

Financial Reporting Credibility After SOX: Evidence From Earnings Restatements

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ABSTRACT

Motivated by assertions that the purpose of the Sarbanes-Oxley Act (SOX) was to improve the credibility of financial reporting, this paper examines changes in the ways investors respond to accounting restatements before and after the implementation of the Act. We examine reporting credibility in the context of earnings restatements because restatements have significant implications for damaging investor trust and raising doubts about reporting credibility. We analyze three measures associated with investors' reputational concerns following earnings restatements: 1) the information content of post-restatement earnings announcements, 2) the contagion effects on market returns for industry-peer firms not announcing restatements, and 3) the investment activity of institutional investors. This study incorporates a pre/post SOX research design to test whether these characteristics are different following the implementation of SOX. We find that firms that announce earnings restatements after the implementation of SOX do not exhibit a significant decline in the information content of earnings, do not invoke significant contagion effects for industry-peer firms, and have more stable institutional ownership levels relative to restatements announced prior to SOX. Collectively the results support the idea that the reforms imposed by SOX have had a significant impact on increasing investors' assessments of reporting credibility for firms admitting to accounting errors.

JEL Classification: M41, M48, G34

Keywords: Accounting restatements; Sarbanes-Oxley Act; Reporting Credibility

I. Introduction

This paper examines whether the credibility of financial reporting has improved for firms announcing earnings restatements following the implementation of the Sarbanes-Oxley Act (SOX). The Sarbanes-Oxley Act was passed on July 30, 2002 following numerous well-publicized accounting scandals and restatements that peaked in the years leading up to law's ratification, and was lauded as "the bill that will help restore investor confidence and integrity in America's capital markets."¹ Regulators have claimed that SOX "contains some of the most far-reaching changes that Congress has ever introduced to the business world" (Melancon 2002), and academic research has demonstrated that some improvements in reporting quality have occurred since the implementation of the Act (e.g., Lobo and Zhou 2006, Cohen, Dey and Lys 2008, Bartov and Cohen 2009). However, little is known about whether SOX has had an impact on investors' assessments of financial reporting credibility, which was a primary goal of the regulatory Act.

We investigate whether SOX has had an impact on reporting credibility by examining whether investors react differently to earnings restatements announced after the Act's implementation. This setting allows us to evaluate whether investors' assessments of credibility have changed for a sample of firms that have viable suspicion about the integrity of reported information. Earnings restatements are significant economic events that damage a firm's reputation for integrity and reliable reporting (Karpoff, Lee and Martin 2008), and evidence from studies of restatements announced prior to SOX documents that investors are wary of accounting information following restatement announcements (Wilson 2008, Kravet and Shevlin 2010). However, if the reforms imposed by SOX and the affiliated awareness towards reliable reporting

¹ Statement by SEC Chairman Harvey L. Pitt on the Passage of the Public Company Accounting Reform and Investor Protection Act of 2002 (i.e., the Sarbanes-Oxley Act of 2002), July 15, 2002.

have resulted in improvements in investors' assessments of reporting credibility, we should observe diminished reputational consequences from earnings restatements in the post-SOX era.

The comprehensive set of regulations imposed under SOX was designed to improve the accuracy and reliability of corporate disclosures (Hamilton and Trautman 2002). Various outcomes of SOX, from improved detection of accounting mistakes (Feng and Li 2010), better audit quality (DeFond and Lennox 2011), and the imposition of greater deterrents of intentional earnings manipulation (Perino 2002), should collectively have an effect on investors' opinions of the reliability of financial reports. We hypothesize that in the context of earnings restatements, the reforms imposed by SOX should cause investors to have less skepticism that the issues that led to the restatement will have an ongoing impact on the quality of the firm's reported financial information. The lack of significant investor skepticism should lead to improvements in assessments of reporting credibility (Shin 1994).

A decrease in the number of reported accounting restatements would provide a foundation for investors to place greater trust in the financial information disseminated by U.S. firms. Therefore, it is noteworthy that the volume of restatement announcements has risen significantly over time, with an increase in the number of announcements made each year since SOX was enacted. Regulators have expressed concern over the increase in restatement activity, as evidenced by the study commissioned by the U.S. Treasury Department to investigate the rise in number of restatement announcements (Scholz 2008). In addition, former U.S. Treasury Secretary Henry Paulson expressed concern in 2007 that "restatements have the potential to erode public confidence in financial reporting."² Evidence from surveys of investor sentiment also indicates that securities holders continue to have concerns about financial reporting, with 71

² Editorial by former U.S. Treasury Secretary Henry Paulson, *The Financial Times*, May 17, 2007.

percent of investors stating that accounting issues continue to have a negative effect on the market in the post-SOX era.³

Furthermore, evidence from recent research shows that firms recognize these reputation concerns and take action to correct their image following earnings restatements. Ettredge, Huang and Zhang (2011) find that firms issue more frequent and more transparent earnings guidance after restatements to signal their intent to provide more credible information in the future. Chakravarthy, deHaan, and Rajgopal (2011) show that firms initiate specific repair actions, such as engaging in share repurchases and announcing changes in internal control mechanisms, in order to restore their credibility with investors. Considering the concerns expressed by regulatory officials, along with evidence that firms engage in actions to restore their reputations following restatements, it is not clear that the regulatory changes imposed by SOX have been successful in mitigating credibility concerns for firms announcing earnings restatements.

This study evaluates three ways in which the effects of SOX could impact investors' perceptions of reporting credibility following earnings restatements: 1) the information content of post-restatement earnings announcements, 2) the contagion effects on market returns for industry-peer firms not announcing restatements, and 3) the investment activity of institutional investors. Our choice of these three measures is based on research evidence that shows that these characteristics are associated with investors' concerns about reporting credibility following earnings restatements (Wilson 2008, Gleason, Jenkins and Johnson 2008, Burns, Kedia and Lipson 2010). The study incorporates a pre/post SOX research design to test whether these characteristics are different following the implementation of SOX. If the reforms imposed under the Act were successful in improving investors' assessments of reporting credibility, we

³ The UBS/Gallup poll results were released in May of 2006 in conjunction with the monthly publication of the UBS/Gallup Index of Investor Optimism. Results from the Index of Investor Optimism poll are based on telephone interviews with 803 investors.

hypothesize that earnings restatements should show lower declines in the information content of earnings, decreased contagion effects for industry-peer firms, and more stable institutional ownership after the implementation of SOX.

The results are consistent with improvements in financial reporting credibility for firms announcing restatements following the implementation of SOX. First, results from our analysis of the information content of earnings show that while investors exhibit a diminished view of reporting credibility for restatement firms prior to SOX, the decline is relatively inconsequential after SOX. This suggests that investors are not wary of the credibility of post-restatement earnings announcements in the post-SOX information environment. Second, we find that the price response to peer-firm restatement announcements is not significant in the post-SOX era, which implies that the negative connotations associated with restatements among firms within the same industry are dampened after the implementation of SOX. Third, we find that while institutional investors decrease their ownership interests around restatements announced prior to SOX, this effect is not observed for restatements announced in the post-SOX period. Collectively, the evidence is consistent with a lack of overriding concern with respect to ongoing reporting quality for firms announcing restatements after the implementation of SOX.

Recognizing that changes in the underlying causes for restatements over time could provide an alternative explanation for our results, we separately examine whether the differences in investors' reactions to restatements before and after SOX are robust across various measures of restatement severity. In particular, we build on prior research that shows that the severity of the issues causing restatements has declined over time (Scholz 2008, Myers, Scholz and Sharp 2010, Burks 2011) and test whether the information content of earnings and contagion effects are similar for restatements related to fraud, restatements with a more negative effect on net income,

and restatements with high disclosure transparency. The results are robust across the pre- and post-SOX time periods regardless of restatement severity. This result provides further confirmation that despite the decrease in number of more impactful restatements in recent years, credibility concerns do not appear to be significant following the implementation of SOX.

Our paper makes several contributions to the restatement literature as well as to the line of research on changes in financial reporting behavior after SOX. In the post-SOX era of increased accountability and heightened reporting scrutiny, regulators and academics have speculated that accounting restatements still cause significant concern for investors. The results from this study are not consistent with this proposition, but rather indicate that the reforms provided by SOX have resulted in an environment of more credible financial reporting for firms admitting to errors in previously reported financial statements. Our evidence shows that for firms announcing restatements, SOX has been helpful in improving investors' assessments of reporting credibility. This outcome is likely to be of interest to regulatory officials and legislators, particularly those who highlighted SOX as an important legislative measure that would improve the credibility of financial reporting.

Our finding that credibility improvements have been a beneficial outcome of SOX is noteworthy given the mixed evidence from event studies of the anticipated net benefits and costs of SOX (Li, Pincus and Rego 2008, Zhang 2007) and from research regarding the post-implementation consequences of SOX (Ge and McVay 2005). Our study also contributes to the line of research that examines characteristics of financial reporting in the post-SOX environment (Lobo and Zhou 2006, Koh, Matsumoto and Rajgopal 2008, Bartov and Cohen 2009) by providing evidence that greater reporting credibility for firms announcing earnings restatements is a benefit of the regulations imposed by SOX.

This study also compliments research that examines the reputational consequences of the large volume of restatements announced in recent years. Motivated by regulatory skepticism that investors are confused about the surge in earnings revisions, Burks (2011) examines long-run price drifts and abnormal trading volume following more recent restatement announcements. While the results in Burks's study are not consistent with investor confusion surrounding recent restatements, it is not evident ex-ante that this lack of confusion would necessarily imply a decreased concern regarding post-restatement reporting credibility. Evidence from our study suggests that improvements in the credibility of financial reporting are likely a significant influence on the increase in pricing efficiency with respect to restatements announced in the post-SOX reporting environment.

A major difficulty in evaluating the specific influence of SOX is that the regulation applied to the majority of publicly traded firms and had a substantial impact on multiple aspects of securities markets (Leuz and Wysocki 2009, Leuz 2007). As a result, it is challenging to disentangle the effects of SOX from other contemporaneous events, such as changes in NYSE and NASDAQ listing requirements, which occurred during the same time period (Leuz 2007). Therefore, we are careful to interpret our results as providing evidence of an association between the implementation of SOX and its package of reforms with improvements in reporting credibility, rather than attributing specific provisions enacted under SOX as providing the only support for our inferences.

The remainder of the paper is organized as follows: Motivation and hypothesis development is in Section II and the empirical methodology is described in Section III. Section IV provides a description of the sample and the results are presented in Section V. Conclusions and implications for accounting and public policy are provided in Section VI.

II. Motivation and Hypothesis Development

At the time SOX was enacted, the Act was promoted as “the bill that will help restore investor confidence and integrity in America’s capital markets.”⁴ Several well-noted features of the Act were designed to improve reporting quality, including increased governance requirements (e.g., enhanced role of independent audit committee members under Section 301), imposition of more significant penalties for managerial misconduct (Section 906), and more extensive requirements for executive attestation of accurate reporting (Section 302). From a legal perspective, Coates (2007) argues that the most influential provisions of SOX were its overhaul of the auditing process of U.S. public companies (e.g., establishment of the Public Company Accounting Oversight Board under Sections 101-109) and the implementation of incentives for firms to direct resources toward well-functioning internal control systems (Section 404). Given the wide range of changes imposed by SOX, it follows that the Act’s package of provisions should have helped to promote investors’ assessments of the credibility of financial reporting.⁵

Empirical studies of changes in accounting characteristics after SOX provide mixed evidence as to whether the quality of accounting information was improved. Several studies report results that are consistent with improvements in reporting quality after SOX. Lobo and Zhou (2006) find an increase in conservative reporting in the post-SOX environment, where conservatism is measured as lower discretionary accruals and more timely recognition of losses

⁴ Statement by SEC Chairman Harvey L. Pitt on the Passage of the Public Company Accounting Reform and Investor Protection Act of 2002 (i.e., the Sarbanes-Oxley Act of 2002), July 15, 2002.

⁵ While regulators and leading accounting practitioners have claimed that SOX “contains some of the most far-reaching changes that Congress has ever introduced to the business world” (Melancon 2002), critics have challenged whether the reforms are as impactful, from a legal perspective, as many have alleged (Ribstein 2002, Cunningham 2003). Similarly, accounting research has debated whether SOX imposed net benefits or net costs on firms (Zhang 2007, Leuz 2007). We acknowledge these debates, but reinforce that the primary goal of our paper is to examine whether reporting credibility has improved following the implementation of SOX, which should be of interest to both supporters and critics of SOX. We do not view this study as providing evidence on whether SOX has been beneficial in a broader sense, as that would require a complete analysis of all the benefits and costs of the regulatory changes.

relative to gains. Bartov and Cohen (2009) find that the frequency of just meeting or beating analyst earnings forecasts (i.e., behavior that is commonly interpreted as indicative of earnings management) diminished in the post-SOX period, and Koh, Matsumoto and Rajgopal (2008) report that the lower frequency of just meeting or beating forecasts is caused by less reliance on earnings management and greater use of expectations management. However, mixed evidence is reported by Cohen, Dey, and Lys (2008), who find that accrual-based earnings management decreased and real earnings management activities increased following SOX, suggesting that managers shifted from one type of accounting manipulation to another. While these studies find some evidence of changes in reporting characteristics following the enactment of SOX, whether the Act has been successful in improving investor trust in the financial reporting process remains an open question.

Anecdotal evidence from surveys conducted after the enactment of SOX suggests that investors harbor concerns about the quality of information disseminated by public firms. Results from a UBS/Gallup poll conducted in May of 2006 indicates that 71 percent of investors felt that accounting issues were negatively affecting the market, compared with 91 percent who responded that accounting issues were significant prior to SOX.⁶ Additional evidence from a 2006 survey conducted by Financial Executives International (FEI) indicates that 56 percent of corporate executives agreed that investors have greater confidence in financial reports following the passage of SOX, which is far from the substantial improvement in credibility that regulators were aiming for.⁷ Overall the survey results hint at slight improvements, but they demonstrate

⁶ The UBS/Gallup poll results were released in May of 2006 in conjunction with the monthly publication of the UBS/Gallup Index of Investor Optimism. Results from the Index of Investor Optimism poll are based on telephone interviews with 803 investors.

⁷ The FEI survey results were released in April of 2006. FEI polled 274 public companies, the majority of which were large accelerated filers, to gauge executives' experiences in complying with various aspects of SOX, particularly regulations imposed by Section 404.

that substantial doubt about reporting quality remains. Ultimately, whether investors' perceptions of reporting credibility have changed in the post-SOX era of increased accountability is an empirical issue and is the focus of this study.

We are motivated to examine the impact of SOX on reporting credibility in the context of earnings restatements because restatements have significant implications for damaging investor trust. A substantial body of research demonstrates that major accounting restatements damage a firm's reputation for integrity and reliable reporting, with estimates of the cumulative "reputation-related loss" resulting from a restatement of up to two-thirds of the total value destruction from the event (Karpoff, Lee and Martin 2008). Specific evidence of investors' doubt about reporting credibility is demonstrated by a diminished stock price response to post-restatement earnings news (Wilson 2008), negative contagion effects for non-restating industry-peer firms (Gleason, Jenkins and Johnson 2008), and a decrease in institutional ownership (Burns, Kedia and Lipson 2010) following earnings restatement announcements.

While empirical research shows that investors' assessments of the credibility of reported information is impacted by earnings restatements, the aforementioned results are provided by studies of earnings restatements announced prior to the enactment of SOX. Firms announcing restatements before the SOX reforms were implemented may have suffered more adverse consequences due to uncertainty about the controls in place to ensure future soundness of the reporting process, or as a result of doubt about management's willingness to devote resources to these tasks. We speculate that the collective mandates required under SOX provided reassurance to investors that the reporting quality issues that caused the restatements would be corrected going forward. Therefore, the reforms imposed under SOX, along with the heightened regulatory

scrutiny and focus on accountability associated with the Act, should result in decreased concerns about reporting credibility for firms announcing restatements in the post-SOX period.

However, it is not obvious that a regulatory provision, even one such as SOX that promotes ethical behavior, could have significant implications for improving investors' assessments of the credibility of financial reporting (Rockness and Rockness 2005). Despite the fact that several years have passed since SOX was implemented, restatements have continued to impart negative consequences on firms and regulators have expressed concern that "restatements have the potential to erode public confidence in financial reporting."⁸ Furthermore, recent empirical evidence shows that firms actively engage in strategies to correct reputation problems following restatements, suggesting that firms continue to have concerns about the damaging impact of restatements. Ettredge, Huang and Zhang (2011) find that firms issue more frequent and more transparent earnings guidance after restatements to signal their intent to provide more credible information in the future. Chakravarthy, deHaan and Rajgopal (2011) find that firms take specific repair actions (e.g., engage in share repurchases, report changes to internal control systems, remove senior management, etc.) in order to restore their reputations following restatements. Experimental evidence also indicates that managers use extraordinary communication strategies to restore investor trust following restatements (Elliott, Hodge and Sedor 2012). With continued concern arising from regulators, as well as empirical evidence documenting the actions taken by firms to restore their flawed reputations, whether the regulatory effects imposed under SOX have been helpful in mitigating reporting credibility concerns for restatements announced in the post-SOX period remains an unanswered question.

We propose three hypotheses to examine whether financial reporting credibility has changed for firms announcing restatements since the implementation of SOX. The first

⁸ Editorial by former U.S. Treasury Secretary Henry Paulson, *The Financial Times*, May 17, 2007.

hypothesis examines whether the decline in the information content of earnings following restatement announcements exists in the post-SOX era. Wilson (2008) finds a short-term decline in the price response to subsequent earnings announcements following restatements, which is consistent with a decline in the market's assessment of post-restatement reporting credibility. Given that improving the integrity of financial reporting was a primary goal of SOX, it follows that the regulatory changes brought about by the Act would result in mitigating suspicions with respect to reporting credibility following restatements. Accordingly, the first hypothesis is:

H1: The decrease in the information content of earnings following restatements is moderated in the post-SOX period.

The second hypothesis relates to whether restatements announced following the implementation of SOX continue to invoke reporting concerns for nonrestating industry-peer firms. Using a sample of firms that announced restatements prior to SOX, Gleason, Jenkins and Johnson (2008) find that nonrestating peer firms within the same industry as companies announcing restatements experience statistically significant share price declines over the restatement announcement window.⁹ This result is consistent with restatements causing reassessments of the quality of financial statement information released by nonrestating firms. If the Act has been effective in mitigating credibility concerns following restatements, we would not expect to find evidence of contagion effects for nonrestating peer firms in the post-SOX period. However, evidence from Files and Gurun (2011) of contagion effects negatively affecting nonrestating peer firms' loan spreads following SOX suggests that reporting credibility may

⁹ Durnev and Mangen (2009) and Acito, Burks and Johnson (2009) also find evidence of industry-contagion effects in the context of restatements. Durnev and Mangen (2009) show that restatements alter investment decisions at non-restating peer firms, and Acito, Burks and Johnson (2009) report evidence that restatement disclosure choices are influenced by disclosures of industry-peer restatement firms. These papers document several ways in which contagion effects have been found to affect the consequences imposed by restatements.

remain a concern following restatements. Therefore, the second hypothesis, stated in alternative form, is:

H2: Restatement-induced contagion share price effects are moderated in the post-SOX period.

The third hypothesis focuses on whether institutional investors adjust their ownership interests surrounding restatements. Using samples of restatements announced prior to the implementation of SOX, Hribar, Jenkins, and Wang (2009) and Burns, Kedia and Lipson (2010) find that institutional investors decrease their ownership levels around the time of restatement announcements. Decreases in institutional ownership have also been documented around other significant reputation-damaging events such as investigations of accounting fraud (Larson 2008).

Because institutional owners have sophisticated methods to process information (Ke and Petroni 2004, Amihud and Li 2006), evidence of a decrease in their ownership around restatement announcements is consistent with institutional investors having concerns about reporting credibility. Theoretical work by Shin (1994) also provides a foundation for why a decrease in institutional ownership is consistent with credibility concerns. Shin's model shows that when investors have uncertainty about the quality of a firm's information, the degree of skepticism held by investors in interpreting the firm's disclosures is affected and leads to a lower valuation of the firm. Therefore, it follows that if the reforms imposed by SOX decreased the level of skepticism applied by institutional investors following restatements, their ownership levels should not be adversely impacted in the post-SOX period. The third hypothesis, stated in alternate form, is:

H3: Institutional investors' ownership interests are not affected by restatements in the post-SOX period.

III. Empirical Methodology

Information Content of Earnings

We use the following cross-sectional regression in the analysis of whether the information content of quarterly earnings announces changes following restatements:

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

This regression measures the earnings response coefficient (ERC) for quarterly earnings releases around each restatement announcement. UR_QTR_{it} is the equally-weighted market-adjusted unexpected return over the three day period centered on the quarterly earnings announcement date.¹⁰ QTR_{it} is an indicator variable equal to 1 if firm i 's earnings announcement belongs to quarter t and is equal to zero otherwise, and UE_{it} is unexpected quarterly earnings for firm i at quarter t 's announcement date. Quarters $t = 0$ and $t = 1$, respectively, represent the quarterly earnings release just prior to and just following firm i 's restatement announcement. We include data for all additional earnings announcements available for each firm, from four quarters before time $t = 0$ (i.e., quarters $t = -4, -3, -2, -1$, the "base period") through six quarters after the restatement announcement (i.e., quarters $t = 1, 2, 3, 4, 5, 6$). Additional variables incorporated in the model include $NONLINEAR_{it}$, to account for nonlinearity in the price-earnings relation (Freeman and Tse 1989), as well as $CONTROLS_{it}$, a series of variables designed to control for factors known to influence the relation between price and earnings (e.g., Kormendi

¹⁰ The value of UR_QTR is winsorized at the one percent level to control for the influence of outliers. We test different weighting schemes and empirical methods for calculating abnormal returns and find consistent results using traditional market-adjusted, mean-adjusted, and market model-adjusted unexpected returns (results not tabulated).

and Lipe 1987; Easton and Zmijewski 1989, Subramanyam and Wild 1996), including earnings predictability, persistence, growth, and size. Firm characteristics for the control variables are obtained from Compustat, stock price is gathered from CRSP, and analyst forecasts from I/B/E/S are used to calculate unexpected earnings. Detailed definitions of all variables are provided in the appendix.

We are interested in comparing the ERC of the base period (i.e., β_1) to each quarter's ERC following the restatement announcement (i.e., $\beta_1 + \sum_{t=1}^6 \beta_{2,t}$). We estimate the regression separately for restatements announced before and after July 30, 2002 to analyze whether the ERC patterns across the individual regulatory regimes differ. If investors do not have significant doubts about the reporting credibility of firms announcing restatements in the post-SOX era, we expect the ERCs for the quarters after the restatement announcement will not be significantly different from the base period for restatements announced after July 30, 2002.

Restatement-induced Contagion Effects

We follow the methodology of Gleason, Jenkins and Johnson (2008) in the analysis of whether restatement-induced contagion effects persist in the post-SOX period. Specifically, we analyze the three-day unexpected return for nonrestating firms that is coincident with industry-peer firm restatements (i.e., UR_ANN_{it} , the “contagion response”) before and after SOX. The restatement firms used in this analysis are those with an unexpected announcement-period return of less than -1.0 percent, which identifies the restatements most likely to convey unfavorable information about the announcing firm (Gleason, Jenkins and Johnson 2008). The nonrestating peer firms have the same eight-digit Global Industry Classification Standard code, a market price of greater than \$5 per share, and are covered by I/B/E/S. All firms that announced restatements

during our sample period are removed from consideration for the industry-peer comparison group to eliminate potential carry-over effects from previous restatements.

Information transfer effects are evidenced by mean unexpected announcement period stock returns for nonrestating industry-peer firms that are significantly different from zero (i.e., UR_ANN_{it} that is significantly different from zero). If concerns with respect to reporting quality are diminished following the implementation of SOX, we expect to observe smaller or insignificant contagion effects for industry-peer firms during the post-SOX period.

Institutional Investor Analysis

We examine changes in institutional ownership levels surrounding restatement announcements in order to investigate whether institutional investors have doubt about reporting credibility in the post-SOX period. We calculate the change in institutional ownership percentage:

$$(2) \quad CHANGEOWN_t = ADJOWN_t - ADJOWN_{t-1}$$

where $ADJOWN_t = R_AVGOWN_t - OTH_AVGOWN_t$, $R_AVGOWN_t = (\sum_{i=1}^n R_OWN_t / n)$, and $OTH_AVGOWN_t = (\sum_{i=1}^n OTH_OWN_t / n)$.

R_OWN (OTH_OWN) is the percentage of the restatement (non-restatement) firm owned by institutional investor i during quarter t , and $\sum_{i=1}^n R_OWN_t / n$ ($\sum_{i=1}^n OTH_OWN_t / n$) represent the average ownership percentage for all restatement (non-restatement) firms across n firms in quarter t . Adjusted ownership levels ($ADJOWN$) are calculated as the difference between the restatement firm ownership average (R_AVGOWN) and the average ownership of firms not announcing restatements (OTH_AVGOWN) in order to account for macroeconomic trends in institutional ownership over time. Evidence of a change in institutional ownership from one quarter to the next is represented by

$CHANGEOWN_t$. While our primary focus is on changes in average institutional ownership levels in restatement firms for all institutional investors in aggregate ($CHANGEOWN_t$), we perform subsequent analyses of changes in ownership by each individual investor type j ($CHANGEOWN_{jt}$), where $j \in \{\text{transient, quasi-indexer, dedicated}\}$ based on Bushee (1998). Data on institutional holdings is obtained from the Thomson/Reuters Institutional Holdings Database, which provides institutional common stock ownership as reported on Form 13-F that is filed quarterly with the SEC.

Evidence from studies of firms announcing restatements prior to SOX (Hribar, Jenkins and Wang 2009, Burns, Kedia and Lipson 2010) shows that institutional investors reduce their ownership levels in advance of restatement announcements, which is consistent with these investors having concerns about reporting credibility. Therefore, we are interested in comparing changes in ownership levels around restatement announcements before and after SOX (i.e., whether $CHANGEOWN_t$ is significantly different from zero). If institutional investors do not experience the same degree of concern about reporting credibility in the post-SOX period, we expect the changes in ownership levels for the quarters immediately before and after the restatement announcement will not be significant for restatements announced after July 30, 2002.

IV. Sample

The sample consists of restatements announced by U.S. companies during the 12 year period from 1995 to 2006. For the years 1995 to 2004, we identified restatements using keyword searches of Lexis-Nexis news wire and SEC Form 8-K filings (key-words: restate, error, adjust, revise). We augmented the hand-collected sample with restatements collected from Audit Analytics that were announced between 2000 and 2006 and removed duplicate restatements between the two groups.¹¹ As shown in panel A of Table 1, after eliminating observations

¹¹ Coverage by Audit Analytics begins with restatements announced in 2000.

missing identification data and repeated announcements made within 180 days by the same firm we have a base sample size of 2,395 restatement announcements. As more extensive data from Compustat, CRSP, I/B/E/S, and the Thomson/Reuters Institutional Holdings Database are required for tests of the three hypotheses, we form separate subsamples for each in order to retain the maximum number of sample observations possible. The subsamples used for our analyses of the information content of earnings, contagion effects, and institutional ownership hypotheses consist of 1,036 (“information content subsample”), 1,321 (“contagion subsample”), and 2,273 (“institutional investor subsample”) unique restatement announcements, respectively.¹² The number of observations for each subsample is reported by the year of the restatement announcement in Figure 1.

<<Insert Table 1 and Figure 1 about here>>

Descriptive statistics for each of the subsamples are reported in Table 2, with all values reported separately for restatements that were announced before and after SOX was implemented (panel A and B, respectively). All firm-level characteristics are measured as of the fiscal year-end prior to the restatement announcement. Looking across the subsamples, the firm-level characteristics are not markedly different in the pre- and post-SOX periods, with the exception that sample firms that announced restatements in the post-SOX period are relatively more profitable, have higher book value of assets, and show relatively lower growth rates compared to firms that announced restatements prior to SOX. Compared to the population of firms covered by Compustat, we find that our restatement sample firms are relatively smaller (larger) and less

¹² The most significant data restriction for the information content subsample is availability of analyst forecasts from I/B/E/S. We report results in the paper using this subsample because of the long-standing belief in the accounting literature that analyst forecasts are a superior measure of the market’s expectations of earnings (Brown, Hagerman, Griffin, and Zmijewski 1987), which is used to calculate *UE* in the empirical analysis. However, we conduct a robustness check using an expanded sample of 1,509 restatements that have sufficient data to calculate *UE* based on a seasonal random-walk model of expected earnings (Bradshaw, Drake, Myers and Myers 2012). Results from tests of equations (1) and (3) using this alternative sample are quantitatively unaltered from those reported in the paper.

(more) profitable before (after) SOX, which is consistent with descriptive statistics reported by other restatement research (results not tabulated).

<<Insert Table 2 about here>>

We report descriptive statistics regarding restatement-related characteristics that have been shown to differ between restatements announced more recently (mid to late 2000s) relative to those announced in the late 1990s and early 2000s (Scholz 2008): unexpected announcement-period returns (*UR_ANN*), the magnitude of the restatement (*MAGNITUDE* and *MAGNITUDE_ADJ*), whether the restatement is related to fraud (*FRAUD*), and transparency of restatement disclosure (*TRANSP_DISC*). Across all subsamples, *UR_ANN* is significantly more negative in the pre-SOX period relative to the post-SOX period. For example, the mean (median) *UR_ANN* for the information content sample is -7.00 percent (-3.50 percent) in the pre-SOX period relative to -0.76 percent (-0.47 percent) in the post-SOX period.¹³ The diminished price response to more recent restatement announcements is consistent with observations made in regulators' reports (GAO 2006, Scholz 2008) and by related research (Burks 2011). On average, smaller restatement magnitudes are reported in the post-SOX period, both in terms of absolute net income impact (*MAGNITUDE*) as well as net income relative to firm size (*MAGNITUDE_ADJ*). Restatements announced after SOX also have lower likelihood of fraudulent activity relative to those announced before SOX, though the transparency of disclosure is not remarkably different between the time periods. Due to the observed differences in restatement characteristics related to severity across time, we control for these effects in all of our stock price-based empirical analyses.

¹³ Consistent with the research design of Gleason, Jenkins and Johnson (2008), the contagion subsample is restricted to restatements that result in a greater than -1.0 percent stock price decline in the short-window period around the announcement date. Therefore, the statistics regarding mean and median *UR_ANN* in both the pre- and post-SOX period are more negative for the contagion subsample relative to the other subsamples. The stock price condition placed on this subsample also provides most of the explanation for the data attrition reported in Table 1.

V. Empirical Results

Information Content of Earnings

The first hypothesis posits that firms announcing restatements in the post-SOX period will not experience the same loss in the information content of earnings as firms announcing restatements prior to SOX. Panels A and B of Table 3 report the ERC for quarterly earnings announcements surrounding restatements before and after the implementation of SOX. In each panel, coefficient values for relevant variables from equation (1) are reported in the left column, with summation of coefficients for calculation of the quarterly ERC pattern in the column on the right.

<<Insert Table 3 about here>>

Results reported in panel A of Table 3 show that firms announcing restatements prior to SOX experience a loss in the information content of post-restatement earnings. Looking to the column on the right, the ERC for the first (ERC = 2.39), second (ERC = 2.41) and third (ERC = 2.48) quarter following a restatement is significantly lower than the ERC before the restatement announcement (ERC = 2.95). For the fourth quarter after the restatement and beyond the ERC is insignificantly different from the base period. Overall, these results are consistent with investors having suspicions about the post-restatement reporting quality of firms in the time period before SOX was enacted, which is consistent with results from Wilson (2008).

As noted in the right column of panel B, the information content of earnings for firms announcing restatements after SOX is notably different from the pattern reported in panel A. For the post-SOX period, the ERC after a restatement is marginally lower in the first quarter following the restatement (ERC = 4.66 relative to the base period ERC = 4.95) and is

insignificant from the base period for all subsequent earnings announcements. This result suggests that investors harbor less concern with respect to reporting credibility for firms announcing restatements in the post-SOX era and is consistent with our predictions.

While the results reported in Table 3 are consistent with dampened credibility concerns for firms announcing restatements after SOX, an alternative explanation is that this effect could be due to the smaller economic implications of restatements announced in more recent years (Scholz 2008, Burks 2011).¹⁴ Due to the differences in restatement characteristics for our sample between the pre and post SOX periods that were reported in Table 2, we extend our analysis of the information content of earnings announcements by evaluating whether these effects are consistent across different restatement characteristics. We incorporate the following regression for this analysis:

$$\begin{aligned}
 UR_QTR_{it} = & \sum_{t=1}^6 \alpha_{i,t} QTR_{it} + \beta_1 UE_{it} + \sum_{t=1}^6 \beta_{2,t} [UE_{it} * QTR_{it}] + \sum_{t=1}^6 \beta_{3,t} [SEVERE_{it} * QTR_{it}] \\
 & + \sum_{t=1}^6 \beta_{4,t} [SEVERE_{it} * UE_{it}] + \beta_5 SEVERE_{it} + \beta_6 NONLINEAR_{it} \sum_{k=7}^{13} \beta_k CONTROLS_{it} \\
 & + \sum_{k=14}^{20} \beta_k [UE_{it} * CONTROLS_{it}] + \varepsilon_{it} \tag{3} \\
 & +
 \end{aligned}$$

¹⁴ Required attestation of internal controls by the auditor and management under Section 404 of SOX could also potentially influence the results reported in Table 3. If firms that announced restatements in the post-SOX period had reported deficiencies in their internal control systems under Section 404 prior to or concurrent with the revelation of the restatement, the ERC for post-restatement earnings announcements might be lower due to investors' assessments of poor reporting credibility due to weak internal controls rather than the restatement event. To investigate whether internal control weaknesses are potentially affecting our results, we divide the post-SOX restatement sample into three groups: firms that disclosed material internal controls weaknesses, firms that reported effective internal controls, and firms that did not issue a 404 report. The results from this analysis (not tabulated) show that the information content of earnings around the restatement event is similar to that for the main sample (as reported in Panel B of Table 3) across all three groups. This result provides reassurance that disclosures of internal control weaknesses are not impacting our primary results.

Equation (3) is similar to equation (1), with indicator variables for restatement severity added. Specifically, $SEVERE_{it} \in \{FRAUD_{it}, MAGNITUDE_ADJ_{it}, TRANSP_DISC_{it}\}$, where all variables are as previously defined.

<Insert Table 4 about here>>

Table 4 displays the ERC for quarterly earnings announcements following restatement announcements for each severe and non-severe restatement category in the pre-SOX and post-SOX periods (panel A and B, respectively). Within each category, the more severe restatement characteristic of the pair (e.g., below-median magnitude) is reported in the left column with the less severe characteristic (e.g., above-median magnitude) reported in the right column. Looking first to the pre-SOX period (Table 4, panel A), the information content of earnings is consistently lower for at least three quarters following the restatement announcement for all of the severe restatement categories. For example, the ERC for the three earnings announcements following restatements with below-median magnitude is significantly less than the ERC for the base period (ERC = 1.19 for quarter 1, ERC = 1.47 for quarter 2, and ERC = 1.43 for quarter 3, relative to the ERC = 2.17 for the base period). In addition, the information content of earnings is lower following the restatement for two of the less severe restatement categories (restatements not involving fraud and restatements with above-median magnitude). The only exception to the longer duration decline in the information content of earnings is for restatements disclosed less transparently, where the ERC is significantly lower than the base period for earnings announced only one quarter following the restatement (ERC = 2.04 for quarter 1 relative to the ERC = 2.65 for the base period). Overall, the multiple-quarter decline in the information content of earnings is consistent with the general pattern observed prior to SOX (Table 3, panel A) and indicates that concerns with respect to reporting credibility were widespread. There is a nearly uniform short-

term loss in the information content of subsequently released earnings during the pre-SOX time period, and this effect does not appear to be confined to more severe restatements.

Panel B of Table 4 shows that the ERC patterns are substantially different in the post-SOX period across all categories. The information content of earnings for restatements related to fraud shows the most significant decline in the period following SOX, where the ERC is significantly lower for two quarters following these restatement announcements (ERC = 0.95 for quarter 1 and ERC = 1.39 for quarter 2 relative to the ERC = 3.16 for the base period). On the other hand, restatements with below median magnitude, restatements announced more transparently, and restatements not related to fraud exhibit marginally significant declines in the information content of earnings for just one quarter. These results are in line with the pattern observed for the entire sample of restatements announced following SOX (Table 3, panel B). Lastly, no significant declines are observed for restatements with above-median magnitude and those announced less transparently. Overall, the subsample results reported in Table 4 corroborate evidence presented in Table 3, and lend support to the idea that investors experience minimal concerns with respect to reporting credibility following restatement announcements in the post-SOX period. The only significant reputational concerns affiliated with post-SOX restatement announcements seem confined to restatements related to fraudulent behavior, and the effects are more short-lived relative to the decline in the information content of earnings prior to SOX.

Restatement-induced Contagion Effects

The second hypothesis proposes that restatement-induced contagion effects are mitigated following the enactment of SOX. Descriptive statistics regarding the unexpected announcement period returns (UR_ANN) incurred by 43,754 industry-peer firms for 1,321 restatement

announcements are reported in panel A of Table 5.¹⁵ The average *UR_ANN* for the restatement firms across the entire period is – 10.00 percent, with a significant difference in the magnitude of unexpected returns before and after SOX (*UR_ANN* = – 15.30 percent and *UR_ANN* = – 7.13 percent, respectively). As expected, the nonrestating peer firms exhibit significantly negative unexpected returns for restatements announced prior to SOX (*UR_ANN* = – 0.27 percent), with a contagion effect similar in magnitude to that reported by Gleason, Jenkins and Johnson (2008). The contagion effect for nonrestating industry-peer firms is significantly different for restatements announced before and after SOX (t-statistic = 4.55), and it notable that the contagion effect for restatements announced after SOX is insignificantly different from zero (*UR_ANN* = – 0.02 percent). This diminished unexpected return for nonrestating peer firms is consistent with an absence of information transfer effects after the implementation of SOX. We interpret these results as suggesting that restatements do not convey significant credibility concerns within industries in the post-SOX period.

To analyze whether the results reported in panel A are robust across different restatement characteristics, we separately report contagion effects for more and less severe restatements. Panels B, C, and D report the unexpected announcement-period returns for peer firms of firms announcing restatements due to fraud, restatements with above-median magnitude, and restatements with more transparent disclosure, respectively. If these types of restatements are more severe they should invoke greater concerns with respect to reporting credibility following

¹⁵ Restatements were excluded from the base group of the contagion analysis if another restatement was announced within the same industry over the previous ten days. This eliminated 138 restatements. Excluding multiple industry-related restatements announced during a short window of time mitigates concern that the rise in number of annual restatements during the sample period has resulted in diminished contagion effects that are simply due to a saturation effect (i.e., with many firms in an industry announcing restatements close in time, the price of non-restating firms may react less due to the abundance of bad news regardless of whether investors have credibility concerns about the restatement firms). However, we replicated the contagion analyses with these 138 observations in the base restatement group and found that the contagion effects are significantly different for non-restating firms in the pre- and post-SOX periods.

the restatement announcements, and we expect to see greater contagion effects for nonrestating peer firms.

<<Insert Table 5 about here>>

Results for the subgroup analyses indicate that the contagion effect for nonrestating peer firms is minimal and largely insignificant in the post-SOX period. Looking to the column for post-SOX unexpected returns, the information transfer effects are negative and marginally significant for restatements involving fraud ($UR_ANN = -0.23$ percent, t -statistic=1.74) and for restatements of above-median magnitude ($UR_ANN = -0.08$ percent, t -statistic=1.72), but are not significant for restatements announced more transparently ($UR_ANN = -0.05$ percent, t -statistic=1.49). However, the comparison between pre- and post-SOX contagion effects shows a significant reduction across two of the severity measures (above-median magnitude, as reported in panel C and more transparent restatements, reported in panel D) and across all categories of less severe restatements. The only subgroup that does not experience a significantly less negative contagion effect is industry-peer firms for restatements related to fraud, where the pre-SOX UR_ANN is equal to -0.29 percent and is not significantly different from the post-SOX UR_ANN of -0.23 percent. Overall, the significant decrease in contagion effects surrounding restatements for industry-peer firms indicates that investors have diminished concerns about credibility for all types of restatements, including those with larger adverse effects on previously reported net income and restatements that are announced transparently.

Institutional Investor Ownership

The third hypothesis proposes that institutional investors' ownership levels are not impacted by restatement announcements made after the SOX reforms were implemented. If regulatory changes made under SOX caused reporting credibility to be less worrisome for

investors, ownership levels should not decline following restatement announcements as they did for restatements announced prior to SOX (Hribar, Jenkins and Wang 2009, Burns, Kedia and Lipson 2010). Panel A of Table 6 reports aggregate institutional holdings for the entire institutional investor subsample and panels B and C display ownership levels divided into the pre- and post-SOX periods, respectively. The quarter in which the restatement is announced is identified as quarter $t=0$ with all other quarters for one year before and after the restatement announcement numbered relative to the announcement quarter.

As reported in panel A, the average institutional ownership of the sample firms (R_AVGOWN_t) ranges from 43.45 to 47.98 percent and is increasing monotonically over the two year period surrounding restatement announcements. The pattern of steadily increasing ownership is also observed in the column that reports the adjusted levels of institutional ownership ($ADJOWN_t$). The adjusted ownership levels range from 21.91 to 23.66 percent for the entire sample. The adjusted ownership level ($ADJOWN_t$) takes into account market-wide trends in institutional ownership over time, and is calculated as the difference between the ownership percentage for all non-restating firms (OTH_AVGOWN_t) and the institutional ownership of restatement firms (R_AVGOWN_t) for each calendar quarter. Both the level (R_AVGOWN_t) and adjusted ($ADJOWN_t$) ownership percentages are similar in magnitude to those reported by related research (Burns, Kedia and Lipson 2010).

The two columns at the far right are most relevant to our analysis. Looking first to the change in adjusted ownership level ($CHANGEOWN_t$), the results indicate that institutional ownership declines significantly in the quarter that the restatement announcement is made ($CHANGEOWN_t = -0.620$). This result is consistent with findings of Hribar, Jenkins and Wang (2009) and demonstrates that, on average, institutional investors dispose of their ownership

interests at the time of the restatement announcement. Surprisingly, we find evidence that institutional investors significantly increase their ownership interests in the two quarters following a restatement announcement. This result is not consistent with credibility concerns and has not been documented by other research.

Because the mean change in ownership level ($CHANGEOWN_t$) could be skewed by significantly large values, we also calculate the percentage of firms that experienced a decrease in institutional ownership for each quarter. These results are reported in the far right column of Table 6. For the overall sample, the percentage of negative change observations is highest in the quarter that the restatement announcement is made (48.20 percent) and is second-highest in the quarter immediately following the restatement announcement (45.15 percent). These figures indicate that nearly half of the sample firms experience a decline in institutional ownership in a short time around the restatement announcement, which is consistent with investors reducing their holdings because of worries about reporting credibility.

Panels B and C report the changes in institutional ownership separately for restatements announced before and after SOX was implemented. As reported in panel B of Table 6, $CHANGEOWN_t$ is negative for all three quarters surrounding the restatement announcement, and is significantly negative for the quarter that the restatement is announced ($CHANGEOWN_{t=0} = -0.740$) and for the quarter following the restatement ($CHANGEOWN_{t=1} = -0.558$). There are no other discernible patterns of changes in institutional ownership holdings around restatement announcements, and with the exception of a slight decrease in the quarters immediately following the restatement announcement there are no noticeable changes in the aggregate ownership level ($ADJOWN_t$) over time. As reported in the right column of panel B, the percentage of negative change observations is highest for quarters following the restatement announcement, with 55.67

percent of firms experiencing declines in institutional ownership in the quarter of the restatement announcement and 52.07 percent of firms experiencing declines in the quarter following the restatement announcement. Collectively, this evidence indicates that institutional owners decreased their holdings significantly following restatement announcements, which is consistent with sales of ownership interests due to concern over accounting credibility following a restatement announcement.

Institutional ownership interests for firms announcing restatements after the implementation of SOX are reported in panel C of Table 6. The results reported in panel C are markedly different from those reported in panel B, where the change in adjusted ownership level is not significantly negative for any of the quarters surrounding the restatement announcements in the post-SOX period. In fact, $CHANGEOWN_t$ is significantly positive for three of the nine quarters, with a significant increase in ownership for the first ($CHANGEOWN_{t=1} = 0.672$) and second ($CHANGEOWN_{t=2} = 0.813$) quarters following the restatement announcement. Overall, the pattern of changes in ownership varies quite a bit over time, with significant increases prior to and following the restatement announcements. In fact, the adjusted level of institutional ownership is steadily increasing over time in the post-SOX period, with values of $ADJOWN_t$ ranging from 24.32 percent to 27.05 percent. Finally, results reported in the right column of panel B show that the percentage of negative change observations is lower than that reported for the pre-SOX period. The largest proportion of firms that experience decreases in institutional ownership occurs in the quarter prior to the restatement announcement, where 38.46 percent of firms experience a negative change in institutional ownership. There is some variance in the negative change percentages for other quarters surrounding the restatement, and overall they are lower by 10 to 20 percent relative to the number of negative change observations reported for the

pre-SOX period. Together, the evidence reported in panel C does not indicate consistent patterns of shares sold for firms announcing restatements after SOX was implemented.

While decreases in aggregate ownership levels indicate that institutional investors, on average, have concerns regarding reporting credibility following restatements, this effect should be most prominent for transient institutions. Transient investors are active traders and are characterized as having relatively high portfolio turnover and diversified holdings, making them more likely to have the capability to sell shares in the short-term following a disruptive corporate event (Burns, Kedia and Lipson 2010). In contrast, dedicated investors (those with relatively low turnover rates and stable ownership patterns over time) and quasi-indexers (institutions with relatively low portfolio turnover and diversified holdings) are less likely to have the flexibility to respond in the short-term following a restatement announcement.

To test whether changes in institutional holdings varies across types of investors, we follow Bushee (1988) and group institutions as transient, quasi-indexers, and dedicated based on their investment style. In studies of institutional ownership of firms announcing restatements prior to the implementation of SOX, Hribar, Jenkins and Wang (2009) find that transient investors significantly decrease their ownership in firms announcing restatements in the quarter that the restatement is announced, and Burns, Kedia and Lipson (2010) report evidence that both transient and quasi-indexer institutions sell shares in the quarter of and the quarter immediately following the restatement announcements. Both studies conclude that these results provide evidence of institutional investors responding to bad news about the restating firms that are indicative of doubts about the reporting credibility and future prospects of these firms.

Results from the analysis of changes in institutional ownership by investor style are presented in Table 7, with results for the entire sample reported in panel A and the results split

into the pre- and post-SOX periods in panels B and C, respectively. Looking to the results for the entire sample, there are no discernible differences across changes in ownership levels for different investor types. $CHANGEOWN_{jt}$ is negative for transient investors for the quarter before and the quarter during which the restatement announcement is made, but the change is not significantly different from zero. For each investor type, $CHANGEOWN_{jt}$ shows a range of positive and negative values across time. Quasi-indexers show significantly positive increases in ownership in the third quarter before the restatement and the quarter after the restatement, but neither change appears to be part of a more concentrated pattern over time or relative to the restatement event.

In contrast, the results reported in panels B and C indicate that several investor types exhibit significant changes in ownership around the restatement announcement. As reported in panel B, transient investors have a significantly negative average change in ownership for three quarters surrounding the restatement announcement, notably in the quarter before the restatement and the quarter during which the announcement is made. These results are consistent with the findings of Hribar, Jenkins and Wang (2009) and indicative that transient investors sell ownership interests due to their concerns about firms announcing restatements. Quasi-indexers also have a significantly negative change in ownership for the quarter during which the restatement is announced, which is consistent with results found by Burns, Kedia and Lipson (2010). It is also worth noting that adjusted ownership levels are generally decreasing over time for restatements announced prior to SOX, with $ADJOWN_{jt}$ lower for quarter $t = 4$ relative to quarter $t = -4$ for all three types of institutional investors. On the other hand, results reported in panel C show that quasi-indexers are the only investor type with significant changes in ownership, where significantly positive changes in ownership are noted for five of the nine

quarters surrounding the restatement announcement. We do not find evidence of significant changes in ownership by transient institutions in the post-SOX period, which is consistent with our expectation and is in line with the most active traders not adjusting their holdings following restatements announced after SOX. In addition, the subsample results reported in panel C of Table 7 demonstrate that the positive ownership changes observed for aggregate levels of institutional ownership (panel C of Table 6) appear to be driven by increases in ownership by quasi-indexers. In general, institutional ownership interests for all three types of investors are increasing over time in the post-SOX period.

VI. Conclusion

This study examines whether investors respond differently to accounting restatements following the implementation of SOX. The objective of the paper is to evaluate whether the regulatory changes imposed by the Act have had a significant effect on increasing the credibility of financial reporting for firms announcing restatements. Our study is motivated by regulators' assertions that a goal of SOX was to improve the perceived reliability of information reported by U.S. firms, as well as concerns that have been expressed with respect to the rise the number of restatements announced since the implementation of SOX. We analyze three measures that extant research has shown to be affiliated with reputational concerns following restatements: 1) the information content of post-restatement earnings announcements, 2) the contagion effects for nonrestating industry-peer firms, and 3) the investment activity of institutional investors. If the emphasis on accounting reliability following the enactment of SOX resulted in increased financial reporting credibility, we hypothesize a decrease in negative reputational consequences following restatements

Results are consistent with decreased concerns with respect to reporting credibility following earnings restatements following the implementation of SOX. We find very little evidence of a decrease in the information content of earnings following restatements, which indicates that concerns with respect to reporting quality are not widespread following restatement announcements in the post-SOX era. We also find muted restatement contagion effects following SOX, which is consistent with a decrease in the previously documented information transfer effects that caused reporting credibility concerns for industry-related firms in the pre-SOX period. Finally, we do not find evidence that institutional investors decrease their ownership interests surrounding restatement announcements in the post-SOX period. The inferences are consistent after accounting for changes in the severity of causes underlying earnings restatements over across time.

Our study enhances the literature on earnings restatements, as the results indicate that reputational concerns are not significant following restatements announced in the years since SOX was implemented. This finding is in contrast with regulators' assertions that the large number of accounting restatements in recent years has continued to cause credibility issues for U.S. firms. Our paper also relates to the line of research examining improvements in financial reporting quality following the enactment of SOX. Evidence from this study provides support for an improvement in financial reporting along a dimension that has not yet been the focus of existing research – financial reporting credibility – which is noteworthy given regulators' claims that the primary goal of SOX was to increase the perceived reliability of financial reporting.

APPENDIX: VARIABLE DEFINITIONS

Variable	Description
$ADJOWN_t$	Adjusted level of institutional ownership in quarter t , calculated as the difference between the restatement firm's institutional ownership average and the average institutional ownership for nonrestating firms
$BETA^*$	Market-model beta, estimated over the year prior to the earnings announcement ending two days prior to the announcement date
$CHANGEOWN_t$	$= ADJOWN_t - ADJOWN_{t-1}$
$FRAUD^{\text{¥}}$	Indicator variable equal to 1 if the restatement was related to fraud, and 0 otherwise
$LOSS^*$	Indicator variable equal to 1 if reported earnings per share is less than 0, and 0 otherwise
$MAGNITUDE$	Amount of restated net income (in millions)
$MAGNITUDE_ADJ^{\text{¥}}$	Amount of restated net income, scaled by total assets as of the year-end prior to the restatement announcement date
MTB^*	Market-to-book ratio as of the end of the quarter for which the earnings announcement is made
$NONLINEAR$	$UE * UE $
$PERSIST^*$	The autoregressive coefficient from Foster's (1977) model estimated over the two-year period prior to the earnings announcement
$PREDICT^*$	Variance of the absolute values of unexpected earnings, based on a seasonal random walk, over the two-year period prior to the earnings announcement
$Q4^*$	Indicator variable equal to 1 if the earnings announcement is for the fourth quarter of the firm's fiscal year, and 0 otherwise
QTR	Indicator variable equal to 1 if firm i 's earnings announcement belongs to quarter t , and 0 otherwise
R_AVGOWN_t	Average level of institutional ownership in quarter t for firms announcing restatements
$SIZE^*$	Log of total assets, measured as of the year-end prior to the restatement announcement
$TRANSP_DISC^{\text{¥}}$	Indicator variable equal to 1 if the restatement was disclosed via press release, filing of form 8-K, or an amended filing, and zero otherwise
UE	Unexpected quarterly earnings for firm i at quarter t 's announcement date, where expected earnings is based on the median of analyst forecasts outstanding within 60 days prior to the day before the earnings announcement, scaled by price as of the end of the quarter for which earnings are announced
UR_ANN	Unexpected return around the restatement announcement date, calculated as the difference between the firm's buy-and-hold return and the equally-weighted CRSP market index buy-and-hold return for the three days centered on the restatement announcement date
UR_QTR	Unexpected return around the quarterly earnings announcement, calculated as the difference between the firm's buy-and-hold return and the equally-weighted CRSP market index buy-and-hold return for the three days centered on the earnings announcement date

* Indicates variable is included in $CONTROLS_{it}$, a series of control variables used in equations (1) and (3).

¥ Indicates variable is included in $SEVERE_{it}$ in equation (3).

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Figure 1
Number of Restatements Per Year

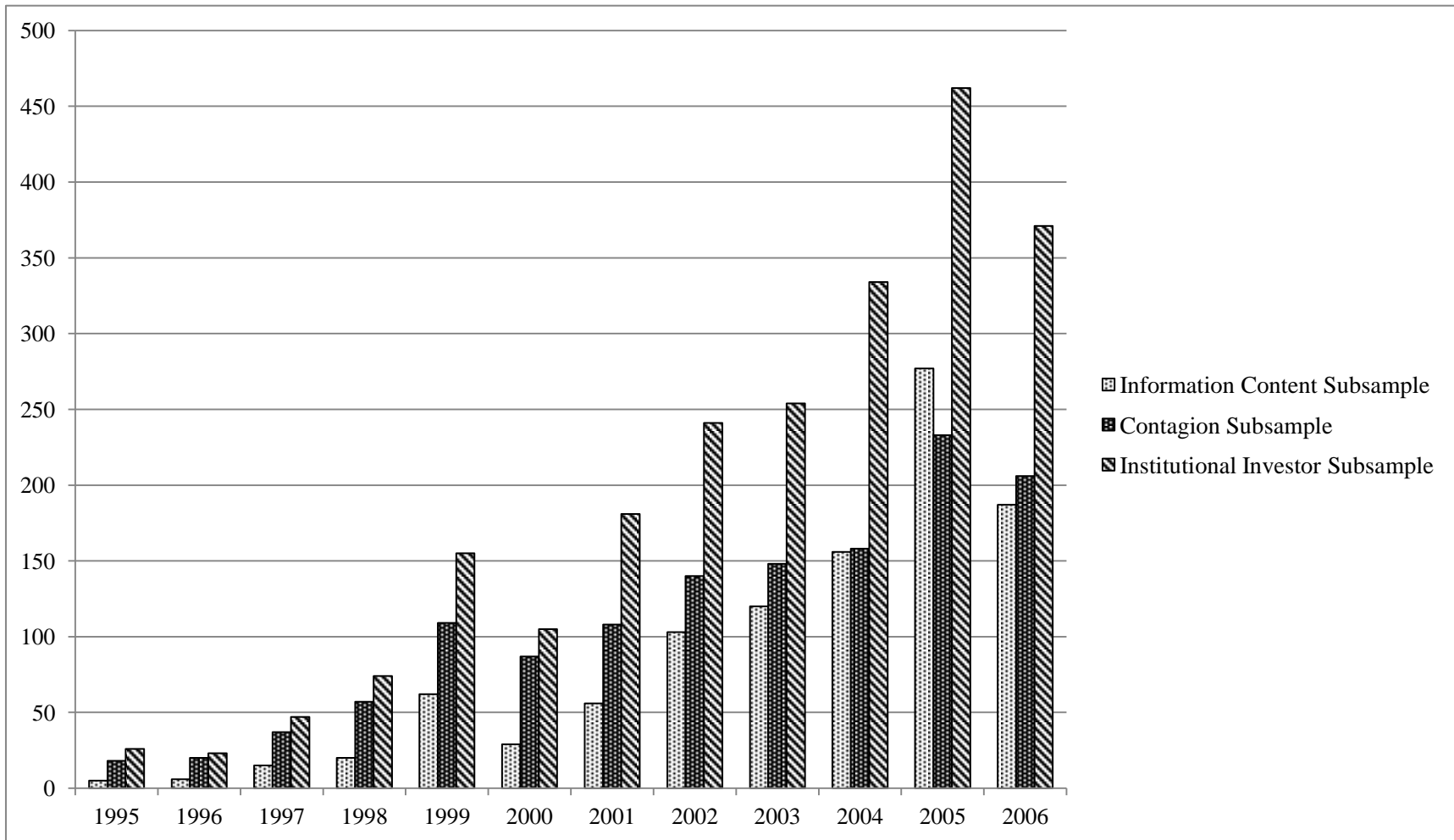


Table 1
Sample Attrition

		<u>Number of observations</u>	
Initial sample of restatement announcements		7,013	
Observations missing identification data		(2,815)	
Observations with multiple restatements within 180 days		(734)	
Observations missing return data		(959)	
Observations missing control variables		<u>(110)</u>	
Restatement sample		2,395	
Observations missing data for information content analysis	(1,359)		
Observations removed for contagion analysis		(1,074)	
Observations not included in institutional investor analysis			<u>(122)</u>
Information content subsample	1,036		
Contagion subsample		1,321	
Institutional investor subsample			2,273

The base sample consists of 2,395 restatements announced between 1995 and 2006. After collecting relevant information from I/B/E/S and Compustat, the subsample for the information content analysis consists of 1,036 restatements. After removing restatements with abnormal announcement-period returns greater than -1.0%, the subsample for the contagion analysis consists of 1,321 restatement announcements. After merging data from Thompson/Reuters on institutional ownership, the subsample for the institutional investor analysis consists of 2,273 restatement announcements.

Table 2
Descriptive Statistics

<i>Panel A: Pre-SOX period</i>	Information Content Subsample (n = 231)		Contagion Subsample (n = 470)		Institutional Investor Subsample (n = 707)	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
<i>Restatement-related variables</i>						
<i>UR_ANN</i>	-7.00%	-3.50%	-15.30%	-10.04%	-6.90%	-0.35%
<i>MAGNITUDE</i>	-14.51	-1.59	-14.67	-1.85	-14.09	-1.53
<i>MAGNITUDE_ADJ</i>	-5.28%	-0.14%	-4.47%	-0.70%	-4.96%	-0.14%
<i>FRAUD</i>	0.19	0.00	0.21	0.00	0.17	0.00
<i>TRANSP_DISC</i>	0.57	1.00	0.59	1.00	0.61	1.00
<i>Firm-level characteristics</i>						
<i>UR_QTR</i>	-0.06%	0.10%	n/a	n/a	n/a	n/a
Market value of equity	3,551.59	248.40	1,554.93	174.07	4,898.72	922.25
Book value of assets	4,650.46	380.22	1,720.91	213.77	5,470.33	879.69
Log of assets	6.18	5.94	5.42	5.36	6.88	6.78
Revenues	3,009.95	378.62	1,185.09	145.94	3,522.13	758.92
Sales growth	27.13%	11.93%	38.22%	18.30%	29.80%	13.66%
Net Income	97.26	2.78	-10.12	-1.18	109.66	15.28
Return on Assets	-3.46%	1.38%	-13.41%	-0.98%	0.83%	2.69%
Return on Equity	-19.33%	3.21%	-29.96%	-1.11%	-10.92%	8.41%
<i>Panel B: Post-SOX period</i>						
	Information Content Subsample (n = 805)		Contagion Subsample (n = 851)		Institutional Investor Subsample (n = 1,566)	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
<i>Restatement-related variables</i>						
<i>UR_ANN</i>	-0.76%	-0.47%	-7.13%	-4.49%	-1.23%	-0.80%
<i>MAGNITUDE</i>	-24.61	-0.94	-31.60	-0.62	-25.25	-0.94
<i>MAGNITUDE_ADJ</i>	-1.14%	-0.14%	-3.09%	-0.002%	-1.14%	-0.015%
<i>FRAUD</i>	0.17	0.00	0.05	0.00	0.09	0.00
<i>TRANSP_DISC</i>	0.63	1.00	0.64	1.00	0.60	1.00
<i>Firm-level characteristics</i>						
<i>UR_QTR</i>	-0.03%	-0.05%	n/a	n/a	n/a	n/a
Market value of equity	3,653.29	475.93	1,670.30	267.68	6,379.22	899.21
Book value of assets	6,867.75	716.59	3,096.07	395.53	14,996.00	982.98
Log of assets	6.69	6.57	5.98	5.98	7.08	6.89
Revenues	3,591.15	612.05	1,620.92	266.21	4,544.59	692.48
Sales growth	9.53%	5.29%	16.93%	7.97%	11.52%	6.91%
Net Income	154.86	9.48	47.02	2.67	193.44	21.27
Return on Assets	-0.17%	1.96%	-6.03%	0.87%	-0.11%	2.76%
Return on Equity	-5.87%	7.07%	-16.04%	4.56%	22.82%	8.84%

Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) period. The restatement variable *MAGNITUDE* and the following firm-level characteristics are reported in millions: market value of equity, book value of assets, revenues, and net income. All firm-level characteristics are measured as of the fiscal year-end prior to the restatement announcement. Restatement-related variables are defined in the appendix.

Table 3
Change in the Information Content of Earnings Pre/Post-SOX

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

Panel A: Pre-SOX period

Individual Estimates			Sum of Estimates		
	Predicted Sign	Coefficient Value	Qtr.	ERC Coefficient	ERC
β_1	+	2.95	Base Period	β_1	2.95
$\beta_{2,t=1}$	-	-0.56	1	$\beta_1 + \beta_{2,t=1}$	2.39**
$\beta_{2,t=2}$	-	-0.54	2	$\beta_1 + \beta_{2,t=2}$	2.41**
$\beta_{2,t=3}$	-	-0.47	3	$\beta_1 + \beta_{2,t=3}$	2.48**
$\beta_{2,t=4}$	-	-0.35	4	$\beta_1 + \beta_{2,t=4}$	2.60
$\beta_{2,t=5}$	-	-0.03	5	$\beta_1 + \beta_{2,t=5}$	2.93
$\beta_{2,t=6}$	-	-0.01	6	$\beta_1 + \beta_{2,t=6}$	2.94

Number of observations = 2,073

Panel B: Post-SOX period

Individual Estimates			Sum of Estimates		
	Predicted Sign	Coefficient Value	Qtr.	ERC Coefficient	ERC
β_1	+	4.95	Base Period	β_1	4.95
$\beta_{2,t=1}$?	-0.29	1	$\beta_1 + \beta_{2,t=1}$	4.66*
$\beta_{2,t=2}$?	-0.11	2	$\beta_1 + \beta_{2,t=2}$	4.84
$\beta_{2,t=3}$?	0.07	3	$\beta_1 + \beta_{2,t=3}$	5.03
$\beta_{2,t=4}$?	0.02	4	$\beta_1 + \beta_{2,t=4}$	4.97
$\beta_{2,t=5}$?	0.10	5	$\beta_1 + \beta_{2,t=5}$	5.05
$\beta_{2,t=6}$?	0.12	6	$\beta_1 + \beta_{2,t=6}$	5.08

Number of observations = 7,849

Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) period. The sample observations reported in panel A (panel B) consists of 2,073 (7,849) quarterly earnings announcements surrounding 231 (805) unique restatement announcements in the pre- and post_SOX periods, respectively. The coefficient values from equation (1) are reported in the left column with the sum of relevant coefficients for calculation of the ERC reported in the right column. The ERC for four quarters prior to the restatement announcement is the base period and the ERC for the six quarters after the restatement announcement is noted as quarter t= 1, 2, 3, 4, 5, 6. All variables in equation (1) are defined in the appendix. The symbols ***, ** and * denote significance of the ERC from the base period at the 1%, 5%, and 10% levels, respectively (one-tailed).

Table 4
Change in the Information Content of Earnings Pre/Post-SOX: Subsample Analyses

Panel A: Pre-Sox period

Qtr.	Fraud involved	No fraud involved	Below-median magnitude	Above-median magnitude	More transparent disclosure	Less transparent disclosure
Base Period	3.35	2.70	2.17	5.75	3.41	2.65
1	1.51**	2.16**	1.19**	4.48***	1.61***	2.04**
2	1.04**	2.19**	1.47***	4.55***	1.42***	2.44
3	1.20**	2.27**	1.43***	4.52**	2.07*	2.56
4	1.27*	2.48	1.66	5.11	2.04*	2.57
5	2.57	2.73	2.02	5.47	2.40	2.51
6	2.53	2.68	2.26	5.45	3.35	2.76
Number of observations	418	1,655	1,198	875	1,182	891

Panel B: Post-Sox period

Qtr.	Fraud involved	No fraud involved	Below-median magnitude	Above-median magnitude	More transparent disclosure	Less transparent disclosure
Base Period	3.26	3.49	5.47	4.66	5.07	4.52
1	0.95***	3.22*	5.03*	4.34	4.60*	4.30
2	1.39**	3.66	5.23	4.48	4.83	4.54
3	1.69	3.69	5.23	4.70	5.01	4.52
4	2.38	3.55	5.33	4.77	5.09	4.51
5	3.49	3.54	5.44	4.68	5.13	4.50
6	3.27	3.61	5.63	4.68	5.11	4.62
Number of observations	249	7,600	4,679	3,170	4,945	2,904

Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) time period. The ERC for four quarters prior to the restatement announcement is the base period and the ERC for each of the six quarters after the restatement announcement is noted as quarter t= 1, 2, 3, 4, 5, 6. Restatements are classified as involving fraud if: (1) press releases or amended filings mention fraud or irregularities; (2) the SEC issued an Accounting and Auditing Enforcement Action (AAER) against the company and/or management; or (3) criminal indictments against the company or its managers resulted from the restatement. Restatements are classified as having below-median (above-median) magnitude if the amount of restated net income, scaled by total assets, is below (above) the median for the information content subsample. Restatements are classified as having more transparent disclosure if they are disclosed via press release, filing of form 8-K, or an amended filing, and are classified as having less transparent disclosure otherwise. The symbols ***, ** and * denote significance of the ERC from the base period at the 1%, 5%, and 10% levels, respectively (one-tailed).

Table 5
Unexpected Returns for Peer Firms Pre/Post-SOX

	<i>UR_ANN</i> (-1, 1)			
	All Restatements	Pre-SOX	Post-SOX	Pre vs. Post
<i>Panel A: Contagion Subsample</i>				
Restatement firms				
Number of observations	1,321	470	851	
Average abnormal return	-10.00%	-15.30%	-7.13%	
<i>t</i> -statistic (<i>null</i> = 0)	32.98***	23.94***	26.79***	13.75***
Non-restating Peer firms				
Number of observations	43,754	17,895	25,859	
Average abnormal return	-0.13%	-0.27%	-0.02%	
<i>t</i> -statistic (<i>null</i> = 0)	4.68***	4.99***	0.95	4.55***
<i>Panel B: Fraud Effects</i>				
Peer firms of restatements involving fraud				
Number of observations	5,847	4,622	1,225	
Average abnormal return	-0.27%	-0.29%	-0.23%	
<i>t</i> -statistic (<i>null</i> = 0)	3.34***	2.93***	1.74*	0.30
Peer firms of restatements not involving fraud				
Number of observations	37,907	13,273	24,634	
Average abnormal return	-0.10%	-0.27%	-0.01%	
<i>t</i> -statistic (<i>null</i> = 0)	3.63***	4.10***	0.54	4.27***
<i>t</i> -statistic (<i>null: groups equal</i>)	2.20**	0.18	1.81*	
<i>Panel C: Magnitude Effects</i>				
Peer firms of restatements with above-median magnitude				
Number of observations	19,432	8,161	11,271	
Average abnormal return	-0.17%	-0.29%	-0.08%	
<i>t</i> -statistic (<i>null</i> = 0)	2.83***	2.90***	1.72*	2.08**
Peer firms of restatements with below-median magnitude				
Number of observations	24,322	9,734	14,588	
Average abnormal return	-0.08%	-0.23%	-0.01%	
<i>t</i> -statistic (<i>null</i> = 0)	4.72***	5.07***	0.71	2.46**
<i>t</i> -statistic (<i>null: groups equal</i>)	3.46***	4.24***	2.81***	
<i>Panel D: Disclosure Effects</i>				
Peer firms of restatements announced more transparently				
Number of observations	27,084	10,534	16,550	
Average abnormal return	-0.14%	-0.27%	-0.05%	
<i>t</i> -statistic (<i>null</i> = 0)	3.96***	3.78***	1.49	3.22***
Peer firms of restatements announced less transparently				
Number of observations	16,670	7,361	9,309	
Average abnormal return	-0.11%	-0.27%	-0.02%	
<i>t</i> -statistic (<i>null</i> = 0)	2.53**	3.26***	0.45	3.32***
<i>t</i> -statistic (<i>null: groups equal</i>)	0.48	0.04	1.26	

UR_ANN is the unexpected return around the restatement announcement date, calculated as the difference between the buy-and-hold return on the equally-weighted CRSP market index and the firm's buy-and-hold return for the three days centered on the restatement announcement date. Restatements are classified as involving fraud if: (1) press releases or amended filings mention fraud or irregularities; (2) the SEC issued an Accounting and Auditing Enforcement Action (AAER) against the company and/or management; or (3) criminal indictments against the company or its managers resulted from the restatement. Restatements are classified as having above-median (below-median) magnitude if the amount of restated net income, scaled by total assets, is above (below) the median for the contagion subsample. Restatements are classified as announced more transparently if they are made via press release, filing of form 8-K, or an amended filing. Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) time period. The symbols ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Levels and Changes in Institutional Holdings Pre/Post-SOX

Quarter	# Institutional Ownership Observations	Ownership Level R_AVGOWN_t	Adjusted Ownership Level $ADJOWN_t$	Change in Adjusted Ownership Level $CHANGEOWN_t$	% Negative Change Observations
<i>Panel A: Institutional Investor Subsample</i>					
-4	2,204	43.45%	21.91%	0.050	42.38%
-3	2,229	44.32%	22.53%	0.659 **	34.39%
-2	2,251	44.60%	22.62%	0.001	40.85%
-1	2,273	44.81%	22.77%	0.002	43.92%
0	2,256	44.81%	22.10%	-0.620 **	48.20%
1	2,191	45.44%	22.84%	0.760 ***	45.15%
2	2,136	45.93%	23.62%	0.706 **	40.06%
3	2,066	47.18%	23.53%	-0.007	38.40%
4	2,009	47.98%	23.66%	0.002	37.05%
<i>Panel B: Pre-SOX period</i>					
-4	673	34.20%	16.81%	0.210	49.53%
-3	684	35.18%	16.76%	-0.080	44.72%
-2	695	34.97%	16.77%	0.021	46.23%
-1	707	34.46%	16.48%	-0.260	57.07%
0	693	33.45%	16.03%	-0.740 ***	55.67%
1	658	32.67%	15.50%	-0.558 **	52.07%
2	634	32.78%	16.12%	0.290	45.04%
3	599	33.76%	16.40%	0.293	52.89%
4	584	34.03%	16.60%	0.103	41.55%
<i>Panel C: Post-SOX period</i>					
-4	1,531	45.86%	24.32%	0.704 **	36.95%
-3	1,545	46.64%	24.81%	0.550	31.39%
-2	1,556	47.13%	25.01%	0.176	37.70%
-1	1,566	47.34%	25.28%	0.228	38.46%
0	1,563	47.71%	25.41%	0.126	34.37%
1	1,533	49.26%	26.30%	0.672 **	32.24%
2	1,502	50.08%	27.16%	0.813 ***	28.35%
3	1,467	51.76%	26.96%	-0.145	31.35%
4	1,425	52.77%	27.05%	0.082	32.78%

Institutional ownership levels are reported for four quarters before and after the restatement announcement. Quarter zero is the quarter during which the restatement announcement is made and quarters = -4, -3, -2, -1 (quarters = 1, 2, 3, 4) indicate the four quarters leading up to (following) the restatement announcement. Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) time period. R_AVGOWN_t is the percentage of the restatement firm owned by institutional investors at the end of quarter t . $ADJOWN_t$ is the adjusted level of institutional ownership and is equal to R_AVGOWN_t less OTH_AVGOWN_t , where OTH_AVGOWN_t is the average percentage of institutional ownership across all firms. $CHANGEOWN_t$ is the change in adjusted ownership level and is calculated as the difference between $ADJOWN_t$ and $ADJOWN_{t-1}$. The percentage of negative change observations is equal to the number of restatement firms that had a decrease in institutional ownership from quarter t to quarter $t-1$ divided by the number of ownership observations available for quarter t . The symbols ***, ** and * denote significance from zero at the 1%, 5%, and 10% levels, respectively.

Table 7
Levels and Changes in Institutional Holdings Pre/Post-SOX: Subsample Analyses

Quarter	# Institutional Ownership Observations	TRANSIENT			QUASI-INDEXER			DEDICATED		
		Ownership Level R_AVGOWN_{jt}	Adjusted Ownership Level $ADJOWN_{jt}$	Change in Adjusted Ownership Level $CHANGEOWN_{jt}$	Ownership Level R_AVGOWN_{jt}	Adjusted Ownership Level $ADJOWN_{jt}$	Change in Adjusted Ownership Level $CHANGEOWN_{jt}$	Ownership Level R_AVGOWN_{jt}	Adjusted Ownership Level $ADJOWN_{jt}$	Change in Adjusted Ownership Level $CHANGEOWN_{jt}$
<i>Panel A: Institutional Investor Subsample</i>										
-4	2,204	11.71%	4.63%	-0.138	21.70%	15.26%	0.155	7.06%	1.59%	-0.189
-3	2,229	11.27%	4.60%	-0.033	22.91%	16.02%	0.760 ***	6.98%	1.60%	0.056
-2	2,251	10.95%	4.64%	-0.068	23.62%	16.14%	0.124	6.92%	1.35%	-0.254
-1	2,273	11.20%	4.50%	-0.130	24.26%	16.42%	0.340	6.86%	1.35%	0.001
0	2,256	10.19%	4.12%	-0.362	25.27%	16.10%	-0.322	7.16%	1.10%	-0.243
1	2,191	10.23%	4.46%	0.320	24.29%	16.78%	0.463 *	7.13%	1.20%	0.114
2	2,136	10.98%	4.58%	0.141	24.20%	17.38%	0.615	7.30%	1.43%	0.230
3	2,066	10.95%	4.64%	0.060	25.15%	17.15%	-0.239	7.28%	1.07%	-0.291
4	2,009	11.23%	4.39%	-0.238	24.82%	17.57%	0.418	7.28%	1.25%	0.154
<i>Panel B: Pre-SOX period</i>										
-4	673	12.01%	4.10%	0.194	13.14%	10.06%	0.289	6.91%	2.09%	0.028
-3	684	11.56%	4.56%	0.422 *	13.50%	10.20%	0.099	6.69%	1.91%	-0.202
-2	695	11.30%	4.46%	-0.087	13.78%	10.37%	0.142	6.81%	1.86%	-0.042
-1	707	11.07%	3.97%	-0.457 **	13.73%	10.25%	-0.146	6.56%	1.71%	-0.157
0	693	10.04%	3.31%	-0.667 ***	12.64%	9.57%	-0.716 ***	6.92%	1.99%	0.247
1	658	10.12%	2.99%	-0.319	12.05%	9.82%	0.260	6.95%	1.90%	-0.088
2	634	10.68%	3.68%	0.670 **	12.10%	9.91%	0.093	6.77%	1.77%	-0.158
3	599	10.76%	4.00%	0.319	11.96%	9.92%	0.026	6.71%	1.77%	0.091
4	584	10.81%	3.59%	-0.403 *	11.95%	9.87%	-0.004	6.59%	1.61%	-0.184
<i>Panel C: Post-SOX period</i>										
-4	1,531	11.32%	4.82%	0.191	27.40%	17.41%	0.850 **	7.15%	0.66%	-0.425
-3	1,545	11.09%	4.83%	0.028	28.09%	18.11%	0.701 ***	7.27%	0.64%	-0.019
-2	1,556	11.13%	4.83%	-0.001	28.02%	18.21%	0.111	7.21%	0.58%	-0.025
-1	1,566	11.80%	5.02%	0.220	27.72%	18.38%	0.160	7.35%	0.64%	0.114
0	1,563	11.60%	5.28%	0.262	28.40%	18.60%	1.242 ***	7.44%	0.65%	0.040
1	1,533	11.69%	5.49%	0.204	29.26%	19.79%	1.230 ***	7.41%	0.65%	-0.048
2	1,502	11.85%	5.62%	0.099	29.23%	20.05%	0.656 ***	7.59%	0.74%	0.107
3	1,467	11.79%	5.66%	0.054	29.43%	20.43%	-0.028	7.53%	0.61%	-0.150
4	1,425	12.07%	5.67%	0.001	30.04%	20.38%	-0.054	7.72%	0.76%	0.148

Institutional ownership levels are reported for four quarters before and after the restatement announcement. Classification of investor type j as transient, quasi-indexer, or dedicated follows Bushee (1998). Quarter zero is the quarter during which the restatement announcement is made and quarters = -4, -3, -2, -1 (quarters = 1, 2, 3, 4) indicate the four quarters leading up to (following) the restatement announcement. Restatement announcements that occur prior to or on (after) July 30, 2002 are included in the pre-SOX (post-SOX) time period. R_AVGOWN_{jt} is the percentage of the restatement firm owned by investor type j at the end of quarter t . $ADJOWN_{jt}$ is the adjusted level of institutional ownership and is equal to R_AVGOWN_{jt} less OTH_AVGOWN_{jt} , where OTH_AVGOWN_{jt} is the average percentage of institutional ownership for type j across all firms. $CHANGEOWN_{jt}$ is the change in adjusted ownership level and is calculated as the difference between $ADJOWN_{jt}$ and $ADJOWN_{jt-1}$. The symbols ***, ** and * denote significance from zero at the 1%, 5%, and 10% levels, respectively.