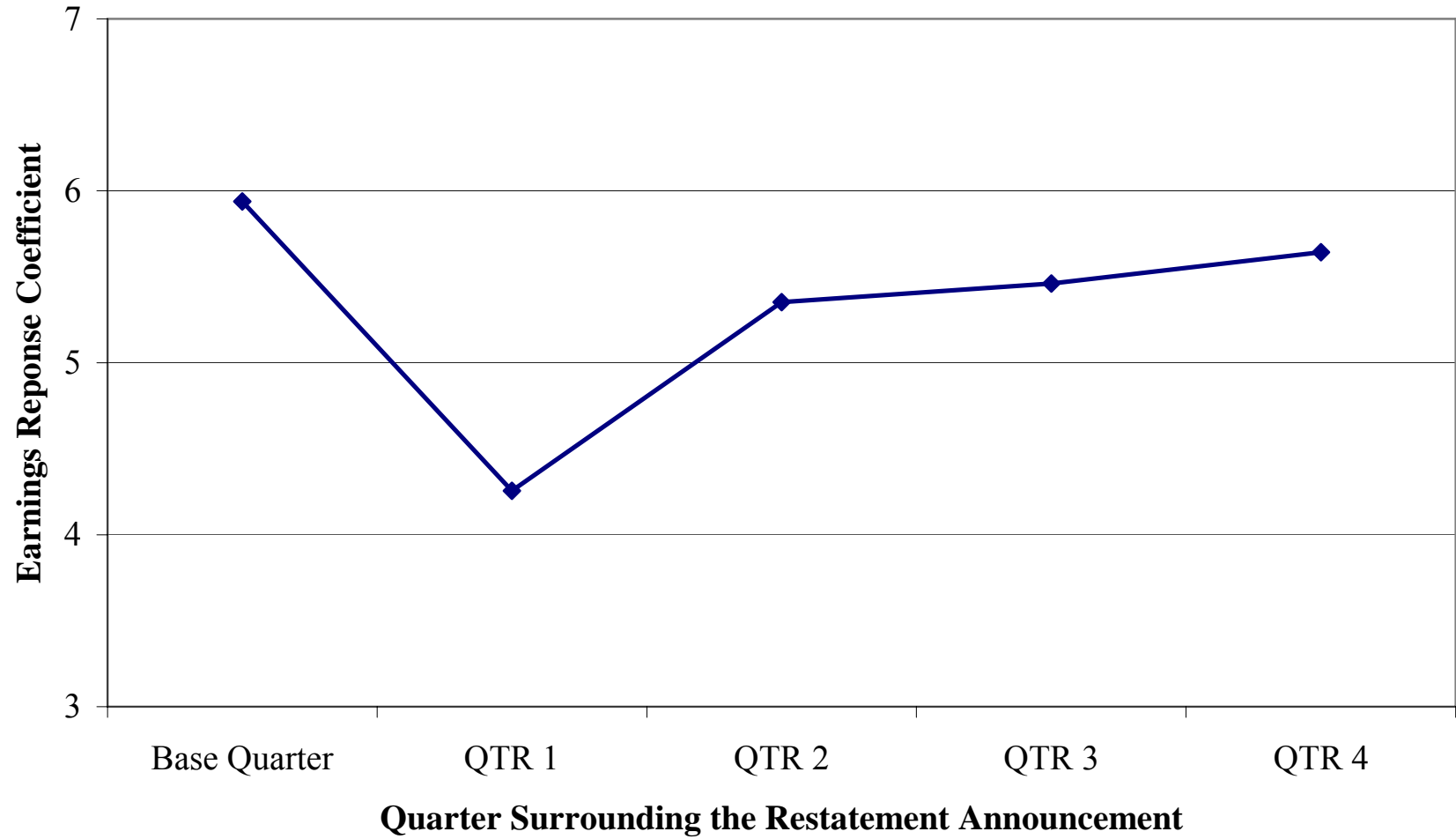


TABLE 1
Sample Attrition

	<u># obs</u>
Restatement announcement observations from GAO database	919
Observation not included because:	
Potential restatement did not result in actual restatement ^a	(28)
Foreign firm ^b	(16)
Missing necessary data from CRSP or Compustat ^c	(387)
Missing necessary data from I/B/E/S ^d	<u>(281)</u>
Final Sample	207

The General Accounting Office (GAO) Restatement Report's database of earnings restatements that occurred between January, 1997 and July, 2002 forms the basis of the sample for this paper.

^a These observations were not included in the final sample because the firms never restated previously reported results. All restatements from the GAO database were cross-checked to the public announcement of the restatement or to the restated financial statements. These 28 announcements mentioned the possibility of a future restatement in the initial announcement (often due to an SEC investigation or other accounting inquiry), but a restatement was not subsequently reported.

^b These observations represent firms from the following countries: Canada (14), Netherlands (1), and Norway (1). Many of the Canadian firms were restating results to change accounting treatment of transactions under Canadian GAAP. All foreign firms were omitted from the final sample because of the different filing and disclosure requirements required of foreign firms trading ADRs in the US relative to US-domiciled firms.

^c The majority of the missing items were for data measured after the restatement announcement, as data were required for calculation of all the regression variables for the two quarters immediately surrounding the restatement announcement in order to be included in the sample. The lack of available data following the restatement is caused by the fact that many of the sample firms either filed for bankruptcy or were delisted from their trading exchange shortly following the restatement announcement.

^d Most of these observations were not included because the firms were not covered by I/B/E/S. Some were omitted from the final sample because there were no analyst forecasts made within 60 days of a quarterly earnings announcement.

TABLE 2
Descriptive Statistics

Panel A: Regression Variables

Variable	Mean	Median	Standard Deviation	Q1	Q3
<i>SIZE</i>	6,505.5	1,157.65	14,623.72	349.23	5,838.31
<i>MTB</i>	3.63	2.69	7.27	1.50	4.97
<i>BETA</i>	1.03	0.83	0.73	0.51	1.46
<i>UE</i>	-0.003	0.000	0.019	-0.001	0.001
<i>UR</i>	-0.009	-0.010	0.129	-0.067	0.043
<i>PREDICT</i>	0.016	0.001	0.069	0.000	0.004
<i>PERSIST</i>	0.388	0.353	1.570	0.080	0.684
<i>NONLINEAR</i>	-0.001	0.000	0.002	-0.000	0.000
<i>STDRET</i>	0.041	0.036	0.025	0.024	0.054
<i>COSTCAP</i>	0.149	0.112	0.147	0.079	0.162

Panel B: Industry Composition

<u>Industry</u>	<u>Number of Observations</u>	<u>Percentage of Observations</u>
Mining and Construction	5	2.42 %
Manufacturing	81	39.13 %
Transportation and Utilities	12	5.80 %
Wholesale and Retail Trade	27	13.04 %
Finance, Insurance and Real Estate	21	10.14 %
Services	59	28.50 %
Public Administration	2	0.97 %
Total	207	100 %

The regression variables are defined as follows: *SIZE* is market value (in millions); *MTB* is the market to book value ratio; *BETA* is the market-model beta estimated over the year prior to the restatement announcement ending two days prior to the restatement announcement date; *UE* is the unexpected quarterly earnings for each announcement date, scaled by price as the end of the quarter for which earnings are announced, where expected earnings is based on the median analyst forecast of quarterly earnings per share outstanding within 60 days prior to the announcement date; *UR* is the cumulative abnormal return measured over a three-day window surrounding the earnings announcement date, where the abnormal return is the firm's return less the CRSP value-weighted market return; *PREDICT* is the average of the absolute values of *UE* over the two-year period prior to the earnings announcement; *PERSIST* is the autoregressive coefficient from Foster's (1977) model estimated over the two-year period prior to the restatement announcement; *NONLINEAR* is equal to $UE^2/|UE|$; *STDRET* is the standard deviation of daily stock returns for 25 trading days prior to the earnings announcement; and *COSTCAP* is the implied cost of equity capital calculated using the methodology of Gode and Mohanram's (2002) implementation of the Ohlson and Juettner-Nauroth (2004) model. Data provided in this table for all variables (with the exception of *BETA*) are measured as of the end of the quarter for the earnings announcement prior to the restatement.

TABLE 3
Restatement Characteristics

Panel A: Distribution of Restatements by Year and Type

Reason for Restatement	1997	1998	1999	2000	2001	2002	Total
Revenue Recognition	6	6	9	9	6	4	40
Adjustment of Expenses	7	6	10	7	8	5	43
Basis of Assets/Investments	1	1	2	3	3	2	12
Inventory	0	1	0	2	1	0	4
Acquisition/merger	1	2	4	2	2	0	11
Technical ^a	3	0	4	6	31	0	44
Misc. errors – fraud or intent implied ^b	2	3	2	2	2	1	12
Misc. errors – fraud or intent not implied ^c	0	1	2	0	1	2	6
In response to SEC guidance ^d	0	2	15	3	3	2	25
Other	<u>0</u>	<u>0</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>10</u>
Total	20	22	51	36	59	19	207

Panel B: Firm Restatement Frequency

	<u>One Restatement</u>	<u>Two Restatements</u>	<u>Total Restatements in Sample</u>
Number of Firms	171	18	207

TABLE 3
Restatement Characteristics (cont'd)

Panel C: Statistics by Reason for Restatement^e									
Reason for Restatement	# obs.	Average Duration (in quarters)	\$ amount, in millions					% of Firm Assets	Average Announcement Date CAR
			Mean	Median	Standard Deviation	Q1	Q3		
Revenue Recognition	40	5.25	-66.11	-5.70	227.27	-19.40	-1.77	-4.03%	-15.72%
Adjustment of Expenses	43	5.28	-15.92	-1.92	110.36	-6.70	-0.03	-2.49%	-9.80%
Basis of Assets/Investments	12	5.08	-4.42	-2.90	36.54	-17.50	0	-0.10%	-4.85%
Inventory	4	1.75	-4.79	-4.64	3.42	-7.35	-2.24	-0.72%	-4.53%
Acquisition/merger	11	6.18	-15.54	-0.50	55.62	-31.46	26.0	0.76%	-2.88%
Technical	44	4.43	-19.44	0	59.23	-8.63	0	-0.59%	-0.02%
Misc. errors – fraud or intent to deceive implied	12	7.50	-20.72	-8.80	22.72	-37.00	-2.15	-1.46%	-20.38%
Misc. errors – fraud or intent to deceive not implied	6	6.33	-15.22	-12.50	14.86	-30.24	-1.08	-0.25%	-2.27%
In response to SEC guidance	25	5.24	-19.64	4.40	172.21	-2.70	28.00	4.04%	-3.96%
Other	<u>10</u>	3.90	-34.44	-8.20	65.97	-27.00	-0.27	-0.15%	0.97%
Total Sample	207	5.15	-27.07	-2.20	131.50	-15.00	0	-0.83%	-7.58%

The reason for restatement was obtained from the press release issued on the restatement announcement date or from information contained in the restated financial statements. Characteristics of the restatement were collected from the press release, where available, otherwise from the restated financial statements.

^a Technical restatements include those restatements of prior results following the adoption of SAB 101 and the issuance of various EITF Consensuses.

^b Restatements are included in this group if the restatement announcement did not state a specific reason for restatement other than the discovery of accounting irregularities. Restatement announcements for this group were very specific that the cause of the restatement was isolated to specific transactions or the intentional actions of specific employees.

^c Restatements are included in this group if the restatement announcement did not state a specific reason for restatement other than the discovery of accounting irregularities. Restatement announcements for this group contained specific language to demonstrate that computer error or accidental misreporting of an accounting amount caused the restatement.

^d Restatements in this group include correction of the accounting previously applied under various Statement of Financial Accounting Standards (SFAS), including SFAS 125 and SFAS 133, among others.

^e Average duration of the restatement is measured as the number of quarters restated. The restatement percentage is the dollar amount of the restatement divided by the firm's assets as of the quarter prior to the restatement announcement. The announcement date cumulative abnormal return (CAR) is measured over the three-day window surrounding the restatement announcement.

TABLE 4
Change in the Information Content of Earnings Surrounding a Restatement

$$UR_{it} = \alpha_1 + \sum_{t=1}^4 \alpha_{2,t} QTR_{it} + \beta_1 UE_{it} + \sum_{t=1}^4 \beta_{2,t} [UE_{it} * QTR_{it}] + \varepsilon_{it} \quad (5)$$

$$UR_{it} = \alpha_1 + \sum_{t=1}^4 \alpha_{2,t} QTR_{it} + \beta_1 UE_{it} + \sum_{t=1}^4 \beta_{2,t} [UE_{it} * QTR_{it}] + \beta_3 NONLINEAR_{it} + \sum_{k=4}^{10} \beta_k CONTROLS_{it} + \sum_{k=11}^{17} \beta_k [UE_{it} * CONTROLS_{it}] + \varepsilon_{it} \quad (6)$$

	Predicted Sign	Equation (5)	Equation (6)
		<i>UE</i>	<i>UE</i>
Individual coefficient estimates:			
β_1	+	2.037***	5.938***
$\beta_{2,1}$	-	-1.479**	-1.682**
$\beta_{2,2}$	-	-0.444	-0.586
$\beta_{2,3}$	-	-0.333	-0.478
$\beta_{2,4}$	-	-0.333	-0.295
Sum of coefficient estimates:			
ERC for quarter before restatement (β_1)	+	2.037***	5.938***
ERC for quarter 1 ($\beta_1 + \beta_{2,1}$)	+	0.558###	4.256***,###
ERC for quarter 2 ($\beta_1 + \beta_{2,2}$)	+	1.593***	5.352***
ERC for quarter 3 ($\beta_1 + \beta_{2,3}$)	+	1.730***	5.460***
ERC for quarter 4 ($\beta_1 + \beta_{2,4}$)	+	1.704***	5.643***
Controls included in model?		No	Yes
Adj. R ²		.0381	.0803
Number of observations		878	878

,* significantly different from zero at 0.05 and 0.01 level, respectively (two-tailed)

##, ### significantly different from base quarter at 0.05 and 0.01 level, respectively (one-tailed)

The dependent variable is *UR*, and is the cumulative abnormal return surrounding the earnings announcement date, where the abnormal return is the firm's return less the CRSP value-weighted market return, measured over a three-day window surrounding each earnings announcement. The independent variable definitions are as follows: *UE* is the unexpected quarterly earnings for each announcement date, where expected earnings is based on the median analyst forecast outstanding within 60 days prior to the announcement, scaled by price as the end of the quarter for which earnings are announced; *QTR* is an indicator variable =1 if the earnings announcement belongs to the given quarter following the restatement and zero otherwise, and *NONLINEAR* is equal to $UE * |UE|$ for each announcement date. *CONTROLS* is a vector that consists of five control variables for each observation: *PREDICT* is the average of the absolute values of *UE* over the two-year period prior to the earnings announcement; *PERSIST* is the autoregressive coefficient from Foster's (1977) model estimated over the two-year period prior to the restatement announcement; *MTB* is the market to book value ratio as of the end of the quarter for which the earnings announcement is made; *BETA* is the market-model beta estimated over the year prior to the restatement announcement ending two days prior to the announcement date; *SIZE* is the log of the market value of equity, in millions. OLS coefficient estimates are reported for *UE* and significance levels are reported using White (1980) heteroskedasticity-adjusted standard errors.

TABLE 5
Change in Dispersion of Analyst Forecasts and Cost of Capital Estimates
Before & After a Restatement Announcement

Panel A: Univariate Analysis of Analyst Forecast Dispersion (N=135)^a			
	Before	After	p-value for difference over time
Mean	0.0085	0.0142	0.008 ^{***}
Median	0.0025	0.0034	0.058 ⁺

Panel B: Multivariate Analysis of Analyst Forecast Dispersion (N=270)^b			
$DISP_{it} = \alpha + \beta_1 RESTAT_{it} + \beta_2 LOGTA_{it} + \beta_3 LOSS_{it} + \beta_4 EPSVOL_{it} + \beta_5 RETVOL_{it} + \varepsilon_{it}$			
Independent Variable	Predicted Sign	Coefficient Value	t-statistic
<i>intercept</i>	?	-0.0875	- .85
<i>RESTAT</i>	+	0.1014	2.67 ^{***}
<i>LOGTA</i>	-	0.0022	.20
<i>LOSS</i>	+	0.1693	3.76 ^{***}
<i>EPSVOL</i>	+	0.0375	1.91 ^{**}
<i>RETVOL</i>	+	0.7641	3.72 ^{***}
Adj. R ²	.1192		

Panel C: Cost of Equity Capital Estimates (N=207)^c					
Variable	Mean	Standard Deviation	Q1	Median	Q3
Before Restatement <i>r_e</i>	0.149	0.147	0.079	0.112	0.162
After Restatement <i>r_e</i>	0.185	0.199	0.093	0.129	0.194
Percentage change in <i>r_e</i>	0.925 ^{***}	2.805	-0.057	0.085 ⁺⁺⁺	0.422

** , *** significantly different from zero at 0.05 and 0.01 level, respectively (two-tailed)
+, ++, +++ Non-parametric sign test rejected at 0.10, 0.05, and 0.01 level, respectively

^a Analyst forecast dispersion (*DISP*) is the standard deviation of analyst forecasts outstanding within 60 days prior to or 60 days following the restatement announcement, scaled by stock price. The p-value for test of difference in mean (paired t-test) and difference in median (Wilcoxon sign test) are reported. Analyst forecast dispersion values are winsorized at the 1% level.

^b The sample for the multivariate analysis consists of 270 observations, with two observations for each of 135 firms from the forecast dispersion sample. Variable definitions are as follows: *DISP* is equal to analyst forecast dispersion as defined previously. *RESTAT* is an indicator variable =1 if dispersion is measured during the 60 days following a restatement announcement and =0 if dispersion is measured during the 60 days prior to a restatement announcement. *LOGTA* is the log of total assets at the end of the fiscal year prior to the restatement announcement. *LOSS* is an indicator variable =1 if the firm reported negative annual earnings per share in the year prior to the restatement announcement and =0 if prior year earnings per share were positive. *EPSVOL* is a firm-specific measure of the volatility of earnings per share, measured as the standard deviation of earnings per share over the four years prior to a restatement announcement. *RETVOL* is a firm-specific measure of return volatility, measured as the standard deviation of monthly returns during the year prior to the restatement announcement. Analysts forecast dispersion values are winsorized at the 1% level.

^c *r_e* is the estimated implied cost of equity capital following Gode and Mohanram's (2002) implementation of the Ohlson and Juettner-Nauroth (2004) model. *r_e* calculated before (after) the restatement is estimated using average prices and analyst forecasts outstanding with 60 days prior to (following) the restatement announcement.

TABLE 6
Change in the Information Content of Earnings Surrounding a Restatement
With Uncertainty and Cost of Capital Control Variables

$$UR_{it} = \alpha_1 + \sum_{t=1}^4 \alpha_{2,t} QTR_{it} + \beta_1 UE_{it} + \sum_{t=1}^4 \beta_{2,t} [UE_{it} * QTR_{it}] + \beta_3 NONLINEAR_{it} + \sum_{k=4}^{10} \beta_k CONTROLS_{it} + \sum_{k=11}^{17} \beta_k [UE_{it} * CONTROLS_{it}] + \varepsilon_{it} \quad (6)$$

	Predicted Sign	Equation (6)
<i>UE</i>		
Individual coefficient estimates:		
β_1	+	5.863***
$\beta_{2,1}$	-	-2.040***
$\beta_{2,2}$	-	-0.961
$\beta_{2,3}$	-	-1.255
$\beta_{2,4}$	-	-0.540
Sum of coefficient estimates:		
ERC for quarter before restatement (β_1)	+	5.863***
ERC for quarter 1 ($\beta_1 + \beta_{2,1}$)	+	3.823***,###
ERC for quarter 2 ($\beta_1 + \beta_{2,2}$)	+	4.902***
ERC for quarter 3 ($\beta_1 + \beta_{2,3}$)	+	4.608***
ERC for quarter 4 ($\beta_1 + \beta_{2,4}$)	+	5.323***
Controls included in model?		Yes
Adj. R ²		.0862
Number of observations		878

*** significantly different from zero at 0.01 level (two-tailed)

significantly different from base quarter at 0.01 level (one-tailed)

The dependent variable is *UR*, and is the cumulative abnormal return surrounding the earnings announcement date, where the abnormal return is the firm's return less the CRSP value-weighted market return, measured over a three-day window surrounding each earnings announcement. The independent variable definitions are as follows: *UE* is the unexpected quarterly earnings for each announcement date, where expected earnings is based on the median analyst forecast outstanding 60 days prior to the announcement, scaled by price as the end of the quarter for which earnings are announced; *QTR* is an indicator variable =1 if the earnings announcement belongs to the given quarter following the restatement and zero otherwise, and *NONLINEAR* is equal to $UE * |UE|$ for each announcement date. *CONTROLS_i* is a vector that consists of seven control variables for each observation: *PREDICT* is the average of the absolute values of *UE* over the two-year period prior to the earnings announcement; *PERSIST* is the autoregressive coefficient from Foster's (1977) model estimated over the two-year period prior to the restatement announcement; *MTB* is the market to book value ratio as of the end of the quarter for which the earnings announcement is made; *BETA* is the market-model beta estimated over the year prior to the restatement announcement ending two days prior to the announcement date; *SIZE* is the log of the market value of equity, in millions; *STDRET* is the standard deviation of daily stock returns for 25 trading days prior to the earnings announcement; and *COSTCAP* is the implied cost of equity capital calculated using the methodology of Gode and Mohanram's (2002) implementation of the Ohlson and Juettner-Nauroth (2004) model. OLS coefficient estimates are reported for *UE* and significance levels are reported using White (1980) heteroskedasticity-adjusted standard errors.

TABLE 7
The Information Content of Earnings Following a Restatement
Subsample Analyses

$$UR_{it} = \alpha_1 + \alpha_2 SUB_i + \alpha_3 RESTAT_{it} + \beta_1 UE_{it} + \beta_2 [UE_{it} * RESTAT_{it}] + \beta_3 [SUB_i * RESTAT_{it}] + \beta_4 [UE_{it} * SUB_i * RESTAT_{it}] + \beta_5 NONLINEAR_{it} + \sum_{k=6}^{12} \beta_k CONTROLS_{it} + \sum_{k=13}^{19} \beta_k [UE_{it} * CONTROLS_{it}] + \varepsilon_{it} \quad (7)$$

Panel A: Revenue Restatement Firms

	Predicted Sign	<i>UE</i>
Individual coefficient estimates:		
β_1	+	7.522***
β_2	-	-1.498*
β_4	-	-3.531***
Sum of coefficient estimates:		
ERC for quarter 1 for non-revenue recognition restatement firms ($\beta_1 + \beta_2$)	+	6.024***
ERC for quarter 1 for revenue recognition restatement firms ($\beta_1 + \beta_2 + \beta_4$)	+	2.493*,†††
Adj. R ²		.1116
Number of observations		414

Panel B: High CAR Firms

	Predicted Sign	<i>UE</i>
Individual coefficient estimates:		
β_1	+	6.851***
β_2	-	-2.391***
β_4	-	1.090
Sum of coefficient estimates:		
ERC for quarter 1 for low CAR restatement firms ($\beta_1 + \beta_2$)	+	4.460***
ERC for quarter 1 for high CAR restatement firms ($\beta_1 + \beta_2 + \beta_4$)	+	5.550***
Adj. R ²		.1202
Number of observations		414

*, **, *** significantly different from zero at 0.10, 0.05, and 0.01 level, respectively (two-tailed)

††† significantly different between groups at 0.01 level (one-tailed)

The revenue recognition firms were identified based on the reason for restatement as taken from the firm's restatement announcement press release or from information contained in the restated financial statements. The high CAR firms are those for which the three-day cumulative abnormal return (CAR) surrounding the restatement announcement date is above the median CAR across the entire sample. The low analyst coverage firms are those for which the number of analysts following the firm in the quarter prior to the restatement is below the median for the entire sample. All regression variables are as defined in Table 6. OLS coefficient estimates are reported for *UE* and significance levels are reported using White (1980) heteroskedasticity-adjusted standard errors.

TABLE 8
Regression Results for Incremental Information Content of Accruals
Surrounding a Restatement Announcement

$$UR_{it} = \alpha_1 + \alpha_2 QTR_{it} + \beta_1 UACC_{it} + \beta_2 UCF_{it} + \beta_3 [UACC_{it} * QTR_{it}] + \beta_4 [UCF_{it} * QTR_{it}] + \varepsilon_{it} \quad (8)$$

	Predicted Sign	<i>UACC</i>	<i>UCF</i>
Individual coefficient estimates:			
β_1	-	-0.2935**	
β_2	+		0.4910*
β_3	?	0.1718	
β_4	?		-0.2411
Sum of coefficient estimates:			
Incremental information content of accruals Quarter prior to restatement (β_1)	-	-0.2935**	
Incremental information content of accruals Quarter following restatement ($\beta_1 + \beta_3$)	-	-0.1217	
p-value for difference over time (one-tailed)		.1413	
Adj. R ²		.0242	
Number of observations		382	

*,** significantly different from zero at 0.10 and 0.05 level, respectively (two-tailed)

Total Accruals are measured as the difference between net income before extraordinary items and net cash flow from operations. The regression variables are defined as follows: *UR* is the cumulative abnormal return, where the abnormal return is the firm's return less the CRSP value-weighted market return, measured over the quarter for which earnings are being announced; *UACC* is unexpected quarterly accruals, deflated by price at the end of the quarter for which earnings are being announced, and expected accruals are based on a seasonal random walk; and *UCF* is unexpected cash flows, deflated by price at the end of the quarter for which earnings are being announced, and expected cash flows are based on a seasonal random walk.

TABLE 9
Change in Audit Firm Following a Restatement

Panel A: Number of Firms that Changed Auditors

	<u>Restatement firms</u>	<u>Compustat population</u>
# of firms that changed auditors (1997-2002)	33	934
# of firm-year observations included in the analysis	207	38,430
% of firms that changed auditors (1997-2002)	15.94%	2.43%

Panel B: Date of Auditor Switch Relative to Restatement Announcement

	Quarter 1 following the restatement	Quarter 2 following the restatement	Quarter 3 following the restatement	Quarter 4 following the restatement	Second year following the restatement	Total
# of firms that changed auditors	3	7	7	7	9	33

Audit firm information was collected from Compustat over a two-year window for each observation, where inconsistencies in a firm's auditor from year to year were investigated by matching this information to audit firm changes reported on Form 8-K or from press releases found on Lexis-Nexis (for the restatement sample only). The auditor switch date was collected from either Form 8-K or a press release for the restatement sample.