The Impact of Earnings Quality on Investors' and Analysts' Reactions to Restatement Announcements

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by

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(ABSTRACT)

Despite countless efforts to elucidate market participants' understanding of the implications of earnings quality, empirical accounting research has rendered two distinct perspectives. The first perspective considers market participants naïve users of accounting information who fail to grasp the implications of earnings quality resulting in temporary security mispricing. The second perspective suggests that market participants scrutinize earnings reports carefully and subsequently discern and price the quality of earnings. The purpose of my research is to help clarify the ambiguity surrounding market participants' pricing of earnings quality using one clearly observable indicator of low-quality earnings, accounting restatements.

This study examines the effect pre-restatement earnings quality has on short-window returns and analyst forecast revisions and dispersion following restatement announcements using a cross-section of 719 publicly traded firms that announced restatements between 1997 and 2004. Accrual and book-tax difference metrics are used to proxy for earnings quality. The metrics are examined separately and collectively to ascertain their individual and incremental effects in modeling the market reaction. Further analyses investigate the effects that various levels of investor sophistication have on the market reaction.

Results indicate that the market reaction to restatement announcements is significantly influenced by pre-restatement earnings quality. Specifically, both the accrual and book-tax difference measures of earnings quality are significantly and negatively related to the market reaction. Further analysis indicates the predictive power of the model is improved by including both the accrual and book-tax difference proxies. This finding suggests the information in book-tax differences may provide market participants with signals from which to assess earnings quality that are distinct from those contained in accruals. Basic results for analyst forecast dispersion and revisions are not conclusive. Results of the interactions between each earnings quality proxy and level of investor sophistication are significant only for the accrual based measure of earnings quality. This suggests that sophisticated investors are more attuned to the implication of accrual based measures of earnings quality than book-tax difference measures.

DEDICATION

This dissertation is dedicated to my parents, Raymond and Cecilia Romanus, who instilled in me an unwavering belief that no goal in this life is too great for me to achieve.

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Chapter 1
Introduction and Motivation

Publicly reported accounting data has wide-spread capital market implications for a broad spectrum of users. Misinterpreted or misleading accounting information may instigate inefficient resource allocation, obfuscate the standard setting process, and erode investor confidence (GAO 2002; Schipper & Vincent 2003). Consequently, the quality of reported earnings along with capital market participants' use of the subtle cues communicated by managements' accounting discretion have triggered substantial interest by regulators and accounting researchers, resulting in an emergent body of research that examines the market pricing of earnings quality (e.g. Aboody et al. 2005, Francis et al. 2005, GAO 2002, Sloan 1996, and Xie 2001).

Despite rigorous efforts to elucidate market participants' aptitudes for discerning the intricacies associated with earnings quality, the findings of researchers have resulted in two particularly distinct perspectives (Dechow & Schrand 2004). The first perspective views market participants as naïve users of accounting information who fail to understand the differential persistence in accruals and cash flows resulting in temporary security mispricing (e.g. Sloan 1996, and Xie 2001). [1] Conversely, the second perspective suggests that in the wake of accounting scandals, market participants scrutinize earnings reports carefully and subsequently discern and price the quality of earnings (Baber et al. 2006; Balsam et al. 2002; Francis et al. 2005; Hanlon 2005). The purpose of this research is to help clarify the ambiguity surrounding market participants' pricing of earnings quality using one clearly observable indicator of low-quality earnings, accounting restatements.

[1] Earnings are frequently decomposed into cash flow and accrual components to provide insights into the persistence of each component and thus, earnings quality. Earnings quality is the extent to which current earnings reflect current operating performance, are a good indicator of future operating performance, and useful in assessing firm value (Dechow & Schrand 2004).

Accounting restatements provide a unique and innovative environment for investigating the pricing of earnings quality because they represent relatively direct evidence of low-quality earnings (DeFond and Francis 2005).[2] Additionally, despite heightened awareness of financial reporting quality from regulators, auditors, market participants, and the popular press, the number of restatements escalated to an all time high of 1,876 in 2006 (Reilly 2006 & 2007). Numerous studies have used restatements as an indicator of either low-quality earnings or earnings management (Desai et al. 2006b; Hribar & Jenkins 2004; Kinney et al. 2004; Richardson et al. 2002) and provide clear evidence that firms suffer a substantial loss in market value following restatement announcements (Anderson & Yohn 2002; Dechow et al. 1996; GAO 2002; Palmrose et al. 2004). Despite the severe market repercussions associated with the negative signal communicated via earnings restatements and paradoxical findings regarding the pricing of earnings quality, prior research has not empirically addressed to what extent the quality of pre-restatement earnings affects the market participants' reactions to these subsequent, more demonstrative indicators of low earnings quality. The present research fills this gap by examining the effect pre-restatement earnings quality has on market participants' reactions to the more visible signal of low-quality earnings conveyed by the issuance of a restatement.

Palmrose et al. (hereinafter PRS; 2004) provide evidence that numerous factors are associated with the market reaction to restatement announcements, including fraud, the number and type of account groups affected, and the directionality (income increasing vs. decreasing) of the restatement. My research extends their model to include various proxies for earnings quality. In the framework of the model, and using a cross-section of publicly traded firms that announced restatements between 1997 and 2004, this study examines the effect pre-restatement earnings

[2] Not all restatements are the result of low-quality earnings. Certain restatements such as those involving stock splits, discontinued operations and mergers and acquisitions are not related to the quality of earnings and have been omitted from this study, as detailed in the sample development section.

quality has on short-window returns and analyst forecast revisions and dispersion following restatement announcements. More specifically, my research examines how different proxies for earnings quality influence the investors' and analysts' reactions to restatement announcements and if the different proxies provide supplementary rather than complementary information to market participants. This study also examines the extent to which investor sophistication influences the association between the different earnings quality proxies and the market reaction to restatement announcements.

This research offers three primary contributions. First, this study considers the pricing of earnings quality using a clearly observable indicator of poor earnings quality, accounting restatements. Although some studies provide evidence that a misunderstanding of earnings quality by market participants leads to temporary resource misallocation (Richardson et al. 2005; Sloan 1996; Xie 2001), more recent research suggests this may not be the case. This research provides evidence that market participants use the information contained in specific earnings quality proxies during the valuation process.

Second, this research also provides additional insights into the factors associated with market participants' extremely heterogeneous reactions to financial report restatements. Studies investigating market responses to restatements report reactions that vary from slightly positive returns to negative returns in excess of 20% (Anderson & Yohn 2002; Dechow et al. 1996; Kinney & McDaniel 1989; Palmrose et al. 2004). While the number of restatements has escalated more than ten-fold over the past decade (GAO 2006), few studies have explored the factors that directly contribute to the market reaction. This study uncovers an additional factor that influences investors' reactions to the negative signal communicated by restatements and provides evidence that the factor is more likely to influence sophisticated investors.

Supplementary analyses demonstrate that these relationships are more pronounced in recent years.

The third and final contribution of this research is to provide empirical evidence regarding the supplementary information provided by various earnings quality proxies. Different accounts provide investors with differential information cues regarding firms' quality of earnings. Specifically, research indicates that large book-tax differences may signal auditors that firms have earnings quality issues, thus prompting a more thorough and detailed audit (Hanlon & Krishnan 2005). This study provides evidence that investors may also rely on information provided by multiple earnings quality indicators.

The remainder of this dissertation is organized as follows. The next chapter reviews the restatement and earnings quality literature and develops the associated hypotheses. Chapter Three describes the research design and methodology. Chapter Four presents the analyses and results. Chapter Five concludes with a discussion of contributions and limitations.

Chapter 2
Literature Review and Hypotheses Development

2.1 Restatement Research

Academic research, governmental reports, and the popular press have documented fairly extensively the dramatic increases in the numbers of restatements over the last decade (GAO 2002 & 2006; Huron Consulting 2003 & 2004; Palmrose et al. 2004; Reilly 2007). Restatements are required when previously issued financial reports are later discovered to not be in accordance with Generally Accepted Accounting Principles (GAAP). Although many restatements do not have immediate cash flow implications, they convey important information regarding firms' potential for future earnings and the accuracy and reliability of financial data. As such, they send a potentially negative signal to market participants regarding earnings quality. The effect this signal has on capital markets is substantiated by the strong negative reaction that occurs when companies announce their intention to restate earnings (GAO 2002 & 2006; Palmrose 2004). Despite the severe capital market repercussions associated with the decision to restate earnings, little research has attempted to examine empirically the factors that influence this decline in market capitalization. The recent escalation in the number of restatements, however, has created a heightened interest in both the causes and consequences of restatements.

The negative financial implications of restatements are widely documented. Based on a study of SEC enforcement actions resulting in restatements between 1981 and 1992, Dechow et al. (1996) report an average negative return of 6 percent. [3] In addition to firm specific market reactions, Gleason et al. (2004) note that restatements induce a reduction in share prices of firms in the same industry. Their findings provide some evidence relative to the influence of earnings

[3] See GAO 2002 and 2006 for a comprehensive review of market reaction for years 1997-2005

quality on reactions to restatements, as the most pronounced reactions are associated with firms in the same industry as the restating firm that have low accounting quality. Xu et al. (2006) also report that restatements affect the equity valuations of competing firms. Specifically, they state that firms having cash flow characteristics similar to restating firms experience a negative return of 0.76 percent when the restatement reduces the stock price of the restating firm. The effect on investors' confidence in the rival firms does not appear to be long lasting; however, as the non-restating firms do not experience significant increases in the cost of capital. These findings demonstrate that investors are somewhat adept at identifying certain earnings and/or cash flow characteristics that may be associated with a potential restatement.

In addition to eroding market capitalization, restatement firms are subject to other economic penalties. Firms issuing restatements are also frequently the subject of class action law suits (Jones & Weingram 1997). Palmrose and Scholz (2004) extended this finding by investigating the relationship between restatement characteristics and litigation. They indicate that core restatements and those involving a greater number of accounts (more pervasive) increase both the likelihood of litigation and of plaintiff success. Hribar and Jenkins (2004) determine that restatements are associated with increases in the cost of equity capital, particularly restatements initiated by the auditor or by companies with high leverage. These studies provide support for the view that restatements have economically meaningful implications that go far beyond documented deteriorations in market capitalization.

Studies also investigate the direct consequences imparted on executives of restating firms. Srinivasan (2005) documents that turnover of audit committee directors following restatements is almost 35 percent higher in the three years following a restatement than in years preceding the restatement. He notes that the highest rates of turnover are associated with

income-decreasing non-technical restatements. Desai et al. (2006a) similarly show that turnover of top managers is 25 percent higher in firms issuing restatements than in a matched control sample. The authors also document a deterioration in the future employment prospects of managers displaced from restating firms. Athaud-Day et al. (2006) provide evidence consistent with the above two studies. They find that the chief executive and financial officers of restatement firms were more than twice as likely to either resign or be terminated as the same officers in a matched control sample. Audit committee members of restating firms were more than 70 percent more likely to exit than members of non-restating firms. These studies suggest that there are private penalties in addition the capital market penalties imposed on restating firms.

The recent proliferation in the number of restatements has focused attention on attempting to identify the predictors of restatements in addition to the consequences of restatements. Research involving restatements provides evidence of an association between restatements and future earnings growth, company size, and use of an audit committee (DeFond & Jiambalvo 1991). Abbott et al. (2004) find a negative association between the level of audit committee independence and activity and the incidence of restatements. They also discover that audit committees with at least one financial expert are associated with a lesser incidence of restatements. Richardson et al. (2002) note that firms with incentives to attract lower cost external financing and maintain positive earnings growth are more likely to adopt the aggressive accounting policies that often precede restatements. They also provide evidence that operating and investing accruals may be prime indicators of earnings management.

Although these studies explore a variety of factors associated with restatements, PRS (2004) extend this research and attempt to empirically model the capital market effect of

restatement announcements. PRS examine restatement announcements during the period 1995-1999 and observe significant abnormal negative returns over a two-day window. The severity of these returns, however, varies greatly depending on characteristics of the restatement. For example, restatements associated with management fraud elicit the most severe stock price reactions. Additionally, restatements initiated by the auditor or related to core operating accounts such as revenue also result in substantial negative market reactions.

In a subsequent study examining the market reaction to restatements, Salavei and Moore (2005) classify restatements according to the reason for the restatement. They extend PRS (2004) by examining the market reaction according to nine different categories of restatements including revenue, cost, securities and transaction related. They determine that market reactions differ significantly both by the type of restatement and its magnitude. Specifically, they find that restatements of noisy information items, such as securities and restructurings, increase investors' information sets and therefore result in more negative reactions. Conversely, restatements that are transaction-based increase the noisiness of investors' information sets and do not impact the market reaction as strongly.

While restatement announcements have obvious negative market consequences, there is a limited amount of research investigating what factors lead to the broad variability in returns following the announcement event. Examining the relationship between pre-restatement earnings quality and severity of the market reaction should help clarify and elucidate the substantial heterogeneity in the market response.

2.2 The Market Pricing of Earnings Quality

Evidence is mixed as to the extent to which earnings quality is used by investors and analysts to extract value relevant information. Some research provides evidence that market participants consider larger accruals or book-tax differences to be indicative of poor earnings quality resulting in a contemporaneous reduction in stock prices (Baber et al. 2006; Balsam et al. 2002; Francis et al. 2005; Hanlon 2005). Other research indicates that market participants overprice the discretionary component of income thus temporarily over-inflating stock prices (Bradshaw et al. 2001; Sloan 1996; Subramanyam 1996; Xie 2001). Widely publicized accounting scandals, however, coupled with new regulatory requirements, have resulted in an increased focus on earnings quality issues. Consistent with a heightened emphasis on earnings quality, recent research indicates investors and analysts have become more cognizant of potential earnings management techniques and the subsequent implications for future earnings (Baber et al. 2006; Balsam et al. 2002; Francis et al. 2005; Hanlon 2005). These findings imply market participants may be capable of identifying the earnings quality signals communicated in accrual and tax accounts, which may impact the market reaction to restatement announcements.

2.2.1 Accrual Measures of Earnings Quality

The use of discretionary accruals as a proxy for earnings quality has become commonplace in the extant accounting literature. Various measures of accruals have been utilized and the measures themselves refined and ostensibly improved over time. Francis et al. (2005) provide convincing empirical evidence suggesting investors price accrual quality. Francis et al. note that the debt and equity markets impound information regarding the quality of earnings that is represented by accruals. They find that firms with low accruals quality have

significantly larger earnings-price ratios than other firms in the same industry. Francis et al. also investigate the effect of accruals quality on CAPM betas and discover that higher betas are associated with lower accrual quality indicating that decreased accruals quality increases systematic risk. Francis et al. also examine debt ratings and similarly find accruals quality is negatively associated with the cost of debt. These findings demonstrate that investors extract fundamental valuation information from firm level accruals.

Other studies corroborate these findings, suggesting that investors utilize information concerning the quality of earnings during price formation. For example, Balsam et al. (2002) analyze stock returns over a short window following the release of quarterly financial statements by companies for which there is ex post evidence of earnings management. Firms are identified as engaging in earnings management utilizing two criteria: 1) firms that have just met or beaten earnings expectations, and 2) firms that have a discretionary accrual component that is at least one percent of total assets. They report a negative association between unexpected discretionary accruals and cumulative abnormal returns over a 17-day window following the release of the form 10-Q. This finding suggests that accrual related data sway investors' assessments of information contained in prior earnings releases. Similarly, Baber et al. (2006) examine the influence of the voluntary disclosure of balance sheet and cash flow information on price reactions to earnings announcements. The authors provide evidence that investors discount earnings when contemporaneous supplemental disclosures contain information suggesting earnings have been managed via discretionary accruals. These findings indicate investors impound available information representative of the quality of earnings into security prices in a relatively timely manner.

DeFond and Park (2001) also provide evidence suggesting market participants adjust, at least in part, for earnings quality at the time earnings are announced. DeFond and Park (2001) report that firms announcing positive earnings surprises have lower earnings response coefficients when income-increasing accruals exaggerate the magnitude of the earnings surprises. If, as these studies imply, investors are adjusting for the earnings quality information communicated by accruals, then investors may have already adjusted prices to reflect the quality of earnings prior to the low earnings quality signal communicated by restatement announcements. Therefore, the additional evidence about the insufficiency of earnings quality conveyed by restatement announcements of firms with low-quality earnings will not be as significant for subsequent price formation. This logic leads to the supposition that stock prices of firms with low earnings quality react less significantly to restatement announcements than those with high earnings quality.

2.2.2 Book-tax Measures of Earnings Quality

Recent accounting scandals focused a great deal of attention on earnings quality. One result of this increased focus is the recognition that many prominent failing companies accused of having low-quality earnings have also had sizable book-tax differences (e.g. Enron, Tyco, Xerox). The association between corporate failures and large book-tax differences suggested that book-tax differences can provide information on the quality of earnings.

Initial investigations into the relationship between book-tax differences and earnings quality focused on suspected cases of earnings management. Book-tax differences are considered potentially useful in detecting earnings management because deferred tax expense reflects the tax effects of temporary differences in book and taxable income arising from accruals

for revenue and expense items. To the extent that management manipulates book income via operating accruals, the effects of the manipulation may be reflected in firms' deferred taxes. For example, Phillips et al. (2003) identify instances in which firms are likely to engage in earnings management so as to avoid losses or failure to meet analysts' forecasts. They report evidence that increases in deferred tax expense are associated with instances where firms are attempting to avoid a loss or an earnings decline.

In a similar vein, Phillips et al. (2004) decompose changes in deferred tax assets and liabilities and find that changes in deferred tax liabilities resulting from revenue and expense accruals are related to suspected cases of earnings management. Dhaliwal et al. (2004) show that firms in jeopardy of missing consensus analyst forecasts will lower their projected effective tax rates to reduce their estimated tax expense to meet earnings targets. Badertscher et al. (2006) examine the relationship between deferred tax expense and restatements and observe that deferred tax expense is incrementally useful to abnormal accruals in identifying income increasing restatements. These studies suggest that financial statement information related to taxable income can be useful in distinguishing cases of earnings management, which are frequently associated with low-quality earnings.

In addition to studying the association between book-tax differences and earnings management, researchers examine market participants' use of this information. Lev and Nissim (2004) investigate the extent to which a tax-to-book income ratio is reflected in stock prices. They find that during the period 1973 to 1992, taxable income information is not reflected in contemporaneous stock prices and therefore is not related to subsequent stock returns. In a more recent sample between 1993 and 2000, however, the book-to-tax income ratio is significantly related to contemporaneous stock returns, thereby indicating that market participants have

become increasingly aware of the implications for future earnings communicated in book-tax differences.

Hanlon (2005) also documents that investors incorporate the information in book-tax differences. She reports that investors assess the persistence of earnings for firms with large positive book-tax differences to be lower than firms with small book-tax differences or large negative book-tax differences. Hanlon and Krishnan (2005) subsequently provide evidence that auditors use the information in book-tax differences to assess the risk of earnings management. They show that larger book-tax differences are associated with larger audit fees, more modified audit opinions, and a greater incidence of auditor turnover.

This research provides evidence that investors are capable of discerning the information conveyed in accruals and book-tax differences. As such, signals of low-quality earnings in accruals and book-tax differences should be reflected in stock prices prior to firms announcing restatements. Restatements, to some degree, confirm investors' prior suspicions regarding poor earnings quality. As such, this signal provides investors with less new or surprise information, resulting in a less substantial stock price reaction. This argument leads to the following hypothesis.

> H_1: *Firms with low earnings quality will experience a less severe market reaction to the announcement of a restatement relative to firms with high earnings quality.*

Research also indicates that the information contained in book-tax difference provides information for market participants incremental to that found in accruals. For example, Hanlon (2005) provides evidence that investors more correctly assess the accruals components of earnings when firms have large positive book-tax differences. She concludes that investors

utilize the information in book-tax differences as a "red flag" when interpreting current earnings quality. Hanlon and Krishnan (2005) also demonstrate that book-tax differences provide information to auditors incremental to accruals by associating large book-tax differences with higher audit fees while controlling for working capital and total accruals. If, as these studies suggest, market participants use book-tax differences in conjunction with accruals to assess earnings quality, then the market reaction to restatement announcements should vary as a function of each of these earnings quality measures, resulting in the following hypothesis:

> H_2: *The information in book-tax differences is incrementally useful relative to accruals in determining the market reaction to restatement announcements.*

2.3 Institutional Ownership

A consistent theme found in the accounting literature is the assumption that investors vary with degree of sophistication. More sophisticated investors are more adept at accumulating and evaluating public information while less sophisticated investors are not as skillful at performing in depth financial statement analyses and rely on other information sources such as the financial press (Bartov et al. 2000). Research suggests that investor sophistication is an important determinant in the earnings-returns relationship. Walther (1997) shows that excess returns are associated with increased weights placed on analyst forecasts of firms with high institutional holdings and Bartov et al. (2000) detect a negative association between investor sophistication and post-earnings abnormal returns.[4] These studies indicate that heterogeneity among investors may impact their abilities to extract value relevant information from the accrual and cash flow components of earnings.

[4] Institutional holdings are a commonly used proxy for investor sophistication.

Recent evidence suggests that sophisticated investors may give additional credence to information related to earnings quality. Balsam et al. (2002) examine returns around 10-Q filing dates. Often the detailed information contained in the Form 10-Q is not available when firms announce quarterly earnings. As such, investors are not able to ascertain the discretionary and non-discretionary accrual components of earnings until the 10-Q is filed with the SEC. Balsam et al. discover a negative relationship between the level of unexpected discretionary accruals and cumulative abnormal returns (CAR) around the 10-Q filing date. The timing of this relationship, however, is dependent on the level of institutional ownership, their proxy for investor sophistication. Firms with low institutional holdings have CAR following the filing of the 10-Q, but firms with high institutional ownership exhibit CAR over a period ending two days prior to the 10-Q release; this finding suggests that sophisticated investors incorporate earnings quality information more efficiently.

Additional research findings maintain the supposition that institutional investors are more adept at evaluating accounting information than individual investors. Jiambalvo et al. (2002) demonstrate that firms with higher levels of institutional ownership impound more future earnings information into stock prices than firms with low institutional holdings. Collins et al. (2003) provide evidence that firms with high levels of institutional ownership price the accrual component of earnings significantly more accurately than firms with low institutional ownership. Ke and Petroni (2004) examine institutional investors' abilities to predict a break in strings of consecutive quarterly earnings increases. Breaks in earnings increases are associated with stock price declines at the break announcement date. They show that, in the quarter preceding the

break, transient institutional investors predict the impending break and sell their interests prior to the subsequent price decline, thereby avoiding losses in the range of 5% to 15%.[5]

Griffin (2003) examines the decisions made by short sellers and institutional holders around the announcements of corrective disclosures that gave rise to class action law suits. He reports evidence that both short sellers and institutional investors trade in a manner consistent with the impending corrective disclosure. Short interests increase and institutional holdings decrease in the months preceding the disclosures thereby signifying that the sophistication of these market participants exceeds that of average investors. Two subsequent studies also provide evidence that short sellers realize the implications of events associated with poor earnings quality. Efendi et al. (2005) and Desai et al. (2006b) provide evidence that short sellers increase their positions in companies that issue restatements in the months leading up to the restatement announcement. Desai et al. find that the increase in short interest is greater for firms with high levels of accruals, which is consistent with sophisticated investors using the earnings quality information conveyed in accruals to identify the potential for an impending restatement.

Taken together, these studies suggest that investors of differing sophistication have an enhanced ability to infer or detect information associated with poor earnings quality characterized by excessive accruals or restatements. While investors in general may be able to use the information contained in accruals and book-tax differences to more accurately price earnings quality prior to restatement announcements, this relationship is expected to be stronger for the subset of sophisticated investors. Consistent with prior literature, the level of institutional ownership is used as a proxy for investor sophistication resulting in the following hypothesis:

[5] Classifying investors based on level of institutional ownership is one method of extracting investor sophistication. Many studies further decompose institutional investors into categories based on various aspects of their trading behavior. For further information on this decomposition, see Bushee (1998 and 2001).

H_3: The relationship between earnings quality and the market reaction to restatement announcements will be stronger for firms with high levels of institutional ownership relative to firms with low levels of institutional ownership.

2.4 Analyst Forecast Accuracy and Dispersion

Financial analysts play a prominent role as information intermediaries in the U.S. financial market (Schipper 1991). Analysts' abilities to incorporate earnings quality information into future earnings forecasts can significantly impact securities price formation (Elgers et al. 2003). Research findings to date regarding analysts' interpretation of earnings quality indicators are varied (e.g. Bradshaw et al. 2001, Burgstahler & Eames 2003, and Elgers et al. 2003). Extending this body of knowledge necessitates a more thorough and inventive exploration of analysts' uses of earnings quality data. Moreover, research indicating restatements increase the demand for analyst forecast information accentuates the importance of investigating analysts' reaction to restatement announcements (Barniv & Cao 2006).

Analogous to research investigating investors' pricing of earnings quality, numerous studies examine analysts' utilization of accruals and other earnings quality data. Bradshaw et al. (2001) evaluate the relationship between current period working capital accruals and analysts' forecast errors and report that analysts' over-optimism is significantly greater for high accrual firms. Teoh and Wong (2002) report that analysts' forecasting errors are predicted by firms' accrual levels. Ahmed et al. (2005) provide evidence that analysts' forecasts fail to correctly reflect the persistence variability associated with discretionary versus non-discretionary accruals. These studies indicate that analysts may lack a thorough understanding of the implications of accruals for earnings persistence.

Further research, however, indicates that analysts' forecasting models at least partially reflect the differential persistence of accruals. Ettredge et al. (1995) find that analyst forecast

revisions around over-inflated earnings announcements partially adjust for the overstated earnings. Elgers et al. (2003) present evidence that analysts' forecasts explain no more than 40% of the market's suspected underestimation of the transitory nature of accruals, indicating that analysts' forecasts reflect information about earnings persistence more correctly than investors at large. Burgstahler and Eames (2003) investigate analysts' identification of potential instances of earnings management and the effects on their subsequent forecasts. They report that analysts foresee earnings manipulation to avoid earnings decreases and losses. Their findings also show, however, that analysts are not capable of discerning all cases of earnings management.

Conflicting findings regarding analysts' incorporation of accruals and earnings management into their future earnings forecasts suggest that analysts' pricing of earnings quality continues to be an unresolved empirical question. Nonetheless, recent studies provide ample evidence that analysts comprehend the implications of earnings quality for earnings persistence. If analysts' future earnings forecasts reflect the earnings quality associated with past earnings, then restatements of past low-quality earnings should introduce less uncertainty into analysts' forecasts. Restatement announcements are not as likely to cast as much doubt on the future earnings of firms with past low-quality earnings as they will for firms that have had a history of high earnings quality. Consequently, I expect analysts' forecast revisions following restatements to be less severe for restating firms with low earnings quality, leading to the following hypothesis:

> H_4: *The magnitude of analyst forecast revisions following restatement announcements is positively related to earnings quality.*

Using similar logic, the information conveyed by restatement announcements for firms with low-quality earnings provides less new information to analysts, thereby introducing less

uncertainty for future earnings. This reduced uncertainty should lead to less (greater) analyst forecast dispersion following restatement announcements of firms with low (high) earnings quality. This rationale leads to the final hypothesis:

> H_5: *The change in analyst forecast dispersion following restatement announcements is positively related to earnings quality.*

Chapter 3
Research Design and Methodology

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3.1 Variable Development

Research by Palmrose, Richardson and Scholz (hereinafter PRS; Palmrose et al. 2004) provides the basic foundation for the model to test the five hypotheses. The model relates various characteristics of restatements and restating firms to the cumulative abnormal returns on the day of and the day preceding a restatement announcement. Their model consists of nine variables, all of which are used as control variables in the model for the five hypotheses. The PRS model is enhanced by additional variables taken from related literature, most notably the earnings quality proxy. In addition to the earnings quality proxy, two additional control variables are added to the PRS model. These variables, as well as the dependent variables, are developed in the following sections.

3.2 Control Variables

3.2.1 Information about management

The first set of variables developed by PRS (2004) provides information as to managements' competence and integrity. Fundamental characteristics of the restatement may reduce investors' confidence in management decisions thereby increasing uncertainty regarding the company's future prospects and profitability. Restatements resulting from fraud are one primary indicator that management may lack integrity. These restatements are expected to be associated with more negative reactions because they indicate management may have intentionally misrepresented the financial performance of the company and may also be making

decisions that fail to optimize company performance (Palmrose et al. 2004). Additionally, restatements resulting from fraud are often the subject of costly litigation and regulatory actions that impact future profitability (Palmrose & Scholz 2004). Restatements associated with fraud were identified by the issuance of an SEC Accounting and Auditing Enforcement Release (AAER). *FRAUD* is an indicator variable equal to 1 in instances where the restating firm was subject to an AAER and 0 otherwise.

In addition to fraudulent financial reporting, PRS (2004) include a second variable associated with management competence and integrity. Restatement attribution (*ATTRIB)* designates the party that identified the need for restatement. In many instances (68 percent in the PRS sample), the restating firm provides relatively clear attribution in the restatement press release. For example, Appendix 4 includes an illustration of a restatement announcement in which the restatement is identified as being the result of an SEC probe. In addition to the SEC, the external auditor is another outside party that may identify the need for restatement. Restatements attributed to outside parties indicate the failure of management and internal monitoring functions to identify and correct material misstatements. As such, they are expected to introduce a greater amount of uncertainty about the reliability of financial information and be associated with more negative market reactions.

Although the announcement of a restatement is considered unfavorable, instances where the firm identified the need for restatement may provide a heightened level of assurance vis-à-vis the ability of management and other parties involved in internal oversight to identify and correct potential misstatements (Palmrose et al. 2004). Furthermore, management's identification and admission of a material misstatement provides greater confidence in their integrity and

credibility. Restatements attributed to management are therefore expected to be positively associated with market reactions to the restatement announcements.

Attribution (*ATTRIB*) is captured as a series of indicator variables, one for each attributing party, management, SEC and external auditor. Restatement announcements with no attribution serve as a no-information baseline. In some cases, the restatement announcement attributes the restatement to multiple parties such as both management and the external auditor. These instances were appropriately categorized and are discussed as part of the univariate analyses.

3.2.2 Information about restatement materiality

The PRS (2004) model also includes variables associated with the aspects of the material impact of the restatement. Restatements affecting core (*CORE*) accounts such as revenue, cost of goods sold, and operating expenses are expected to be associated with a more negative market reaction because they represent changes in on-going operating income. This is consistent with research that shows that surprises in operating income elicit more severe market reactions than income surprises that are transitory in nature (Elliot & Hanna 1996; Strong & Meyer 1987). Additionally, Palmrose and Scholz (2004) report that core account restatements are positively associated with shareholder litigation, which may negatively impact firms' future profitability. *CORE* is an indicator variable equal to 1 if the restatement affected one or more core account groups and 0 otherwise.[6] A detailed breakdown of the account groups classified as core and non-core is included in Appendix 1.

[6] Restatements are classified as core in instances where the restatement affected both core and non-core account groups simultaneously.

The materiality variable (*MAT*) represents the impact of the restatement on net income. Materiality captures both the size of the restatement and its directional impact on net income. Feroz et al. (1991) find that the magnitude of disputed earnings in SEC Accounting and Auditing Enforcement Releases is significantly correlated with the market return following AAER disclosure. Similarly, PRS (2004) indicate that magnitude and directionality of the restatements' net income effects are significantly positively related to the market reaction surrounding the announcement date. Following PRS, materiality (*MAT*) is computed by subtracting restated net income from original income over all restated periods and scaling the difference by total assets.

In addition to the type of account groups affected and the material impact of the restatement, the number of account groups affected may also influence the market reaction. Restatements that affect larger numbers of account groups indicate greater weaknesses in internal control and may diminish investors' confidence in both management and the reliability of financial data. Therefore, the pervasiveness of the restatement is expected to be negatively related to the market reaction. Following PRS (2004), the pervasiveness (*PERVAS*) of the restatement is defined as the number of general account groups affected by the restatement. Broad classifications of general account groups are used due to the variability in accounts across firms. The seven account classifications taken from Palmrose and Scholz (2004) are displayed in Appendix 1.

Restatements can involve a single quarter, multiple quarters, a year, or multiple years. The persistence of the misstatement provides information about the competence of management and the reliability of the firm's internal control structure. If a misstatement is identified after a short period of time, such as one or two quarters, it is likely to reflect less negatively on the firm than misstatements that go undetected for a year or more. As such, the persistence of the

restatement (*YEARS*) is expected to be negatively related to the market reaction. Persistence is measured as the number of periods impacted by the restatement, where a quarter is equal to 0.25.

3.2.3 Additional control variables

The PRS (2004) model includes three variables that control for company specific characteristics of the restating firms. An interaction term between firm size, measured as the natural log of the book value of total assets at yearend in the period prior to restatement, and the materiality variable (*SIZEMAT*) is used to control for variations in the relative size of the restating firm. Prior research suggests the market reaction to earnings surprises is magnified for smaller firms and attenuated for larger firms (Collins et al. 1987). Furthermore, larger firms may have more pre-disclosure information or be subject to greater analyst following, resulting in an attenuated market reaction surrounding the restatement announcement date (El-Gazzar 1998; O'Brien & Bhushan 1990). Consistent with PRS (2004) *SIZEMAT* is expected to be negatively related to the market reaction.

Research also indicates that market reactions differ across debt levels (Billings 1999; Core & Schrand 1999). An interaction term between the ratio of long term debt to total assets and the materiality measure (*LEVMAT*) is used to control for variations in debt levels across the restating firms. Long term debt and total assets are measured at year-end in the period prior to the earliest restated period. *LEVMAT* is expected to be negatively related to the market reaction to restatement announcements.

The final control variable in the PRS (2004) model captures the returns of the restating firm in the 120 day period preceding the restatement announcement (*PRIORRET)*. Buy and hold returns prior to the restatement announcement (days -1 to -120) are generally associated with

anticipation of the restatement. The notion that information concerning the potential restatement is uncovered by investors prior to the restatement announcement date is partially supported by the prior return in the PRS study. PRS find an average negative return of 15 percent in the 120 days preceding the restatement announcement. Other researchers, however, have indicated that the consistent decline in returns prior to many restatements may actually trigger more thorough investigations by external auditors that ultimately result in the restatement (Kinney & McDaniel 1989).

I enhance the PRS (2004) model with two additional control variables. An indicator variable (*BIGN*) is set equal to 1 if the firm engaged a Big N auditor in the year(s) of restatement and 0 otherwise. This variable is included to control for variations in audit quality between big N and non-big N firms (Francis et al. 1999**).** In addition, Lazer et al. (2004) report a higher incidence and magnitude of quarterly restatements for firms that switched auditors as compared to those that did not. The authors contend that these restatements are a function of the incoming auditor attempting to the manage litigation associated with the new client. If restatements following auditor changes are the result of audit firms' attempts to manage litigation risk, then the signal conveyed to the market by the restatement announcement may not be considered as indicative of low-quality earnings. Therefore, an indicator variable (*AUDCHNG*) equal to 1 if the firm changed auditors in the year of the restatement announcement and 0 otherwise is also included in the model.

3.3 Model

The PRS (2004) model combined with earnings quality (*EQ)* and the two additional

control variables (*BIGN* and *AUDCHNG*) is represented by the following regression equation:

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE \quad (1)$$

Where:

$$CAR_i = \sum_{t=0}^{t=1} (DAILYRET_i - INDRET) \quad (2)$$

DAILYRET	=	Daily Return for company *i* for days 0 and +1;
INDRET	=	CRSP Market Index Return
FRAUD	=	Indicator variable 1 for fraud 0 for no fraud (determined by the company disclosure of fraud or irregularity or an issuance of an SEC Accounting and Auditing Enforcement Release)
ATTRIB	=	Series of three indicator variables where 1 equals auditor, management or SEC attribution and 0 indicates either no or other attribution. The three attribution indicator variables are: Attribution Auditor, Attribution Management and Attribution SEC.
CORE	=	Indicator variable 0 for restatements not involving core accounts, 1 for restatements involving core accounts (revenue, cost of sales and on-going operating expenses)
MAT	=	Originally reported income less restated income for all years summed over all restatement periods and scaled by total assets in the year immediately prior to the restatement
PERVAS	=	Pervasiveness as the number of account groups from 1 to 7 that represent the focus of the restatement. Account group descriptions are presented in Appendix 5.
YEARS	=	Persistence of restatement defined as the number of years the financial statements were restated (a restated quarter equals .25)
SIZEMAT	=	Interaction between firm size [natural log of the book value of total assets reported the last fiscal year end prior to restatement (SIZE)] and the earnings change measure (MAT)
LEVMAT	=	Interaction between ratio of long term debt to total assets (based on book values at fiscal year end prior to restatement) and the earnings change measure (MAT)
PRIORRET	=	Buy and hold returns over the last 120 days prior to the restatement announcement (day –120 to day –1).
BIGN	=	Indicator variable equal to 1 if firm engaged a Big N auditor in year or quarter of restatement; 0 otherwise
AUDCHNG	=	Indicator variable equal to 1 if firm changed auditors in the year of the restatement announcement; 0 otherwise
EQ	=	Dechow and Dichev (2002) modified accruals quality (*DDEQ)* or book-tax difference (*BTDEQ)* (Hanlon 2005) proxy for earnings quality
INST	=	Percentage of institutional ownership during the period immediately preceding the restatement announcement as found in the CDA Spectrum Institutional Holding Database
*EQ*INST*	=	Interaction term between earnings quality and institutional ownership.

For primary tests of hypotheses 1 through 3, cumulative abnormal returns are measured on days 0 and 1 where day 0 is the day of the restatement announcement. Sensitivity tests capture additional return windows varying from day -1 to day +3. The results of these tests are included in section 4.3.

Hypotheses 4 and 5 examine the effects of the preceding model on both analyst forecast revisions and dispersion. Consistent with Lacina and Karim (2004), *analyst forecast revision* is measured as follows:

$$FREV_{ij} = \frac{AF_{j,s+1} - AF_{j,s-1}}{P_{i,s-1}} \tag{3}$$

where *j* represents the individual restatement announcement to which the analysts respond, *s* is the month during which the initial restatement announcement is made, *s*-1 and *s*+1 are the quarters immediately preceding and following the restatement announcement, *P* is the I/B/E/S stock price, and *AF* is the consensus analyst forecast.

Analyst forecast dispersion is measured following Lang and Lundholm (1996):

$$\sigma_{Frcst} = \left\{ \left[\sum_{k=1}^{K} \left(Frcst_k - \overline{Frcst} \right)^2 \right]^{1/2} \right\} / P_{i,s-1} \tag{4}$$

where $Frcst_k$ is the *k*'th analyst forecast, *P* is the I/B/E/S stock price and *s* is the month during which the initial restatement announcement is made. Analyst forecast dispersion following the restatement announcement will be compared with analyst forecast dispersion in the period preceding the restatement announcement to ascertain the dispersion change.

The research model and three dependent variables provide a foundation to test the five hypotheses. The independent variable development follows.

3.4 Independent Variable Development

3.4.1 Accrual measure of earnings quality

Consistent with Francis et al. (2005) a measure of accruals quality developed by Dechow and Dichev (2002) (hereinafter DD) is utilized. Accruals quality in the DD model is measured by the extent to which working capital accruals map into operating cash flow realizations in the prior, current, and future period. The DD model captures both intentional estimation errors arising from earning manipulations and unintentional accrual estimation errors resulting from uncertainty in the operating environment. Francis et al. enhance the reliability of the DD model by adding accrual proxies from the modified Jones model (Dechow et al. 1995; Jones 1991). This adaptation results in the following accruals model, which estimates the proxy for earnings quality:

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \phi_{0,j} + \phi_{1,j}\frac{CFO_{j,t-1}}{Assets_{j,t}} + \phi_{2,j}\frac{CFO_{j,t}}{Assets_{j,t}} + \phi_{3,j}\frac{CFO_{j,t+1}}{Assets_{j,t}} + \phi_{4,j}\frac{\Delta \mathrm{Re}v_{j,t}}{Assets_{j,t}} + \phi_{5,j}\frac{PPE_{j,t}}{Assets_{j,t}} + \nu_{j,t} \quad (5)$$

where:

t	=	Year prior to latest year or quarter restated
j	=	Firm
$TCA_{j,t}$	=	Firm j's total current accruals for year t ($\Delta CA_{j,t}$ - $\Delta CL_{,j,t,}$ - $\Delta Cash_{j,t}$+ $\Delta STDEBT_{j,t}$)
$Assets_{j,t}$	=	Firm j's average total assets (Compustat #6) for year t and t-1
$CFO_{j,t}$	=	Firm j's cash flow from operations for year t; Net income before extraordinary items (Compustat #18) less total accruals (where $TA_{j,t} = \Delta CA_{j,t}$ - $\Delta CL_{j,t}$ - $\Delta Cash_{j,t}$ + $\Delta STDEBT_{j,t} - DEPN_{j,t}$)
$DEPN_{j,t}$	=	Firm j's depreciation and amortization expense (Compustat #14) for year t
$\Delta CA_{j,t}$	=	Firm j's change in current assets (Compustat #4) from year t-1 to year t
$\Delta CL_{j,t}$	=	Firm j's change in current liabilities (Compustat #5) from year t-1 to year t
$\Delta Cash_{j,t}$	=	Firm j's change in cash (Compustat #1) from year t-1 to year t
$\Delta STDEBT_{j,t}$	=	Firm j's change in short term debt (Compustat #34) from year t-1 to year t
$\Delta Rev_{j,t}$	=	Firm j's change in revenue (Compustat #12) between year t-1 and year t
$PPE_{j,t}$	=	Firm j's gross value of PPE (Compustat #7) in year t.

These estimations produce firm and year specific residuals that form the basis of the first earnings quality metric: $DDEQ = \sigma(\hat{\nu}_{j,t-1})$. The metric is equal to the rolling five-year standard deviation of firm j's (calculated over the years *t* - 4 through *t*) estimated residuals with larger standard deviations indicating lower earnings quality.[7] Equation (5) is estimated for each year for each one of the nine industry groups described in Palmrose et al. (2004) for which there are at least 20 observations. This metric is hereinafter identified as *PRS-DDEQ*. The industry groups and associated SIC codes are listed in Appendix 2. Equation (5) is also calculated using a modified version of the Fama and French 30(+3) industry classifications (Edelen & Kadlec 2005).[8] This metric is hereinafter identified as *FF-DDEQ*. The industry groups and associated SIC codes are listed in Appendix 3.[9] Consistent with prior research, the extreme values of the distribution are winsorized to the 1 and 99 percentiles (Francis et al. 2005).

Interpretation of the regression coefficient on earnings quality is intuitively complicated by the fact that there is an inverse relationship between the *DDEQ* statistic and earnings quality (i.e., greater standard deviations equal worse earnings quality). For this reason, all values of both *PRS-DDEQ* and *FF-DDEQ* have been multiplied by negative one (-1). This transformation allows a more direct intuitive interpretation of the results in that larger values (less negative) of both *DDEQ* estimates are associated with better earnings quality.

[7] The five years of data and the lead lag terms in equation (5) resulted in 109 firms with less than seven years of data being eliminated from the sample. This reduction is not dissimilar from other earnings quality studies (Ecker et al. 2005)

[8] The residuals in the earnings quality metric are calculated by industry grouping and therefore more appropriately calculated using a broader industry classification system (Ecker et al. 2005). The requirement that at least 20 observations for each industry grouping be used to estimate equation (5) resulted in 107 firms being eliminated from the sample.

[9] Seventeen of the initial 33 industry classifications are represented in the final sample. A detailed listing of restatement announcement by industry classification is presented in Table 2 in Chapter 4.

3.4.2 Book-tax difference measure of earnings quality

Following Hanlon et al. (2005) financial statement data are used to calculate the total book-tax differences (BTD). Taxable income is estimated by grossing up firms' current tax expense by the statutory tax rate and then subtracting from the result the change in firms' net operating loss. Estimated taxable income is then subtracted from firms' reported income before taxes (Compustat #170). The log of the absolute value of the total book-tax difference is used because both large positive and large negative book-tax difference provide indications of low earnings quality (Hanlon & Krishnan 2005). As with the *DDEQ* variable, because larger values of book-tax differences are associated with worse earnings quality, the measure is multiplied by negative one (-1). Therefore, larger values of book-tax differences are associated with better earnings quality. This measure of book-tax differences (*BTDEQ*) is used individually to test hypothesis one, three, four and five. It is also used simultaneously with both estimations of the *DDEQ* metric to test hypothesis two.

3.4.3 Institutional ownership

To investigate the impact of investor sophistication on the market reaction to statement announcements conditional on earnings quality (Hypothesis 3), the proxy for sophistication, institutional ownership (*INST)*, is interacted with each proxy for earnings quality (*DDEQ* and *BTDEQ*). Institutional ownership is measured using data provided in the CDA/Spectrum Institutional (13f) Holdings database that reports the percentage of outstanding shares owned by institutions and corporate owners. Institutional ownership is measured continuously as the percentage of institutional ownership in the period immediately preceding the restatement announcement.

3.5 Sample and Data

The sample consists of companies announcing restatements between January 1, 1997 and December 31, 2004. These sample firms were obtained from the GAO database and from searches on the Lexis-Nexis News Library. The GAO (2002) database contains a list of all companies announcing restatements between January 1, 1997 and June 30, 2002. To locate firms that announced restatements after June 30, 2002, I performed key word searches (e.g. adjust, error, misstate, restate, revise) in the Lexis-Nexis News Library.

There were 1,368 restatement announcements identified during the sample window. This number included certain firms that announced restatements more than once in a six month period. In instances where firms issued more than one restatement within a six month period, all but the earliest announcement was dropped from the sample. These *duplicate* announcements reduced the sample by 30 firms. Also included in the remaining 1,338 firms were firms that announced restatements for technical reasons such as discontinued operations, mergers and acquisitions, and changes in GAAP. These 213 firms were also eliminated from the sample to ensure the sample contained only announcements of *misstatements.* The sample was further reduced by 74 firms that did not ultimately issue a restatement. Finally, 332 firms were eliminated due to missing data items. This reduction resulted primarily from the number of years of data required to calculate the DD measure of earnings quality. This resulted in a final sample of 719 restatement announcements. The breakdown of sample attrition is presented in Table 1.

Table 1
Sample Attrition

Announcements of all potential restatements[a]	1368
Duplicate restatement announcements[b]	(30)
Restatements for technical reasons not amounting to misstatements[c]	(213)
Announcements that did not result in actual restatements[d]	(74)
Restatements eliminated by missing data[e]	(332)
Restatements included in analysis	719

[a]Number of initial restatement announcement identified through key word searches on Lexis Nexis (July 2002 - December 2004) and the GAO database (January 1997 - June 2002).
[b]Firms that announced a restatement within a six month period of a prior announcement were eliminated from the sample if the restated periods were the same as in the original announcement.
[c]Restatements for technical reasons such as change in accounting policy, discontinued operations, mergers/acquisitions and stock splits were eliminated because they are not properly classified as misstatements.
[d]Announcements of potential restatements later determined to be unnecessary.
[e]Restatements with missing data items are those primarily missing CRSP returns and the seven years of data required to compute Dechow & Dichev (2002) earnings quality metric. Additionally, earnings quality metrics could not be calculated for certain industry groupings due to the number of observations required per industry. Ecker et al. (2005, p. 6-9) discuss the severe data constraints that may result in survivorship bias associated with estimating earnings quality

Additional information was taken directly from the restatement announcement. An example of a restatement announcement is included in Appendix 4. If more than one news agency covered the announcement, the announcement containing the largest amount of information was used.[10] The restatement announcement generally contains information indicating to whom the restatement is attributed (*ATTRIB*), the total impact on net income, the fiscal period(s) affected (*YEARS)*, the account groups impacted and/or the reason for the restatement (i.e. revenue recognition timing)(*CORE, PERVAS*). These details, among others, are captured to develop variables for Equation 1.

[10] LexisNexis Academic contains reports from multiple national news outlets such as The Associated Press, The Wall Street Journal, and The New York Times. Restatement announcements are often reported by multiple news outlets.

Hand collected data items not found in the restatement announcement were taken from a combination of 10-K, 10-Q and 8-K reports filed with the SEC <http://www.sec.gov>. Additional data were collected electronically from COMPUSTAT, CRSP, I/B/E/S, and Thomson Financial (13F) Filings.

Chapter 4
Analysis of Results

4.1 Descriptive Statistics

4.1.1 Distribution of restatements by time and industry

Table 2 presents a breakdown of the restatement announcements by each of the 17 industry classifications represented in the final sample of 719. The table further classifies each announcement by the quarter in which the restatement was announced. The table indicates the largest percentage of announcements occurred during the first quarter (31 percent). This suggests the importance of year-end procedures and/or the external audit in identifying potential misstatements. Of the 224 restatements announced during the first calendar quarter, 20 percent were attributed to the auditor. Although this percentage is higher than any other quarter (Quarter 3 being the next highest with 18 percent auditor attributed restatement announcements), the difference is not statistically significant.

Table 3 presents a similar breakdown by industry and by year of announcement. Consistent with increases noted in other studies (GAO 2002 & 2006; Huron Consulting 2003 & 2004; Palmrose et al. 2004), the sample increases, although not consistently, across years with the largest number of announcements in 2004. Although over 50 percent of restatement announcements are clustered in the business and services industry grouping, the distribution of restatements across both calendar quarters and years is independent of industry (χ^2 statistics = 8.29 and 15.52 respectively). This suggests market anticipation of announcements due to industry clustering is not likely to be an important factor in the observed market reactions.

Table 2
Distribution of Restatement Sample by Industry and Announcement Quarter

Industry[a]	Announcement Quarter								Total	
	1		2		3		4			
Food Products	5	1%	2	<1%	5	1%	1	<1%	13	2%
Recreation	2	<1%	4	1%	7	1%	2	<1%	15	2%
Printing and Publishing	0	<1%	1	<1%	2	<1%	1	<1%	4	1%
Consumer Goods	3	<1%	2	<1%	1	<1%	2	<1%	8	1%
Apparel	3	<1%	1	<1%	1	<1%	2	<1%	7	1%
Healthcare & Medical Products	15	2%	11	2%	15	2%	17	2%	58	8%
Construction & Materials	1	<1%	0	0%	2	<1%	1	<1%	4	1%
Steel Works	2	<1%	1	<1%	1	<1%	1	<1%	5	1%
Fabricated Products & Machinery	10	1%	5	1%	6	1%	11	2%	32	4%
Electrical Equipment	1	<1%	0	0%	3	<1%	0	0%	4	1%
Automobiles & Trucks	0	0%	2	<1%	2	<1%	2	<1%	6	1%
Petroleum & Natural Gas	10	1%	5	1%	5	1%	4	1%	24	3%
Utilities	8	1%	3	<1%	4	1%	6	1%	21	3%
Communications	12	2%	7	1%	6	1%	7	1%	32	4%
Personal & Business Services	116	16%	67	9%	94	13%	99	14%	376	52%
Business Equipment	3	<1%	0	0%	1	<1%	2	<1%	6	1%
Computer Software	33	5%	21	3%	25	3%	25	3%	104	14%
Total	224	31%	132	19%	180	25%	183	25%	719	100%

[a]Industries are defined SIC code based on a *modified* version of Fama and French's classification for 30 industries. Detailed SIC code classifications are included in Appendix 3.

4.1.2 Calculation and description of abnormal returns

Following PRS (2004), a market-adjusted model based on an equally weighted index (with dividends) was used to estimate abnormal returns. This model subtracts the CRSP market index return from a firm's daily return to obtain the market-adjusted abnormal return for each day and firm. The daily abnormal returns are summed over different event windows, days (0, 1), (-1, 0, 1), (-1, 0, 1, 2) and (-1, 0, 1, 2, 3), to calculate the cumulative abnormal returns (CAR) for a given time period.

Table 3
Distribution of Restatement Sample by Industry and Announcement Year

Industry[a]	Announcement Year														Total	
	1997		1998		1999		2000		2001		2002		2003		2004			
Food Products	0	0%	0	0%	1	<1%	3	<1%	5	1%	2	<1%	1	<1%	1	<1%	13	2%
Recreation	0	0%	3	<1%	1	<1%	1	<1%	3	<1%	1	<1%	2	<1%	4	1%	15	2%
Printing and Publishing	1	<1%	0	0%	1	<1%	0	0%	0	0%	1	<1%	1	<1%	0	0%	4	1%
Consumer Goods	2	<1%	1	<1%	1	<1%	0	0%	2	<1%	1	<1%	1	<1%	0	0%	8	1%
Apparel	0	0%	1	<1%	0	0%	1	<1%	2	<1%	1	<1%	1	<1%	1	<1%	7	1%
Healthcare & Medical Products	3	<1%	5	<1%	5	<1%	7	1%	6	1%	10	1%	8	1%	14	2%	58	8%
Construction & Materials	0	0%	0	0%	0	0%	2	<1%	2	<1%	0	0%	0	0%	0	0%	4	1%
Steel Works	1	<1%	0	0%	0	0%	0	0%	2	<1%	0	0%	0	0%	2	<1%	5	1%
Fabricated Products & Machinery	1	<1%	0	0%	2	<1%	3	<1%	8	1%	7	1%	3	<1%	8	1%	32	4%
Electrical Equipment	0	0%	0	0%	0	0%	2	<1%	0	0%	0	0%	1	<1%	1	<1%	4	1%
Automobiles & Trucks	1	<1%	0	0%	0	0%	1	<1%	2	<1%	0	0%	1	<1%	1	<1%	6	1%
Petroleum & Natural Gas	1	<1%	0	0%	1	<1%	1	<1%	3	<1%	6	1%	3	<1%	9	1%	24	3%
Utilities	0	0%	0	0%	2	<1%	1	<1%	2	<1%	9	1%	3	<1%	4	1%	21	3%
Communications	4	<1%	1	<1%	2	<1%	4	<1%	2	<1%	5	1%	7	1%	7	1%	32	4%
Personal & Business Services	18	3%	19	3%	31	4%	63	9%	49	7%	60	8%	67	9%	69	10%	376	52%
Business Equipment	1	<1%	0	0%	0	0%	2	<1%	1	<1%	0	0%	0	0%	2	<1%	6	1%
Computer Software	0	0%	4	<1%	21	3%	16	2%	11	2%	12	2%	14	2%	26	4%	104	14%
Total	33	5%	34	5%	68	9%	107	15%	100	14%	115	16%	113	16%	149	21%	719	100%

[a]Industries are defined SIC code based on a modified version of Fama and French's classification for 30 industries. Detailed SIC code classifications are included in Appendix 3.

The summary statistics for the CAR associated with restatements announcements are presented in Table 4 by return window. The table presents returns for each of the four different event windows. In addition to providing returns on all restatements in Panel A, the table classified restatements into two distinct subsets. Panel B contains those restatements announced in conjunction with earnings releases and Panel C contains those restatements announced separately. Market participants' reactions to restatements announced in conjunction with earnings releases may be attenuated due to the accompanying information.[11] Indeed, the mean CAR on day (0, 1) surrounding restatements announced in earnings releases is -3 percent which is significantly greater than the mean CAR of restatements announced separately, -5.4 percent (*z*-statistic 3.06). This supports the conjecture that information contained in earning releases may attenuate reactions to the restatement announcements.

As expected, the CAR are significantly negative across all four different return windows and all three classifications of announcement groupings. The CAR in the first column of Table 2 represent the primary dependent variable for the regressions associated with hypotheses one through three. Not surprisingly, the most negative returns are associated with restatements announced separately from earnings releases. The abnormal reaction at the 75th percentile is positive across all classifications and return windows. These results are similar to the abnormal returns reported in PRS (2004) surrounding the announcement day. Although the announcement of a restatement would not appear to be positive news, 22 percent (161) of the restatements in the sample ultimately result in increases to net income. The percentage of restatement

[11] For this reason, descriptive statistics and further analyses are presented by these classifications hereinafter.

Table 4
Cumulative Abnormal Returns

Market-adjusted CAR %[a]	Event window surrounding announcement day 0: 0, 1	-1, 0, 1	-1, 0, 1, 2	-1, 0, 1, 3
Panel A: All Restatements[b]				
Mean	-4.50	-5.16	-5.42	-5.59
Standard deviation	0.14	0.15	0.15	0.16
t -statistic[c]	(-8.77)	(-9.54)	(-9.42)	(-9.64)
First quartile	-7.69	-8.85	-9.73	-9.92
Median	-1.60	-2.11	-2.74	-2.76
Third quartile	1.62	1.49	1.47	1.47
Panel B: Restatements announced in earnings releases[d]				
Mean	-3.00	-3.71	-4.02	-4.04
Standard deviation	0.12	0.13	0.15	0.15
t -statistic[c]	(-3.98)	(-4.65)	(-4.46)	(-4.47)
First quartile	-6.10	-8.12	-9.73	-8.08
Median	-0.67	-1.30	-1.85	-2.41
Third quartile	3.13	2.85	2.78	3.04
z -statistic[c]				
Panel C: Restatements *not* announced in earnings releases[e]				
Mean	-5.43	-6.04	-6.28	-6.54
Standard deviation	0.14	0.15	0.16	0.16
t -statistic[c]	(-7.93)	(-8.40)	(-8.44)	(-8.71)
First quartile	-8.44	-9.03	-9.58	-10.30
Median	-2.12	-2.59	-3.02	-2.99
Third quartile	0.87	1.02	1.37	1.25
z -statistic[c]				

[a]Market-adjusted CARs calculated using equally weighted index (Palmrose et al. 2004). Calculated as the summation of firm i's daily return less CRSP market index return over each of the four event windows.

[b]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[c]Null hypothesis for each window is CAR = 0. *T* -tests are two-tailed.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

announcements associated with positive returns is somewhat higher. Specifically, 35 percent of day (0, 1) CAR are non-negative.[12] However, at 43 percent, the number of positive CAR is higher in the sample announced in conjunction with earnings releases compared to 32 percent in the sample of restatements announced separately from earnings releases. As previously mentioned, this indicates that positive information contained in earnings announcements may mute market participants' reactions to the restatement. Although not all restatements result in a negative reaction, the majority of announcements are associated with negative reactions, indicating that, in general, restatements send a negative signal to capital markets.

4.1.3 Summary statistics for control variables

Table 5 presents descriptive statistics and univariate results for the control variables. In most cases, the results are similar to the findings of PRS (2004). Fraud observations (12 percent, 84 of 719) have an average CAR of -11 percent, significantly lower than the -3.6 percent CAR associated with non-fraud observations (*t*-statistic = -2.83). This relationship is more pronounced in the sub-sample of restatements not released with earnings announcements, with a difference in CAR between the fraud and non-fraud observations of 8 percent compared to a difference of 5 percent in the earnings release sub-sample. Restatements involving core accounts also have significantly lower average CAR of -6.5 percent compared to -0.9 percent for non-core restatements (*t*-statistic = -6.38). The CAR for the non-core earnings observations in the earnings release sub-sample are slightly positive at 0.7 percent, although, the difference between core and non-core is no more pronounced between the two sub-samples of restatements announcements (both differ by 5.6 percent).

[12] This percentage is similar to results in Palmrose et al. (2004), who find 29% of restatement announcements are associated with positive CAR on days (0, 1).

Table 5
Descriptive Statistics for Control Variables[a]

	All Restatements[b]			Restatements announced in earnings releases[c]			Restatements *not* announced in earnings releases[d]		
	#	Percent or Mean	CAR[e] Days (0,1)	#	Percent or Mean	CAR[e] Days (0,1)	#	Percent or Mean	CAR[e] Days (0,1)
	719			273			446		
Control Variables									
Fraud	84	12%	-0.111	23	8%	-0.074	61	14%	-0.124
No Fraud	635	88%	-0.036	250	92%	-0.026	385	86%	-0.043
(*t*- statistic)			(-2.83) ***			(-1.25)			(-2.45) **
(*z*- statistic)			(-3.30) **			(-1.30)			(-3.01) ***
Attribution[f]									
Auditor	97	13%	-0.104	30	11%	-0.079	67	15%	-0.109
Management	357	50%	-0.049	143	52%	-0.039	214	48%	-0.055
SEC	72	10%	-0.028	29	11%	-0.026	43	10%	-0.030
Unattributed	164	23%	-0.018	66	24%	0.003	98	22%	-0.032
Auditor & Mgmt	25	3%	-0.018	4	1%	0.067	21	5%	-0.034
Auditor & SEC	1	<1%	0.009	1	<1%	0.009	0	0%	0.000
Mgmt & SEC	3	<1%	0.043	0	0%	0.000	3	<1%	0.043
(*F*- statistic)			(4.39) ***			(2.53) **			(3.14) ***
(χ^2)			(19.56) ***			(15.89) ***			(8.25)
Core earnings	465	65%	-0.065	182	67%	-0.049	283	63%	-0.075
Non-core earnings	254	35%	-0.009	91	33%	0.007	163	37%	-0.019
(*t*- statistic)			(6.38) ***			(4.30) ***			(4.91) ***
(z- statistic)			(4.74) ***			(3.06) ***			(3.79) ***
Materiality									
Overall Mean		-0.040			-0.001			-0.065	
Quintile Means	144	-0.263	-0.090	54	-0.105	-0.062	89	-0.361	-0.102
	144	-0.023	-0.085	55	-0.017	-0.051	89	-0.027	-0.115
	143	-0.006	-0.025	55	-0.005	-0.030	90	-0.007	-0.028
	144	-0.001	-0.024	55	-0.001	-0.006	89	-0.001	-0.023
	144	0.081	-0.001	54	0.104	-0.001	89	0.069	-0.003
(*F*- statistic)			(13.26) ***			(2.55) **			(12.04) ***
(χ^2)			(56.11) ***			(11.42) **			(49.04) ***
Pervasiveness									
1	541	75%	-0.032	210	77%	-0.026	332	74%	-0.036
2	112	16%	-0.056	43	16%	-0.048	69	15%	-0.061
3	36	5%	-0.086	11	4%	-0.006	25	6%	-0.121
4	18	3%	-0.128	6	2%	-0.101	12	3%	-0.141
5	6	1%	-0.154	1	0%	-0.004	5	1%	-0.184
6	5	1%	-0.463	2	1%	-0.041	3	1%	-0.745
7	0	0%	0.000		0%	0.000	0	0%	0.000
(*F*- statistic)			(14.19) ***			(0.72)			(21.55) ***
(χ^2)			(23.96) ***			(4.12)			(24.46) ***
Years									
Mean		1.42			1.15			1.58	
Median		1.00			0.75			1.00	

Table continued on the next page

Table 5 (continued)
Descriptive Statistics for Control Variables[a]

	All Restatements[b]			Restatements announced in earnings releases[c]			Restatements *not* announced in earnings releases[d]		
	#	Percent or Mean	CAR[e] Days (0,1)	#	Percent or Mean	CAR[e] Days (0,1)	#	Percent or Mean	CAR[e] Days (0,1)
	719			273			446		
SizeMat									
Mean		-0.07			-0.013			-0.105	
Median		-0.012			-0.001			-0.016	
LevMat									
Mean		-0.022			-0.013			-0.035	
Median		-0.001			-0.001			-0.001	
Prior Returns									
Mean		-0.043			-0.027			-0.052	
Median		-0.001			-0.001			-0.001	
BigN									
BigN	641	89%	-0.046	243	89%	-0.018	398	89%	-0.056
Non-BigN	78	11%	-0.029	30	11%	-0.031	48	11%	-0.037
(*t*- statistic)			(1.03)			(0.55)			(0.86)
(z- statistic)			(1.58)			(1.14)			(1.11)
Auditor Change									
Changed	154	21%	-0.053	49	18%	-0.048	105	24%	-0.056
No Change	565	79%	-0.043	224	82%	-0.026	341	76%	-0.054
(*t*- statistic)			(0.84)			(0.93)			(0.88)
(z- statistic)			(0.93)			(0.23)			(0.81)

*,**,*** Difference across quintiles is significant at 0.10, 0.05, 0.01 levels respectively. *T*-tests are two-tailed. Non-parametric results are based on the Mann-Whitney z-statistic (two group comparisons) or the Kruskal-Wallis $\chi 2$ (quintile and multiple group comparisons).

[a]Control variables defined as follows (in table order). *Fraud:* SEC issued an accounting and auditing enforcement release (AAER). *Core earnings:* Restatements involving revenue, cost of goods sold, or on-going operations. *Non-core earnings:* Restatements involving transitory items such as merger accounting, tax accounting, non-operating gains or losses and others. *Attribution Auditor, Management, SEC or combination of multiple entities:* Restatement attributed to specific entity in press release, baseline case is *Unattributed.* *Materiality*: Restated income (loss) less originally reported net income over restated period scaled by book value of total assets at the year end prior to the earliest restated period. *Pervasiveness:* Number of account groups involved in restatement. The seven account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. The sub-account groups used in these classifications are defined in Appendix X. *Years:* Sum of periods restated where a fiscal year = 1 and a fiscal quarter = 0.25. *SizeMat*: Interactio value of total assets in at yearend in the year prior to the earliest restated period. *LevMat*: Interaction between materiality variable and ratio of book value of long term debt to book value of total assets at yearend in the year prior to the earliest restated period. *Prior Returns*: Buy and hold returns over last 120 prior to restatement announcement. *BigN:* Indicator variable equal to one if restating firm engaged a BigN auditor during the period of restatement and 0 otherwise. *Auditor Change*: Indicator variable if restating firm changed auditors from the restated period up the period ending with the announcement date.

[b]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[c]Subset of 273 restatements announced in earnings releases.

[d]Subset of 446 restatements announced separately from earnings releases.

[e]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[f]Instances of restatements attributed to multiple parties in the restatement announcement were coded as such.

The restatement attribution is enhanced beyond that developed in PRS (2004). Their attribution variable is limited to four classifications: auditor, management, SEC, and unattributed. During data collection, it was noted that a small percentage of restatement announcements (4 percent) were dually attributed. My classification captures this anomaly by creating three dual classifications, auditor and management, auditor and SEC, and management and SEC. The 3 percent (25 of 719) of the sample that is attributed to both auditor and management results in average CAR equal to the unattributed classification (both -1.8 percent). This may indicate that confusion over the true attribution muted the reaction. As in the PRS study, the 97 restatements attributed to auditor result in the most negative returns (-10.4 percent) and the 357 attributed to management the second most negative returns (-4.9 percent). Of those restatements attributed to only one party, the SEC initiated restatements results in the least negative returns (-2.8 percent). Despite the somewhat logical presumption that SEC involvement should elicit a more negative reaction, these findings are also corroborated by Dechow et al. (1996), who document auditor identified accounting problems being associated with more negative reactions than those identified by the SEC.

The materiality measure indicates that restatements associated with larger decreases in net income are associated with more negative returns. The relationship is monotonic across the entire sample of restatement announcements and the sub-sample of announcements released with earnings. This is not the case with the sub-sample of restatements announced separately, as the second quintile is associated with more negative returns (-11.5 percent) than the first quintile (-10.2 percent). This difference is not significant, however (*t*-statistic = 0.47, p value = 0.64; not tabulated). The absence of a purely monotonic relationship for this subset may be due to individuals' ability to assess a larger set of other key indicators pertaining to the restatement

severity when not confronted with an abundance of information related to current operations contained in the earnings releases.

The above conjecture is supported by the monotonic relationship associated with the pervasiveness variable in the sub-sample of non-earnings release announcements. Returns decrease significantly as the number of account groups increases (F-statistic = 21.55, p value < 0.01). For the sub-sample of earning release announcements, the relationship is decidedly not monotonic, once again indicating that information about current earnings may attenuate the significance of certain restatement specific data. Although the majority of the full restatement sample affects only one account group (75 percent, 541 out of 713) and is associated with a negative reaction, -3 percent, restatements affecting more than four account groups elicit a considerably larger negative return of -19 percent. These results are also consistent with those in the PRS (2004) study.

The number of years that were restated averages 1.4 for the entire sample and slightly more at 1.6 years for the sub-sample of no earnings release announcements. The average 120 day return for the sample firms is -4.3 percent. The return is slightly more negative for the sub-sample of restatements not announced with earnings releases at -5.2 percent and slightly less negative for the other sub-sample, -2.7 percent. These returns are considerably less negative then those in PRS (2004) study. Their restatement sample has an average negative return of 15% over the 120 days prior to the restatement announcement. The PRS study contained restatements announced between 1995 and 1999, however, which may account for some of the disparity.

The number of firms that engaged a BigN auditor is substantially higher than those that did not, 89 percent compared to 11 percent. This representation remains consistent across both sub-samples. In the sub-sample of no earnings release announcements, however, the returns are

more negative for BigN firms (-5.6 percent compared to -3.7 percent), but not significantly so (*t*-statistic = 0.86). The reverse relationship exists for the sub-sample of earnings release announcements, wherein less negative returns are associated with BigN firms (-1.8 percent compared to -3.1 percent).

Of the 719 firms, 154 (21 percent) changed auditors between the latest restated period and the year of announcement. Both auditor changes and non-changes are associated with negative returns across the primary sample and sub-samples. CAR are not significantly different between groups in the full sample or either sub-sample. Despite evidence that restatements are more likely to occur following auditor changes (Lazer et al. 2004), this variable does not appear related to the market reaction.

Additional descriptive statistics for the control variables including medians, standard deviations, minima and maxima are presented in Table A1 in the section titled "Additional Tables" following the Appendices.

4.1.4 Descriptive statistics for earnings quality variables

Table 6 presents quintile means for the three earnings quality metrics along with associated CAR for both the full restatement sample and two sub-samples. Recall less negative values are associated with better earnings quality across all three metrics. The differences in CAR between earnings quality quintiles are only significant for the full restatement sample as estimated using the modified Fama and French industry classifications (*FF-DDEQ*) (χ^2 statistic = 13.11). The relationship with CAR across the quintiles is decidedly non-monotonic for both the *FF-DDEQ* and *PRS-DDEQ* estimations. Similarly, the relationship across quintiles is non-monotonic for book-tax difference estimates of earnings quality (*BTDEQ*)

Table 6

Descriptive Statistics for Earning Quality Variable[a]

		All Restatements[b]			Restatements announced in earnings releases[c]			Restatements *not* announced in earnings releases[d]		
		#	Mean	CAR[e] Days (0,1)	#	Mean	CAR[e] Days (0,1)	#	Mean	CAR[e] Days (0,1)
		719			273			446		
Earnings Quality										
FF-DDEQ										
Quintile Means	1	144	-0.012	-0.058	54	-0.014	-0.035	89	-0.110	-0.069
	2	144	-0.031	-0.039	55	-0.032	-0.035	89	-0.030	-0.045
	3	143	-0.059	-0.029	55	-0.058	-0.006	90	-0.059	-0.042
	4	144	-0.114	-0.075	55	-0.127	-0.057	89	-0.109	-0.083
	5	144	-0.455	-0.023	54	-0.481	-0.016	89	-0.441	-0.032
(*F*- statistic)				(3.43) **			(1.36)			(1.89)
(χ^2)				(13.11) **			(7.77) *			(5.23)
PRS-DDEQ										
Quintile Means	1	144	-0.009	-0.027	54	-0.011	-0.002	89	-0.007	-0.043
	2	144	-0.030	-0.060	55	-0.032	-0.031	89	-0.029	-0.078
	3	143	-0.054	-0.039	55	-0.057	-0.031	90	-0.053	-0.042
	4	144	-0.096	-0.054	55	-0.096	-0.024	89	-0.098	-0.069
	5	144	-0.299	-0.044	54	-0.279	-0.063	89	-0.312	-0.039
(*F*- statistic)				(1.29)			(1.62)			(1.42)
(χ^2)				(6.33)			(8.82) *			(3.74)
BTDEQ										
Quintile Means	1	144	-0.107	-0.057	54	0.252	-0.032	89	-0.317	-0.082
	2	144	-1.943	-0.054	55	-1.792	-0.023	89	-2.038	-0.075
	3	143	-2.993	-0.047	55	-2.736	-0.035	90	-3.192	-0.048
	4	144	-4.139	-0.033	55	-3.696	-0.040	89	-4.487	-0.031
	5	144	-6.170	-0.034	54	-5.505	-0.021	89	-6.465	-0.036
(*F*- statistic)				(0.90)			(0.92)			(2.31) *
(χ^2)				(0.95)			(3.93)			(5.97)

*,** Difference across quintiles is significant at 0.10, 0.05 levels respectively. Non-parametric results are based on the Kruskal-Wallis χ^2.

[a]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modifed Dechow-Dichev (2002) model using modified Fama & French 30 industry classfications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modifed Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*. NOTE: All original values of earnings quality have been multiplied by -1 to align the directionality of the measurement values with the earnings quality variable, i.e. larger values (less negative) are associated with better earnings quality.

[b]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[c]Subset of 273 restatements announced in earnings releases.

[d]Subset of 446 restatements announced separately from earnings releases.

[e]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

across the full sample and sub-samples of restatements announcements. For the most part, however, the differences across quintiles are not significantly different. Although these univariate results appear somewhat contrary to the hypotheses associating better earnings quality with more negative returns following the announcement, the returns associated with restatement announcements are likely affected by many factors related to both the restatement firm and characteristics of the restatement. These influences will be more accurately captured in the multivariate analyses.

Panel A of Table 7 presents quintile means for the three earnings quality metrics along with the associated analyst forecast revisions and changes in dispersion for the full sample of restatements. Although forecast revisions are significantly different across earnings quality quintiles for both the *FF-DDEQ* and *PRS-DDEQ* metrics, as with the CAR, they are non-monotonic (χ^2 statistics = 12.12 and 11.47, respectively). Forecast revisions are not significantly different across the *BTDEQ* quintiles (χ^2 statistic = 4.80) but are similarly non-monotonic. Conversely, for the full restatement sample, the differences in forecast dispersion changes are significantly different only across the *BTDEQ* quintiles (χ^2 statistic = 25.25).

Panel B of Table 7 presents the quintile means for the three earnings quality metrics along with associated forecast revisions and changes in dispersion for the sample of restatements announced in earning releases. Only the differences in forecast dispersion changes across earnings quality quintiles estimated with the *BTDEQ* metric are significantly different (χ^2 statistic = 12.53). All other earnings quality quintile differences are not significant in this sub-sample. Panel C presents the same statistics for the sub-sample of restatements announced separately from earnings releases. As with Panels A and B the forecast dispersion changes estimated with

Table 7

Descriptive Statistics for Earnings Quality Variable and Analyst Forecasts[a]

PANEL A:		All Restatements[b]					
		#	Mean	Forecast Revision[e]	#	Mean	Forecast Dispersion[f]
		400			319		
Earnings Quality							
FF-DDEQ							
Quintile Means	1	80	-0.011	-0.135	64	-0.010	-0.0010
	2	80	-0.027	-0.004	64	-0.026	0.0019
	3	80	-0.049	-0.011	63	-0.047	0.0001
	4	80	-0.093	-0.002	64	-0.097	-0.0042
	5	80	-0.416	0.003	64	-0.467	-0.0045
(*F*- statistic)				(0.47)			(0.59)
(χ^2)				(12.12) **			(3.02)
PRS-DDEQ							
Quintile Means	1	80	-0.007	-0.011	64	-0.007	-0.0013
	2	80	-0.027	-0.005	64	-0.026	0.0015
	3	80	-0.049	-0.010	63	-0.049	0.0002
	4	80	-0.084	-0.008	64	-0.089	-0.0085
	5	80	-0.283	0.008	64	-0.315	0.0004
(*F*- statistic)				(0.60)			(1.25)
(χ^2)				(11.47) **			(7.55)
BTDEQ							
Quintile Means	1	80	-0.712	-0.009	64	-0.527	0.0020
	2	80	-2.387	-0.007	64	-2.252	0.0017
	3	80	-3.432	-0.002	63	-3.412	0.0007
	4	80	-4.577	-0.013	64	-4.593	-0.0060
	5	80	-6.420	0.004	64	-6.465	-0.0061
(*F*- statistic)				(0.45)			(1.32)
(χ^2)				(4.80)			(25.25) ***

Table and footnotes continued on the next page

*,**, *** Difference across quintiles is significant at 0.10, 0.05, and 0.01 levels respectively. Non-parametric results are based on the Kruskal-Wallis χ^2.

[a]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j'*s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table 7 (continued)

Descriptive Statistics for Earnings Quality Variable and Analyst Forecasts[a]

PANEL B:	Restatements announced in earnings releases[c]					
	#	Mean	Forecast Revision[e]	#	Mean	Forecast Dispersion[f]
	170			138		
Earnings Quality						
FF-DDEQ						
Quintile Means	34	-0.013	-0.003	28	-0.013	-0.0001
	34	-0.029	0.001	27	-0.027	0.0030
	34	-0.051	-0.011	28	-0.048	0.0011
	34	-0.093	-0.016	27	-0.094	0.0016
	34	-0.316	0.032	28	-0.340	-0.0001
(*F*- statistic)			(1.45)			(0.08)
(χ^2)			(4.42)			(1.35)
PRS-DDEQ						
Quintile Means	34	-0.010	-0.002	28	-0.009	-0.0010
	34	-0.029	-0.005	27	-0.027	0.0029
	34	-0.022	-0.006	28	-0.050	-0.0004
	34	-0.086	-0.020	27	-0.089	0.0024
	34	-0.215	0.037	28	-0.227	0.0017
(*F*- statistic)			(1.82)			(0.14)
(χ^2)			(5.22)			(5.11)
BTDEQ						
Quintile Means	34	-0.477	-0.003	28	-0.308	0.0045
	34	-2.216	-0.001	27	-2.103	0.0006
	34	-3.110	0.027	28	-3.164	0.0047
	34	-4.074	0.001	27	-4.086	-0.0030
	34	-5.955	-0.024	28	-6.160	-0.0014
(*F*- statistic)			(1.31)			(0.55)
(χ^2)			(1.70)			(12.53) **

Table and footnotes continued on the next page

*,**, *** Difference across quintiles is significant at 0.10, 0.05, and 0.01 levels respectively. Non-parametric results are based on the Kruskal-Wallis χ^2.

[b]Announcements of 400 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004 for which analyst forecast data were available and 319 restatements for which analyst forecast dispersion data were available.

[c]Subsets of 170 and 138 restatements announced in earnings releases for which analyst forecast and analyst forecast dispersion data were available, respectively.

[d]Subset of 230 and 181restatements announced separately from earnings releases for which analyst forecast and analyst forecast dispersion data were available, respectively.

Table 7 (continued)
Descriptive Statistics for Earnings Quality Variable and Analyst Forecasts[a]

PANEL C:	Restatements *not* announced in earnings releases[d]					
	#	Mean	Forecast Revision[e]	#	Mean	Forecast Dispersion[f]
	230			181		
Earnings Quality						
FF-DDEQ						
Quintile Means	46	-0.009	-0.019	36	-0.009	-0.0029
	46	-0.025	-0.009	36	-0.024	0.0022
	46	-0.048	-0.011	37	-0.047	0.0015
	46	-0.093	0.007	36	-0.100	-0.0103
	46	-0.491	-0.018	36	-0.566	-0.0084
(*F*- statistic)			(0.77)			(1.13)
(χ^2)			(5.67)			(7.67)
PRS-DDEQ						
Quintile Means	46	-0.006	-0.017	36	-0.006	-0.0018
	46	-0.025	-0.006	36	-0.025	0.0004
	46	-0.048	-0.016	37	-0.048	0.0016
	46	-0.082	-0.015	36	-0.091	-0.0176
	46	-0.333	0.005	36	-0.383	-0.0006
(*F*- statistic)			(0.63)			(2.27) *
(χ^2)			(9.56) **			(8.85) *
BTDEQ						
Quintile Means	46	-0.891	-0.016	36	-0.699	-0.0001
	46	-2.577	-0.11	36	-2.380	0.0026
	46	-3.691	-0.023	37	-3.647	-0.0103
	46	-5.007	-0.006	36	-5.029	0.0001
	46	-6.618	0.007	36	-6.581	-0.0097
(*F*- statistic)			(0.84)			(1.31)
(χ^2)			(7.85) *			(17.93) ***

*,**, *** Difference across quintiles is significant at 0.10, 0.05, and 0.01 levels respectively. Non-parametric results are based on the Kruskal-Wallis χ^2.

[e]Analyst forecast revision is change in consensus analyst forecasts from the period prior to the restatement announcement to the period following the restatement announcement scaled by stock price in the period preceding the restatement announcement.

[f]Analyst forecast dispersion is change in standard deviation of analyst forecasts from the month prior to the restatement announcement to the period following the restatement announcement scaled by stock price in the period preceding the restatement announcement.

the *BTDEQ* metric are significant (χ^2 statistic = 12.53) across quintiles. However, both the differences across *PRS-DDEQ* quintiles are significant for both forecast revision and dispersion changes (χ^2 statistics = 9.56 and 8.85 respectively). Again, none of the earnings quality analyst relationships are monotonic.

Additional descriptive statistics for the each of the three earnings quality variables including medians, standard deviations, minimums and maximums are presented in Table A1 in the section titled "Additional Tables" following the Appendices

4.2 Regression Results

4.2.1 Hypothesis one

Hypothesis one tests the impact earnings quality has on the market reaction to restatement announcements and examines each earnings quality proxy within the context of the multivariate model. As previously discussed in Chapter 3, the earnings quality variable is estimated using both accrual and book-tax difference proxies. The accrual proxy (*DDEQ)* is estimated using both the modified Fama and French (*FF-DDEQ)* and PRS (*PRS-DDEQ*; 2004) industry classification systems. Hypothesis one results for each of the three earnings quality proxies (*FF-DDEQ, PRS-DDEQ,* and *BTDEQ*) are presented and discussed below, respectively.

Results for the OLS regression[13] for the both the full sample of restatements and each sub-sample with the *FF-DDEQ* measure of earnings quality are presented in Table 8.[14] The full sample regression model is highly significant (*F*-statistic = 7.69, adjusted R^2 = 12%)[15]. Contrary to the univariate tests, earnings quality is significantly negatively related to restatement announcement market reactions (*t*-statistic = -2.66, p value < 0.01). This result holds in the sub-sample of restatements announced separately from earnings releases, although the coefficient on *FF-DDEQ* is less significant (*t*-statistic = -1.85, p value < 0.05). In this sub-sample, the full model is slightly weaker but also highly significant (*F*-statistic = 7.25). The R^2 for this sub-sample is somewhat higher (16%). The sub-sample announced concurrent with earnings announcements renders the poorest overall model although still at least marginally significant (*F*-statistic = 2.13, p value < 0.05, R^2 = 5%). Importantly, the coefficient on *FF-DDEQ* remains negative and significant in this sub-sample (*t*-statistic = -2.01, p value < 0.05).

[13] Table A2 included in the section titled "Additional Tables" located after the Appendices presents the Spearman correlation coefficients for the independent variables. The materiality (*MAT*) variable is highly correlated with the two materiality interaction terms, *SIZEMAT* and *LEVMAT*. Multicollinearity diagnostics reveal that only these three control variables are problematic; Variance inflation factors (VIF) for the three variables are 144, 80 and 17, respectively. VIF over 10 are considered problematic (Ott & Longnecker 2001). To address this issue the primary regression model was run without including the materiality (MAT) variable. This step changes the VIF factor on all remaining regresssors including *SIZEMAT* and *LEVMAT* to less than 3. This step does not change any inferences associated with the individual coefficients; therefore, to maintain consistency with Palmrose et al. (2004), the materiality (*MAT*) variable was included in the model.
Descriptive statistics, including the fact that 35 percent of all day (0, 1) returns are non-negative, indicate that the relationship between earnings quality and the CAR may not be linear and therefore the functional form of the earnings quality variables may be misspecified. To address this issue, Ramsey's Reset test of regression specification error was performed. The test is an F test that assesses the differences in R^2 under linear versus nonlinear assumptions. Including both squared and cubic variations of earnings quality in the model renders an F-statistic of 3.03. Only the cubic form is significant in the model (p=.09, one-tailed). Rerunning the model with the cubic functional form only minimally changes the adjusted R^2 form 11.5% to 11.7% and does not change the significance or directionality of any variables, including the original linear form of earnings quality. Therefore, only the liner form of each earnings quality variable is included in the model.
[14] Note that the dependent variable for hypotheses one through three is CAR over days (0, 1). Discussions of alternative return windows are included in section 4.3 titled "Sensitivity tests".
[15] Hereinafter all reported R^2 refer to adjusted-R^2.

Table 8
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 1

Fama French Earnings Quality (FF-DDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
DDEQ-FamaFrench	-	-0.051	-2.66 ***	-0.065	-2.01 **	-0.045	-1.85 **
Control Variables[f]							
Fraud	-	-0.050	-3.28 ***	-0.049	-1.79 **	-0.055	-2.91 ***
Auditor attribution	-	-0.031	-2.16 **	-0.036	-1.43 *	-0.022	-1.23
Management attribution	+	0.001	0.02	-0.029	-1.63 *	0.18	1.23
SEC attribution	+	0.018	1.01	-0.035	-1.30 *	0.052	2.25 **
Core	-	-0.031	-2.88 ***	-0.053	-3.28 **	-0.023	-1.65 *
Materiality	+	0.206	1.67 **	0.348	0.65	0.223	1.68 **
Pervasiveness	-	-0.034	-5.74 ***	-0.011	-0.12	-0.051	-6.95 ***
Years	-	0.006	1.38 *	0.010	1.32 *	0.004	0.82
SizeMat	-	-0.107	-1.50 *	-0.179	-0.52	-0.115	-1.52 *
LevMat	-	-0.061	-1.71 **	-3.540	-0.78	-0.067	-1.69 *
120 Day return	+	0.027	2.05 **	0.028	1.40 *	0.025	1.53 *
BigN	-	-0.018	-1.17	-0.003	-0.15	-0.029	-1.38 *
Auditor change	+	-0.002	-0.13	-0.027	-1.32 *	0.013	0.79
Intercept		0.034	1.77	0.022	0.74	0.026	1.65
Model Statistics							
n			719		273		446
Adjusted R^2			12%		5%		16%
F-Statistic			7.69 ***		2.13 **		7.25 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *DDEQ*-FamaFrench = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

Table 9 presents the OLS regression results for the *PRS-DDEQ* earnings quality variable. The full sample regression model and both sub-sample models are significant (p values < 0.05); however, the coefficients on *PRS-DDEQ* are not significant in the full sample or either sub-sample (*t*-statistics = -0.08, -0.03 and -1.08 respectively). Table 10 presents the OLS regression results for the book-tax difference (*BTDEQ*) measure of earnings quality. The full sample regression model is significant (*F*-statistic = 7.41, p value < .01), as is the coefficient on *BTDEQ* (*t*-statistic = -1.89, p value < 0.05). The result is similar for the sub-sample of restatements issued separately from earnings releases. Both the overall model (*F*-statistic = 7.47, p value < 0.01) and coefficient on earnings quality (*t*-statistic = -2.44, p value < 0.01) are highly significant. The coefficient on *BTDEQ* is not significant (*t*-statistic = -0.47) in the sub-sample of restatement announcements issued with earnings reports.

To summarize, the above results for the *FF-DDEQ* and *BTDEQ* measures of earnings quality support hypothesis one in the context of both the full restatement sample and the sub-sample announced separately from earnings releases. In both samples, both *FF-DDEQ* and *BTDEQ* are significantly negatively related to the market reaction to restatement announcements. However, *FF-DDEQ* is not significantly related to the market reaction in the sub-sample of restatements announced in conjunction with earnings releases and none of the *PRS-DDEQ* measures is significantly related to the market reaction. While these findings may appear to only provide mixed support for hypothesis one, earnings quality is more appropriately estimated using a broader industry classification system (Ecker et al. 2005). Therefore, the *FF-DDEQ* metric is a more dependable estimate of earnings quality than *PRS-DDEQ*. The *BTDEQ* measure captures information related to, but different from, the information contained in either *DDEQ* measure. Although book-tax differences are associated with accruals, the *BTDEQ*

Table 9
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 1

Palmrose et al. Earnings Quality (PRS-DDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
PRS-DDEQ	-	-0.026	-0.08	-0.001	-0.03	-0.048	-1.08
Control Variables[f]							
Fraud	-	-0.050	-3.23 ***	-0.041	-1.46 *	-0.055	-2.92 ***
Auditor attribution	-	-0.032	-2.20 **	-0.035	-1.37 *	-0.022	-1.25
Management attribution	+	0.001	0.10	-0.027	-1.54 *	0.019	1.26
SEC attribution	+	0.019	1.08	-0.033	-1.20	0.052	2.25 **
Core	-	-0.031	-2.87 ***	-0.052	-3.19 ***	-0.023	-1.66 **
Materiality	+	0.201	1.63 *	0.467	0.86	0.217	1.63 *
Pervasiveness	-	-0.034	-5.74 ***	-0.001	-0.13	-0.054	-6.94 ***
Years	-	0.006	1.29 *	0.009	1.07	0.004	0.83
SizeMat	-	-0.104	-1.46 *	-0.254	-0.73	-0.112	-1.47 *
LevMat	-	-0.059	-1.66 **	-2.770	-0.60	-0.064	-1.62 *
Prior returns	+	0.025	1.93 **	0.027	1.37 *	0.024	1.48 *
BigN	-	-0.018	-1.15	-0.004	-0.17	-0.028	-1.36 *
Auditor change	+	-0.002	-0.17	-0.025	-1.20	0.012	0.77
Intercept		0.038	0.02	0.030	1.02	0.042	1.67
Model Statistics							
n			719		273		446
Adjusted R^2			11%		4%		16%
F-Statistic			7.17 ***		1.81 **		7.05 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels repectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *PRS-DDEQ* = standard deviation of firm j's residuals, from year t-4 to year t from annual cross sectional estimations of the modifed Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separtely from earnings releases.

Table 10
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 1

Book Tax Difference Earnings Quality (BTDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 BTDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
BTDEQ	-	-0.004	-1.89 **	-0.002	-0.47	-0.007	-2.44 ***
Control Variables[f]							
Fraud	-	-0.054	-3.44 ***	-0.042	-1.53 *	-0.062	-3.30 ***
Auditor attribution	-	-0.031	-2.15 **	-0.035	-1.41 *	-0.019	-1.09
Management attribution	+	0.002	0.21	-0.028	-1.58 *	0.023	1.60 *
SEC attribution	+	0.019	1.08	-0.035	-1.26	0.056	2.43 ***
Core	-	-0.03	-2.82 ***	-0.053	-3.22 ***	-0.021	-1.50 *
Materiality	+	0.198	1.60 *	0.453	0.84	0.213	1.61 *
Pervasiveness	-	-0.033	-5.59 ***	-0.001	-0.11	-0.049	-6.67 ***
Years	-	0.005	1.24	0.009	1.06	0.005	0.88
SizeMat	-	-0.102	-1.43 *	-0.244	-0.71	-0.111	-1.47 *
LevMat	-	-0.059	-1.64 **	-2.880	-0.63	-0.062	-1.59 *
120 Day return	+	0.026	1.98 **	0.028	1.39 *	0.025	1.53 *
BigN	-	-0.024	-1.52 *	-0.006	-0.25	-0.039	-1.83 **
Auditor change	+	-0.001	-0.06	-0.023	-1.10	0.011	0.73
Intercept		0.031	1.57	0.029	0.94	0.026	0.96
Model Statistics							
n			719		273		446
Adjusted R^2			11%		4%		17%
F-Statistic			7.41 ***		1.83 **		7.47 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is he change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

measure estimates earnings quality over a much shorter window than either *DDEQ* metric. Furthermore, the book-tax difference is more readily observable and less complex than the *DDEQ* metric. As such, while both measures inform on earnings quality, they likely present market participants with somewhat different informational cues. Therefore, the *FF-DDEQ* and *BTDEQ* earnings quality estimates provide clear support for hypothesis one.

4.2.2 Hypothesis two

The prior assertion that book-tax differences inform on earnings quality beyond the *DDEQ* metric is the focus of hypothesis two. Tests of hypothesis two are conducted using the same regression model as hypothesis one, but, the *DDEQ* and *BTDEQ* metrics are included in the model simultaneously. The results of the OLS regression for the *FF-DDEQ* and *BTDEQ* metrics are presented in Table 11. The model is significant across all three restatement samples (p values < 0.05). In the full restatement sample, the coefficients on both *FF-DDEQ* and *BTDEQ* are significant (*t*-statistics = -2.64 and -1.87, p values < 0.01 and 0.05, respectively). In the sample of restatements announced separately from earnings releases, the coefficients on both *FF-DDEQ* and *BTDEQ* are also significant (*t*-statistics = -1.81 and -2.40, p values < 0.05 and 0.01, respectively). In the sample of restatements announced with earnings releases, however, only *FF-DDEQ* is significant (*t*-statistic = -2.01, p value < 0.05). The significance of both earnings quality variables in the full sample and sample announced separately from earnings releases appears to provide initial support for the hypothesis two. The lack of significance of *BTDEQ* in the sample of restatements announced with earnings releases can be attributed, at least in part, to the fact that the effect is attenuated by the abundance of

Table 11
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 2

Fama French Earnings Quality (FF-DDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 BTDEQ - \beta_3 FRAUD + \beta_4 ATTRIB - \beta_5 CORE - \beta_6 MAT - \beta_7 PERVAS - \beta_8 YEARS - \beta_9 SIZEMAT - \beta_{10} LEVMAT + \beta_{11} PRIORRET - \beta_{12} BIGN + \beta_{13} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	-	-0.051	-2.64 ***	-0.065	-2.01 **	-0.044	-1.81 **
BTDEQ	-	-0.004	-1.87 **	-0.002	-0.48	-0.007	-2.40 ***
Control Variables[f]							
Fraud	-	-0.055	-3.52 ***	-0.051	-1.84 **	-0.061	-3.26 ***
Auditor attribution	-	-0.031	-2.13 **	-0.036	-1.46 *	-0.019	-1.06
Management attribution	+	0.001	0.06	-0.029	-1.67 **	0.021	1.45 *
SEC attribution	+	0.017	0.94	-0.037	-1.36 *	0.053	2.32 **
Core	-	-0.029	-2.81 ***	-0.054	-3.30 ***	-0.021	-1.47 *
Materiality	+	0.202	1.65 **	0.331	0.62	0.224	1.70 **
Pervasiveness	-	-0.033	-5.55 ***	0.000	-0.09	-0.049	-6.65 ***
Years	-	0.006	1.35 *	0.011	1.30 *	0.005	0.89
SizeMat	-	-0.104	-1.47 *	-0.168	-0.49	-0.117	-1.55 *
LevMat	-	-0.06	-1.69 **	-3.660	-0.80	-0.066	-1.69 **
Prior returns	+	0.027	2.15 **	0.028	1.42 *	0.027	1.66 **
BigN	-	-0.024	-1.50 *	-0.006	-0.23	-0.038	-1.83 **
Auditor change	+	0.001	0.01	-0.025	-1.21	-0.013	0.84
Intercept		0.024	1.20	0.019	0.65	0.020	0.76
Model Statistics							
n		719		273		446	
Adjusted R^2		12% [g]		5% [g]		17% [g]	
F-Statistic		7.44 ***		1.99 **		7.23 ***	
***Partial F*-Statistic**		3.38 ***		0.02		7.61 ***	

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is the change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Control variables are defined in Table 5.

[g]Hypothesis 1 R^2 using the Fama French measure of earnings quality (*FF-DDEQ*) were 11.54%, 5.48% and 16.43% compared to 11.86%, 5.20% and 17.34% above, respectively.

Table 12
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 2

Palmrose et al. Earnings Quality (PRS-DDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 BTDEQ - \beta_3 FRAUD + \beta_4 ATTRIB - \beta_5 CORE - \beta_6 MAT - \beta_7 PERVAS - \beta_8 YEARS - \beta_9 SIZEMAT - \beta_{10} LEVMAT + \beta_{11} PRIORRET - \beta_{12} BIGN + \beta_{13} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
PRS-DDEQ	-	-0.026	-0.80	-0.003	-0.05	-0.045	-1.02 **
BTDEQ	-	-0.004	-1.89 **	-0.002	-0.48	-0.007	-2.41 ***
Control Variables[f]							
Fraud	-	-0.054	-3.48 ***	-0.043	-1.51 *	-0.062	-3.27 ***
Auditor attribution	-	-0.031	-2.17 **	-0.035	-1.40 *	-0.019	-1.09
Management attribution	+	0.002	0.15	-0.028	-1.58 *	0.022	1.48 *
SEC attribution	+	0.018	1.02	-0.035	-1.26	0.054	1.32 **
Core	-	-0.029	-2.80 ***	-0.530	-3.21 ***	-0.021	-1.49 *
Materiality	+	0.198	1.61 *	0.449	0.82	0.219	1.65 **
Pervasiveness	-	-0.033	-5.54 ***	-0.001	-0.10	-0.049	-6.63 ***
Years	-	0.005	1.27	0.008	1.06	0.005	0.90
SizeMat	-	-0.102	-1.44 *	-0.242	-0.70	-0.114	-1.50 *
LevMat	-	-0.058	-1.63 *	-2.908	-0.63	-0.064	-1.62 *
120 Day return	+	0.026	2.03 **	0.028	1.39 *	-0.026	1.60 *
BigN	-	-0.024	-1.49 *	-0.006	-0.25	-0.038	-1.81 **
Auditor change	+	-0.001	-0.02	-0.023	-1.09	0.013	0.81
Intercept		0.028	1.40	0.028		0.021	0.79
Model Statistics							
n			719		273		446
Adjusted R^2			11% [g]		4% [g]		17% [g]
F-Statistic			6.95 ***		1.70 **		7.04 ***
***Partial F*-Statistic**			3.54 ***		0.01		7.67 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *PRS-DDEQ* = standard deviation of firm j's residuals, from year t-4 to year t from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is the change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

[g]Hypothesis 1 R^2 with *PRS-DDEQ* were 10.73%, 4.00% and 15.99% compared to 11.06%, 3.71% and 16.92% above respectively.

information contained in earnings releases. The extent to which the inclusion of both variables improves the market reaction prediction is more appropriately ascertained with a partial *F*-test, however.

The partial *F*-test determines if the prediction of *Y* is significantly improved by the inclusion of an additional variable to the model. The results of the partial *F*-tests are presented at the bottom of Table 11 and clearly indicate in the full sample and sample announced separately from earnings releases that the inclusion of *BTDEQ* improves the model's predictive power (Partial *F*-statistics = 3.38 and 7.61, p values < 0.01 and 0.01, respectively). Therefore, hypothesis two is supported for the *FF-DDEQ* measure of earnings quality. This finding provides additional evidence to corroborate the assertion of Hanlon and Krishnan (2005), that the information in book-tax differences may provide market participants with signals from which to assess earnings quality that are distinct from those contained in accruals.

Table 12 presents hypothesis two results for *PRS-DDEQ*. Interestingly, in the sample of restatements announced separately from earnings releases, both *PRS-DDEQ* and *BTDEQ* are significant (*t*-statistics = -1.02 and -2.41, p values < 0.05 and 0.01, respectively). This is surprising given that the coefficient on *PRS-DDEQ* is not significant in any of the hypothesis one tests. The significance of *PRS-DDEQ* only when *BTDEQ* is also included in the model appears to support Hanlon's (2005) contention that large book-tax differences provide a signal that prompts a more thorough investigation of other earnings quality indicators. Not surprisingly however, the partial *F*-test indicates that the inclusion of *BTDEQ* significantly improves the predictive power in both the full sample and sample announced separately from earnings (*F*-statistics = 6.95 and 7.04, p values < 0.01 and 0.01, respectively). Given the significance of the model with only *BTDEQ* (hypothesis one) and the lack of significance of the model with only

PRS-DDEQ, it is logical that the addition of *BTDEQ* to the model increases the *F*-statistic. This notion is further supported by the partial *F*-tests for both the full and no-earnings release samples (Partial *F*-statistics = 3.54 and 7.67, p values < 0.01 and 0.01, respectively).

These results support hypothesis two and indicate that the information contained in book-tax differences is incrementally useful relative to accruals in determining the market reaction to restatement announcements. Furthermore, the results for the PRS measure of earnings quality indicate that book-tax differences may send a negative signal at to earnings quality that spurs an examination of other earnings quality indicators.

4.2.3 Hypothesis three

Hypothesis three examines the extent to which the association between earnings quality and the market reaction to restatement announcements is influenced by the level of investor sophistication. Two independent variables are added to the model to test this relationship: a variable that captures the level of institutional ownership (*INST*) and an interaction between *INST* and each earnings quality proxy. Consistent with the prior two sections, results for each earnings quality proxy are presented separately.

Results of the OLS regression model for the full sample and sub-samples with *FF-DDEQ* and the interaction of *FF-DDEQ* with institutional ownership (*INST*) are shown in Table 13. If sophisticated investors recognize and price earnings quality more so than unsophisticated investors, then the coefficient on the interaction term should be significant and the coefficient on *FF-DDEQ* should be zero. Across all three samples, the coefficient on the interaction term (*FF-*

Table 13
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 3

Fama French Earnings Quality (FF-DDEQ)[a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 INST - \beta_3 DDEQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT - \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	-	-0.005	-0.13	-0.015	-0.23	-0.014	-0.28
INST[f]	-	-0.008	-0.35	-0.014	-0.36	-0.015	-0.52
FF-DDEQ*INST	-	-0.212	-2.60 ***	-0.235	-1.50 *	-0.216	-2.19 **
Control Variables[g]							
Fraud	-	-0.083	-4.88 ***	-0.059	-1.99 **	-0.098	-4.64 ***
Auditor attribution	-	-0.032	-2.07 **	-0.028	-1.04	-0.025	-1.31 *
Management attribution	+	-0.005	-0.37	-0.029	-1.53 *	0.010	0.64
SEC attribution	+	-0.001	-0.01	-0.037	-1.28	0.025	0.94
Core	-	-0.027	-2.34 ***	-0.040	-2.27 **	-0.023	-1.50 *
Materiality	+	0.837	2.78 ***	0.379	0.70	1.091	-2.83 ***
Pervasiveness	-	-0.021	-3.12 ***	-0.002	-0.18	-0.035	-4.05 ***
Years	-	0.003	0.71	0.010	14.21	0.001	0.14
SizeMat	-	-0.450	-2.49 ***	-0.053	-0.15	-0.575	-2.54 ***
LevMat	-	-2.172	-3.01 ***	-28.740	-2.35 ***	-2.900	-3.10 ***
Prior returns	+	0.020	1.40 *	0.022	0.96	-0.018	0.94
BigN	-	-0.027	-1.47 *	-0.038	-1.31 *	-0.031	-1.33 *
Auditor change	+	-0.002	-0.15	-0.050	-2.17 **	0.024	1.35 *
Intercept		0.033	1.50	0.054	1.52	0.037	1.29
Model Statistics							
n			565		222		343
Adjusted R^2			12%		8%		16%
F-Statistic			5.90 ***		2.12 ***		5.15 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investor information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement.

[g]Control variables defined in Table 5.

*DDEQ*INST*) is significantly and negatively related to the market reaction. The coefficient is significant in the full sample (*t*-statistic = -2.60, p value < 0.01), but only marginally significant in the reduced earnings release sample (*t*-statistic = -1.50, p value < 0.10) and no-earning release sample (*t*-statistic = -2.19, p value < 0.05). The coefficient on *FF-DDEQ* is insignificant across all three samples. This finding suggests that sophisticated investors' reactions to restatement announcements are negatively impacted by pre-restatement earnings quality, indicating this investor set considers earnings quality during price formation.

The results are the same for *PRS-DDEQ* but only in the full sample and sub-sample of no-earnings release announcements. These results are presented in Table 14. In the full sample, the coefficient on *PRS-DDEQ* is insignificant (*t*-statistic = 1.01) and the coefficient on *PRS-DDEQ*INST* is significantly negative (*t*-statistic = -2.11, p value < 0.05). The results are similar in the sub-sample of restatements announced separately from earnings, the coefficient on *PRS-DDEQ*INST* is significantly negative (*t*-statistic = -2.44, p value < 0.01) but the coefficient on *PRS-DDEQ* is not significant (*t*-statistic = 0.072). All three full models remain significant. Therefore, hypothesis three is supported with the *FF-DDEQ* and *PRS-DDEQ* metrics, but not with *BTDEQ*.

Table 15 presents the results of the regression model containing the interaction between *BTDEQ* and investor sophistication (*BTDEQ*INST*). Note that across all three models, *BTDEQ* and its interaction with *INST* become insignificant. This finding may be interpreted as sophisticated investors being are more attuned to the earnings quality indicators communicated via accruals as opposed to book-tax differences. Therefore, hypothesis three is supported only for the accrual measures of earnings quality, *FF-DDEQ* and *PRS-DDEQ*, and not for the book-tax difference measure.

Table 14
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 3

Palmrose et al. Earnings Quality (PRS-DDEQ.) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 INST - \beta_3 DDEQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT - \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
PRS-DDEQ	-	0.067	1.01	-0.088	-0.53	0.053	0.72
INST[f]	-	-0.034	-0.57	0.017	0.40	-0.027	-0.89
PRS-DDEQ*INST	-	-0.314	-2.11 **	0.172	0.48	-0.411	-2.44 ***
Control Variables[g]							
Fraud	-	-0.079	-4.64 ***	-0.042	-1.41 *	-0.093	-4.37 ***
Auditor attribution	-	-0.034	-2.17 **	-0.033	-1.19	-0.027	-1.40 *
Management attribution	+	-0.004	-0.32	-0.028	-1.46 *	0.010	0.63
SEC attribution	+	0.003	0.13	-0.034	-1.14	0.024	0.88
Core	-	-0.029	-2.44 ***	-0.039	-2.19 **	-0.024	-1.55 *
Materiality	+	0.759	2.52 ***	0.447	0.80	0.905	2.39 ***
Pervasiveness	-	-0.022	-3.18 ***	-0.003	-0.27	-0.035	-4.07 ***
Years	-	0.003	0.56	0.009	1.06	-0.001	-0.01
SizeMat	-	-0.417	-2.29 **	-0.102	-0.28	-0.488	-2.18 **
LevMat	-	-1.822	-2.54 ***	-25.109	-1.95 **	-2.220	-2.54 ***
Prior returns	+	0.021	1.43 *	0.015	0.64	-0.026	1.34 *
BigN	-	-0.025	-1.38 *	-0.034	-1.16	-0.03	-1.28
Auditor change	+	-0.001	-0.09	-0.050	-2.10 **	0.025	1.43 *
Intercept		0.042	1.84	0.048	1.24	0.045	1.54
Model Statistics							
n			565		222		343
Adjusted R^2			11%		4%		16%
F-Statistic			5.19 ***		1.65 **		4.95 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: PRS-*DDEQ* = standard deviation of firm j's residuals, from year t-4 to year t from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investor information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement

[g]Control variables defined in Table 5.

Table 15

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Hypothesis 3

Book Tax Difference Earnings Quality (BTDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 BTDEQ - \beta_2 INST - \beta_3 BTDEQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT - \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
BTDEQ	-	0.001	0.01	0.004	0.45	-0.002	-0.31
INST[f]	-	-0.036	-1.00	-0.031	-0.53	-0.067	-1.41 *
BTDEQ*INST	-	-0.012	-1.19	-0.012	-0.64	-0.015	-1.25
Control Variables[g]							
Fraud	-	-0.084	-4.87 ***	-0.047	-1.58 *	-0.104	-4.79 ***
Auditor attribution	-	-0.033	-2.10 **	-0.032	-1.16	-0.022	-1.17
Management attribution	+	-0.001	-0.09	-0.026	-1.32 *	0.017	1.05
SEC attribution	+	0.008	0.38	-0.033	-1.11	0.039	1.49 *
Core	-	-0.028	-2.38 ***	-0.039	-2.20 **	-0.023	-1.46 *
Materiality	+	0.784	2.60 ***	0.520	0.96	0.919	2.42 ***
Pervasiveness	-	-0.021	-3.15 ***	-0.003	-0.28	-0.034	-3.98 ***
Years	-	0.003	0.71	0.009	1.05	0.002	0.42
SizeMat	-	-0.433	-2.37 ***	-0.152	-0.43	-0.506	-2.25 **
LevMat	-	-1.889	-2.62 ***	-23.630	-1.93 **	-2.190	-2.50 ***
120 Day return	+	0.018	1.23	0.014	0.58	0.022	1.12
BigN	-	-0.024	-1.31 *	-0.031	-1.03	-0.030	-1.26
Auditor change	+	-0.003	-0.19	-0.051	-2.10 **	0.019	1.10
Intercept		0.035	1.47	0.063	1.64	0.031	1.02
Model Statistics							
n			565		222		343
Adjusted R^2			11%		5%		15%
F-Statistic			5.15 ***		1.66 **		4.87 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is the change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investor information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement

[g]Control variables defined in Table 5.

4.2.4 Hypothesis four

Hypothesis four examines the extent to which pre-restatement earnings quality impacts analyst forecast revisions following restatement announcements. The same independent variables used to test hypothesis one are used to test this hypothesis, but the dependent variable is changed to analyst forecast revision.

Hypothesis four results for *FF-DDEQ* are presented in Table 16. For the full sample and sample announced in earnings releases, the model is highly significant (*F*-statistics = 3.67 and 9.07, p values < 0.01 and 0.01, respectively). On the other hand, the insignificance of the model in the subset of announcements issued separately from earnings releases (*F*-statistic = 1.07, R^2 < 1%); appears to indicate that the model is poorly specified. Although in this sub-sample *FF-DDEQ* is significant at the p < 0.05 level, the coefficient is negative (coeff. = -0.033), which is contrary to the hypothesis that earnings quality is positively related to earnings forecast revisions. Furthermore, only the control variables *PRIORRET* is significant (*t*-statistic = 3.18, p value < 0.01). The majority of variables that are significant in the full and earnings release samples are associated with income (*MAT*), size (*SIZEMAT*), leverage (*LEVMAT*), and previous returns (*PRIORRET*), which may indicate spillover from changes associated with normal operations not related to the restatement announcement strengthen the model predictability. This notion is supported by the high R^2 of 40 percent for the sample of restatements announced in conjunction with regular earnings. Relaxing the above dilemma of poor model specification for these two samples does not provide support for the hypothesis as the coefficients on *FF-DDEQ* in both the full sample and sub-sample announced with earnings are negative (coeff. = -0.021 and -0.014, respectively). Therefore, regardless of the model misspecification, hypothesis four is not supported.

Table 16

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Hypothesis 4

Fama French Earnings Quality (FF-DDEQ) [a]

$$FREV^{b} = \beta_0 + \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	+	-0.021	-1.32 *	-0.014	-0.35	-0.033	-1.89 **
Control Variables[f]							
Fraud	-	0.011	0.80	0.012	0.61	0.001	0.06
Auditor attribution	-	0.006	0.48	-0.007	-0.36	0.013	0.75
Management attribution	+	0.009	0.92	0.002	0.18	0.007	0.50
SEC attribution	+	0.005	0.33	0.008	0.43	0.003	0.16
Core	-	-0.008	-0.92	-0.024	-1.80 **	-0.001	-0.03
Materiality	+	-0.808	-4.56 ***	-2.600	-3.86 ***	-0.019	-0.09
Pervasiveness	-	-0.001	-0.22	-0.001	-0.17	-0.001	-0.12
Years	-	-0.001	-0.11	-0.002	-0.31	-0.001	-0.02
SizeMat	-	0.414	4.29 ***	1.350	3.17 ***	0.009	0.08
LevMat	-	6.415	2.69 ***	16.030	5.17 ***	-1.089	-0.23
Prior returns	+	0.039	3.31 ***	0.036	2.53 ***	0.047	3.18 ***
BigN	-	0.002	0.11	0.010	0.29	-0.007	-0.29
Auditor change	+	0.020	1.73 **	0.045	2.60 ***	0.008	0.58
Intercept		-0.011	-0.48	0.003	0.08	-0.012	-0.42
Model Statistics							
n			400		170		230
Adjusted R^2			9%		40%		<1%
F-Statistic			3.67 ***		9.07 ***		1.07

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3.

[b]Analyst forecast revision *(FREV)* calculated as consensus analyst forecast in the 45 day period immediately following the restatement announcement less consensus analyst forecast in the 45 day period immediately preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 400 restatements to correct misstatements of annual and quarterly financial reports for which analyst forecast information was available surrounding the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 170 restatements announced in earnings releases.

[e]Subset of 230 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

The results of the regression for hypothesis four with *PRS-DDEQ* are presented in Table 17. The results are similar to the results with *FF-DDEQ*. Although the coefficient on *PRS-DDEQ* is significant for all three samples, the coefficients across samples are negative. Additionally, poor specification of the model for the sub-sample of restatements not announced with earnings releases (F-statistic = 1.03, R^2 < 1%) raises questions regarding the meaningfulness of the coefficients. The possibility exists that earnings quality is impacting analyst forecast revisions related to information released in earnings announcements. In other words, analysts may not be revising the forecasts of firms with positive or negative news about current earnings as much if the firms have poor earnings quality. Although this notion seems somewhat reasonable given the significance of the coefficient on *PRS-DDEQ* for the earnings release sub-sample (*t*-statistic = -2.28, p value < 0.05) and the overall model predictability (R^2 = 42%), the association of the regular earnings announcement with restatements limits conclusions that can be drawn from this sample.

The results for *BTDEQ* are presented in Table 18. Consistent with previous hypothesis four results, the model again appears poorly specified for the subset of restatements announced separately from earnings releases (*F*-statistic = 1.11, R^2 = 1%). Similar conclusions can be drawn as above with regards to the superior R^2 of 40 percent for the sub-sample of earning release announcements. Unlike the above results for *FF-DDEQ* and *PRS-DDEQ*, though, the *BTDEQ* coefficient is only significant for the sub-sample of restatements not released with earnings (*t*-statistic = -2.00, p value < 0.05). The coefficient is negative (coeff. = -0.006), however, which fails to support hypothesis four.

The negative coefficients on each earnings quality metric fail to support hypothesis four. Without regard to model specification, it would appear that pre-restatement earnings quality is

Table 17

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Hypothesis 4

Palmrose et al. Earnings Quality (PRS-DDEQ) [a]

$$FREV^{b} = \beta_0 + \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
PRS-DDEQ	+	-0.073	-2.41 ***	-0.130	-2.28 **	-0.060	-1.71 **
Control Variables[f]							
Fraud	-	0.010	0.77	0.007	0.36	0.002	0.09
Auditor attribution	-	0.006	0.42	-0.011	-0.54	0.012	0.72
Management attribution	+	0.007	0.70	-0.003	-0.22	0.006	0.48
SEC attribution	+	0.004	0.27	0.002	0.10	0.005	0.22
Core	-	-0.008	-0.94	-0.025	-1.97	-0.001	0.05
Materiality	+	-0.796	-4.54 ***	-2.719	-4.10 ***	-0.052	0.25
Pervasiveness	-	-0.001	-0.20	0.001	0.04	-0.001	-0.16
Years	-	-0.001	-0.11	-0.001	-0.17	-0.001	-0.02
SizeMat	-	0.408	4.28 ***	1.439	3.43 ***	0.026	0.23
LevMat	-	6.130	2.59 ***	14.706	4.81 ***	-0.808	-0.17
Prior returns	+	0.041	3.81 ***	0.040	2.82 ***	0.047	3.16 ***
BigN	-	0.004	0.18	0.008	0.24	-0.005	-0.19
Auditor change	+	0.021	1.82 **	0.042	2.48 ***	0.010	0.67
Intercept		-0.015	-0.65	-0.001	-0.01	-0.015	-0.53
Model Statistics							
n			400		170		230
Adjusted R^2			10%		42%		<1%
F-Statistic			4.00 ***		9.73 ***		1.03

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *PRS-DDEQ* = standard deviation of firm j's residuals, from year t-4 to year t from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2.

[b]Analyst forecast revision *(FREV)* calculated as consensus analyst forecast in the 45 day period immediately following the restatement announcement less consensus analyst forecast in the 45 day period immediately preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 400 restatements to correct misstatements of annual and quarterly financial reports for which analyst forecast information was available surrounding the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 170 restatements announced in earnings releases.

[e]Subset of 230 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

Table 18
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 4

Book Tax Difference Earnings Quality (BTDEQ)[a]

$$FREV^{b} = \beta_0 + \beta_1 BTDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
BTDEQ	+	-0.002	-0.78	0.001	0.23	-0.006	-2.00 **
Control Variables[f]							
Fraud	-	0.010	0.71	0.014	0.69	-0.004	-0.22
Auditor attribution	-	0.006	0.43	-0.007	-0.37	0.013	0.76
Management attribution	+	0.011	1.09	0.003	0.22	0.011	0.84
SEC attribution	+	0.006	0.40	0.010	0.51	0.005	0.22
Core	-	-0.007	-0.78	-0.023	-1.77 **	0.004	0.28
Materiality	+	-0.835	-4.75 ***	-2.570	-3.84 ***	-0.045	-0.22
Pervasiveness	-	-0.001	-0.20	-0.002	-0.23	0.001	0.16
Years	-	-0.001	-0.21	-0.002	-0.31	-0.001	-0.18
SizeMat	-	0.427	4.46 ***	1.330	3.14 ***	0.021	0.19
LevMat	-	6.833	2.89 ***	16.280	5.38 ***	0.315	0.07
Prior returns	+	0.039	3.56 ***	0.036	2.51 ***	0.045	3.15
BigN	-	0.003	0.15	0.010	0.30	-0.006	-0.24
Auditor change	+	0.021	1.78 **	0.045	2.59 ***	0.007	0.50
Intercept		-0.017	-0.67	0.005	0.14	-0.035	-1.13
Model Statistics							
n			400		170		230
Adjusted R^2			8%		40%		1%
F-Statistic			3.58 ***		9.06 ***		1.11

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Analyst forecast revision *(FREV)* calculated as consensus analyst forecast in the 45 day period immediately following the restatement announcement less consensus analyst forecast in the 45 day period immediately preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 400 restatements to correct misstatements of annual and quarterly financial reports for which analyst forecast information was available surrounding the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 170 restatements announced in earnings releases.

[e]Subset of 230 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

negatively associated with analyst forecast revisions following restatement announcements. Nevertheless, the poor model specification in the sub-set of restatements announced separately from earnings releases precludes firm conclusions with regards to hypothesis four.

4.2.5 Hypothesis five

Similar to hypothesis four, the final hypothesis examines the impact earnings quality has on analysts' reactions to restatement announcements. Hypothesis five examines this relationship using the same primary model but with a different dependent variable that is often associated with information uncertainty, analyst forecast dispersion.

The regression results for hypothesis five, which tests the impact of earnings quality on changes in analyst forecast dispersion following restatement announcements, are presented in Tables 19 through 21. Table 19 presents the results for *FF-DDEQ*. Distinctly dissimilar from the results of hypothesis four tests, the models for the full sample and sub-sample of restatements announced separately from earnings are significant (*F*-statistics = 2.19 and 1.82, p values < 0.01 and 0.05, respectively). In these two samples, however, the coefficients on *FF-DDEQ* are not significant (*t*-statistics = 0.029 and 0.51, respectively). Again, decidedly dissimilar from test statistics for hypothesis four, the model for the sub-sample of restatements announced in earnings releases is so poorly specified that the R^2 is negative (-2 percent). The results presented in Table 20 for *PRS-DDEQ* are almost identical. The models for both the full sample and sub-sample of restatements not publicized in earnings releases are significant (*F*-statistics = 2.19 and 1.80, p values < 0.01and 0.05, R^2 = 5% and 6%, respectively). Yet, neither of the coefficients on *PRS-DDEQ* in these samples is significant. Therefore, although the overall model fit is

Table 19
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 5

Fama French Earnings Quality (FF-DDEQ) [a]

$$\Delta\sigma_{Frcst}{}^{b} = \beta_0 + \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	+	0.002	0.29	-0.013	-0.93	0.003	0.51
Control Variables[f]							
Fraud	-	-0.013	-2.64 ***	-0.006	-0.88	-0.018	-2.63 ***
Auditor attribution	-	-0.016	-3.17 ***	-0.008	-1.14	-0.019	2.73 ***
Management attribution	+	-0.012	-2.98 ***	-0.006	-1.07	-0.016	-2.77 ***
SEC attribution	+	-0.006	-1.02	-0.006	-0.79	-0.006	-0.67
Core	-	-0.001	-0.28	-0.001	-0.07	-0.001	-0.12
Materiality	+	-0.020	-0.33	-0.146	-0.62	-0.013	-0.16
Pervasiveness	-	-0.002	-1.25	-0.001	-0.42	-0.002	-0.92
Years	-	-0.001	-0.19	-0.001	-0.06	-0.001	-0.17
SizeMat	-	0.014	0.41	0.102	0.68	0.008	0.20
LevMat	-	0.496	0.60	-0.760	-0.71	2.299	1.21
Prior returns	+	0.009	-2.41 ***	-0.013	-2.46	-0.007	-1.11
BigN	-	0.001	-0.03	0.001	0.06	0.002	0.16
Auditor change	+	0.005	1.17	0.010	1.54	0.003	0.46
Intercept		0.013	1.52	0.006	0.43	0.015	1.30
Model Statistics							
n			319		138		181
Adjusted R^2			5%		-2%		6%
F-Statistic			2.19 ***		0.83		1.82 **

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 2.

[b]Change in analyst forecast dispersion ($\Delta\sigma_{Frcst}$) calculated as the standard deviation in analyst forecasts in the 45 day period following the restatement announcement less the standard deviation in analyst forecasts in the 45 day period preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 319 restatements to correct misstatements of annual and quarterly financial reports for adequate data was available to calculate the standard deviation in analyst forecasts both before and after the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 138 restatements announced in earnings releases.

[e]Subset of 181 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

Table 20

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Hypothesis 5

Palmrose et al. Earnings Quality (PRS-DDEQ) [a]

$$\Delta\sigma_{Frcst}{}^{b} = \beta_0 + \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
PRS-DDEQ	+	-0.002	-0.16	-0.010	-0.48	0.001	0.06
Control Variables[f]							
Fraud	-	-0.013	-2.65 ***	-0.006	-0.83	-0.019	-2.61 ***
Auditor attribution	-	-0.016	-3.17 ***	-0.009	-1.21	-0.019	-2.72 ***
Management attribution	+	-0.012	-3.02 ***	-0.006	-1.03	0.016	-2.81 ***
SEC attribution	+	-0.006	-1.04 ***	-0.005	-0.73	-0.006	-0.68 ***
Core	-	-0.001	-0.30	0.001	0.04	-0.001	-0.13
Materiality	+	-0.016	-0.27	-0.132	-0.56	-0.006	-0.07
Pervasiveness	-	-0.002	-1.23	-0.002	-0.48	-0.002	-0.90
Years	-	-0.001	-0.20	-0.001	-0.08	-0.001	-0.18
SizeMat	-	0.012	0.36	0.092	0.62	0.005	0.12
LevMat	-	0.450	0.55	-0.655	-0.61	2.151	1.13
Prior returns	+	-0.009	2.35 ***	-0.013	-2.42 ***	-0.006	-1.05
BigN	-	0.001	0.03	0.001	0.09	0.002	0.15
Auditor change	+	0.005	1.18	0.010	1.59 *	0.003	0.47
Intercept		0.013	1.49	0.060	0.42	0.015	1.28
Model Statistics							
n			319		138		181
Adjusted R^2			5%		-2%		6%
F-Statistic			2.19 ***		0.78		1.80 **

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *PRS-DDEQ* = standard deviation of firm j's residuals, from year t-4 to year t from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2.

[b]Change in analyst forecast dispersion ($\Delta\sigma_{Frcst}$) calculated as the standard deviation in analyst forecasts in the 45 day period following the restatement announcement less the standard deviation in analyst forecasts in the 45 day period preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 319 restatements to correct misstatements of annual and quarterly financial reports for which analyst forecast dispersion information was available surrounding the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 138 restatements announced in earnings releases.

[e]Subset of 181 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

better than the hypothesis four results, the two accrual based measures of earnings quality do not provide support for hypothesis five.

The regression results for the *BTDEQ* measure are presented in Table 21. The overall model is significant only in the full restatement sample and sub-sample released separately from earnings (*F*-statistics = 2.94 and 2.59, p values = 0.01 and 0.01, R^2 = 8% and 11%, respectively). In these two samples, the coefficients on *BTDEQ* are highly significant and positive (coeff. = 0.002 and 0.004, *t*-statistics = 3.11 and 3.10, p values < 0.01 and 0.01, respectively). These results provide some support for hypothesis five. Once again, however, the full model for the sub-sample of earnings release restatements is very poorly specified (R^2 = -2%). Therefore, while *BTDEQ* appears to provide a limited amount of support for hypothesis five, the above results for the accrual models of earnings quality coupled with apparent model specification problems leave hypothesis five generally unsupported.

In summary, results of tests are unable to overturn hypotheses one through three. The results for hypothesis one demonstrate that firms with poor earnings quality elicit a less severe negative market reaction to the announcement of a restatement than firms with superior earnings quality. These results indicate that market participants are extracting information from earnings quality signals communicated in both accruals and book-tax differences. Hypothesis two results advance this contention by demonstrating that the information in book-tax differences is useful in addition to the information contained in accruals. The results for hypothesis three, however, demonstrate that these relationships are driven by a more sophisticated investor set.

Failure to support hypotheses four and five, along with poor model specification, detracts from the conclusions that can be drawn from tests of these two hypotheses about analysts'

Table 21
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases
Hypothesis 5

Book Tax Difference Earnings Quality (BTDEQ)[a]

$$\Delta\sigma_{Frcst}{}^{b} = \beta_0 + \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
BTDEQ	+	0.002	3.11 ***	0.001	1.06	0.004	3.10 ***
Control Variables[f]							
Fraud	-	-0.011	-2.20 **	-0.004	-0.53	-0.016	-2.34 **
Auditor attribution	-	-0.016	-3.24 ***	-0.009	-1.17	-0.020	-2.91 ***
Management attribution	+	-0.013	-3.26 ***	-0.005	-0.94	-0.018	-3.22 ***
SEC attribution	+	-0.005	-0.87	-0.004	-0.50	-0.006	-0.68
Core	-	-0.002	-0.53	0.001	0.13	-0.003	-0.49
Materiality	+	-0.032	-0.55	-0.115	-0.49	-0.033	-0.44
Pervasiveness	-	-0.003	-1.61 *	-0.002	-0.59	-0.004	-1.49 *
Years	-	-0.001	-0.01	0.001	0.03	-0.001	-0.27
SizeMat	-	0.020	0.63	0.080	0.54	0.019	0.47
LevMat	-	0.482	0.60	-0.511	-0.49	2.390	1.31 *
Prior returns	+	-0.010	-2.74 ***	-0.013	-2.53 ***	-0.009	-1.53 *
BigN	-	0.001	0.07	0.001	0.06	0.003	0.25
Auditor change	+	0.004	1.08	0.009	1.46 *	0.004	0.61
Intercept		0.022	2.45	0.009	0.67	0.031	2.47
Model Statistics							
n			319		138		181
Adjusted R^2			8%		-2%		11%
F-Statistic			2.94 ***		0.85		2.59 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is the change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Change in analyst forecast dispersion ($\Delta\sigma_{Frcst}$) calculated as the standard deviation in analyst forecasts in the 45 day period following the restatement announcement less the standard deviation in analyst forecasts in the 45 day period preceding the restatement announcement scaled by stock price 30 days prior to the restatement announcement.

[c]Announcements of 319 restatements to correct misstatements of annual and quarterly financial reports for which analyst forecast dispersion information was available surrounding the restatement announcement. Restatements announced between 1997 and 2004.

[d]Subset of 138 restatements announced in earnings releases.

[e]Subset of 181 restatements announced separately from earnings releases.

[f]Control variables defined in Table 5.

reactions to restatement announcements. One reasonable conclusion can be drawn from these results, however, when coupled with the results of hypothesis three. Although analysts are generally considered to be one subset of sophisticated market participants, the results indicate they appear to be drawing on a distinctly different information set when interpreting or reacting to restatement announcements than the other sub-set of sophisticated investors examined in hypothesis three. While many of the PRS (2004) model independent variables influenced institutional investors' reactions to restatements announcements, very few of these same variables appear to influence analysts' reactions.

4.3 Sensitivity tests

The primary sensitivity tests entail employing different return windows surrounding the announcement date. Although the most substantial reaction to the announcement of a restatement is expected to occur on days 0 and +1 (PRS 2004), early news leakage may result in a reaction on day -1. Furthermore, following the initial surprise reaction to the restatement announcement on days 0 and +1, prices may stabilize or rebound. To capture this potential effect, sensitivity tests extend the return window to day +3.

To reduce unnecessary disclosures, only the coefficients, related *t*- statistics for the earnings quality variables, and overall model statistics are reported in the tables. Additionally, hypothesis one results for all three earnings quality metrics and CAR on days (-1, 0, 1) are presented in a single table (22). Eight remaining tables present results for hypothesis one and the return windows CAR on days (-1, 0, 1, 2) and (-1, 0, 1, 2, 3), as well as the results for hypotheses two and three over all three additional return periods. These tables (A3 – A10) can be found in the section titled "Additional Tables" following the Appendices.

Table 22
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1) [a]

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$ [b]

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.049	-2.42 ***	-0.061	-1.81 **	-0.044	-1.71 **
n		719		273		446	
Adjusted R^2		11%		8%		15%	
F-Statistic		7.23 ***		2.74 ***		6.46 ***	
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.002	-0.05	0.034	0.24	-0.034	-0.71
n		719		273		446	
Adjusted R^2		10%		7%		14%	
F-Statistic		6.75 ***		2.52 ***		6.25 ***	
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	-0.002	-0.88	0.001	0.29	-0.005	-1.70 **
n		719		273		446	
Adjusted R^2		10%		7%		15%	
F-Statistic		6.81 ***		2.48 ***		6.46 ***	

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0 and 1 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

The results presented in Table 22 examine the relationship between earnings quality and the market reaction to restatement announcements within a three day window following the announcement, CAR over days (-1, 0, 1). The results are similar to the results for hypothesis one over a two day return window (0, 1). *FF-DDEQ* is significantly negatively related to the market return in the full restatement sample and both sub-samples (*t*-statistics = -2.42, -1.81 and -1.71, p values < 0.01, 0.05 and 0.05, respectively). *PRS-DDEQ* is not significant in the full sample or either sub-sample (*t*-statistics = -0.05, 0.24, and -0.71, respectively) and *BTDEQ* is significant in the announcement sample released separately from earnings (*t*-statistic = -1.70, p value < 0.01). The primary two day CAR (0, 1) results indicate *BTDEQ* is significant for the full sample, but that is not the case over the three day return window, as *BTDEQ* is insignificant (*t*-statistic = -0.88). Over the three day return window, all three full models are highly significant across the full and both sub-samples (All *F*-statistics > 2.48, all p values < 0.01).

Hypothesis one is similarly supported over the four day return window, CAR on days (-1, 0, 1, 2), the results of which are presented in Table A3. The only result that differs significantly from the previously reported results is the lack of significance of *BTDEQ* for the full restatement sample (*t*-statistic = -0.76). The results are also similar over the five day return window, CAR on days (-1, 0, 1, 2, 3) presented in Table A4. As with the four day window, however, *BTDEQ* is not significant for the full sample and *PRS-DDEQ* becomes only moderately significant in the sub-sample of announcements contained in earnings releases (*t*-statistic = -1.58, p value < 0.10). These results generally confirm the principal findings and provide additional support for hypothesis one.

The test of hypothesis two examines the incremental effect the book-tax difference (*BTDEQ)* has on the market reaction to restatements above and beyond the accrual earnings

quality metrics (*FF-DDEQ* and *PRS-DDEQ*). Tables A5 through A7 present results of the sensitivity analyses related to hypothesis two for the three different return windows: (-1, 0, 1), (-1, 0, 1, 2), and (-1, 0, 1, 2, 3). *BTDEQ* is not significant in the full restatement sample when combined with *FF-DDEQ* for any of the additional three returns windows and it is slightly less significant in the restatements announced separately sub-sample; p values are significant at the 0.05 and 0.10 versus 0.01 in the primary tests. Additionally, *PRS-DDEQ* becomes insignificant across all three return windows in both the full and sub-samples. *BTDEQ* does remain significant and negative across all three return windows, but only in the sub-sample of restatements announced separately from earnings releases (*t*-statistics = -1.68, -1.62 and -1.92, p values < 0.05, 0.10, and 0.05, respectively) . Despite these few differences in significance, hypothesis two remains supported.

Tests of hypothesis three examine the effect investor sophistication has on the association between earnings quality and the market reaction to restatements. The relationship is examined by including an interaction term between each earnings quality proxy and institutional ownership (*DDEQ*INST* and *BTDEQ*INST*) in the primary regression model. The sensitivity tests for hypothesis three over the additional three return windows are presented in Tables A8 through A10. Except for slight changes in the significance levels, the results are the same for hypothesis three with *FF-DDEQ* and the associated interaction term across all three return windows. The same is true for *PRS-DDEQ* and *PRS-DDEQ*INST* over the first additional return window of days (-1, 0, 1), which supports hypothesis three. The interaction term *PRS-DDEQ*INST* is only marginally significant (*t*-statistic = -1.62) in the restatements announced separately sub-sample at the p < 0.10 level over days (-1, 0, 1, 2), however, and not significant for the full or sub-samples over days (-1, 0, 1, 2, 3). These results could potentially be due to more sophisticated investors

reacting relatively more quickly to bad news and/or the fact that extra days add more noise surrounding the actual event. The results for *BTDEQ* and the associated interaction term are also similar to the primary results. *BTDEQ*INST* is only marginally significant in the full sample and separately announced sub-sample over days (-1, 0, 1) and (-1, 0, 1, 2), (p values < 0.10). Over days (-1, 0, 1, 2, 3) *BTDEQ*Inst* is significant only in the full restatement sample (p value < 0.10). These results, although weaker than in the primary tests, support hypothesis three. As with the *PRS-DDEQ* metric, the additional noise associated with expanding the return window to three days following the restatement announcements may attenuate the results.

In summary, sensitivity analyses provide additional support for the first three hypotheses. As the return windows increase, results are not uniformly as strong, but remain generally significant and in the predicted direction. The weaker results may possibly be a function of the increased noise associated with the larger return windows.

4.4 Additional analyses

4.4.1 Restatement quantification

In this section I examine the potential significance of quantifying the net income effect of the restatement in the announcement. A large percentage of restatement announcements estimate the effect the future restatement will likely have on net income. Of the 719 restatements remaining in the final sample, 486 (68 percent) were quantified in some manner.[16] By quantifying the restatement, management introduces less uncertainty about future income and

[16] Restatement announcements vary in the precision of quantification. Announcements that included any estimate of the future net income effect of the restatement were classified as quantified.

cash flows. The indicator variable *QUANT* is added to the analysis for hypothesis one to determine if quantification impacts the market reaction. *QUANT* is set equal to 1 if the restatement is quantified in the announcement and 0 otherwise. If quantifying the restatement introduces less uncertainty, the coefficient on *QUANT* should be positive and significant.

Panel A of Table 23 presents results of regressions for hypothesis one for *FF-DDEQ* and *BTDEQ*. [17] As predicted the coefficient on *QUANT* is significantly positive but only for the full restatement sample for both the *FF-DDEQ* and *BTDEQ* earnings quality variables (*t*-statistics = 2.05 and 1.93, p values < 0.05 and 0.05, respectively). The coefficient on *QUANT* is not significant for either earnings quality measure in either of the two sub-samples. To further explore this issue, Panel B of Table 23 provides the results of re-estimating the model for hypothesis one on the full sample and sub-samples using only the 486 restatements that were quantified in the announcement. The results are not quite as strong as the original sample containing all restatements. The R^2's in the quantification sample are between 3 percent and 13 percent. The R^2's in the full sample for hypothesis one are between 4 percent and 17 percent.

The above tests cast some doubt on the extent to which quantifying restatements actually reduces uncertainty. As such, univariate analyses assessing the extent to which CAR, analyst forecast revisions, and analyst forecast dispersion differ between the quantified and not quantified restatement sub-samples were also performed. Table 24 displays these results. Results indicate that the two day CAR (0, 1) are significantly less negative for the 486 quantified restatements (*t*-statistic = -1.75, p value < 0.05) than for the 233 restatements not quantified.

[17] Because the accruals measure of earnings quality is more appropriately estimated using a broader industry classification system (Ecker et al. 2005), the *PRS-DDEQ* metric is not included in supplementary analyses. Additional analyses are conducted only for the *FF-DDEQ* and *BTDEQ* metrics.

Table 23

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases with *QUANT*

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS - \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE + \beta_{13} QUANT$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
PANEL A: Full Restatment Sample[b]							
FF-DDEQ[f]	-	-0.053	-2.76 ***	-0.064	-1.98 **	-0.048	-1.96 **
QUANT[g]	+	0.021	2.05 **	0.018	1.06	0.016	1.22
Model statistics							
n			719		273		446
Adjusted R^2			12%		6%		17%
F-Statistic			7.49 ***		2.06 ***		5.49 ***
BTDEQ[f]	-	-0.004	-1.90 **	-0.002	-0.43	-0.007	-2.43 ***
QUANT[g]	+	0.020	1.93 **	0.019	1.10	0.013	1.02
Model statistics							
n			719		273		446
Adjusted R^2			11%		4%		17%
F-Statistic			7.19 ***		1.99 ***		5.51 ***
PANEL B: Quantified Restatments[h]							
FF-DDEQ[f]	-	-0.088	-3.10 ***	-0.070	-1.83 **	-0.116	-2.47 ***
Model statistics							
n			486		201		285
Adjusted R^2			9%		4%		13%
F-Statistic			4.30 ***		1.66 **		3.95 ***
BTDEQ[f]	-	-0.002	-0.54	-0.001	-0.28	-0.003	-0.70
Model statistics							
n			486		201		285
Adjusted R^2			7%		3%		11%
F-Statistic			3.56 ***		1.40 *		3.47 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality and quantification variables and the overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before

[g]*QUANT* = Indicator variable equal to 1 if restatement quantified in announcement and 0 otherwise

[h]Analysis for sub-sample of 486 quantified restatement announcements and sub-samples of 201 and 285 restatements announced in conjunction with and separately from earnings announcements, respectively.

Table 24
Univariate Tests of Restatement Quantification

	All Restatements[a]								
Variable	#	%	CAR[c] Days (0,1)	#	%	Forecast Revision[d]	#	%	Forecast Dispersion[e]
	719			400			319		
Quantified[b]	486	68%	-0.039	275	69%	-0.008	213	67%	-0.001
Not quantified	233	32%	-0.058	125	31%	-0.004	106	33%	-0.006
(*t*- statistic)			(-1.75) **			(-0.38)			(-1.60) **
(z- statistic)			(-2.07) **			(-0.14)			(-1.86) **

*,**,*** Difference across groups is significant at 0.10, 0.05, 0.01 levels respectively. *T*-tests are one-tailed. Non-parametric results are based on the Mann-Whitney z-statistic.

[a]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports, and sub-samples of 400 and 319 restatements for which analyst forecast revision and dispersion data was available, respectively. Restatements announced between 1997 and 2004.

[b]QUANT = Indicator variable equal to 1 if net income effect of if restatement quantified in announcement and 0 otherwise

[c]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[d]Analyst forecast revision is change in consensus analyst forecasts from the period prior to the restatement announcement to the period following the restatement announcement scaled by stock price in the period preceding the restatement announcement.

[e]Analyst forecast dispersion is change in standard deviation of analyst forecasts from the month prior to the restatement announcement to the period following the restatement announcement scaled by stock price in the period preceding the restatement announcement.

Similarly, the quantified restatements result in a significantly smaller change in analyst forecast dispersion (*t*-statistic = -1.60, p value < 0.05) than those restatements not quantified. There is not a significant difference in analyst forecast revisions between the two quantification groupings (*t*-statistic = -0.38), however. Although the addition of *QUANT* to the multivariate analyses did not strongly support the contention that quantifying the net income effect of the restatement reduced uncertainty, the univariate analyses provide additional evidence to indicate quantification reduces information uncertainty.

4.4.2 Restatement announcements over time

During the period covered by the sample, 1997 to 2004, the number of accounting restatements increased dramatically (Reilly 2007). Additionally, highly visible accounting scandals and legislation have focused attention on earnings quality issues in recent years. As such, the market reaction to restatement announcements may have changed during the sample period. More specifically, market participants' scrutiny of earnings quality indicators may have increased. In this section, I examine changes in the market response to restatement announcements that have occurred over time.

As restatements have become increasingly common, the negative signal they convey to market participants appears to have dwindled. The average CAR over days (0, 1) in the first four years of the sample, 1997-2000, is -10 percent compared to an average of -2 percent over years 2001-2004. The increased prevalence of restatements may be partly responsible for the attenuation in market reactions. The possibility also exists, however, that recent accounting scandals and the subsequent erosion in investor confidence have spurred investors' awareness of the implications of earnings quality. If this is the case, the negative relationship between earnings quality and the market reaction to restatement announcements should be more apparent in the post-Enron era. I investigate this trend by dividing the sample of 719 restatements into two sub-samples, pre-2001 and post-2001. The pre-2001 sample contains all restatements announced between 1997 and 2000; the post-2001 sample contains those restatements announced between 2002 and 2004.[18] The regressions for hypothesis one and three are re-estimated for

[18] The 100 restatements announced in 2001 were not included in these analyses in order to more clearly separate the effects of associated with accounting scandals.

these sub-samples. Tables 25 through 27 present these results. The first column in each table presents the original results on the full sample of 719 firms for comparison purposes.

The results presented in Table 25 for *FF-DDEQ* and hypothesis one support the notion that investors are more attuned to the implications of earnings quality in the post-2001 era. The coefficient on *FF-DDEQ* is highly significant and negative in the post-2001 sample (*t*-statistic = -3.03, p value < 0.01) but only marginally significant in the pre-2001 sample (*t*-statistic = -1.40, p value < 0.10). The results for *BTDEQ* and hypothesis one are presented in Table 26. Unlike *FF-DDEQ*, which is highly significant in the post-2001 sample, *BTDEQ* is only significantly negatively related to the market reaction over the full sample period (*t*-statistic = -1.89, p value < 0.05). This result conceivably indicates that public concern over the reliability of financial information increased investors' awareness of the implications of accruals quality as opposed to earnings quality in general.

Hypothesis three is reconsidered over the two-sample periods as well; these results are presented in Table 27. The interaction term, *FF-DDEQ*INST* is significantly and negatively related to returns in both the full sample and post-2001 sample (*t*-statistic = -1.85, p value < 0.05), but not in the pre-2001 sample (*t*-statistic = 1.05). This result is consistent with the argument that investors, particularly sophisticated investors, have been more attuned to the implications of earnings quality following accounting scandals early this decade. These results provide an interesting avenue for future research into earnings quality trends in recent years and the market implications associated with those trends.

In addition to changes in the implications of earnings quality, the results of the hypotheses across the two sub-sample periods indicate that the impact other variables have on

Table 25

OLS regression results for all sample restatements and subsets that were announced Pre and Post 2001

Hypothesis 1

Fama French Earnings Quality (DDEQ-FamaFrench) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Pre-2001 Restatements[d]		Post-2001 Restatements[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	-	-0.051	-2.66 ***	-0.061	-1.40 *	-0.06	-3.03 ***
Control Variables[f]							
Fraud	-	-0.050	-3.28 ***	-0.068	-2.29 **	-0.019	-0.99
Auditor attribution	-	-0.031	-2.16 **	-0.074	-2.07 **	-0.011	-0.80
Management attribution	+	0.001	0.02	0.002	0.05	-0.012	-1.40 *
SEC attribution	+	0.018	1.01	0.024	0.61	0.002	0.09
Core	-	-0.031	-2.88 ***	-0.058	-2.22 **	-0.012	-1.15
Materiality	+	0.206	1.67 **	0.904	2.21 **	0.106	1.04
Pervasiveness	-	-0.034	-5.74 ***	-0.047	-4.13 *	-0.016	-2.36 ***
Years	-	0.006	1.38 *	0.015	1.05	-0.005	-1.24
SizeMat	-	-0.107	-1.50 *	-0.460	-1.82 **	-0.058	-0.99
LevMat	-	-0.061	-1.71 **	-13.300	-1.47 *	-0.028	-0.95
120 Day return	+	0.027	2.05 **	0.026	1.02	-0.005	-0.34
BigN	-	-0.018	-1.17	-0.012	-0.33	-0.031	-1.99 **
Auditor change	+	-0.002	-0.13	-0.036	-1.14	-0.009	-0.78
Intercept		0.034	1.77	0.024	0.52	0.050	2.67
Model Statistics							
n			719		242		377
Adjusted R^2			12%		19%		5%
F-Statistic			7.69 ***		5.05 ***		2.44 **

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 242 restatements announced between 1997 and 2000.

[e]Subset of 377 restatements announced between 2002 and 2004.

[f]Control variables defined in Table 5.

Table 26

OLS regression results for all sample restatements and subsets that were announced Pre and Post 2001

Hypothesis 1

Book Tax Difference Earnings Quality (BTDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 BTDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Pre-2001 Restatements[d]		Post-2001 Restatements[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
BTDEQ	-	-0.004	-1.89 **	-0.007	-1.26	-0.002	0.52
Control Variables[f]							
Fraud	-	-0.054	-3.44 ***	-0.075	-2.46	-0.002	-1.01
Auditor attribution	-	-0.031	-2.15 **	-0.076	-2.12	-0.020	-0.79
Management attribution	+	0.002	0.21	0.003	0.10	-0.011	-1.13
SEC attribution	+	0.019	1.08	0.019	0.47	0.004	0.24
Core	-	-0.03	-2.82 ***	-0.060	-2.31	-0.012	-1.08
Materiality	+	0.198	1.60 *	0.948	2.31	0.088	0.85
Pervasiveness	-	-0.033	-5.59 ***	-0.046	-4.10	-0.016	-2.27 **
Years	-	0.005	1.24	0.016	1.17	-0.005	-1.38 *
SizeMat	-	-0.102	-1.43 *	-0.492	-1.94	-0.049	-0.83
LevMat	-	-0.059	-1.64 **	-12.157	-1.34	-0.023	-0.76
120 Day return	+	0.026	1.98 **	0.027	1.07	-0.009	-0.58
BigN	-	-0.024	-1.52 *	-0.022	-0.61	-0.031	-1.91 **
Auditor change	+	-0.001	-0.06	-0.034	-1.00	-0.009	-0.77
Intercept		0.031	1.57	0.026	0.57	0.050	2.52
Model Statistics							
n			719		242		377
Adjusted R^2			11%		19%		3%
F-Statistic			7.41 ***		5.05 ***		1.77 **

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *BTDEQ* = The log of the absolute value of firm j's book-tax difference where book-tax difference is the change in firm j's net operating loss in years t and t-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year t.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 242 restatements announced between 1997 and 2000.

[e]Subset of 377 restatements announced between 2002 and 2004.

[f]Control variables defined in Table 5.

Table 27

OLS regression results for all sample restatements and subsets that were announced Pre and Post 2001

Hypothesis 3

Fama French Earnings Quality (FF-DDEQ) [a]

$$CAR^{b} = \beta_0 - \beta_1 DDEQ - \beta_2 INST - \beta_3 DDEQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT - \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Pre-2001 Restatements[d]		Post-2001 Restatements[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Earnings Quality							
FF-DDEQ	-	-0.005	-0.13	-0.075	-0.99	-0.062	-0.98
INST[f]	-	-0.008	-0.35	0.024	0.4	0.004	0.18
FF-DDEQ*INST	-	-0.212	-2.60 ***	0.386	1.05	-0.179	-1.85 **
Control Variables[g]							
Fraud	-	-0.083	-4.88 ***	-0.121	-3.43 ***	0.050	-2.39 ***
Auditor attribution	-	-0.032	-2.07 **	-0.063	-1.48 *	-0.010	-0.71
Management attribution	+	-0.005	-0.37	0.008	0.22	-0.024	-2.19
SEC attribution	+	-0.001	-0.01	0.017	0.38	-0.005	-0.22 **
Core	-	-0.027	-2.34 ***	-0.072	-2.26 **	-0.013	-1.17
Materiality	+	0.837	2.78 ***	1.331	2.50 ***	0.365	0.96
Pervasiveness	-	-0.021	-3.12 ***	-0.019	-1.29 *	-0.015	-2.23 **
Years	-	0.003	0.71	0.008	0.51	-0.004	-0.9
SizeMat	-	-0.450	-2.49 ***	-0.704	-25.17 **	-0.165	-0.74
LevMat	-	-2.172	-3.01 ***	-14.620	-1.20	-1.400	-1.73 **
120 Day return	+	0.020	1.40 *	0.014	0.49	-0.002	-0.14
BigN	-	-0.027	-1.47 *	-0.044	-0.92	-0.022	-1.3 *
Auditor change	+	-0.002	-0.15	-0.036	-0.99	0.001	0.05
Intercept		0.033	1.50	0.035	0.58	0.035	1.69
Model Statistics							
n			565		177		305
Adjusted R^2			12%		17%		12%
F-Statistic			5.90 ***		3.24 ***		3.61 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Earnings quality variable defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3.

[b]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days 0 and 1 where day 0 is the date of the restatement announcement.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investor information was available. Restatements announced between 1997 and 2004.

[d]Subset of 177 restatements announced between 1997 and 2000.

[e]Subset of 305 restatements announced between 2002 and 2004.

[f]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement.

[g]Control variables defined in Table 5.

the market reaction may have attenuated over time. The low R^2's for the post-2001 sample of 5 percent and 3 percent for the tests of hypothesis one indicate that many of the variables identified by PRS (2004) appear to be considerably more important in determining the market reaction to restatement announcements pre-2001 (both R^2 = 19%). The PRS study spanned the years 1995 through 1999, and the full sample R^2 in their study is 17 percent. Determining the other variables not included in the PRS model that impact the market reaction in more recent years presents an interesting research avenue.

Following this thought, I examine the effect the two additional control variables added to the PRS (2004) model, Big N (*BIGN*) and auditor change (*AUDCHANGE),* have in the pre- and post-2001 samples. Big N auditor significantly affects the market reaction in the post-2001 period but not the pre-2001 period. As seen in Tables 25 and 26, *BIGN* is significantly negatively related to market reaction in the post-2001 period in tests of hypothesis one using both the *FF-DDEQ* and *BTDEQ* metrics (*t*-statistics = -1.99 and -1.91, p values < 0.05 and 0.05, respectively) but not in the pre-2001 period (*t*-statistics = -0.33 and -0.61, respectively). Auditor change, however, is not significant in the full sample tests of hypothesis one or in either the pre- or post-2001 sub-sample tests. Prior research indicating that auditor changes impact the likelihood of restatements addressed only on quarterly restatements. To determine if the periods restated influenced the results for the auditor change variable, the full sample was divided into two sub-samples, those restatements affecting one or more years and those restatements affecting three or fewer quarters. The results (not-tabulated) are similar to the full sample and indicate that auditor change does not influence the market reaction to annual or quarterly restatements.

The difference in significance levels of the *FF-DDEQ* metric across the two sub-sample periods provide reason to believe that market participants have become increasingly familiar

with the implications of earnings quality in recent years. While the influence earnings quality has on the market reaction to restatement announcements appears to have increased, the importance of many other previously identified variables appears to have diminished. These results demonstrate the importance of continuing to conduct restatement research as market participants' mind-sets transform and their aptitudes evolve over time.

Chapter 5

Limitations and Conclusions

5.1 Limitations

While proper research procedures have been followed throughout the research process, every study possesses some limitations. As is the case with many studies employing various earnings quality metrics, there is a potential survivorship bias related to the number of years of data required to estimate earnings quality. The final sample is likely skewed towards larger, more successful firms. Additionally, requiring a minimum of twenty industry specific data points reduced the sample size considerably and ultimately resulted in certain industry classifications not being represented in the final sample. In addition to possible survivorship bias, while the accounting literature includes numerous definitions of earnings quality, the primary earnings quality metric (DDEQ) used in this study estimates earnings quality based on the relationship between accruals and cash flows. Signals regarding earnings quality are not limited to the information conveyed by accruals, however. Market participants likely extract earnings quality data from a variety of sources that are outside the scope of this study. The inclusion of book-tax differences as an additional earnings quality proxy helps address this issue to some extent, but the fact that book-tax differences are logically correlated with accruals cannot be overlooked.

The PRS (2004) model was the sole existing model to predict the reaction to restatement announcements at the time the research design for this study was developed. Therefore, all the variables in the PRS model were used as controls as well as two additional variables that may have impacted the market reaction. Nevertheless, results indicating that variables from the PRS

model are not nearly as significant in the post-2001 period suggest that a better model could be developed. This remains a fruitful avenue for future research.

5.2 Conclusion

One primary motivation for undertaking this research was to provide additional insights into market participants' abilities to discern and subsequently price the implications of earnings quality. Unlike prior studies that have relied on associating earnings quality proxies with future returns and cash flows, this study associates earnings quality with returns following an observable signal that earnings are of poor quality -- accounting restatements. Associating pre-restatement earnings quality with the market reaction to restatement announcements provides more demonstrative evidence that to some extent market participants are extracting insightful information regarding firms' future performance and subsequently pricing that information. As such, this research helps elucidate our understanding of investors' use of key accounting information, specifically the information contained in accruals and book-tax differences.

The findings in this study provide evidence of a negative relationship between pre-restatement earnings quality and the market reaction to restatement announcements. Both the accrual and book-tax proxy for earnings quality are negatively related to the market reaction following restatement announcements. These results demonstrate that investors look to multiple indicators of earnings quality when analyzing financial reports. In addition to demonstrating that earnings quality is, at least in part, priced by the market, further analysis demonstrates this relationship is most prevalent in the subset of institutional investors. These findings further our collective knowledge by providing evidence that the implications of earnings quality appear to

be most thoroughly understood by sophisticated investors who impose a stock price penalty on firms with substandard earnings quality.

In addition to demonstrating an association between pre-restatement earnings quality as conveyed by accruals, this research documents the extent to which investors rely on a supplementary earnings quality indicator, book-tax differences. The extent to which book-tax differences inform on earnings quality was examined and results indicate that large book-tax differences are associated with lesser negative market reactions to restatement announcements. Individually, it appears that book-tax difference do convey information vis-à-vis the quality of earnings to investors. This study extends this finding, however, by providing additional support for the contention that book-tax differences *signal* market participants that the quality of earnings may be problematic, thereby increasing investors' due diligence (Hanlon 2005; Hanlon & Krishnan 2005). Tests of hypothesis two indicate that, although book-tax differences inform on earnings quality, they also appear to impart a certain amount of supplementary information. These findings demonstrate that market participants garner information on earnings quality from multiple sources in financial statements including tax information. This suggests that tax planning has pricing consequences that extend beyond bottom line outcomes.

Another primary motivation for undertaking this study was to examine an additional factor that may contribute to the substantial heterogeneity in the market responses to restatements. The significance of the earnings quality variable in the first three hypotheses indicates that pre-restatement earnings quality clearly influences the market reaction. Additionally, an examination of the pre and post-2001 time periods indicates that the impact earnings quality has on investors' reactions to restatements appears to have intensified, while the significance of several other variables in the model appears to be shifting. This finding not only

provides information vis-à-vis the market pricing of earnings quality, but also highlights the importance of continuing to engage in restatement research, particularly using more recent restatement data. Recent shifts in public concern over accounting quality, coupled with the new regulatory environment created by Sarbanes-Oxley, have undoubtedly shaped both how and why investors react to restatements. While this shift may have resulted in the heightened importance of financial statement quality, there remain many unanswered questions about the substantial role restatements play in capital markets.

APPENDICES

APPENDIX 1
Core and Non-core Account Descriptions/Classifications*

CORE ACCOUNTS:

- Revenue
  - Timing Differences
  - Permanent Changes
  - Unclear Changes
- Cost of Sales
- Operating Expenses
  - Operating Reserves
  - Capitalized Expenses
  - Expense Accruals
- Reclassifications between core accounts

NON-CORE ACCOUNTS:

- One-time/Special Items
  - Adjustments to Restructuring Costs
  - PP&E Impairments and Write downs
  - Impairments to intangible assets including goodwill
  - Adjustments impairments to investment (equity, mark to market)
  - Adjustments to non-extraordinary gains and losses
  - Adjust or record fines or settlements
- Merger Related Items
  - Change from pooling to purchase accounting
  - Adding merger previously considered immaterial
  - Adjustments to goodwill
  - Adjustments to IPR&D write-offs
  - Adjustments to acquisition accruals
- Non-Operating Items
  - Adjustments to tax accounts
  - Convertible debt/warrant beneficial interest
  - Adjustments to interest/others
  - Adjustments to other income/expense
  - Adjustments to account for discontinued operations
  - Adjustments to account for extraordinary items
- Other Items
  - Balance sheet reclassifications
  - Adjustment to EPS classifications
  - Consolidation errors
  - Adjustments to equity accounts

**From Palmrose and Scholz (2004)*

APPENDIX 2
Palmrose et al. Industry Classifications**

SIC Codes	Description
0-1999	Mining and Construction
2000-3570 & 3580-3999	Manufacturing
3570-3579 & 7370-7379	Technology
4000-4799	Transportation
4800-4899	Communications
4900-4999	Utilities
5000-5999	Wholesale/Retail
6000-6999	Financial Services
7000-7369 & 7380-7999	Services

***From Palmrose, Richardson & Scholz 2004*

APPENDIX 3
Modified Fama & French 30 Industry Classifications[a]

1 Food Products
- 0100-0199 Agriculture production - crops
- 0200-0299 Agriculture production - livestock
- 0700-0799 Agricultural services
- 0910-0919 Commercial fishing
- 2000-2009 Food and kindred products
- 2010-2019 Meat products
- 2020-2029 Dairy products
- 2030-2039 Canned-preserved fruits-vegetables
- 2040-2046 Flour and other grain mill products
- 2048-2048 Prepared feeds for animals
- 2050-2059 Bakery products
- 2060-2063 Sugar and confectionery products
- 2064-2068 Candy and other confectionery
- 2070-2079 Fats and oils
- 2086-2086 Bottled-canned soft drinks
- 2087-2087 Flavoring syrup
- 2090-2092 Miscellaneous food preps
- 2095-2095 Roasted coffee
- 2096-2096 Potato chips
- 2097-2097 Manufactured ice
- 2098-2099 Miscellaneous food preparations

2 Beer & Liquor
- 2080-2080 Beverages
- 2082-2082 Malt beverages
- 2083-2083 Malt
- 2084-2084 Wine
- 2085-2085 Distilled and blended liquors

3 Tobacco Products
- 2100-2199 Tobacco products

4 Recreation
- 0920-0999 Fishing, hunting & trapping
- 3650-3651 Household audio visual equip
- 3652-3652 Phonographic records
- 3732-3732 Boat building and repair
- 3930-3931 Musical instruments
- 3940-3949 Toys
- 7800-7829 Services - motion picture production and distribution
- 7830-7833 Services - motion picture theatres
- 7840-7841 Services - video rental

4 Recreation (continued)

7900-7900 Services - amusement and recreation
7910-7911 Services - dance studios
7920-7929 Services - bands, entertainers
7930-7933 Services - bowling centers
7940-7949 Services - professional sports
7980-7980 Amusement and recreation services
7990-7999 Services – Miscellaneous entertainment

5 Printing and Publishing

2700-2709 Printing publishing and allied
2710-2719 Newspapers: publishing-printing
2720-2729 Periodicals: publishing-printing
2730-2739 Books: publishing-printing
2740-2749 Miscellaneous publishing
2750-2759 Commercial printing
2770-2771 Greeting card publishing
2780-2789 Book binding
2790-2799 Service industries for print trade
3993-3993 Signs, advertising specialty

6 Consumer Goods

2047-2047 Dog and cat food
2391-2392 Curtains, home furnishings
2510-2519 Household furniture
2590-2599 Miscellaneous furniture and fixtures
2840-2843 Soap & other detergents
2844-2844 Perfumes cosmetics
3160-3161 Luggage
3170-3171 Handbags and purses
3172-3172 Personal leather goods, except handbags
3190-3199 Leather goods
3229-3229 Pressed and blown glass
3260-3260 Pottery and related products
3262-3263 China and earthenware table articles
3269-3269 Pottery products
3230-3231 Glass products
3630-3639 Household appliances
3750-3751 Motorcycles, bicycles and parts (Harley & Huffy)
3800-3800 Miscellaneous inst, photo goods, watches
3860-3861 Photographic equipment (Kodak, Xerox, etc.)
3870-3873 Watches clocks and parts
3910-3911 Jewelry-precious metals
3914-3914 Silverware

6 Consumer Goods (continued)

3915-3915 Jewelers' findings, materials
3960-3962 Costume jewelry and notions
3991-3991 Brooms and brushes
3995-3995 Burial caskets

7 Apparel

2300-2390 Apparel and other finished products
3020-3021 Rubber and plastics footwear
3100-3111 Leather tanning and finishing
3130-3131 Boot, shoe cut stock, findings
3140-3149 Footware except rubber
3150-3151 Leather gloves and mittens
3963-3965 Fasteners, buttons, needles, pins

8 Healthcare, Medical Equipment, Pharmaceutical Products

2830-2830 Drugs
2831-2831 Biological products
2833-2833 Medicinal chemicals
2834-2834 Pharmaceutical preparations
2835-2835 In vitro, in vivo diagnostics
2836-2836 Biological products, except diagnostics
3693-3693 X-ray, electro-medical app
3840-3849 Surgical & medical instruments
3850-3851 Ophthalmic goods
8000-8099 Services - health

9 Chemicals

2800-2809 Chemicals and allied products
2810-2819 Industrial inorganic chemicals
2820-2829 Plastic material & synthetic resin
2850-2859 Paints
2860-2869 Industrial organic chemicals
2870-2879 Agriculture chemicals
2890-2899 Miscellaneous chemical products

10 Textiles

2200-2269 Textile mill products
2270-2279 Floor covering mills
2280-2284 Yarn and thread mills
2290-2295 Miscellaneous textile goods
2297-2297 Non-woven fabrics
2298-2298 Cordage and twine
2299-2299 Miscellaneous textile products
2393-2395 Textile bags, canvas products
2397-2399 Miscellaneous textile products

11 Construction and Construction Materials

0800-0899 Forestry
1500-1511 Building construction - general contractors
1520-1529 Gen building contractors - residential
1530-1539 Operative builders
1540-1549 Gen building contractors - non-residential
1600-1699 Heavy construction - not building contractors
1700-1799 Construction - special contractors
2400-2439 Lumber and wood products
2450-2459 Wood buildings-mobile homes
2490-2499 Miscellaneous wood products
2660-2661 Building paper and board mills
2950-2952 Paving & roofing materials
3200-3200 Stone, clay, glass, concrete etc
3210-3211 Flat glass
3240-3241 Cement hydraulic
3250-3259 Structural clay prods
3261-3261 Vitreous china plumbing fixtures
3264-3264 Porcelain electrical supply
3270-3275 Concrete gypsum & plaster
3280-3281 Cut stone and stone products
3290-3293 Abrasive and asbestos products
3295-3299 Non-metallic mineral products
3420-3429 Hand tools and hardware
3430-3433 Heating equipment & plumbing fixtures
3440-3441 Fabricated structural metal products
3442-3442 Metal doors, frames
3446-3446 Architectural or ornamental metal work
3448-3448 Pre-fabricated metal buildings
3449-3449 Miscellaneous structural metal work
3450-3451 Screw machine products
3452-3452 Bolts, nuts screws
3490-3499 Miscellaneous fabricated metal products
3996-3996 Hard-surface floor cover

12 Steel Works Etc

3300-3300 Primary metal industries
3310-3317 Blast furnaces & steel works
3320-3325 Iron & steel foundries
3330-3339 Prim smelt-refinery non-ferrous metals
3340-3341 Secondary smelt-refinery non-ferrous metals
3350-3357 Rolling & drawing non-ferrous metals
3360-3369 Non-ferrous foundries and casting
3370-3379 Steel works etc
3390-3399 Miscellaneous primary metal products

13 Fabricated Products and Machinery

3400-3400 Fabricated metal, except machinery and trans eq
3443-3443 Fabricated plate work
3444-3444 Sheet metal work
3460-3469 Metal forgings and stampings
3470-3479 Coating and engraving
3510-3519 Engines & turbines
3520-3529 Farm and garden machinery
3530-3530 Construction, mining material handling machinery
3531-3531 Construction machinery
3532-3532 Mining machinery, except oil field
3533-3533 Oil field machinery
3534-3534 Elevators
3535-3535 Conveyors
3536-3536 Cranes, hoists
3538-3538 Machinery
3540-3549 Metalworking machinery
3550-3559 Special industry machinery
3560-3569 General industrial machinery
3580-3580 Refrigeration & service industrial machines
3581-3581 Automatic vending machines
3582-3582 Commercial laundry and dry-cleaning machines
3585-3585 Air conditioning, heating, refrigeration equipment
3586-3586 Measuring and dispensing pumps
3589-3589 Service industry machinery
3590-3599 Miscellaneous industrial and commercial equipment and mach

14 Electrical Equipment

3600-3600 Electrical machine equipment & supply
3610-3613 Electrical transmission
3620-3621 Electrical industrial apparatus
3623-3629 Electrical industrial apparatus
3640-3644 Electric lighting, wiring
3645-3645 Residential lighting fixtures
3646-3646 Commercial lighting
3648-3649 Lighting equipment
3660-3660 Communication equip
3690-3690 Miscellaneous electrical machinery and equip
3691-3692 Storage batteries
3699-3699 Electrical machinery and equip

15 Automobiles and Trucks

2296-2296 Tire cord and fabric
2396-2396 Auto trim
3010-3011 Tires and inner tubes

15 Automobiles and Trucks (continued)

3537-3537 Trucks, tractors, trailers
3647-3647 Vehicular lighting
3694-3694 Electrical internal combustion engines
3700-3700 Transportation equipment
3710-3710 Motor vehicles and motor vehicle equip
3711-3711 Motor vehicles & car bodies
3713-3713 Truck & bus bodies
3714-3714 Motor vehicle parts
3715-3715 Truck trailers
3716-3716 Motor homes
3792-3792 Travel trailers and campers
3790-3791 Miscellaneous transportation equipment
3799-3799 Miscellaneous transportation equip

16 Aircraft, ships, and railroad equipment

3720-3720 Aircraft & parts
3721-3721 Aircraft
3723-3724 Aircraft engines, engine parts
3725-3725 Aircraft parts
3728-3729 Aircraft parts
3730-3731 Ship building and repair
3740-3743 Railroad Equipment

17 Precious Metals, Non-Metallic, and Industrial Metal Mining

1000-1009 Metal mining
1010-1019 Iron ores
1020-1029 Copper ores
1030-1039 Lead and zinc ores
1040-1049 Gold & silver ores
1050-1059 Bauxite and other aluminum ores
1060-1069 Ferroalloy ores
1070-1079 Mining
1080-1089 Mining services
1090-1099 Miscellaneous metal ores
1100-1119 Anthracite mining
1400-1499 Mining and quarrying non-metallic minerals

18 Coal

1200-1299 Bituminous coal

19 Petroleum and Natural Gas

1300-1300 Oil and gas extraction
1310-1319 Crude petroleum & natural gas
1320-1329 Natural gas liquids

19 Petroleum and Natural Gas (continued)

1330-1339 Petroleum and natural gas
1370-1379 Petroleum and natural gas
1380-1380 Oil and gas field services
1381-1381 Drilling oil & gas wells
1382-1382 Oil-gas field exploration
1389-1389 Oil and gas field services
2900-2912 Petroleum refining
2990-2999 Miscellaneous petroleum products

20 Utilities

4900-4900 Electric, gas, & sanitary services
4910-4911 Electric services
4920-4922 Natural gas transmission
4923-4923 Natural gas transmission-distr.
4924-4925 Natural gas distribution
4930-4931 Electric and other services combined
4932-4932 Gas and other services combined
4939-4939 Combination utilities
4940-4942 Water supply

21 Communication

4800-4800 Communications
4810-4813 Telephone communications
4820-4822 Telegraph and other message communication
4830-4839 Radio-TV Broadcasters
4840-4841 Cable and other pay TV services
4880-4889 Communications
4890-4890 Communication services (Comsat)
4891-4891 Cable TV operators
4892-4892 Telephone interconnect
4899-4899 Communication services

22 Personal and Business Services

7020-7021 Rooming and boarding houses
7030-7033 Camps and recreational vehicle parks
7200-7200 Services - personal
7210-7212 Services - laundry, cleaners
7214-7214 Services - diaper service
7215-7216 Services - coin-op cleaners, dry cleaners
7217-7217 Services - carpet, upholstery cleaning
7218-7218 Services - industrial launderers
7219-7219 Services - laundry, cleaners
7220-7221 Services - photo studios, portrait
7230-7231 Services - beauty shops
7240-7241 Services - barber shops

22 Personal and Business Services (continued)

7250-7251 Services - shoe repair
7260-7269 Services - funeral
7270-7290 Services - miscellaneous
7291-7291 Services - tax return
7292-7299 Services - miscellaneous
7300-7300 Services - business services
7310-7319 Services - advertising
7320-7329 Services - credit reporting agencies, collection services
7330-7339 Services - mailing, reproduction, commercial art
7340-7342 Services - services to dwellings, other buildings
7349-7349 Services - cleaning and building maintenance
7350-7351 Services - miscellaneous equipment rental and leasing
7352-7352 Services - medical equip rental
7353-7353 Services - heavy construction equip rental
7359-7359 Services - equip rental and leasing
7360-7369 Services - personnel supply services
7376-7376 Services - computer facilities management service
7377-7377 Services - computer rental and leasing
7378-7378 Services - computer maintenance and repair
7379-7379 Services - computer related services
7380-7380 Services – miscellaneous business services
7381-7382 Services - security
7383-7383 Services - news syndicates
7384-7384 Services - photofinishing labs
7385-7385 Services - telephone interconnections
7389-7390 Services – miscellaneous business services
7391-7391 Services - R&D labs
7392-7392 Services - management consulting & public relations
7393-7393 Services - detective and protective (ADT)
7394-7394 Services - equipment rental & leasing
7395-7395 Services - photofinishing labs (school pictures)
7396-7396 Services - trading stamp services
7397-7397 Services - commercial testing labs
7399-7399 Services - business services
7500-7500 Services - auto repair, services
7510-7519 Services - truck, auto, trailer rental and leasing
7520-7529 Services - automobile parking
7530-7539 Services - auto repair shops
7540-7549 Services - auto services, except repair (car washes)
7600-7600 Services - miscellaneous repair services
7620-7620 Services - electrical repair shops
7622-7622 Services - radio and TV repair shops
7623-7623 Services - refrigeration and air conditioner repair
7629-7629 Services - electrical repair shops
7630-7631 Services - watch, clock and jewelry repair

22 Personal and Business Services (continued)

7640-7641 Services - reupholster, furniture repair
7690-7699 Services – miscellaneous repair shops
8100-8199 Services - legal
8200-8299 Services - educational
8300-8399 Services - social services
8400-8499 Services - museums, galleries, botanic gardens
8600-8699 Services - membership organizations
8700-8700 Services - engineering, accounting, research, management
8710-8713 Services - engineering, accounting, surveying
8720-8721 Services - accounting, auditing, bookkeeping
8730-8730 Services - research, development, testing labs
8732-8734 Services - research, development, testing labs
8740-8748 Services - management, public relations, consulting
8800-8899 Services - private households
8900-8910 Services - miscellaneous
8911-8911 Services - engineering & architect
8920-8999 Services - miscellaneous

23 Business Equipment

3570-3579 Office computers
3622-3622 Industrial controls
3661-3661 Telephone and telegraph apparatus
3662-3662 Communications equipment
3663-3663 Radio TV communication equipment & apparatus
3664-3664 Search, navigation, guidance systems
3665-3665 Training equipment & simulators
3666-3666 Alarm & signaling products
3669-3669 Communication equipment
3670-3679 Electronic components
3680-3680 Computers
3681-3681 Computers - mini
3682-3682 Computers - mainframe
3683-3683 Computers - terminals
3684-3684 Computers - disk & tape drives
3685-3685 Computers - optical scanners
3686-3686 Computers - graphics
3687-3687 Computers - office automation systems
3688-3688 Computers - peripherals
3689-3689 Computers - equipment
3695-3695 Magnetic and optical recording media
3810-3810 Search, detection, navigation, guidance
3811-3811 Engineering lab and research equipment
3812-3812 Search, detection, navigation, guidance
3820-3820 Measuring and controlling equipment
3821-3821 Lab apparatus and furniture

23 Business Equipment (continued)

3822-3822 Automatic controls - environmental
3823-3823 Industrial measurement instruments
3824-3824 Totalizing fluid meters
3825-3825 Electrical measurement & testing instruments
3826-3826 Lab analytical instruments
3827-3827 Optical instruments and lenses
3829-3829 Measurement and control devices
3830-3839 Optical instruments and lenses
7373-7373 Computer integrated systems design

24 Business Supplies and Shipping Containers

2440-2449 Wood containers
2520-2549 Office furniture and fixtures
2600-2639 Paper and allied products
2640-2659 Paperboard containers, boxes, drums, tubs
2670-2699 Paper and allied products
2760-2761 Manifold business forms
3220-3221 Glass containers
3410-3412 Metal cans and shipping containers
3950-3955 Pens pencils and office supplies

25 Transportation

4000-4013 Railroads-line hauling
4040-4049 Railway express service
4100-4100 Transit and passenger transportation
4110-4119 Local passenger transportation
4120-4121 Taxicabs
4130-4131 Inter-city bus transportation (Greyhound)
4140-4142 Bus charter
4150-4151 School buses
4170-4173 Motor vehicle terminals, service facilities
4190-4199 Miscellaneous transit and passenger transportation
4200-4200 Motor freight transit, warehousing
4210-4219 Trucking
4220-4229 Warehousing and storage
4230-4231 Terminal facilities - motor freight
4240-4249 Transportation
4400-4499 Water transport
4500-4599 Air transportation
4600-4699 Pipelines, except natural gas
4700-4700 Transportation services
4710-4712 Freight forwarding
4720-4729 Travel agencies, etc
4730-4739 Arrange transportation - freight and cargo
4740-4749 Rental of railroad cars

25 Transportation (continued)

4780-4780 Miscellaneous services incidental to transportation
4782-4782 Inspection and weighing services
4783-4783 Packing and crating
4784-4784 Fixed facilities for vehicles, not elsewhere classified
4785-4785 Motor vehicle inspection
4789-4789 Transportation services

26 Wholesale

5000-5000 Wholesale - durable goods
5010-5015 Wholesale - autos and parts
5020-5023 Wholesale - furniture and home furnishings
5030-5039 Wholesale - lumber and construction materials
5040-5042 Wholesale - professional and commercial equipment and supplies
5043-5043 Wholesale - photographic equipment
5044-5044 Wholesale - office equipment
5045-5045 Wholesale - computers
5046-5046 Wholesale - commercial equipment
5047-5047 Wholesale - medical, dental equipment
5048-5048 Wholesale - ophthalmic goods
5049-5049 Wholesale - professional equipment and supplies
5050-5059 Wholesale - metals and minerals
5060-5060 Wholesale - electrical goods
5063-5063 Wholesale - electrical apparatus and equipment
5064-5064 Wholesale - electrical appliance TV and radio
5065-5065 Wholesale - electronic parts
5070-5078 Wholesale - hardware, plumbing, heating equip
5080-5080 Wholesale - machinery and equipment
5081-5081 Wholesale - machinery and equipment
5082-5082 Wholesale - construction and mining equipment
5083-5083 Wholesale - farm and garden machinery
5084-5084 Wholesale - industrial machinery and equipment
5085-5085 Wholesale - industrial supplies
5086-5087 Wholesale - machinery and equipment
5088-5088 Wholesale - transportation equipment except motor vehicles
5090-5090 Wholesale – Miscellaneous durable goods
5091-5092 Wholesale - sporting goods, toys
5093-5093 Wholesale - scrap and waste materials
5094-5094 Wholesale - jewelry and watches
5099-5099 Wholesale - durable goods
5100-5100 Wholesale - nondurable goods
5110-5113 Wholesale - paper and paper products
5120-5122 Wholesale - drugs & proprietary
5130-5139 Wholesale - apparel
5140-5149 Wholesale - groceries & related products
5150-5159 Wholesale - farm products

26 Wholesale (continued)

5160-5169 Wholesale - chemicals & allied products
5170-5172 Wholesale - petroleum and petroleum products
5180-5182 Wholesale - beer, wine
5190-5199 Wholesale - non-durable goods

27 Retail

5200-5200 Retail - building material, hardware, garden
5210-5219 Retail - lumber & other building mat
5220-5229 Retail
5230-5231 Retail - paint, glass, wallpaper
5250-5251 Retail - hardware stores
5260-5261 Retail - nurseries, lawn, garden stores
5270-5271 Retail - mobile home dealers
5300-5300 Retail - general merchandise stores
5310-5311 Retail - department stores
5320-5320 Retail - general merchandise stores
5330-5331 Retail - variety stores
5334-5334 Retail - catalog showroom
5340-5349 Retail
5390-5399 Retail - miscellaneous general merchandise stores
5400-5400 Retail - food stores
5410-5411 Retail - grocery stores
5412-5412 Retail - convenience stores
5420-5429 Retail - meat, fish markets
5430-5439 Retail - fruit and vegetable markets
5440-5449 Retail - candy, nut, confectionary stores
5450-5459 Retail - dairy product stores
5460-5469 Retail - bakeries
5490-5499 Retail - miscellaneous food stores
5500-5500 Retail - auto dealers and gas stations
5510-5529 Retail - auto dealers
5530-5539 Retail - auto and home supply stores
5540-5549 Retail - gasoline service stations
5550-5559 Retail - boat dealers
5560-5569 Retail - recreational vehicle dealers
5570-5579 Retail - motorcycle dealers
5590-5599 Retail - automotive dealers
5600-5699 Retail - apparel & accessories
5700-5700 Retail - home furniture and equipment stores
5710-5719 Retail - home furnishings stores
5720-5722 Retail - household appliance stores
5730-5733 Retail - radio, TV and consumer electronic stores
5734-5734 Retail - computer and computer software stores
5735-5735 Retail - record and tape stores
5736-5736 Retail - musical instrument stores

27 Retail (continued)

5750-5799 Retail
5900-5900 Retail - miscellaneous
5910-5912 Retail - drug & proprietary stores
5920-5929 Retail - liquor stores
5930-5932 Retail - used merchandise stores
5940-5940 Retail - miscellaneous
5941-5941 Retail - sporting goods stores, bike shops
5942-5942 Retail - book stores
5943-5943 Retail - stationery stores
5944-5944 Retail - jewelry stores
5945-5945 Retail - hobby, toy and game shops
5946-5946 Retail - camera and photo shop
5947-5947 Retail - gift, novelty
5948-5948 Retail - luggage
5949-5949 Retail - sewing & needlework stores
5950-5959 Retail
5960-5969 Retail - non-store retailers (catalogs, etc)
5970-5979 Retail
5980-5989 Retail - fuel & ice stores (Penn Central Co)
5990-5990 Retail - retail stores
5992-5992 Retail - florists
5993-5993 Retail - tobacco stores
5994-5994 Retail - news dealers
5995-5995 Retail - computer stores
5999-5999 Retail stores

28 Restaurants, Hotels, Motels

5800-5819 Retail - eating places
5820-5829 Restaurants, hotels, motels
5890-5899 Eating and drinking places
7000-7000 Hotels, other lodging places
7010-7019 Hotels motels
7040-7049 Membership hotels and lodging
7213-7213 Services - linen

29 Banking, Insurance, Real Estate, Trading

6000-6000 Depository institutions
6010-6019 Federal reserve banks
6020-6020 Commercial banks
6021-6021 National commercial banks
6022-6022 State banks - Federal Reserve System
6023-6024 State banks - not Federal Reserve System
6025-6025 National banks - Federal Reserve System
6026-6026 National banks - not Fed Reserve System
6027-6027 National banks, not FDIC

29 Banking, Insurance, Real Estate, Trading (continued)

6028-6029 Banks
6030-6036 Savings institutions
6040-6059 Banks
6060-6062 Credit unions
6080-6082 Foreign banks
6090-6099 Functions related to deposit banking
6100-6100 Non-depository credit institutions
6110-6111 Federal credit agencies
6112-6113 FNMA
6120-6129 S&Ls
6130-6139 Agricultural credit institutions
6140-6149 Personal credit institutions (Beneficial)
6150-6159 Business credit institutions
6160-6169 Mortgage bankers
6170-6179 Finance lessors
6190-6199 Financial services
6200-6299 Security and commodity brokers
6300-6300 Insurance
6310-6319 Life insurance
6320-6329 Accident and health insurance
6330-6331 Fire, marine, property-casualty ins
6350-6351 Surety insurance
6360-6361 Title insurance
6370-6379 Pension, health, welfare funds
6390-6399 Insurance carriers
6400-6411 Insurance agents
6500-6500 Real estate
6510-6510 Real estate operators
6512-6512 Operators - non-resident buildings
6513-6513 Operators - apartment buildings
6514-6514 Operators - other than apartment
6515-6515 Operators - residential mobile home
6517-6519 Lessors of real property
6520-6529 Real estate
6530-6531 Real estate agents and managers
6532-6532 Real estate dealers
6540-6541 Title abstract offices
6550-6553 Real estate developers
6590-6599 Real estate
6610-6611 Combined real estate, insurance, etc
6700-6700 Holding, other investment offices
6710-6719 Holding offices
6720-6722 Investment offices
6723-6723 Management investment, closed-end
6724-6724 Unit investment trusts

29 Banking, Insurance, Real Estate, Trading (continued)

6725-6725 Face-amount certificate offices
6726-6726 Unit investment trusts, closed-end
6730-6733 Trusts
6740-6779 Investment offices
6790-6791 Miscellaneous investing
6792-6792 Oil royalty traders
6793-6793 Commodity traders
6794-6794 Patent owners & lessors
6795-6795 Mineral royalty traders
6798-6798 REIT

30 All Other

4950-4959 Sanitary services
4960-4961 Steam, air conditioning supplies
4970-4971 Irrigation systems
4990-4991 Cogeneration - SM power producer

31 Computer Software

7370-7375 Software

32 Bank Holding Companies

6799 Holding companies

33 Pharmaceutical Companies

8731 Pharmaceuticals

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[a] Fama and French 30 industry classifications defined at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/changes_ind.html and modified to include classifications 31 – 33 per Edelen & Kadlec (2005).

APPENDIX 4
Example Restatement Announcement

July 18, 2002 Thursday
HEADLINE: *Avon* to **restate** earnings to settle SEC probe: No penalties levied: Cosmetic company will redo 1999, 2001 financial results

NEW YORK - Avon Products Inc., the world's largest direct seller of cosmetics, will **restate** 1999 and 2001 earnings to settle a U.S. Securities and Exchange Commission investigation into how the company accounted for costs of a failed software system.

No fine or penalties were imposed, the maker of Skin-So-Soft and Anew cosmetics said.

PricewaterhouseCoopers LLP, Avon's auditor and consultant, was charged by the SEC with improper accounting of the costs, and agreed to pay US$5-million to settle that and charges related to issues with other clients.

Avon halted the order-management software project in April, 1999, but wrote off just US$15-million of the US$42-million in costs in that year's first quarter, the SEC said. The software was developed by Avon's auditor, and Avon stopped work after cost overruns would have almost tripled its spending to between US$100-million and US$110-million, the commission said.

"This enforcement action addresses a serious problem and underlines why we need reform," said Ed Durkin, director of special projects for the United Brotherhood of Carpenters, whose US$35-billion in pension funds own 106,000 Avon shares. "Audit firms need to be cordoned off from other work to minimize the financial entanglement between the companies."

The SEC, concluding its two-year investigation, said Avon's disclosure in 1999 was misleading because it suggested the software had been used and the partial writeoff was related to the company's cost-cutting program. Rather, the halt in work stemmed from escalating cost projections and a loss of confidence in the consultant, the SEC said.

New York-based Avon neither admitted nor denied the SEC's findings, and agreed to cease and desist from future securities-law violations.

The restatement will reduce 1999 profit by US6 cents a share and increase 2001 earnings by US6 cents, the company said. Avon had net income of US$1.17 a share in 1999 and US$1.79 a share in 2001.

"The restatements scare me," said David Yucius, with Aurora Investment Counsel, which manages US $150-million and recently sold its 15,000 Avon shares. "This is something you can't take lightly."

Avon paid PricewaterhouseCoopers, the world's largest accounting firm, and a predecessor company, Coopers & Lybrand, "in the range of" US$25-million from 1997 to 1999 to develop and implement the management system, said Victor Beaudet, an Avon spokesman.

PricewaterhouseCoopers agreed to pay the US$5-million fine to settle charges it violated conflict-of-interest rules from 1996 to 2001. The firm based financial-advice fees from 14 audit clients on how successful the transactions recommended by PricewaterhouseCoopers were, the SEC charged.

"This case demonstrates the heightened risk of an audit failure when an accounting firm assists in and approves the accounting treatment of its own consulting fees," said Stephen Cutler, SEC's enforcement chief.

The firm also participated with two clients, Avon and Pinnacle Holdings Inc., in improper accounting of some costs, the commission said.

Information obtained from Lexis-Nexis News Library

Additional Tables

Table A1
Descriptive Statistics for Earnings Quality and Control Variables

Variable	Mean	Standard Deviation	Median	Minimum	Maximum
Earnings Quality [a]					
FF-DDEQ	-0.134	0.253	-0.059	-3.793	-0.001
PRS-DDEQ	-0.098	0.150	-0.054	-1.953	-0.001
BTDEQ	-3.070	2.171	-3.002	-9.994	5.059
Control Variables [b]					
Fraud	0.117	0.321	0.000	0.000	1.000
Auditor Attribution	0.171	0.377	0.000	0.000	1.000
Management Attribution	0.535	0.499	1.000	0.000	1.000
SEC Attribution	0.106	0.308	0.000	0.000	1.000
Unattributed	0.228	0.419	0.000	0.000	1.000
Core	0.647	0.478	1.000	0.000	1.000
Materiality	-0.042	0.473	-0.006	-10.967	1.449
Pervasiveness	1.399	0.855	1.000	1.000	6.000
Years	1.420	1.202	1.000	0.250	8.000
SizeMat	-0.070	0.609	-0.012	-12.103	2.236
LevMat	-0.021	0.561	-0.001	-15.036	0.033
Prior returns	-0.038	0.391	0.000	-0.936	1.087
BigN	0.891	0.311	1.000	0.000	1.000
Auditor Change	0.214	0.410	0.000	0.000	1.000

[a]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

[b]Control variables defined as follows (in table order). *Fraud:* SEC issued an accounting and auditing enforcement release (AAER). *Attribution Auditor, Management, SEC:* Restatement attributed to specific entity in press release, baseline case is *Unattributed.* *Core earnings*: Restatements involving revenue, cost of goods sold, or on-going operations. *Non-core earnings*: Restatements involving transitory items such as merger accounting, tax accounting, non-operating gains or losses and others. *Materiality*: Restated income (loss) less originally reported net income over restated period scaled by book value of total assets at the year end prior to the earliest restated period. *Pervasiveness:* Number of account groups involved in restatement. The seven account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. The sub-account groups used in these classifications are defined in Appendix X. *Years:* Sum of periods restated where a fiscal year = 1 and a fiscal quarter = 0.25.

SizeMat: Interaction between materiality variable and the natural log of the book value of total assets in at yearend in the year prior to the earliest restated period. *LevMat*: Interaction between materiality variable and ratio of book value of long term debt to book value of total assets at yearend in the year prior to the earliest restated period. *Prior Returns*: Buy and hold returns over last 120 prior to restatement announcement. *BigN:* Indicator variable equal to one if restating firm engaged a BigN auditor during the period of restatement and 0 otherwise. *Auditor Change*: Indicator variable if restating firm changed auditors from the restated period up the period ending with the announcement date.

Table A2
Spearman Correlation Matrix

Variable	*FF-DDEQ*	*PRS-DDEQ*	*BTDEQ*	*Fraud*	*Auditor Attrib.*	*Management Attrib.*	*SEC Attrib.*	*Unattributed*	*Core*	*Materiality*	*Pervasiveness*	*Years*	*SizeMat*	*LevMat*	*Prior returns*	*BigN*
FF-DDEQ	1.00															
PRS-DDEQ	0.71	1.00														
	<0.01															
BTDEQ	-0.09	-0.09	1.00													
	<0.01	0.02														
Fraud	-0.01	-0.05	-0.11	1.00												
	0.70	0.22	<0.01													
Auditor Attribution	0.03	0.02	0.04	0.05	1.00											
	0.41	0.68	0.35	0.15	-0.03											
Management Attribution	-0.04	-0.07	0.03	0.03	-0.14	1.00										
	0.24	0.08	0.35	0.35	<0.01											
SEC Attribution	-0.06	-0.07	-0.43	0.02	-0.25	-0.34	1.00									
	0.12	0.07	0.25	0.67	<0.01	<0.01										
Unattributed	0.03	0.10	-0.05	-0.10	-0.25	-0.58	-0.19	1.00								
	0.36	0.01	0.21	<0.01	<0.01	<0.01	<0.01									
Core	0.04	0.04	0.04	0.11	0.11	0.03	-0.02	-0.10	1.00							
	0.33	0.32	0.27	<0.01	<0.01	0.43	0.59	<0.01								
Materiality	0.14	0.18	-0.19	-0.01	-0.04	-0.03	0.05	0.03	-0.10	1.00						
	<0.01	<0.01	<0.01	0.70	0.28	0.44	0.15	0.44	<0.01							
Pervasiveness	0.04	0.05	0.08	0.09	0.04	-0.01	0.10	0.04	0.25	-0.06	1.00					
	0.26	0.20	0.04	0.01	0.25	0.77	<0.01	0.23	<0.01	0.10						
Years	0.03	0.06	0.03	0.04	0.09	-0.16	0.13	0.03	0.06	-0.03	0.19	1.00				
	0.41	0.11	0.46	0.24	<0.01	<0.01	<0.01	0.45	0.10	0.42	<0.01					
SizeMat	0.16	0.21	-0.2	-0.01	-0.04	-0.02	0.05	0.05	-0.08	0.94	-0.06	-0.04	1.00			
	<0.01	<0.01	<0.01	0.77	0.28	0.58	0.23	0.23	0.03	<0.01	0.10	0.25				
LevMat	-0.06	-0.03	-0.08	-0.01	-0.02	0.00	0.04	0.04	-0.07	0.65	-0.05	-0.08	0.69	1.00		
	0.08	0.44	0.04	0.87	0.61	0.98	0.26	0.26	0.04	<0.01	0.22	0.03	<0.01			
Prior returns	0.05	0.06	0.04	-0.12	-0.01	-0.03	0.06	0.01	-0.15	0.11	-0.05	0.02	0.10	0.05	1.00	
	0.14	0.09	0.23	<0.01	0.71	0.44	0.13	0.72	<0.01	<0.01	0.17	0.60	<0.01	0.15		
BigN	0.01	0.03	-0.18	0.03	-0.07	0.06	0.02	-0.01	0.06	0.04	-0.03	0.05	0.03	-0.05	-0.02	1.00
	0.77	0.50	<0.01	0.43	0.07	0.10	0.63	0.73	0.11	0.30	0.40	0.20	0.49	0.20	0.68	
Auditor Change	0.01	0.04	0.07	0.04	0.16	-0.07	-0.01	-0.03	0.07	-0.04	0.07	0.31	-0.06	-0.04	-0.04	-0.01
	0.82	0.33	0.06	0.26	<0.01	0.06	0.93	0.37	0.07	0.24	0.06	<0.01	0.12	0.33	0.35	0.93

p-values listed below correlation coefficients
Variables defined in Table 5

Table A3
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2) [a]

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$ [b]

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.051	-2.34 ***	-0.068	-1.80 **	-0.047	-1.74 **
n			719		273		446
Adjusted R^2			10%		7%		14%
F-Statistic			6.96 ***		2.42 ***		6.17 ***
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.008	-0.21	0.014	0.24	-0.035	-0.72
n			719		273		446
Adjusted R^2			10%		6%		13%
F-Statistic			6.52 ***		2.16 ***		5.95 ***
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	-0.002	-0.76	0.001	0.25	-0.005	-1.64 *
n			719		273		446
Adjusted R^2			10%		6%		14%
F-Statistic			6.56 ***		2.16 ***		6.14 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0, 1 and 2 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table A4

OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2, 3) [a]

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_6 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$ [b]

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF_DDEQ	-	-0.068	-3.09 ***	-0.114	-2.99 ***	-0.051	-1.87 **
n		719		273		446	
Adjusted R^2		10%		8%		12%	
F-Statistic		6.73 ***		2.68 ***		5.49 ***	
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.045	-1.19	-0.093	-1.58 *	-0.029	-0.59
n		719		273		446	
Adjusted R^2		9%		6%		12%	
F-Statistic		6.08 ***		2.17 ***		5.23 ***	
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	-0.002	-0.93	0.002	0.43	-0.006	-1.94 **
n		719		273		446	
Adjusted R^2		9%		5%		12%	
F-Statistic		6.03 ***		1.99 ***		5.51 ***	

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0, 1, 2 and 3 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table A5
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1) [a]

Hypothesis 2

$$CAR = \beta_0 - \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$ [b]

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.049	-2.41 ***	-0.061	-1.81 **	-0.043	-1.68 **
BTDEQ	-	-0.002	-0.83	0.001	0.29	-0.005	-1.67 **
n			719		273		446
Adjusted R^2			11%		8%		15%
F-Statistic			6.79 ***		2.55 ***		6.24 ***
Partial *F*-Statistic			0.52		0.77		3.33 ***
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.002	-0.05	0.041	0.78	-0.031	-0.67
BTDEQ	-	-0.002	-0.85	0.001	0.33	-0.005	-1.68 **
n			719		273		446
Adjusted R^2			10%		7%		15%
F-Statistic			6.35 ***		2.35		6.05 ***
Partial *F*-Statistic			0.60		0.72		3.39 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0 and 1 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j'*s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table A6
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2) [a]

Hypothesis 2

$$CAR = \beta_0 - \beta_1 DDEQ - \beta_2 FRAUD + \beta_3 ATTRIB - \beta_4 CORE - \beta_5 MAT - \beta_6 PERVAS$$
$$- \beta_7 YEARS - \beta_8 SIZEMAT - \beta_9 LEVMAT + \beta_{10} PRIORRET - \beta_{11} BIGN + \beta_{12} AUDCHANGE$$ [b]

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
DDEQ-FamaFrench	-	-0.051	-2.33 ***	-0.069	-1.80 **	-0.046	-1.70 **
BTDEQ	-	-0.002	-0.73	0.001	0.25	-0.005	-1.61 *
n			719		273		446
Adjusted R^2			10%		6%		14%
F-Statistic			6.52		2.25 ***		5.95
Partial *F*-Statistic			0.48		1.19		4.02 ***
Palmrose et al. Earnings Quality[f]							
DDEQ-Palmrose et al.	-	-0.008	-0.21	0.041	0.78	-0.031	-0.67
BTDEQ	-	-0.002	-0.76	0.001	0.33	-0.005	-1.68 **
n			719		273		446
Adjusted R^2			10%		7%		15%
F-Statistic			6.12 ***		2.35		6.05 ***
Partial *F*-Statistic			0.55		0.72		3.39 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0, 1 and 2 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table A7
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2, 3)[a]

Hypothesis 2

$$CAR = \beta_0 - \beta_1 DDEQ - \beta_2 BTDEQ - \beta_3 FRAUD + \beta_4 ATTRIB - \beta_5 CORE - \beta_6 MAT - \beta_7 PERVAS - \beta_8 YEARS - \beta_9 SIZEMAT - \beta_{10} LEVMAT + \beta_{11} PRIORRET - \beta_{12} BIGN + \beta_{13} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.067	-3.08 ***	-0.114	-2.99 ***	-0.050	-1.83 **
BTDEQ	-	-0.002	-0.90	0.002	0.44	-0.006	-1.90 **
n		719		273		446	
Adjusted R^2		10%		8%		13%	
F-Statistic		6.33 ***		5.40		5.40	
Partial *F*-Statistic		0.90		1.30		5.55 ***	
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.045	-1.19	-0.092	-1.56 *	-0.027	-0.53
BTDEQ	-	-0.002	-0.93	0.002	0.35	-0.006	-1.92 **
n		719		273		446	
Adjusted R^2		9%		5%		12%	
F-Statistic		5.73 ***		2.03 ***		5.16 ***	
Partial *F*-Statistic		0.99		1.10		5.70 ***	

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0, 1, 2 and 3 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality variable and overall model statistics are reported.

[c]Announcements of 719 restatements to correct misstatements of annual and quarterly financial reports. Restatements announced between 1997 and 2004.

[d]Subset of 273 restatements announced in earnings releases.

[e]Subset of 446 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

Table A8
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1) [a]

Hypothesis 3

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 INST - \beta_3 EQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT$$
$$- \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.011	-0.28	-0.031	-0.48	-0.017	-0.33
INST[g]	-	-0.006	-0.24	-0.019	-0.48	-0.006	-0.21
FFDDEQ*INST	-	-0.209	-2.47 ***	-0.234	-1.45 *	-0.217	-2.12 **
n			565		222		343
Adjusted R^2			13%		11%		17%
F-Statistic			6.21 ***		2.78 ***		5.47 ***
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	0.064	0.93	-0.136	-0.79	0.046	0.60
INST[g]	-	0.009	-0.36	0.020	0.43	-0.014	-0.45
PRS-DDEQ*INST	-	-0.261	-1.68 **	0.307	0.83	-0.355	-2.03 **
n			565		222		343
Adjusted R^2			11%		8%		16%
F-Statistic			5.34 ***		2.23 ***		5.10 ***
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	0.004	0.82	0.01	1.03	0.001	0.19
INST[g]	-	-0.045	-1.20	-0.055	-0.90	-0.062	-1.27
BTDEQ*INST	-	-0.017	-1.63 *	-0.019	-1.00	-0.018	-1.43 *
n			565		222		343
Adjusted R^2			11%		8%		16%
F-Statistic			5.38 ***		2.26 ***		5.05 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0 and 1 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality, institutional investment, the interaction variables and overall model statistics are reported.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investors information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

[g]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement

Table A9
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2)[a]

Hypothesis 3

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 INST - \beta_3 EQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT - \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.036	-0.86	-0.040	-0.55	-0.047	-0.90
INST[g]	-	0.013	0.50	-0.015	-0.34	0.018	0.58
FF-DDEQ*INST	-	-0.169	-1.90 **	-0.207	-1.15	-0.196	-1.86 **
n			565		222		343
Adjusted R^2			12%		9%		16%
F-Statistic			5.80 ***		2.36 ***		5.12 ***
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	0.025	0.35	-0.118	-0.62	0.001	0.01
INST[g]	-	0.011	0.42	0.015	0.29	0.015	0.47
PRS-DDEQ*INST	-	-0.172	-1.05	0.224	0.54	-0.251	-1.39 *
n			565		222		434
Adjusted R^2			10%		6%		14%
F-Statistic			4.90 ***		1.93 **		4.49 ***
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	0.007	1.29 *	0.011	1.01	0.005	0.74
INST[g]	-	-0.380	-0.95	-0.053	-0.78	-0.046	-0.92
BTDEQ*INST	-	-0.019	-1.80 **	-0.019	-0.91	-0.021	-1.62 *
n			565		222		343
Adjusted R^2			10%		7%		14%
F-Statistic			5.03 ***		1.97 ***		4.47 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0 , 1 and 2 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality, institutional investment, the interaction variables and overall model statistics are reported.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investors information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t* -4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j'*s residuals, from year *t* -4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t* -1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t* .

[g]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement

Table A10
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases

Sensitivity Tests for Dependent Variable CAR over days (-1, 0, 1, 2, 3)[a]

Hypothesis 3

$$CAR = \beta_0 - \beta_1 EQ - \beta_2 INST - \beta_3 EQ * INST - \beta_4 FRAUD + \beta_5 ATTRIB - \beta_6 CORE - \beta_7 MAT$$
$$- \beta_8 PERVAS - \beta_9 YEARS - \beta_{10} SIZEMAT - \beta_{11} LEVMAT + \beta_{12} PRIORRET - \beta_{13} BIGN + \beta_{14} AUDCHANGE$$

Independent variables	Expected Sign	All sample restatements[c]		Restatements announced in earnings releases[d]		Restatements *not* announced in earnings releases[e]	
		Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Fama French Earnings Quality[f]							
FF-DDEQ	-	-0.057	-1.34 *	-0.045	-0.60	-0.072	-1.37 *
INST[g]	-	0.017	0.67	-0.010	-0.22	0.025	0.81
FF-DDEQ*INST	-	-0.145	-1.61 *	-0.182	-0.99	-0.184	-1.73 **
n			565		222		343
Adjusted R^2			12%		8%		16%
F-Statistic			5.73 ***		2.18 ***		4.95 ***
Palmrose et al. Earnings Quality[f]							
PRS-DDEQ	-	-0.015	-0.21	-0.127	-0.65	-0.041	-0.51
INST[g]	-	0.020	0.72	0.017	0.34	0.029	0.90
PRS-DDEQ*INST	-	-0.084	-0.51	0.212	0.50	-0.146	-0.80
n			565		222		343
Adjusted R^2			9%		6%		12%
F-Statistic			4.68 ***		1.82 **		4.03 ***
Book Tax Difference Earnings Quality[f]							
BTDEQ	-	0.004	0.72	0.012	1.06	0.001	0.04
INST[g]	-	-0.027	-0.67	-0.061	-0.88	-0.024	-0.48
BTDEQ*INST	-	-0.015	-1.36 *	-0.022	-1.05	-0.014	-1.06
n			565		222		343
Adjusted R^2			10%		6%		12%
F-Statistic			4.78 ***		1.87 **		4.04 ***

*,**,*** Coefficient or model is significant at 0.10, 0.05, 0.01 levels respectively. Results are one-tailed.

[a]Cumulative abnormal returns (CAR) calculated using market adjusted model and equally weighted index on days -1, 0 , 1, 2 and 3 where day 0 is the date of the restatement announcement.

[b]Only results for earnings quality, institutional investment, the interaction variables and overall model statistics are reported.

[c]Announcements of 565 restatements to correct misstatements of annual and quarterly financial reports for which institutional investors information was available. Restatements announced between 1997 and 2004.

[d]Subset of 222 restatements announced in earnings releases.

[e]Subset of 343 restatements announced separately from earnings releases.

[f]Earnings quality variables defined as follows: *FF-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using modified Fama & French 30 industry classifications (Edelen & Kadlec 2005) defined in Appendix 3. *PRS-DDEQ* = standard deviation of firm *j*'s residuals, from year *t*-4 to year *t* from annual cross sectional estimations of the modified Dechow-Dichev (2002) model using 9 industry classifications from Palmrose, Richardson & Scholz (2004) defined in Appendix 2. *BTDEQ* = The log of the absolute value of firm *j*'s book-tax difference where book-tax difference is the change in firm *j*'s net operating loss in years *t* and *t*-1 less current tax expense divided by the statutory tax rate subtracted from net income before taxes in year *t*.

[g]*INST* = Percentage of institutional ownership during the period immediately preceding the restatement announcement

References

Abbott, L .J., S. Parker, and G. F. Peters. 2004. Audit committee characteristics and restatements. *Auditing: A Journal of Practice and Theory* 23 (1): 69-87.

Aboody, D., J. Hughes, and J. Liu. 2005. Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research* 43(5): 651-673.

Ahmed, A. S., S. M. K. Nainar, and J. Zhou. 2005. Do analysts' earnings forecasts fully reflect the information in accruals? *Journal of Administrative Sciences* 22 (4): 329-342.

Anderson, K. L., and T. L. Yohn. 2002. The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings. Working Paper. Georgetown University.

Athaud-Day, M. L., S. T. Certo, C. M. Dalton, and D. R. Dalton. 2006. A changing of the guard: Executive and director turnover following corporate financial restatements. *Academy of Management Journal* 49 (6): 1119-1136.

Baber, W.R., S. Chen, and S. Kang. 2006. Stock price reaction to evidence of earnings management: Implications for supplementary financial disclosure. *Review of Accounting Studies* 11: 5-19.

Badertscher, B., J. Phillips, M. Pincus, and S. Rego. 2006. Is deferred tax expense useful in detecting earnings management in earnings restatements? Working Paper. University of Iowa.

Balsam, S., E. Bartov, and C. Marquardt. 2002. Accruals management, investor sophistication, and equity valuation: Evidence from 10-Q filings. *Journal of Accounting Research* 40 (4): 987-1012.

Barniv, R., and J. Cao. 2006. Analyst forecast revision and market price discovery following restatement. Working Paper. Kent State University.

Bartov, E., S. Radhakrishnan, and I. Krinsky. 2000. Investor sophistication and patterns in stock returns after earnings announcements. *The Accounting Review* 75 (1): 43-63.

Billings, B. K. 1999. Revisiting the relation between the default risk of debt and the earnings response coefficient. *The Accounting Review* 74 (4): 509-522.

Bradshaw, M. T., S. A. Richardson, and R. G. Sloan. 2001. Do analysts and auditors use information in accruals? *Journal of Accounting Research* 39 (1): 45-74.

Burgstahler, D. C., and M. J. Eames. 2003. Earnings management to avoid losses and earnings decreases: Are analysts fooled? *Contemporary Accounting Research* 20 (2): 253-294.

Bushee, B. 1998. The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73: 305-333.

Bushee, B. 2001. Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research* 18: 207-246.

Collins, D. W., G. Gong, and P. Hribar. 2003. Investor sophistication and the mispricing of accruals. *Review of Accounting Studies* 8: 251-276.

Collins, D. W., S. P. Kothari, and J. D. Rayburn. 1987. Firm size and the information content of earnings with respect to prices. *Journal of Accounting and Economics* 9: 111-138.

Core, J. E., and C. M. Schrand. 1999. The effect of accounting-based debt covenants on equity valuations. *Journal of Accounting and Economics* 27 (1): 1-34.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193-225.

Dechow, P.M., R. G. Sloan, and A. P. Sweeney. 1996. Causes and consequences of earnings manipulations: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research* 13 (1):

Dechow, P. M., and I. D. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (Supplement): 35-59.

Dechow, P. M., and C. M. Schrand. 2004. *Earnings Quality*. The Research Foundation of CFA Institute.

DeFond, M. L., and J. R. Francis. 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice and Theory* 24 (Supplement): 5-30.

DeFond, M. L., and J. Jiambalvo. 1991. Incidence and circumstances of accounting errors. *The Accounting Review* 66 (3): 643-655.

DeFond, M. L., and C. W. Park. 2001. The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review* 76 (3): 375-404.

Desai, H., C. E. Hogan, and M. S. Wilkins. 2006a. The reputational penalty for aggressive accounting: Earnings restatements and management turnover. *The Accounting Review* 81 (1): 83-112.

Desai, H., S. Kirshnamurthy, and K. Venkataraman. 2006b. Do short sellers target firms with poor earnings quality? Evidence from restatements. *Review of Accounting Studies* 11 (1): 71-90.

Dhaliwal, D. S., C. A. Gleason, and L. F. Mills. 2004. Last-chance earnings management: Using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research* 21 (2): 431-459.

Ecker, F., J. Francis, I. Kim, P. Olsson, and K. Schipper. 2005. A returns-based representation of earnings quality. Working paper. Duke University.

Edelen, R. M., and G. B. Kadlec. 2005. Issuer surplus and the partial adjustment of IPO prices to public information. *Journal of Financial Economics* 77: 347-373.

Efendi, J., M. Kinney, and E. Swanson. 2005. Can short sellers anticipate accounting restatements? Working Paper. California Polytechnic State University.

El-Gazzar, S. M. 1998. Pre-disclosure information and institutional ownership: A cross-sectional examination of market revaluations during earnings announcement periods. *The Accounting Review* 73: 119-129.

Elgers, P.T., M. H. Lo, and R. J. Pfeiffer Jr. 2003. Analysts' vs. investors' weightings of accruals in forecasting annual earnings. *Journal of Accounting and Public Policy* 22: 255-280.

Elliot, J. A., and J. D. Hanna. 1996. Repeated accounting write-offs and the information content of earnings. *Journal of Accounting Research* 34: 134-155.

Ettredge, M., P. B. Shane, and D. B. Smith. 1995. Overstated quarterly earnings and analysts' earnings forecast revisions. *Decision Sciences* 26 (6): 781-801.

Feroz, E. H., K. Par, and V. S. Pastena. 1991. The financial market effects of the SEC's accounting and auditing enforcement releases. *Journal of Accounting Research* 29: 107-142.

Francis, J. R., E. L. Maydew, and H. C. Sparks. 1999. The role of big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice and Theory* 18 (2): 17-34.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005. The market pricing of accruals quality. *Journal of Accounting and Economics* 39: 295-327.

General Accounting Office. 2002. Financial statement restatements - Trends, market impacts, regulatory responses and remaining challenges.

General Accounting Office. 2006. Financial restatements – Update of public company trends, market impacts, and regulatory enforcement activities.

Gleason, C. A., N. T. Jenkins, and W. B. Johnson. 2004. Financial statement credibility: The contagion effects of accounting restatements. Working Paper. University of Iowa.

Griffin, P. A. 2003. A league of their own? Financial analysts' responses to restatements and corrective disclosures. *Journal of Accounting, Auditing and Finance* 18 (4): 479-518.

Hanlon, M. 2005. The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences. *The Accounting Review* 80 (1): 137-166.

Hanlon, M., S. LaPlante, and T. Shevlin. 2005. Evidence for the possible information loss of conforming book income and taxable income. *Journal of Law and Economics* 48 (October): 407-442.

Hanlon, M., and G. V. Krishnan. 2005. Do auditors use the information in book tax differences? Working Paper. University of Michigan.

Hribar, P., and N. T. Jenkins. 2004. The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies* 9 (2-3): 337-356.

Huron Consulting Group, LLC. 2003. 2003 Annual Review of Financial Reporting Matters.

Huron Consulting Group, LLC. 2004. 2004 Annual Review of Financial Reporting Matters.

Jiambalvo, J., S. Rajgopal, and M. Venkatachalam. 2002. Institutional ownership and the extent to which stock prices reflect future earnings. *Contemporary Accounting Research* 19 (1): 117-145.

Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 193-228.

Jones, C. L., and S. E. Weingram. 1997. The effects of insider trading, seasoned equity offerings, corporate announcements, accounting restatements and SEC enforcement actions on 10b-5 litigation risk. Working Paper. Stanford University.

Ke, B., and K. Petroni. 2004. How informed are actively trading investors? Evidence from their trading behavior before a break in a string of consecutive earnings increases. *Journal of Accounting Research* 42 (5): 895-927.

Kinney, W. R., and L. S. McDaniel. 1989. Characteristics of firms correcting previously reported quarterly earnings. *Journal of Accounting and Economics* 11: 71-93.

Kinney, W. R., Z-V. Palmrose, and S. Scholz. 2004. Auditor independence, non-audit services, and restatements: Was the U.S. government right? *Journal of Accounting Research* 42 (3): 561-588.

Lacina, M. J., and K. E. Karim. 2004. Tests of market reaction and analysts' forecast revisions to the disclosure of improved management earnings expectations: A case of concurrent bad news management earnings forecasts. *Review of Quantitative Finance and Accounting* 23: 123-148.

Lang, M. H., and R. J. Lundholm. 1996. Corporate disclosure policy and analyst behavior. *The Accounting Review 71* (4): 467-492.

Lazer, R., J. Livnat, and C. E. L. Tan. 2004. Restatements and accruals after auditor changes. Working Paper. New York University.

Lev, B., and D. Nissim. 2004. Taxable income, future earnings, and equity values. *The Accounting Review* 79 (4): 1039-1074.

O'Brien, P., and R. Bhushan. 1990. Analyst following and institutional ownsership. *Journal of Accounting Research* 28: 55-76.

Ott, L. R., and M. Longnecker. 2001. *Statistical Methods and Data Analysis*. 5th edition. Pacific Grove, CA: Wadsworth Group.

Palmrose, Z.-V., V. J. Richardson, and S. Scholz. 2004. Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics* 37: 59-89.

Palmrose, Z-V., and S. Scholz. 2004. The circumstances and legal consequences of non-GAAP reporting: Evidence from restatements. *Contemporary Accounting Research* 21 (1): 139-180.

Phillips, J. D., M. Pincus, and S. Rego. 2003. Earnings management: New evidence based on deferred tax expense. *The Accounting Review* 78 (2):491-521.

Phillips, J. D., M. Pincus, S. Rego, and H. Wan. 2004. Decomposing changes in deferred tax assets and liabilities to isolate earnings management activities. *The Journal of the American Taxation Association* 26 (Supplement): 43-66.

Reilly, D. 2007. Restatements still bedevil firms. *The Wall Street Journal* (February 12): C7.

Richardson, S., I. Tuna, and M. Wu. 2002. Predicting earnings management: The case of earnings restatements. Working Paper. University of Pennsylvania.

Richardson, S., R. G. Sloan, M. T. Soliman, and I. Tuna. 2005. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39 (3): 437-485.

Salavei, K., and N. Moore. 2005. Signals sent by financial statement restatements. Working Paper. University of Connecticut.

Schipper, K. 1991. Analysts' forecasts. *Accounting Horizons* 5 (4): 105-121.

Schipper, K., and L. Vincent 2003. Earnings quality. *Accounting Horizons* 17 (Supplement): 97-110.

Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (3): 289-315.

Srivivasan, S. 2005. Consequences of financial reporting failure: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research* 43 (2): 291-334.

Strong, J. S., and J. R. Meyer. 1987. Asset write-downs: Managerial incentives and securities returns. *The Journal of Finance* 43: 643-661.

Subramanyam, K. R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (1-3): 249-281.

Teoh, S. H., and T. J. Wong. 2002. Why new issues and high-accrual firms underperform: The role of analysts' credulity. *The Review of Financial Studies* 15 (3): 869-900.

Walther, B. R. 1997. Investor sophistication and market earnings expectations. *Journal of Accounting Research* 35 (2): 157-179.

Xie, H. 2001. The mispricing of abnormal accruals. *The Accounting Review* 76 (3): 357-373.

Xu, T., M. Najand, and D. Ziegenfuss. 2006. Intra-industry effects of earnings restatements due to accounting irregularities. *Journal of Business, Finance and Accounting* 33 (5): 696-714.