Mary L. Shapiro
U.S. Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

Dear Chairman Shapiro:

Thank you for the opportunity to comment on the Final Report of the Advisory Committee on Improvements to Financial Reporting (CIFR). CIFR notes that accounting restatements have increased sharply in recent years, and is concerned that investors are deprived of information while firms undergo the restatement process. CIFR has recommended ways to increase the timeliness of disclosures around restatements. To help inform the SEC as it considers CIFR's recommendations, we are submitting a study on the length, causes, and effects of lags in disclosure around restatements.

We find that lengthy disclosure lags are uncommon and concentrated in restatements involving suspected or confirmed fraud. Disclosure lags rarely result in stock delistings or debt covenant violations, but do appear to decrease market values and in some circumstances decrease stock liquidity. Although these negative capital market consequences are cause for concern, we conclude that regulatory reforms are not likely to shorten disclosure lags substantially because lengthy lags are uncommon and appear to be largely unavoidable consequences of fraud investigations and other inherent constraints.

We appreciate this opportunity to share our work and hope the SEC finds it informative. Feel free to contact us with questions or comments.

Sincerely,

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Accounting Restatements and the Timeliness of Disclosures

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Abstract: Regulators are concerned that during the process of preparing accounting restatements firms fail to provide timely progress updates, and delay earnings announcements and regulatory filings. Regulators are considering ways to reduce lags in disclosure following restatements, including controversial proposals to alter materiality guidance so that fewer accounting errors require restatements. We examine the length, causes, and effects of disclosure lags around restatements, finding that lengthy lags are uncommon and concentrated in restatements involving suspected or confirmed fraud. Disclosure lags rarely result in stock delistings or debt covenant violations, but do appear to decrease market values and in some circumstances decrease stock liquidity. Although these negative capital market consequences are cause for concern, regulatory reforms are not likely to shorten disclosure lags substantially because lengthy lags are uncommon and appear to be largely unavoidable consequences of fraud investigations and other inherent constraints.

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Data Availability: Data are available from sources identified in the paper.

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Accounting Restatements and the Timeliness of Disclosures

1. Introduction

The number of accounting restatements has increased substantially in recent years, likely because of heightened efforts to eliminate accounting errors after the Enron scandal and the reforms that followed (e.g. Sarbanes-Oxley). Although investors and regulators generally welcome increased efforts to eliminate accounting errors, some are concerned that when preparing restatements firms fail to provide timely updates about the restatement and delay subsequent earnings announcements and regulatory filings. In its final report to the Securities and Exchange Commission (SEC), the Advisory Committee on Improvements to Financial Reporting (CIFR) claims: "The restatement process, which may take longer than 12 months, imposes significant costs on investors as well as preparers. During that process, companies often go into a 'dark period' and issue very little financial information to the public." (CIFR 2008, p. 6). Elaborating on this point, CIFR states:

> "Companies often provide the market with little financial data during the time between an announcement of the identification of errors in historical financial statements and the filing of restated financial statements. Limited information seriously undermines the quality of investor analysis, and sometimes triggers potential loan default conditions or potential delisting of the company's stock." (CIFR 2008, p. 79)

To reduce lags in disclosure around restatements, CIFR proposes mandating timely disclosure about the magnitude and nature of the errors, altering materiality criteria so that fewer errors require restatement, and finding more efficient ways to correct and disclose accounting errors. The materiality proposals are controversial because they would give firms that uncover accounting errors more leeway to avoid restating their prior financial statements and instead use less transparent catch-up adjustments to current earnings or equity. Some observers claim that the SEC has begun allowing firms to avoid restatements even without formally adopting the proposals (Rummell 2008).

In response to concerns that investors do not receive timely information during the restatement process, we examine the length and causes of disclosure lags. If disclosure lags occur because of the extra clerical tasks that restatements require beyond catch-up adjustments, or because the firm simply chooses to withhold disclosures, then the regulatory reforms would reduce lags by eliminating some restatements, easing clerical burdens, and mandating timely disclosure. However, if disclosure lags occur because the restating firms are fundamentally unable to produce reliable information, then the reforms would have little effect. We argue that when restatements involve suspected or confirmed fraudulent manipulations, firms have difficulty producing reliable information because lengthy investigations are required to identify the parties involved and the scope of the manipulations. We examine the role of fraud and other factors in causing disclosure lags to evaluate the effectiveness of the proposed reforms.

To inform concerns that disclosure lags impose significant costs on investors, we assess the effect of disclosure lags on shareholder wealth, stock liquidity, stock delistings, and debt covenant violations. Even if lags in disclosure are largely unavoidable, sometimes firms might be able to shorten lags at the margins by taking costly actions such as assigning more personnel to the restatement task. Regulators may decide to pressure firms to bear these costs. Understanding the effects of disclosure lags helps preparers and regulators evaluate the cost-benefit tradeoffs of accelerating disclosures when acceleration is possible.

Using a comprehensive sample of restatements announced between 1997 and 2005, we find that lengthy disclosure lags around restatements are uncommon and concentrated in restatements involving suspected or confirmed fraud. When fraud is a factor, disclosure of the restatement's earnings impact typically takes weeks, if not substantially longer. In contrast, when fraud is not a factor, the firm typically discloses the restatement's earnings impact within a day of the initial restatement announcement, and the earnings announcement and SEC filing for the current period are delayed by less than a week compared to the prior year. Thus, when not

constrained by concerns about fraud, firms tend to provide timely information about the magnitude of the restatement, and delay disclosures about the current period by only a few days.

A caveat to this finding is that a small minority of non-fraudulent restatements do exhibit disclosure lags on the order of weeks rather than days, suggesting that the regulatory reforms might benefit a minority of cases.[1] However, many of these restatements involve large dollar amounts and multiple errors, likely requiring some period of investigation before reliable information can be issued. Also, due to the vagueness of some firms' disclosures, we likely misclassified some fraudulent restatements as non-fraudulent. We conclude that the regulatory reforms are not likely to substantially increase disclosure timeliness because they target non-fraudulent errors of small size and scope, which tend to involve little disclosure lag in the first place.

Turning to the effects of disclosure lags, we find that stock prices react more negatively to restatement announcements if the firm fails to disclose the restatement's impact on earnings. Even short lags in disclosing the earnings impact negatively affect stock returns. Moreover, the lost value tends not to be recovered when the earnings impact is eventually released. These relatively permanent losses of value occur whether or not the restatement is fraudulent.

We examine stock liquidity during the days when the market is aware that a restatement is forthcoming but does not know its earnings impact. We find declines in liquidity only for fraudulent restatements. We examine how often restatement firms are delisted because they miss SEC filing deadlines, finding that only 1.7 percent of sample firms delist due to filing delinquencies. Moreover, firms with fraudulent restatements account for 76 percent of these delistings. Thus, restatements rarely cause filing delays long enough to prompt delisting, especially when the accounting errors are unintentional. Finally, we find that restatements

[1] To ease exposition, for the remainder of the paper we refer to restatements involving suspected or confirmed fraud as "fraudulent" and the others as "non-fraudulent." Page 8 describes how fraudulent restatements are identified.

rarely prompt the violation or enforcement of debt covenants that require timely reporting, although this evidence is preliminary and incomplete.

The declines in stock prices and liquidity justify regulators' concern about disclosure lags around restatements, and point to potential benefits of reducing lags. However, causal analysis suggests that lags are largely unavoidable because of investigations necessary to restore the firm's ability to produce reliable information. With the data available, it is difficult for us to test the feasibility or costs of trimming disclosure lags at the margins. The possibility exists that some firms unnecessarily delay releasing reliable information in their possession, or could expedite investigations and other steps of the restatement process at low cost. The negative effects of disclosure lags documented in this study help regulators, auditors, managers, and boards understand the benefits of shortening lags when possible.

In the next section, we discuss the developments that lead to concerns about the timeliness of disclosures around restatements and the regulatory proposals. Section 3 describes the sample. Section 4 discusses findings about the length, causes, and effects of disclosure lags, and Section 5 concludes.

2. Background and Proposed Reforms

Restatement frequency has increased substantially in recent years, with over 1,600 firms (10 percent of public companies) issuing a restatement in 2006 (Johnson 2008). Although the number of restatements declined in 2007 and 2008, restatement counts in these years still dwarf those of a decade ago.[2] Regulators do not interpret the increase in restatements as a sign of deteriorating internal controls or accounting quality. Rather, regulators are concerned that more diligent efforts to detect and correct accounting errors are leading to restatements that are not important to investors.

[2] Counts vary by data provider, but Audit Analytics reports 1,235 and 869 restatements in 2007 and 2008, respectively (Taub 2009). A comprehensive study by Scholz (2008) identifies only 90 and 119 in 1997 and 1998, respectively (Audit Analytics does not track these years).

The SEC commissioned the CIFR to examine the increase in restatements and other developments in the U.S. financial reporting system. Our study complements other academic work inspired by CIFR's concerns and proposals (Burks 2009; Wright et al. 2008). CIFR is concerned that firms unnecessarily suspend their communication with investors around restatements, and recommends that companies be required to disclose information about the errors as it becomes available rather than waiting until the restated financial statements are filed. This information includes the nature of the error, the impact of the error on trends, liquidity, or operations, and management's response to the error (CIFR 2008, p. 86). In the spirit of this recommendation, we examine how long firms take to disclose the estimated and actual earnings impact of the errors after the initial restatement announcement.

CIFR also recommends altering materiality guidance so that fewer errors require restatement. Under U.S. GAAP, restatements are not required for immaterial errors (Statement of Financial Accounting Standards No. 154). CIFR believes that a quantitatively material error should be deemed immaterial if, for instance, the error affects metrics that are not important to investor models, the error is a one-time item that does not affect key trends, or the error affects a portion of the business that does not drive the firm's value or risk (CIFR 2008, p. 81). CIFR also recommends that restatements not be used for errors that are immaterial to prior periods even if taking a catch-up adjustment would materially affect current-period financial statements (CIFR 2008, p. 83). For errors deemed immaterial, CIFR recommends that they be disclosed in an SEC form 8-K and corrected with a catch-up adjustment to equity or earnings. The assumption underlying these recommendations is that a catch-up adjustment involves less clerical burden than does restating prior period financial statements, allowing firms to correct errors and resume regular reporting schedules more quickly.

The materiality recommendations are controversial. Some observers claim that the recommendations undesirably depart from the SEC's existing materiality guidance found in Staff Accounting Bulletin (SAB) No. 99. In a comment letter to the CIFR, the Certified Financial

Analyst Institute stated, "Fundamentally, we do not understand how a quantitatively large error could be immaterial due to qualitative factors. The list of possible factors [cited by the CIFR] contradicts the intention of materiality factors addressed in SEC Staff Accounting Bulletin No. 99."[3] Opposition of a similar nature was registered by the Investors Technical Advisory Committee and the Consumer Federation of America.[4] Other opponents do not want to lose the transparency that a restatement of prior periods provides over correcting the error with a catch-up adjustment, and are worried that firms would abuse the increased leeway to avoid restatements. Responding to the CIFRs' materiality recommendations, an analyst for the Capital Group Cos. stated, "Disclosure is a concern, and investors want to be their own decision-makers of which errors are important in their investment theses" (Johnson 2008).

The SEC has not yet formally adopted the CIFR's materiality proposals. However, citing the decline in restatements since 2006, some observers claim that the SEC has informally softened its approach to materiality and is allowing more firms to avoid restatement (Rummell 2008). Comments by SEC officials themselves also suggest a softening, possibly prompted by concerns about disclosure lags around restatements. In a January 2008 speech, John W. White, director of the SEC's Division of Corporate Finance, cautioned preparers against assuming that the SEC would require restatements for questionably material errors: "Please do not presume the [SEC] staff's conclusion and the need to restate financial statements. Rather, I encourage a discussion with the staff" (White 2008a). In an August 2008 speech, White voiced agreement with CIFR's claim that disclosure timeliness would be improved by avoiding restatements for less material errors (White 2008b).[5]

[3] The comment letter can be found at http://www.sec.gov/comments/265-24/26524-68.pdf.
[4] Their comment letters can be found at http://www.sec.gov/comments/265-24/265-24.shtml.
[5] He stated, "As the [CIFR] notes, this approach of not restating for immaterial errors would provide investors making current investment decisions with more timely financial reports and avoid the costs to investors of delaying prompt disclosure of current financial information in order for a company to correct multiple prior filings" (White 2008b).

Given the controversy surrounding the CIFR's materiality recommendations and the early indications that the SEC is acting upon them, it is important to determine whether the recommendations would achieve the stated objective of increasing disclosure timeliness. If the clerical burden of correcting and reissuing prior period financial statements is primarily responsible for disclosure lags, then reducing the use of restatements would speed the flow of information to investors. However, if disclosure lags occur primarily because the firm needs time to investigate and quantify the errors, then disclosure lags are unavoidable even if the errors are corrected by catch-up adjustment.

To assess how avoidable disclosure lags are, we distinguish restatements involving unintentional errors from those involving suspected or confirmed fraudulent manipulations. Fraud perpetrators often go to great lengths to conceal their actions. Therefore, a firm will have difficulty making reliable disclosures until it investigates whether fraudulent manipulations occurred, and identifies the people, accounts, and amounts involved. Auditors typically refuse to render an opinion on the firm's reports until the fraud is investigated (Hennes, Leone, and Miller (hereafter HLM) 2008). Thus, lags in disclosure around fraudulent restatements are largely unavoidable. As in HLM, we classify restatements as fraudulent if the firm describes them as such or if a regulator or the board of directors launches an independent investigation.

One problem with using the presence of investigations to infer the avoidability of disclosure lags is that the investigations themselves might be unnecessary. Firms might initiate investigations even when there is little evidence of intentional manipulations, precluding internal accounting personnel from quickly resolving the errors. However, HLM argue that independent investigations are unlikely to be initiated unless fraud is credibly suspected because the direct costs of investigations are substantial and the market typically reacts negatively. Furthermore, HLM find that restatements they classify as fraudulent result in extremely high rates of CEO or CFO turnover, suggesting that the investigation findings typically confirm the initial suspicions of fraudulent behavior. Thus, we argue that lags in disclosure are largely unavoidable for

restatements classified as fraudulent using the HLM methodology. Separating fraudulent restatements from those in which firms are less constrained in providing timely disclosures (i.e. non-fraudulent restatements) allows us to better assess the potential effectiveness of the regulatory reforms.

3. Sample Selection and Restatement Episodes

We obtain our sample from two reports by the GAO that identify restatements from 1997 to September 2005 (GAO-03-138 and GAO-06-678). We eliminate 323 of the 2,309 restatements because they are missing data on CRSP and Compustat in the year of or year before the restatement. We eliminate another 513 restatements, most commonly because the error relates to an earnings release for the current period rather than to a prior period 10-K or 10-Q (114); the GAO captures more than one announcement for the same restatement (107); the restatement was due to the adoption of SEC Staff Accounting Bulletin No. 101 (72); or the restatement was due to adoption of a new standard rather than an error (65). See Table 1 for other reasons for exclusion. The remaining 1,473 restatements serve as the base sample for all analyses, but sample sizes differ by analysis depending on data availability.

[INSERT TABLE 1 HERE]

We hand-collect information about the restatements, including the impact on originally reported earnings and the presence of fraud or investigations. We also track the date when each firm discloses the earnings impact. We refer to the time between the initial announcement related to the restatement and the announcement of the restatement's earnings impact as the restatement episode. Figure 1 depicts the periods before, during, and after the restatement episode, with the restatement episode labeled as period 2. Periods 1 and 3 are discussed in later analyses. We assume that during the restatement episode the firm discloses relatively complete information about the restatement, such as the presence of fraud and the accounts involved, because such information would have been uncovered during the process of quantifying the earnings impact.

[INSERT FIGURE 1 HERE]

The date of the initial restatement announcement is usually obtained from the GAO reports. However, we also use the Audit Analytics database and search press releases and SEC filings for earlier dates. To find the ending date of the restatement episode, we look for the first disclosure of the restatement's impact on past earnings, either cumulatively or by period. The firm must state the impact definitively, not as an expectation. The earnings impact can be disclosed in a press release before the restated financial statements are filed with the SEC.

4. Results

4.1 Descriptive Statistics for Disclosure Lags

We measure five types of disclosure lags around restatements. Three of the measures capture how long the firm takes to disclose information about the restatement after announcing that a restatement may be forthcoming. These measures count the number of days between the initial restatement announcement and disclosure of (1) the estimated earnings impact (*TO_ESTIMATE*), (2) the definitive earnings impact (*TO_NUMBERS*), and (3) the SEC filing containing the restated financial statements (*TO_FILING*). If the firm provides the definitive earnings impact without ever providing an estimate, then *TO_ESTIMATE* is set equal to *TO_NUMBERS*. Thus, *TO_ESTIMATE* reflects how long the firm takes to issue the estimated or actual earnings impact.

One limitation of the three measures as proxies for disclosure lags is that disclosures could appear timely when the initial restatement announcement is actually untimely. For instance, a firm that delays its initial announcement until the errors are researched and quantified will appear to deliver timely information about earnings impacts. However, there are two factors that constrain how long firms can delay the initial restatement announcement. First, case law has established that firms have a duty to promptly notify the market of materially false

statements (Brown 1999, p. 3-26 to 3-34).[6] Second, as a practical matter, missing scheduled earnings announcements or SEC filing deadlines forces the firm to explain the reason for delinquency. As described next, we use two other measures of disclosure lag that are not affected by the firm's choice about when to initially announce the restatement.

The two variables measure how long the earnings announcement and SEC filing for the current period are delayed because of the restatement. We use the term preparation quarter to refer to the quarter whose earnings announcement and SEC filing are pending at the time of the initial restatement announcement. For example, if a firm with a quarter ending on December 31 announces a restatement on January 5, 2004, then the preparation quarter for the earnings announcement and SEC filing would probably be the quarter ended December 31, 2003 because the firm likely has not announced earnings or made the SEC filing so soon after the quarter-end. As depicted in scenario 1 of Figure 2, the earnings announcement and SEC filing usually have the same preparation quarter. However, sometimes the errors are discovered after earnings are announced but before filing with the SEC, in which case the preparation quarter for the earnings announcement would be one quarter after the preparation quarter for the SEC filing (depicted in scenario 2 of Figure 2).[7]

[INSERT FIGURE 2 HERE]

To measure how long a restatement delays the earnings announcement for the preparation quarter, we compute *EA_DIFF*. *EA_DIFF* equals the number of days between the earnings announcement and the preparation quarter-end minus the same quantity for the quarter in the prior year. One problem is that if the prior year earnings announcement is late, *EA_DIFF* makes

[6] In August 2004 the SEC formalized this duty by requiring firms to disclose accounting errors in a Form 8-K within four business days of establishing that prior financial statements should no longer be relied upon. See "Final Rule: Additional Form 8-K Disclosure Requirements and Acceleration of Filing Date" at http://www.sec.gov/rules/final/33-8400.htm#seciic.

[7] To identify which earnings announcement and SEC filing is pending, we use earnings announcement dates from Compustat and 10-K or 10-Q filing dates from the SEC's EDGAR database. Operationally, to designate the preparation quarter we identify the most recent quarter whose earnings announcement or SEC filing had been made as of the restatement announcement date, and designate the next quarter as the preparation quarter.

the preparation quarter earnings announcement appear early. To mitigate this problem, when computing the prior year quantity we use the earlier of the earnings announcement date or SEC filing deadline. We compute a variable analogous to *EA_DIFF* to measure how long the SEC filing for the preparation quarter is delayed (denoted *FILE_DIFF*).[8]

Table 2 Panel A presents descriptive statistics for the five disclosure lag measures. *TO_ESTIMATE* and *TO_FILING* are missing for more than half the sample because we rely on a limited supplemental dataset from Audit Analytics to construct these variables. Median *TO_ESTIMATE* equals 0 days, suggesting that for at least half of all restatements, the firm either estimates or definitively quantifies the restatement's earnings impact on the same day as the initial restatement announcement. Median *TO_NUMBERS* of 13 days suggests that at least half the time firms definitively quantify the earnings impact within two weeks of the initial announcement. Median *TO_FILING* of 25 days suggests that at least half of the firms file restated financial statements with the SEC within a month of the initial restatement announcement. Median *EA_DIFF* of 7 and *FILE_DIFF* of 5 days suggest that earnings announcements and SEC filings are delayed by no more than a week in at least half of all restatements. The means of the five disclosure lag measures are considerably higher than the medians because a minority of restatements have extremely long lags. We examine the entire distribution of each measure below, but first partition the sample by whether the restatements involve suspected or confirmed fraud.

[INSERT TABLE 2 HERE]

These fraud-related restatements, which account for 24 percent of the sample, are likely to involve unavoidable disclosure lags. Supporting this idea, Table 2 Panel A shows that disclosure lags tend to be much shorter when firms are not constrained by fraud. For example, median *TO_NUMBERS* for non-fraudulent (fraudulent) restatements is 1 (76) days. For non-

[8] Untabulated Pearson correlations among the five measures of disclosure lag are all positive and significant at the one percent level. *TO_NUMBERS* tends to exhibit the highest correlations with the other variables, ranging from 0.577 (*EA_DIFF*) to 0.937 (*TO_FILING*).

fraudulent restatements, median *EA_DIFF* and *FILE_DIFF* are 6 and 4 days, respectively. The corresponding medians for fraudulent restatements are 21 and 16. Again, in both partitions the means are considerably higher than the medians.

Figures 3 and 4 plot the cumulative distribution of each disclosure lag measure, conditional on whether the restatement is fraudulent. The cumulative percentages are based on 5-day bins. The plots for the non-fraud sample are higher than the corresponding plots for the fraud sample throughout the relevant range, and are more steeply upward sloping earlier in the range. The plots show that while most firms in the non-fraud category quickly release earnings impacts, amended filings, and current-period earnings and SEC filings, some firms in the category do have lengthy disclosure lags.

[INSERT FIGURES 3 AND 4 HERE]

To understand whether some other inherent constraint explains the lengthy disclosure lags, we compare the characteristics of non-fraudulent restatements in the top quartile of disclosure lags to those below the median. Using partitions based on *TO_NUMBERS* and *FILE_DIFF*, Panel B of Table 2 shows that restatements in the top quartile tend to have much larger impacts on earnings. Median earnings impact as a percentage of assets is approximately twice as large in the top quartile as in the below-median partition (significantly different at the 1 percent level). Also, over 25 percent of restatements in the top quartile involve multiple errors, compared to less than 10 percent in the below-median partition (significantly different at the 1 percent level). Thus, the lengthy disclosure lags among a minority of non-fraudulent restatements may occur because the firm needs time to investigate large or varied errors. The lags might also be observed because vague firm disclosures lead us to misclassify these restatements as non-fraudulent. Restatements are considered non-fraudulent unless the firm voluntarily mentions fraud or independent investigations. Although we cannot rule out the possibility that regulatory reforms could speed disclosure for a small minority of non-fraudulent restatements, the results

suggest that other inherent constraints, such as large or numerous errors, may preclude firms from making reliable disclosures.

4.2 Firm and Restatement Descriptive Statistics

Table 3 provides information about the firms and restatements in our sample. The Appendix contains detailed descriptions of the variables. The average cumulative impact of the restatement on prior earnings scaled by total assets (*MAG*) is -0.030, while the median impact is -0.006. In addition, approximately 75% of our sample restated prior fiscal years, which indicates that the restatement process involves more than just revising the prior quarterly financial statements. Focusing on what accounts were restated, 28.6% of our restatements involve core components of earnings (*CORE_PRIMARY*). With regard to firm size (*FIRMSIZE*), our mean (5.92) and median (5.83) are similar but there does seem to be some significant variation (standard error is 2.197). In terms of when the restatements occurred, 65.6% of them occurred in the post-Sarbanes Oxley era (*POSTSOX*), defined as July 2002 and after. This is not surprising given the significant increase in restatements due to SOX and related changes in accounting practice. A Big 4 or 5 auditor (*BIG_N*) audited over 84% of our sample which indicates that disclosure lags are not likely limited to firms that are audited by smaller auditors. Finally, with regards to how the market responded to the announcement of a restatement, the mean (median) *ANNOUNCEMENT_RET* for our sample is negative 5.2% (2.3%). Table 3 shows that our sample contains a wide variety of restatements that span large and small companies and pre and post-SOX time periods.

[INSERT TABLE 3 HERE]

4.3 Causes of Disclosure Lags around Restatements

Table 2 suggests that the suspicion or presence of fraud dramatically reduces the timeliness of disclosures. However, fraud is likely correlated with other factors that contribute to disclosure lags such as the size of the errors, the number of accounts involved, and auditor transitions. To better understand the causes of disclosure lags around restatements, we regress each of the

five lag measures on potential determinants. To reduce skewness, we add one to each measure and take the natural log. Because untransformed *EA_DIFF* and *FILE_DIFF* take on negative values when disclosures are made earlier than in the prior year, these negative values are set to zero before adding one and log transforming. We use Tobit regression because many observations are at the lower bound of zero (Greene 2003).

Disclosure lags for firm i are modeled as a function of restatement, firm, and auditor attributes:

$$\textit{Disclosure lag measure}_i = \alpha_0 + \alpha_1 \textit{Rstmt attributes}_i + \alpha_2 \textit{Firm attributes}_i + \alpha_3 \textit{Auditor attributes}_i + \varepsilon_i \quad (1)$$

We briefly describe the attributes below. The Appendix contains more detailed descriptions, and Table 3 contains descriptive statistics. The first restatement attribute is a dummy variable capturing whether the restatement involves fraud or an independent investigation (*FRAUD*). Because frauds in lower levels of the organization may not take as long to investigate, we also include a dummy capturing whether the firm's disclosures suggest that the fraud occurs below the corporate level of the organization (*FRAUDSUB*). The coefficient on *FRAUDSUB* is expected to be negative to partially offset the positive effect of *FRAUD* on disclosure lags. Disclosure lags are predicted to increase in the absolute value of the restatement's earnings impact scaled by total assets (*ABS_MAG*) and whether prior fiscal years are involved (*ANNUAL*). We also include dummy variables for the types of items restated, described at the end of the Appendix. A dummy called *MULTIPLE* is used for restatements that involve more than one type of item or three or more errors in the same item category. *MULTIPLE* is expected to be positively related to disclosure lags.

Turning to firm attributes, the natural log of the firm's assets (*FIRMSIZE*) is expected to be negatively related to disclosure lags because large firms have more accounting resources. We include a dummy capturing whether the firm faces shorter SEC filing deadlines because it is an accelerated filer (*ACCELERATED_FILER*), expecting that shorter deadlines will prompt firms to

expedite the restatement process and shorten disclosure lags. To complement this variable, we include a dummy capturing whether the accelerated deadlines were effective in the current year but not the previous year (*FIRST_ACCELERATED*). *FIRST_ACCELERATED* is most important in the *EA_DIFF* or *FILE_DIFF* regressions because firms that are newly subject to accelerated deadlines will tend to report earnings announcements and SEC filings earlier than in the prior year. We also include a dummy capturing whether the restatement was announced after passage of the Sarbanes-Oxley Act (*POSTSOX*) to control for general changes in the financial reporting climate.

Turning to auditor attributes, we expect lags to be shorter for Big N auditors (*BIG_N*) because they have more auditing resources. We also include a dummy for restatements that have preparation quarters ending in December, auditors' busiest time of the year (*AUDITOR_BUSY*). Similarly, we include a dummy for restatements whose preparation quarter is the fourth quarter of the firm's fiscal year (*YEAREND*). *YEAREND* could be negatively related to disclosure lags because the audit staff would already be on site at the firm doing the year-end audit. However, *YEAREND* could be positively related to lags because the auditor's workload includes all of the year-end audit tasks in addition to the restatement. Finally, we include a dummy capturing auditor transitions occurring 90 days before to 30 days after the initial restatement announcement (*AUDITOR_CHANGE*), expecting auditor transitions to lengthen lags.[9]

To assess the relative effect of each explanatory variable on disclosure lags, we compute a measure of the change in expected lag when each explanatory variable changes holding the

[9] Event time analysis reveals no spike in auditor transitions around restatement announcements. In constructing *AUDITOR_CHANGE*, we choose 90 days before the restatement announcement because the process of finding a new auditor and undergoing the re-audit can take weeks or months. We choose 30 days after the restatement announcement to allow time for lingering disputes that are slowing the audit to result in resignations or dismissals.

others at their means.[10] Binary explanatory variables are changed from zero to one; continuous explanatory variables are changed from the 10th to 90th percentile. After computing the two expected values of disclosure lag conditioned on the explanatory variable's high and low value ($E[y_{High}]$ and $E[y_{Low}]$), we take the inverse log (exp{.}) of each expected value and compute the difference: $\exp\{E[y_{High}]\} - \exp\{E[y_{Low}]\}$. We caution that the inverse log does not completely reverse the initial log transformation of the dependent variable. The reported differences merely provide an intuitive way to compare economic significance across the explanatory variables.[11]

[INSERT TABLE 4 HERE]

Table 4 presents the regression results for the five measures of disclosure lag. Consistent with the univariate comparisons in Table 2, *FRAUD* has the most powerful effect on disclosure lags. It is highly statistically significant in all regressions, and its estimated economic effect generally dwarfs that of the other variables. For example, in the *TO_ESTIMATE* regression, *FRAUD* has an effect of 11.5 while no other variable has an effect above 3. In the *TO_FILING* regression, *FRAUD* has an effect of 52.2 while no other variable has an effect above 19. *MULTIPLE*-item and *ANNUAL* restatements also appear to contribute to disclosure lags. *MULTIPLE* is statistically significant in all regressions except *TO_ESTIMATE*, has the highest effect in the *FILE_DIFF* regression (7.5), and has the second highest effect in the *TO_NUMBERS* and *TO_FILING* regressions (14.9 and 18.6, respectively). *ANNUAL* is highly statistically significant in all of the regressions except for *TO_ESTIMATE*, although its effect is modest compared to *FRAUD* and *MULTIPLE* (effects ranging from 1.0 to 7.1). Unexpectedly, accelerated filers (*ACCELERATED_FILER*) tend to have longer lags, although the effects are

[10] The expected value for observation i, $E(y_i|x_i)$, from a Tobit regression equals $\Phi(x_i'\beta/\sigma)*(x_i'\beta+\sigma\lambda_i)$, where x and β are vectors of the explanatory variables and coefficients, respectively, σ is the standard error of the residual, Φ(.) is the cumulative density function of the normal distribution, and λ is the inverse Mills ratio (Greene 2003, p. 764).

[11] The inverse log of the expected value is not a valid point estimate of the expected value of the untransformed variable because E[Ln(y)] is not equivalent to Ln[E(y)], so taking exp{E[Ln(y)]} will not result in E(y).

modest. No other variables are consistently significant, statistically and economically, across the regressions.

4.4 Effect of Disclosure Lags on Shareholder Wealth

CIFR is concerned that disclosure lags around restatements impose significant costs on investors, including stock delistings, debt covenant violations, and decreases in market value and liquidity (CIFR 2008, p. 79, 85). We look for evidence of these negative capital market effects, beginning with market values. To examine the impact on market value we need to select a window over which to measure stock returns and a proxy for disclosure lag. We measure returns over the restatement episode window, spanning one day before the initial restatement announcement to one day after the announcement of the restatement's impact on earnings. Thus, the size-adjusted episode return (*EPISODE_RET*) reflects investors' valuation of relatively complete information about the restatement, allowing us to control for a comprehensive set of restatement attributes to assess the incremental effect of reporting lags. Because returns are measured over the episode window, we use the episode length (*TO_NUMBERS*) as our proxy for disclosure lag. Episode length is highly correlated with the other disclosure lag measures, so serves as a representative proxy for lags in general (see footnote 6).

Disclosure lags could have temporary or long term valuation effects. The effect would be temporary if firm value initially declines because of the risk imposed by the lack of disclosure and then recovers when the firm releases complete information about the restatement and resumes a regular reporting schedule. The effect would be relatively permanent if the reporting delay causes the market to lose confidence in the firm's financial reporting processes, increasing the firm's cost of capital over the long term. To sort out whether the effects are temporary or long term, we also examine size-adjusted returns in the three days around the initial restatement announcement (*ANNOUNCEMENT_RET*). If the negative valuation effects are temporary, disclosure lags would negatively affect short-window returns but not episode

returns. If the negative valuation effects are relatively long term, disclosure lags would negatively affect the short-window and episode returns.

The following model is used to test the effects of disclosure lags on shareholder wealth:

$$Return\ measure_i = \alpha_0 + \alpha_1 Disclosure\ lag\ measure_i + \alpha_2 Rstmt\ controls_i + \alpha_3 General\ controls_i + \varepsilon_i \quad (2)$$

Upon the initial restatement announcement, investors know only whether the firm has quantified the earnings impact or not. Therefore, when using short-window returns as the dependent variable, the disclosure lag measure is a dummy capturing whether the earnings impact is quantified in the initial restatement announcement (*NOQUANT*). When using episode returns as the dependent variable, the measures of disclosure lag are dummies capturing the length of the episode. The dummies capture whether episode lengths are between 1 and 15 days (*NOQUANT15*), 16 and 45 days (*NOQUANT45*), 46 and 90 days (*NOQUANT90*), 91 and 180 days (*NOQUANT180*), and greater than 180 days (*NOQUANT>180*). Using multiple length dummies allows us to test whether stock prices are penalized for longer episode lengths only. Because the presence or suspicion of fraud has a large effect on disclosure lags, we estimate the relation between disclosure lags and stock returns separately for fraudulent and non-fraudulent restatements by interacting *FRAUD* with the *NOQUANT* variables.

The restatement attributes we control for are *FRAUD*, *FRAUDSUB*, *MULTIPLE*, the restatement's signed earnings impact (*MAG*), the sign of the restatement's earnings impact (*POS*), whether the restatement affects the quarters of the current fiscal year only (*QUARTERLY*), whether management initiated the restatement as opposed to the auditor or the SEC (*MGT*), and whether the restatement involves a core component of earnings (*CORE_PRIMARY*). We also include *FIRMSIZE*, *POSTSOX*, size-adjusted returns over the 90 days preceding the initial restatement announcement (*PRE_RET*), the mean value of the Chicago Board Options Exchange's volatility index during the return window (*VIX*), and surprises for earnings announcements made during the return window (*ESURP*). These

variables are described in more detail in the Appendix and predicted signs are found in Table 5.[12]

[INSERT TABLE 5 HERE]

Table 5 shows the results of three regressions, one with announcement returns as the dependent variable and two with episode returns as the dependent variable. Only the second episode return regression includes surprises from earnings announcements (*ESURP*) because they are not available on IBES for 23 percent of the sample. *FRAUD*, *MAG*, and *POSTSOX* are highly significant in the predicted directions in all regressions. *ESURP* is also highly significant when included.

The negative relation between *NOQUANT* and short window announcement returns suggests that, for restatements not involving fraud, abnormal returns are significantly more negative when the firm fails to disclose the earnings impact in the initial restatement announcement (p-value < .01). The effect is economically significant, as the coefficient of -0.0383 suggests that firms lose nearly 4 percentage points of market value on average from failing to disclose the earnings impact. Surprisingly however, the market reaction is not significantly more negative when firms with fraudulent restatements fail to disclose the earnings impact in the initial announcement (i.e., the effect of *NOQUANT* + *NOQUANT*FRAUD* is not significantly different from zero).

When episode returns are the dependent variable, coefficients on the *NOQUANT* dummies are almost always significantly negative, statistically and economically. The coefficient on *NOQUANT15* suggests that taking as little as 15 days to disclose the earnings impact reduces market values by around 4 percent on average. The negative coefficients on the other *NOQUANT* dummies are nearly monotonically increasing in episode length, although

[12] Predicted signs are straight forward for most variables. For more information, see Appendix A of Burks (2009).

NOQUANT>180 is statistically insignificant in the regression that includes *ESURP*.[13] Similar results are found for fraudulent restatements. The combined effects of the *NOQUANT* + *NOQUANT*FRAUD* terms are significantly negative for all but the shortest episode dummy (*NOQUANT15*). Because the firm has quantified the impact of the restatement by the end of the episode return window, these results suggest that the market value declines associated with disclosure lags are relatively long term; the initial declines are not restored after removing uncertainty about the restatement's impact.

Next we test whether the value declines are restored in the months and years after the restatement impact is quantified. Following Barber and Lyon (1997), we compute abnormal returns following the restatement episode by subtracting the return of a control firm matched on size and book-to-market. Restatement firms are matched to the control firm closest in book-to-market ratio that also has a market capitalization between 70 and 130 percent of the restatement firm as of the year ended prior to the restatement announcement. Panel B of Table 5 presents mean and median abnormal returns at six months, one year, and two years after the restatement's earnings impact is disclosed. Only firms that had a restatement episode longer than one day are included because we are testing for reversals of the value declines that result from multi-day episodes. We also lose some observations because of delistings during the restatement episode or missing book or market values used for matching. The only measure of long run abnormal returns that is significantly different from zero is median six-month returns for fraudulent restatements. However, the median is significantly negative, so value declines obviously are not restored. Thus, there is no evidence that the value declines accompanying disclosure lags are restored when the definitive impact on earnings is disclosed or over the long run.

[13] NOQUANT>180 is insignificant likely because of low power due to the low number of non-fraudulent restatements that have episode lengths greater than 180 days.

4.5 Stock Illiquidity Following Restatement Announcements

We next examine whether stock liquidity decreases while investors wait for the firm to disclose the restatement's earnings impact. Liquidity involves the speed and cost with which an asset can be sold, and hinges on several factors including bid-ask spreads, the price impact of trading, and direct transaction costs like brokerage commissions (Amihud and Mendelson 1991; Kyle 1985). Consistent with Kyle's (1985) concept of liquidity, we focus on the price impact that trading has on a firm's stock price.[14] Kyle (1985) shows that the price impact of trading depends on the mix of informed and uninformed trading the market. When market makers suspect that informed trading is relatively high, they protect themselves by moving prices more sharply in response to order flows. In our setting, if a lack of public disclosure creates opportunities for trading on private information, then stock prices would move sharply in response to order flows during the restatement episode window.

Amihud (2002) measures the price impact of trading (denoted *ILLIQ*) by scaling the absolute value of daily returns by the dollar value of daily trading volume and then multiplying by 10^6: $ILLIQ_{id} = (|RET_{id}| / VOLD_{id})*10^6$; where RET_{id} is the return and $VOLD_{id}$ is the dollar volume for stock i on day d.[15] We refer to this measure as *ILLIQ* because it increases in illiquidity.[16] Higher values of *ILLIQ* during the restatement episode window would indicate that investors bear higher trading costs due to uncertainty about the restatement's earnings impact. We limit the sample to restatements that have episode lengths of at least five days, and test whether mean

[14] In addition to the price impact of trading, we also considered examining bid-ask spreads. However, Palmrose, Richardson, and Scholz (2004) report no significant changes in bid-ask spreads around initial restatement announcements. We also find no significant changes in bid-ask spreads around initial announcements of fraudulent restatements that have large impacts on originally reported earnings. Since bid-ask spreads do not appear to be affected by the major news event that begins the restatement episode, they are unlikely to change systematically during the episode.

[15] Another interpretation of *ILLIQ* is that it measures the degree of consensus about new information. *ILLIQ* increases with consensus because agreement about information results in stock price changes without trading volume, while disagreement about new information induces only increased trading volume. In our setting, this alternative interpretation seems less relevant because the silence of the firm during the restatement episode means that there is little information to which investors would react.

[16] An advantage of *ILLIQ* is that it does not require microstructure data that are unavailable for some smaller firms (common in restatement settings). Amihud (2002) documents that *ILLIQ* is correlated with microstructure estimates of illiquidity.

ILLIQ during the episode window is higher than in the 90 trading days before the restatement is announced. We exclude the day before the restatement announcement from the 90-day pre-period. From the episode window we exclude the first two and last two days to avoid the information events that begin and end the window. We want to measure illiquidity when uncertainty exists, not when the uncertainty is introduced by the initial restatement announcement or resolved by the release of the earnings impact.

Restatements may result in longer-term illiquidity because of uncertainty about the quality of the firm's internal controls and financial reporting (Hribar and Jenkins 2004; Francis, LaFond, Olsson, and Schipper 2005). Thus, higher *ILLIQ* during the episode window might reflect long-term illiquidity rather than illiquidity specifically arising from disclosure lags. To distinguish between these two types of illiquidity, we include the 90 trading days after the episode window ends (excluding the first day after the episode window ends).[17] Figure 1 portrays the three time periods tested in the analysis: pre-restatement announcement, restatement episode, and post-episode.

For each firm, we run a time series regression of *ILLIQ* on dummy variables denoting the three time periods, and then average the coefficients across the firm-specific regressions. This approach is similar in style to Fama-MacBeth (1973).[18] The days in the episode window are captured by the *EPISODE* dummy, and the 90 days after the episode ends are captured by the *POST_EARN* dummy. The 90 days preceding the episode are represented by the intercept term (α_0):

$$ILLIQ_{id} = \alpha_0 + \alpha_1 EPISODE_{id} + \alpha_2 POST\_EARN_{id} + \alpha_3 TD\_COUNT_{id} + \varepsilon_{id} \quad (3)$$

[17] Using alternative trading day window-sizes (+60, +120, and +240) for the pre- and post-episode periods does not change inferences.

[18] The classic application of Fama-MacBeth (1973) is to run a series of cross-sectional regressions at various points in time and average the coefficients. Coval and Shumway (2005) also use our modified approach of running a time series regression for each cross-sectional unit.

We expect α_1 and α_2 to be positive, reflecting the uncertainty about the restatement itself (α_1) and about the quality of the firm's financial reporting in general (α_2). The final term in the model (*TD_COUNT*) is a time trend variable equal to the number of trading days after the initial restatement announcement. *TD_COUNT* controls for natural dissipation in uncertainty over time, so we expect α_3 to be negative.

Table 6 presents coefficient means across the firm-specific regressions, partitioned by whether the restatement involves suspected fraud. *EPISODE* is significantly positive only in the fraudulent restatement partition (p-value < .01), suggesting that a lag in releasing the restatement's earnings impact increases illiquidity only when the restatement is fraud-related. In the fraudulent partition, the *EPISODE* coefficient is significantly higher than the *POST_EARN* coefficient (p-value < 0.01), suggesting that the illiquidity arises from lack of disclosure rather than a more general uncertainty about the quality of the firm's accounting. Interestingly, *POST_EARN* is significantly negative in both partitions, suggesting that stocks tend to be more liquid after the restatement episode ends than they were before the restatement was first announced. Perhaps the scrutiny on accounting records and procedures that accompanies the restatement results in more transparency than existed before the accounting errors were discovered. The coefficient on *TD_COUNT* is negative as expected, but is significant only in the non-fraudulent partition (p-value < .05).

[INSERT TABLE 6 HERE]

4.6 Disclosure Delays and Stock Delistings

We examine how often firms are delisted because of SEC filing delinquencies around restatements. All major U.S. exchanges (NYSE, AMEX, and Nasdaq) require listed firms to promptly file quarterly and annual reports with the SEC.[19] However, the exchanges explicitly allow grace periods and exercise much discretion over delistings even after the grace periods

[19] See NYSE listing criterion 802.01E, NASDAQ listing criterion 4350(b), and AMEX listing policy 1003(d).

expire. Macey, O'Hara, and Pompilo (2008) conclude that exchanges often allow firms to violate listing rules for long periods to preserve revenue from listing fees.

For each firm that misses its SEC filing deadline for the restatement preparation quarter, we look for delistings between the SEC filing deadline and the date when the firm returns to a normal filing schedule, if ever. Usually filing the 10-Q or 10-K for the preparation quarter marks the return to a normal filing schedule. However, sometimes firms file a 10-Q or 10-K and then realize that the accounting errors have not been completely resolved, resulting in subsequent filing delinquencies. Thus, in a few cases we judgmentally assign a later date to mark the return to a normal filing schedule, improving the probability that we identify all the delistings associated with restatement-related filing delinquencies.

[INSERT TABLE 7 HERE]

Using CRSP to identify delisting dates, we find that that only 1.7 percent (25 / 1,455) of restatement firms delist during the time their SEC filings are delinquent (see Table 7).[20,21] Moreover, 76 percent of the delisted firms had fraudulent restatements. Thus, stock delistings rarely result from delays related to the types of restatements targeted by the regulatory reforms. The reported delisting percentage of only 1.7 percent may actually overstate how often firms are delisted because of restatement-related disclosure delays. The delisting reasons provided by CRSP indicate that some of the delistings occur because of factors such as mergers, bankruptcies, low stock prices, or insufficient float.[22] Basing our count of delinquency-related delistings strictly on the CRSP reasons, we would conclude that only 0.7 percent (10 / 1,455) of

[20] Unique to this analysis, we include restatements in which the firm never files restated financial statements because many of these firms are delisted (see step 6 of the sample selection in Table 1). Overall, the sample size of 1,455 is smaller than the final total of 1,473 in Table 1 because some firms are not followed by CRSP.

[21] We find that 47 percent of sample firms miss their SEC filing deadline for the preparation quarter. We generally identify missed deadlines using SEC forms NT 10-K or NT 10-Q, which firms are required to file when they miss a deadline. We also include firms that appear to miss their deadline by several days but do not file a form NT. Although almost half of restatement firms become delinquent, the relatively low values of *FILE_DIFF* for most of the sample suggest that delinquencies are typically short lived (see Table 2 and Figure 4).

[22] See Macey, O'Hara, and Pompilo (2008) and Panchapagesan and Werner (2004) for discussions of listing requirements and the delisting process.

restatements cause delays that lead to delistings. However, CRSP assigns only one reason code per delisting, so delinquent filings may have played a role in the other delistings as well.

4.7 Disclosure Delays and Debt Covenant Violations (preliminary)

Many debt contracts contain covenants requiring the borrower to furnish timely quarterly and annual reports. We are in the process of determining how often debt covenants are violated because of disclosure delays around restatements. We use LexisNexis to search SEC filings for bond covenant violations during the restatement episode plus the year before and after.[23] Our preliminary analysis of 569 restatements (roughly 40 percent of the sample) suggests that timely reporting covenants are either rarely violated or rarely enforced. Only ten firms disclose they have violated timely reporting covenants, and five of these firms violate other types of covenants as well.[24] The five remaining firms that violate only the timely reporting covenant have lengthy SEC filing delinquencies. Specifically, one firm never remedies the delinquency, and the remaining four firms are delinquent for 42, 124, 304, and 373 days. Consistent with the long delinquencies, three of the five firms have fraudulent restatements. Four of the firms report obtaining waivers for the violations. Thus, debt covenants requiring timely reporting rarely hinder restatement firms, likely because filing deadlines are usually missed by only a few days if missed at all. We caution that this conclusion is preliminary. Restatements analyzed thus far tend to be from earlier in the sample period, and creditors may have begun to enforce timely reporting covenants more aggressively in 2005 (Lattman and Richardson 2006).

5. Conclusion

The increase in restatements in recent years has fostered concern that investors are deprived of information while firms go through the restatement process. An SEC advisory group

[23] The search string is based on footnote 12 of Zhang (2008) and includes ((covenant! or indenture!) w/5 violat!) or "technical! default!" or (default! w/5 (covenant! or indenture!)) or (compl! w/5 (covenant! or indenture!)).

[24] Besides the 10 firms disclosing violations of timely reporting covenants, 30 firms mention that the restatement caused them to violate other types of covenants (typically financial in nature).

has proposed ways to accelerate disclosure to investors, including a controversial proposal to allow firms with questionably material errors to avoid restating altogether. However, the materiality proposal would still require firms to correct errors through catch-up adjustments, meaning that firms would still have to spend time investigating and quantifying the errors. The assumption underlying the materiality proposal appears to be that restatements require extra clerical tasks beyond catch-up adjustments that cause inordinate lags in disclosure of financial information. We examine the length, causes, and effects of disclosure lags around restatements to evaluate the necessity and potential effectiveness of the proposed reforms.

We find that lags in disclosure tend to be short when the firm is not constrained by a fraud investigation. Firms tend to disclose the restatement's estimated or actual earnings impact within a few days of the initial restatement announcement, and earnings announcements and SEC filings for the current period tend to be issued less than a week later than they were in the prior year. Some firms do take longer to disclose even when not constrained by a fraud investigation, but they are often contending with other factors that preclude them from making reliable disclosures, such as large or numerous errors. Given that disclosure lags are primarily driven by constraints on producing reliable information, we conclude that reducing firms' use of restatements or easing clerical aspects of the process are unlikely to substantially speed the flow of information to investors.

Although the observed disclosure lags appear to have a large nondiscretionary component, data limitations make it difficult to determine whether firms could trim disclosure lags at the margins by devoting more accounting resources to the restatement task or more quickly releasing information as it becomes available. Our results suggest that delaying disclosure reduces a firm's market value and in some circumstances reduces stock liquidity, pointing to potential benefits of finding ways to speed disclosures. Since disclosure lags seem to be driven by the inability to produce reliable information, regulators might foster speedier, although less reliable, disclosures by granting firms safe harbor during the restatement process. This idea

was considered by CIFR in early deliberations but did not survive the final report, likely because of the risks associated with giving firms license to release questionably reliable information.[25] Many firms do issue projections about their restatement and some even release earnings and SEC filings for the current period while the restatement is in process. Future research could examine the accuracy and consequences of these disclosures.

[25] See the CIFR Subcommittee III's, "Report for Discussion at November 2, 2007 Full Committee Meeting," at http://www.sec.gov/about/offices/oca/acifr/acifr-sc3-report.pdf.

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TABLE 1
Sample Selection

Restatements identified by the GAO from 1997 to September 2005	2,309
1. Missing basic *Compustat* and *CRSP* data in year of or year before restatement	(323)
2. Firm is amending an earnings release rather than a prior form 10-K or 10-Q	(114)
3. Subsequent announcements related to the same restatement	(107)
4. Adopting SAB 101	(72)
5. Adopting a new standard	(65)
6. Firm never files restated financials because of bankruptcy, acquisition, etc.	(33)
7. Restatement impact is not released in U.S. dollars	(25)
8. Changing from one within-GAAP method to another	(24)
9. Firm is not an SEC filer	(16)
10. Firm decides not to restate after the initial announcement	(16)
11. Other	(41)
Total	**1,473**[#]

[#]The total of 1,473 is the starting point for all tests. Sample sizes differ by table depending on data availability.

TABLE 2
Descriptive Statistics for Disclosure Lags

Panel A: Distributional Statistics

	Mean	Std	Q1	Median	Q3	n
Full sample						
Number of days between restatement announcement and						
Estimate of earnings impact (*TO_ESTIMATE*)	26.5	66.9	0	0	22	616
Definitive earnings impact (*TO_NUMBERS*)	46.6	94.5	0	13	49	1,323
Filing of restated financial statements (*TO_FILING*)	53.0	84.9	6	25	56	620
Days required to release earnings compared to same quarter of prior year (*EA_DIFF*)	27.5	68.8	0	7	25	1,323
Days required to file 10-Q or 10-K compared to same period of prior year (*FILE_DIFF*)	27.3	72.3	0	5	17	1,323
Restatements when the firm is constrained by suspected or confirmed fraud						
Number of days between restatement announcement and						
Estimate of earnings impact (*TO_ESTIMATE*)	79.5**	128.3	0	33**	105	111
Definitive earnings impact (*TO_NUMBERS*)	128.7**	157.5	21	76**	174	309
Filing of restated financial statements (*TO_FILING*)	146.0**	139.9	55	100**	206	113
Days required to release earnings compared to same quarter of prior year (*EA_DIFF*)	71.8**	120.6	5	21**	85	309
Days required to file 10-Q or 10-K compared to same period of prior year (*FILE_DIFF*)	74.4**	123.7	1	16**	101	309
Restatements when the firm is not constrained by suspected or confirmed fraud						
Number of days between restatement announcement and						
Estimate of earnings impact (*TO_ESTIMATE*)	14.8	33.3	0	0	15	505
Definitive earnings impact (*TO_NUMBERS*)	21.5	37.6	0	1	31	1,014
Filing of restated financial statements (*TO_FILING*)	32.3	46.2	4	18	43	507
Days required to release earnings compared to same quarter of prior year (*EA_DIFF*)	14.0	31.3	0	6	17	1,014
Days required to file 10-Q or 10-K compared to same period of prior year (*FILE_DIFF*)	13.0	35.9	0	4	14	1,014

**, * denote that the value in the fraud partition significantly differs from the corresponding value in the non-fraud partition at the 1 and 5 percent levels, respectively, two-tailed. T-tests are used for means and Wilcoxon signed rank tests are used for medians. See Appendix for variable definitions.

Panel B: Characteristics of Restatements when the Firm is Not Constrained by Fraud

	Absolute Earnings Magnitude (*ABS_MAG*)		Multiple Items (*MULTIPLE*)	Core Items (*CORE_PRIMARY*)	n
	Mean	**Median**	**Percentage**	**Percentage**	
Upper quartile of *TO_NUMBERS*	0.039	0.009	28.2%	19.2%	255
At or below median of *TO_NUMBERS*	0.030	0.005	9.3%	29.3%	508
Difference	0.009	0.005**	19.0%**	-10.1%**	
Upper quartile of *FILE_DIFF*	0.040	0.010	26.0%	26.8%	265
At or below median of *FILE_DIFF*	0.027	0.005	9.2%	26.2%	546
Difference	0.013**	0.005**	16.9%**	0.6%	

**, * denote significantly different from zero at the 1 and 5 percent levels, respectively, two-tailed. T-tests are used for means and Wilcoxon signed rank tests are used for medians. Differences in proportions are assessed using chi-squared tests. See Appendix for variable definitions.

TABLE 3
Descriptive Statistics for Firm and Restatement Characteristics

	Mean	Standard Error	Q1	Median	Q3	n
FRAUD	0.243	0.429	0.000	0.000	0.000	1,473
FRAUDSUB	0.049	0.216	0.000	0.000	0.000	1,473
MAG	-0.030	0.089	-0.025	-0.006	0.000	1,467
ABS_MAG	0.039	0.083	0.002	0.009	0.033	1,467
ANNUAL	0.746	0.435	0.000	1.000	1.000	1,473
MULTIPLE	0.229	0.420	0.000	0.000	0.000	1,473
CORE_PRIMARY	0.286	0.452	0.000	0.000	1.000	1,473
CORE_SECONDARY	0.063	0.243	0.000	0.000	0.000	1,473
LEASES	0.087	0.282	0.000	0.000	0.000	1,473
TAXES	0.037	0.190	0.000	0.000	0.000	1,473
AL_VALUE	0.021	0.144	0.000	0.000	0.000	1,473
NONCORE	0.843	0.364	1.000	1.000	1.000	1,468
LEVERAGE	0.077	0.266	0.000	0.000	0.000	1,473
FIN_OTH	0.344	0.475	0.000	0.000	1.000	1,470
DERIVATIVES	0.344	0.475	0.000	0.000	1.000	1,470
NONINC_RECLASS	0.843	0.364	1.000	1.000	1.000	1,468
FIRMSIZE	5.915	2.197	4.415	5.828	7.406	1,442
ACCELERATED_FILER	0.361	0.480	0.000	0.000	1.000	1,464
FIRST_ACCELERATED	0.147	0.354	0.000	0.000	0.000	1,464
POSTSOX	0.656	0.475	0.000	1.000	1.000	1,473
AUDITOR_CHANGE	0.077	0.266	0.000	0.000	0.000	1,473
BIG_N	0.843	0.364	1.000	1.000	1.000	1,468
YEAREND	0.482	0.500	0.000	0.000	1.000	1,473
AUDITOR_BUSY	0.344	0.475	0.000	0.000	1.000	1,470
ANNOUNCEMENT_ RET	-0.052	0.145	-0.094	-0.023	0.013	1,418
EPISODE_RET	-0.081	0.228	-0.149	-0.028	0.025	1,437
ESURP	-0.013	0.059	-0.001	0.000	0.000	1,098
NOQUANT	0.588	0.492	0.000	1.000	1.000	1,473
QUARTERLY	0.254	0.435	0.000	0.000	1.000	1,473
PRE_RET	-0.044	0.272	-0.198	-0.041	0.085	1,422
VIX	20.113	6.850	13.750	19.096	24.810	1,464

See Appendix for variable definitions.

TABLE 4

Causes of Disclosure Lags around Restatements

	Predicted Sign	*TO_ESTIMATE*		*TO_NUMBERS*		*TO_FILING*		*FILE_DIFF*		*EA_DIFF*	
		Coefficient	**Effect**	**Coefficient**	**Effect**	**Coefficient**	**Effect**	**Coefficient**	**Effect**	**Coefficient**	**Effect**
Intercept	?	0.151		-1.951**		1.240*		0.826*		2.199**	
FRAUD	+	2.564**	11.546	2.274**	22.285	1.767**	52.201	1.197**	7.178	1.136**	8.322
FRAUDSUB	-	-2.273*	-2.678	-0.169	-0.730	-0.191	-2.827	-0.687**	-2.157	-0.423	-1.827
ABS_MAG	+	2.205	0.498	3.642**	1.762	1.954	3.245	1.477*	0.627	1.200	0.632
ANNUAL	+	0.521	1.045	1.652**	5.729	0.495**	7.090	0.722**	2.559	0.380**	1.795
MULTIPLE	+	0.999	2.782	1.807**	14.867	0.877**	18.627	1.227**	7.509	0.632*	3.933
CORE_PRIMARY	+	-0.305	-0.641	0.560	2.914	0.163	2.719	0.343	1.537	-0.116	-0.583
CORE_SECONDARY	?	0.656	1.817	-0.738	-2.600	-0.672	-8.203	-0.100	-0.399	-0.870*	-3.210
AL_VALUE	?	-1.480	-2.045	0.355	1.920	-0.490	-6.290	0.230	1.066	-0.729	-2.745
TAXES	?	-1.116	-1.733	-0.285	-1.171	0.030	0.486	0.507	2.667	-0.875*	-3.151
LEASES	?	0.712	1.983	1.338**	10.957	0.554	11.404	-0.614	-2.032	-1.557**	-4.781
NONCORE	?	-0.207	-0.430	0.619	3.589	-0.333	-4.743	-0.086	-0.346	-0.771*	-3.071
LEVERAGE	?	-2.443	-2.636	0.726	4.704	0.289	5.383	0.082	0.355	-0.555	-2.242
FIN_OTH	?	-1.455	-2.071	-0.685	-2.424	-0.969*	-10.361	-0.781	-2.359	-1.254**	-3.968
DERIVATIVES	?	-0.189	-0.389	-0.335	-1.345	-0.390	-5.238	0.304	1.458	-0.132	-0.643
NONINC_RECLASS	?	0.802	2.415	-1.106	-3.305	-0.676	-7.973	-0.321	-1.151	-0.548	-2.217
FIRMSIZE	-	-0.145	-1.761	0.043	1.089	0.007	0.624	-0.174**	-4.052	-0.202**	-5.910
ACCELERATED_FILER	-	-0.425	-0.900	0.842**	4.419	0.381*	6.506	0.944**	4.597	0.547**	3.075
FIRST_ACCELERATED	-	-0.225	-0.468	-0.253	-1.078	-0.355*	-5.066	-1.122**	-3.350	-0.261	-1.236
POSTSOX	?	-0.381	-0.887	0.294	1.296	0.144	2.268	0.231	0.924	0.115	0.581
AUDITOR_CHANGE	+	0.591	1.589	0.325	1.708	0.550*	11.383	0.366	1.773	0.205	1.156
BIG_N	-	0.316	0.644	0.163	0.717	0.354	5.072	-0.179	-0.791	-0.021	-0.108
YEAREND	?	-0.010	-0.022	-0.210	-0.965	0.170	2.749	0.599**	2.551	0.331*	1.728
AUDITOR_BUSY	+	0.106	0.236	0.013	0.061	-0.270	-4.177	-0.081	-0.333	-0.099	-0.503
Coefficient of determination		12.6%		37.1%		32.3%		24.8%		22.5%	
Likelihood Ratio		86.3**		511.7**		218.7**		319.1**		293.2**	
n		616		1,323		620		1,323		1,323	

**, * denote significantly different from zero at the 1 and 5 percent levels, respectively. One-tailed when sign is in predicted direction, two-tailed otherwise. See Appendix for variable definitions.

TABLE 5
Effect of Disclosure Lags on Shareholder Wealth

Panel A: Announcement and Episode Return Regressions

	Predicted Sign	*ANNOUNCEMENT_RET*	*EPISODE_RET*	*EPISODE_RET*
Intercept	?	-0.0165	-0.0211	-0.0319
FRAUD	-	-0.0828**	-0.0801**	-0.0606**
FRAUDSUB	+	0.0035	0.0195	0.0261
NOQUANT	-	-0.0383**		
NOQUANT15	-		-0.0375**	-0.0426**
NOQUANT45	-		-0.0539**	-0.0573**
NOQUANT90	-		-0.0772**	-0.0693**
NOQUANT180	-		-0.0769*	-0.0882**
NOQUANT>180	-		-0.2360*	-0.1818
*NOQUANT*FRAUD*	-	0.0125		
*NOQUANT15*FRAUD*	-		0.0364	0.0108
*NOQUANT45*FRAUD*	-		-0.0293	-0.0378
*NOQUANT90*FRAUD*	-		0.0111	-0.0435
*NOQUANT180*FRAUD*	-		-0.0783	-0.0375
*NOQUANT>180*FRAUD*	-		0.0807	0.0858
MAG	+	0.1503**	0.2954**	0.3395**
POS	+	0.0065	-0.0050	-0.0103
*MAG * POS*	-	-0.0193	-0.0377	-0.1232
POSTSOX	+	0.0380**	0.0563**	0.0606**
FIRMSIZE	?	0.0031	0.0056*	0.0055
QUARTERLY	+	-0.0354**	-0.0535**	-0.0592
MGT	+	-0.0040	0.0002	-0.0005
CORE_PRIMARY	-	-0.0234**	-0.0165	-0.0199
MULTIPLE	-	-0.0229*	-0.0086	-0.0254
PRE_RET	-	0.0030	0.0200	0.0001
VIX	-	-0.0006	-0.0012	-0.0005
ESURP	+			0.4366**
Adj. R-square		16.5%	19.8%	20.6%
n		1,385	1,386	1,066

DELAY + DELAY*FRAUD interactions

*NOQUANT + NOQUANT*FRAUD*	-0.026		
*NOQUANT15 + NOQUANT15*FRAUD*		-0.001	-0.032
*NOQUANT45 + NOQUANT45*FRAUD*		-0.083*	-0.095**
*NOQUANT90 + NOQUANT90*FRAUD*		-0.066*	-0.113**
*NOQUANT180 + NOQUANT180*FRAUD*		-0.155**	-0.126**
*NOQUANT>180 + NOQUANT>180*FRAUD*		-0.155**	-0.096*

**, * denote significantly different from zero at the 1 and 5 percent levels, respectively. One-tailed when sign is in predicted direction, two-tailed otherwise. Significance tests are based on White (1980) standard errors. See Appendix for variable definitions.

Panel B: Long Run Returns Starting Two Days after the Restatement Episode Ends

Time Horizon	Non-fraudulent Restatements		Fraudulent Restatements	
	Mean	**Median**	**Mean**	**Median**
6 months	4.38%	4.08%	-1.87%	-7.63%*
1 year	3.45%	-0.11%	12.39%	-1.04%
2 years	2.51%	0.97%	14.50%	1.76%
n	420	420	224	224

**, * denote significantly different from zero at the 1 and 5 percent levels, respectively, two-tailed. T-tests are used for means and Wilcoxon signed rank tests are used for medians. Results include only the restatements where the impact on earnings is not disclosed at the time of the initial announcement.

TABLE 6
Effect of Disclosure Lags on Stock Liquidity

$$ILLIQ_{id} = \alpha_0 + \alpha_1 EPISODE_{id} + \alpha_2 POST\_EARN_{id} + \alpha_3 TD\_COUNT_{id} + \varepsilon_{id} \quad (3)$$

	Predicted Sign	Non-fraudulent Restatements	Fraudulent Restatements
Intercept	?	0.073**	0.089**
EPISODE	+	0.007	0.041**
POST_EARN	+	-0.064**	-0.029*
TD_COUNT	-	-0.003*	-0.003
n		420	224

**, * denote significantly different from zero at the 1 and 5 percent levels, respectively, two-tailed. The difference between *EPISODE* and *POST_EARN* is statistically significantly (p-value < 0.01) for the non-fraudulent (*FRAUD*=0) and fraudulent restatement (*FRAUD*=1) sample. The table presents mean coefficients across firm-specific time series regressions. The sample consists of firms with restatement episode lengths of at least five days. See Appendix for variable definitions.

TABLE 7
Disclosure Delays and Stock Delistings

	All Restatements		Fraudulent Restatements	
CRSP Delisting Reason (Code)	Frequency	% of Total	Frequency	% of Total
Merged with another company (233)	1	4.0%	1	5.3%
Issue stopped trading on current exchange and now trades Over-the-Counter (520)	1	4.0%	1	5.3%
Price fell below acceptable level (552)	1	4.0%	0	0.0%
Insufficient float or assets (561)	1	4.0%	1	5.3%
Declared insolvent (574)	6	24.0%	4	21.1%
Delinquent in filing (580)	10	40.0%	7	36.8%
Insufficient capital (582)	2	8.0%	2	10.5%
Does not meet exchange's financial guidelines for continued listing (584)	1	4.0%	1	5.3%
Protection of investors and the public interest (585)	2	8.0%	2	10.5%
Total	**25**	**100%**	**19**	**100%**
Percentage of all restatement firms that delist during SEC filing delinquencies	**1.7% (25/1,455)**			
Percentage of the delistings that involve firms with fraudulent restatements			**76.0% (19/25)**	

The table provides information about restatement firms that delist while their SEC filings are delinquent. We use CRSP to identify delisting dates and reasons.

FIGURE 1
A Timeline of a Restatement Announcement and Subsequent Disclosure

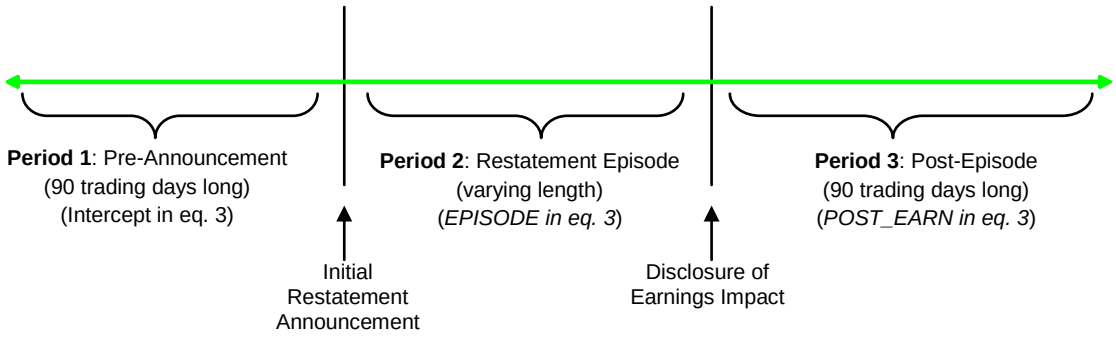
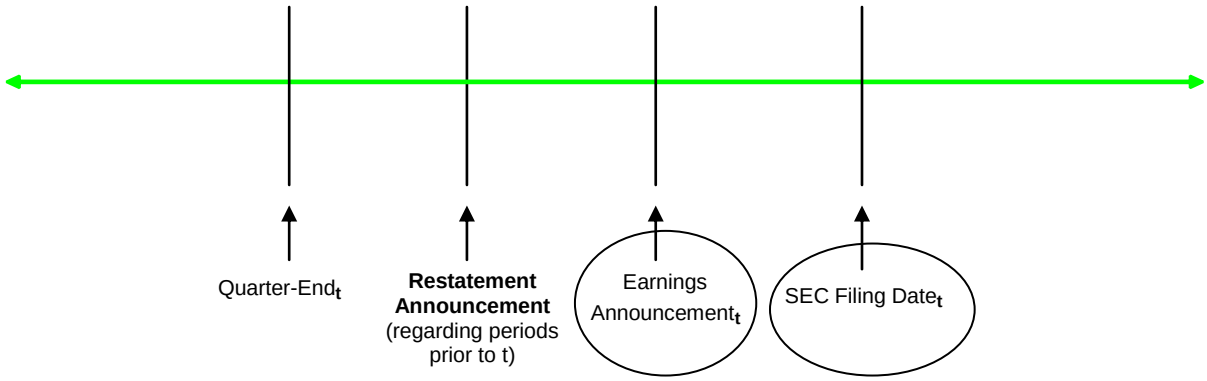


FIGURE 2
How to Identify the Preparation Quarter

Scenario 1: Restatement announcement occurs prior to the earnings announcement and SEC filing date.

The quarter t earnings announcement and SEC filing have the potential to be delayed.
Therefore, the preparation quarter is t for both of them.



Scenario 2: Restatement announcement occurs after the earnings announcement but prior to the SEC filing date.

The quarter t SEC filing and the quarter t+1 earnings announcement have the potential to be delayed.
Therefore, the preparation quarter is t for the SEC filing date and t+1 for the earnings announcement.

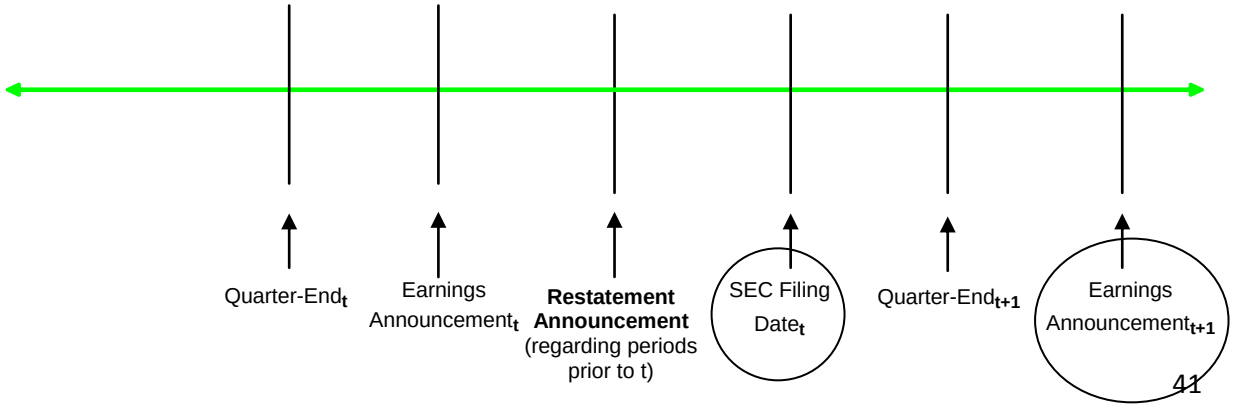
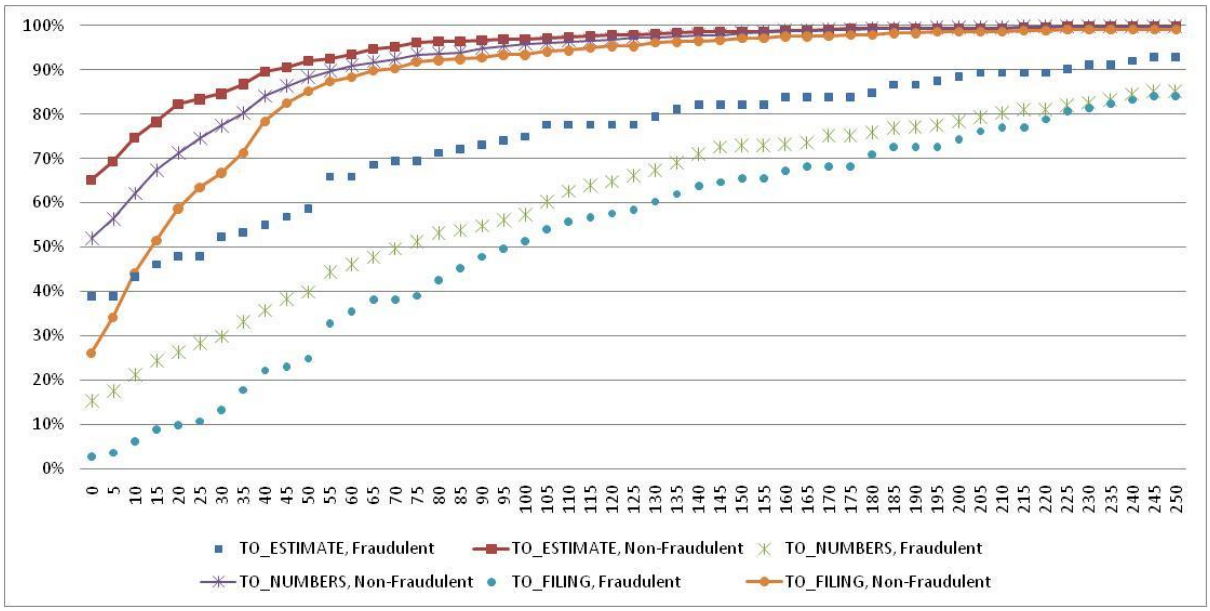
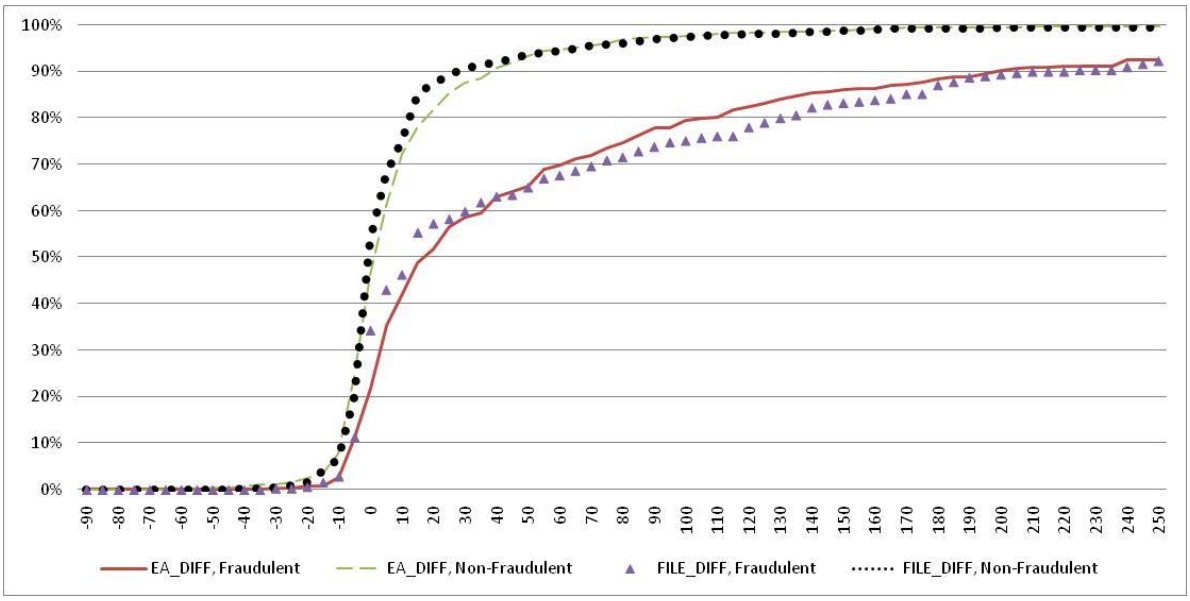


FIGURE 3
Cumulative Distribution of the Number of Days between Initial Restatement Announcement and Estimate of Impact (*TO_ESTIMATE*), Definitive Impact (*TO_NUMBERS*), and SEC filing (*TO_FILING*)



See Appendix for variable definitions.

FIGURE 4
Cumulative Distribution of the Timing of Earnings Announcements and SEC Filings Compared to the Same Quarter of Prior Year



See Appendix for variable definitions.

APPENDIX
Variable Descriptions

ABS_MAG	Absolute value of *MAG*.
ACCELERATED_FILER	Equals 1 if the firm is subject to accelerated filing deadlines for the preparation quarter and 0 otherwise (we assume the firm is subject to accelerated filing deadlines if its market capitalization is greater than $75 million and the quarter ends after December 15, 2003).
ANNOUNCEMENT_ RET	Size-adjusted buy-and-hold stock return over days (-1, +1) relative to the initial restatement announcement.
ANNUAL	Equals 1 if the restatement involves prior fiscal years and 0 otherwise.
AUDITOR_BUSY	Equals 1 if the preparation quarter ends in December and 0 otherwise.
AUDITOR_CHANGE	Equals 1 if the auditor is dismissed from 90 days before to 30 days after the restatement announcement and 0 otherwise.
BIG_N	Equals 1 if the auditor is a Big 4 or 5 audit firm and 0 otherwise.
EA_DIFF	For the quarter in year t whose earnings announcement is potentially delayed by the restatement, *EA_DIFF* equals the number of days between the earnings announcement date and quarter-end minus the same quantity for the quarter in year t-1. If the t-1 earnings were announced after the SEC filing deadline, then the t-1 quantity is set to the number of days between the SEC filing deadline and quarter-end.
EPISODE	Equals 1 if the day falls within the restatement episode window and 0 otherwise. EPISODE is also 0 if the day is the first two or last two days of the episode window.
EPISODE_RET	Size-adjusted buy-and-hold stock return from one day before the initial restatement announcement to one day after the restatement's impact on earnings is announced.
ESURP	If earnings are announced in the three-day window around the restatement announcement, then *ESURP* is the difference between actual earnings per share and the most recent consensus analyst forecast from IBES, scaled by stock price one day before the earnings announcement. If earnings are not announced in the three-day window around the restatement announcement, then *ESURP* equals 0. When episode returns are the dependent variable, *ESURP* is the sum of all the individual *ESURP*s in the restatement episode window.
FILE_DIFF	For the quarter in year t whose SEC filing is potentially delayed by the restatement, *FILE_DIFF* equals the number of days between the SEC filing date and quarter-end minus the same quantity for the quarter in year t-1. If the t-1 filings were filed late, then the t-1 quantity is set to the number of days between the SEC filing deadline and quarter-end.
FIRMSIZE	Natural log of the firm's total assets for the fiscal year ended prior to the restatement announcement.
FIRST_ACCELERATED	Equals 1 if the preparation quarter is the first that the firm is subject to accelerated filing deadlines and 0 otherwise.
FRAUD	Equals 1 if the restatement is described as intentional or if investigations by a

	government entity, the board or directors, or audit committee are disclosed and 0 otherwise.
FRAUDSUB	Equals 1 if a fraud or investigation pertains to errors committed in subsidiaries or lower levels of the organization and 0 otherwise.
$ILLIQ_{id}$	A daily measure of the price impact of trading. As in Amihud (2002), equals ($\|RET_{id}\|$ / $VOLD_{id}$)*10^6; where RET_{id} is the return and $VOLD_{id}$ is the dollar volume for stock i on day d.
MAG	Cumulative impact of the restatement on past earnings, scaled by total assets for the year ended prior to the restatement announcement.
MGT	Equals 1 if the GAO report identifies the company as the prompter of the restatement and 0 otherwise.
NOQUANT	Equals 1 if no definitive earnings impact is disclosed when the initial restatement announcement is made, 0 otherwise.
NOQUANTX	Equals 1 if the firm discloses the definitive earnings impact during a particular window following the initial restatement announcement. The windows are 1 to 15 days (*NOQUANT15*), 16 to 45 days (*NOQUANT45*), 46 to 90 days (*NOQUANT90*), 91 to 180 days (*NOQUANT180*), and greater than 180 days (*NOQUANT>180*).
POS	Equals 1 if cumulative restated earnings are greater than or equal to cumulative original earnings and 0 otherwise.
POST_EARN	Equals 1 if the day is between 2 and 90 trading days after the restatement episode ends and 0 otherwise.
POSTSOX	Equals 1 if the restatement is announced in the month SOX was passed (July 2002) or after, 0 otherwise.
PRE_RET	Size-adjusted buy-and-hold stock return over days (-90, -1) relative to the initial restatement announcement.
QUARTERLY	Equals 1 if the restatement involves only prior quarters of the current fiscal year and 0 otherwise.
TD_COUNT	Number of trading days after the restatement announcement.
TO_ESTIMATE	Number of days between the initial restatement announcement and disclosure of the restatement's estimated earnings impact
TO_FILING	Number of days between the initial restatement announcement and the filing of the restated financial statements with the SEC
TO_NUMBERS	Number of days between the initial restatement announcement and definitive disclosure of the restatement's earnings impact
VIX	Mean value of the Chicago Board Options Exchange's volatility index over the three-day announcement window. When restatement episode returns are used as the dependent variable, VIX is the mean value of the index during the restatement episode.
YEAREND	Equals 1 if the preparation quarter is the firm's fiscal fourth quarter and 0 otherwise.

Categories for the Types of Items Restated

We classify each restatement into one of twelve mutually exclusive categories based on the description of the restated items in press releases and restatement footnotes. A description of each category follows.

CORE_PRIMARY	Components of pre-tax operating income whose initiation or reversal typically affects net operating cash flow. *CORE_PRIMARY* restatements do not necessarily change previously reported operating cash flow. They simply involve items that are related to operating cash flow during a normal operating cycle. Examples include: Revenue and accounts receivable, inventory or cost of goods sold, and other operating expenses.
CORE_SECONDARY	Components of pre-tax operating income that are not directly related to net operating cash flow. Examples include depreciation and amortization, equity-based compensation, issuance of equity to acquire goods and services from outside parties, reclassification of revenues and expenses.
LEASES	Errors involving operating leases announced by many firms in 2004 and 2005. The errors involve: Failing to accrue rent expense for leases with rent escalation clauses, amortizing leasehold improvements too slowly, and misclassifying incentive consideration received from landlords.
TAXES	Errors involving any type of tax (income, sales, excise, etc.). Errors arising from non-tax items that have a secondary effect on taxes are not included in this category.
AL_VALUE	Valuation of noncurrent operating assets or liabilities. Examples include: asset impairment, asset retirement obligations, estimating proved reserves.
DERIVATIVES	Accounting for derivatives. Examples include: hedge effectiveness and embedded derivatives.
NONCORE	Merger-related items and special items not included in other categories. Examples include: Allocating the purchase price of an acquisition, allocating between discontinued and continuing operations, choosing between pooling-of-interest and purchase accounting for acquisitions, choosing between equity method and consolidation, minority interest, post-retirement benefits, self-funded insurance, gain or loss on sale of assets, classifying investment securities as trading, available-for-sale, or held-to-maturity, valuing investment securities, and foreign currency translation.
LEVERAGE	Recognition of liabilities on the balance sheet. Examples include: classifying leases as operating or capital and other off-balance-sheet liabilities.
FIN_OTH	Financing activities other than off-balance-sheet issues. Examples include: interest expense, capitalized interest, beneficial conversion features of convertible securities, gain or loss on retirement of debt, and costs associated with issuance of debt or equity.
MULTIPLE	Restatements that involve errors in more than one category, or involve three or more errors in the same category.
OTHER	Unspecified errors or those not fitting the categories above.