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Determinants of market reactions to restatement announcements ☆

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Abstract

We examine the market reaction to a sample of 403 restatements announced from 1995 to 1999. We document an average abnormal return of about −9 percent over a 2-day announcement window. We find that more negative returns are associated with restatements involving fraud, affecting more accounts, decreasing reported income and attributed to auditors or management (but not the Securities and Exchange Commission). There appears to be an additional penalty for announcements that do not quantify the restatement. Finally, we provide evidence on the relation between restatement announcements and analyst earnings forecast dispersion, bid–ask spreads and subsequent revisions in analyst earnings forecasts.

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1. Introduction

Regulators have expressed great concern over restatements to correct non-GAAP accounting in previously issued financial statements. The perceived need to reduce

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the number of restatements helped motivate the U.S. Securities and Exchange Commission's (SEC) earnings management initiative and formation of the Public Oversight Board (POB) Panel on Audit Effectiveness.[1] It also influenced the SECs auditor independence rule-making on non-audit services provided to audit clients (Levitt, 2000; McNamee et al., 2000),[2] a General Accounting Office probe of restatements (GAO, 2002), and certain provisions in the Sarbanes-Oxley Act of 2002 (e.g., Section 304).

Regulators have used the impact of restatements on equity values to justify these activities (GAO, 2002). For example, the former SEC Chairman testified before a Senate Subcommittee that, "in recent years, countless investors have suffered significant losses as market capitalizations have dropped by billions of dollars due to restatements of audited financial statements" (Levitt, 2000). While dramatic declines in market values do occur, there is limited systematic evidence on market reactions to recent restatements. Our study informs the discourse on the effect of restatements by assessing the restatement characteristics of greatest concern to market participants. Currently, such distinctions are not commonly made.

We analyze 2-day market reactions to a sample of 403 restatements of annual (10-K) and quarterly (10-Q) financial statements announced from 1995 to 1999. We investigate the association between stock price reactions to restatement announcements and restatement characteristics likely to influence market participants' valuation of the company.

Using market-adjusted abnormal returns, we document an economically and statistically significant negative mean (median) market reaction to restatement announcements of −9.2 percent (−4.6 percent) over a 2-day event window (day 0 to day 1). We find that fraud and restatements attributed to auditors are associated with more negative returns. These results are consistent with both diminished company prospects and increased risk/uncertainty. To explore the latter, we examine analyst earnings forecast dispersion. We document a significant increase in the forecast dispersion at the time of the restatement announcement, which is negatively correlated with the market reaction to earnings restatements.

We also find that larger restatements of previously reported income and those affecting multiple accounts are associated with more negative market reactions. These results indicate a relation between restating companies' reduced prospects and announcement returns. Further, we document a significant downward revision in earnings forecasts following restatements and find a positive relation between forecast revisions and returns. Finally, our analysis of the content of restatement announcements suggests a penalty for incomplete information; and, we find that

[1] The Panel on Audit Effectiveness was appointed after then SEC Chairman Levitt's earnings management speech at the NYU Center for Law and Business (Levitt, 1998). The Panel observed, "restatements of previously audited financial statements raise questions about whether the system that provides assurances about both the quality of audits and the reliability of financial reports is operating effectively" (Panel on Audit Effectiveness, 2000, Chapter 3, paragraph 26).

[2] The SECs final rule on auditor independence mentions limiting restatements as a possible benefit of restricting non-audit services (SEC, 2000, paragraph V.B.1.d.).

auditor attribution appears to proxy for materiality when the initial announcement lacks quantification of the misstatement.

Section 2 of the paper provides background and discusses extant empirical research on restatements. Section 3 discusses the regression model and our test and control variables, Section 4 describes our sample, Section 5 provides the regression results, Section 6 presents additional analyses, and Section 7 contains concluding remarks.

2. Restatement background

2.1. Restatement identification and reporting

Various provisions of the Securities Acts require companies to correct inaccurate, incomplete, or misleading disclosures. As Skinner (1997, p. 252) explains, management has a duty to correct statements made in any filing if the statements "are later discovered to have been false and misleading from the outset, and the issuer knows or should know that persons are continuing to rely on all or any material portion of the statements."

The company, the SEC, an independent auditor or a combination thereof can identify the need for a restatement. The company can find misstatements through internal audits and other internal control procedures, such as period-end closing processes, policy reviews, and mechanisms that solicit and investigate complaints from employees. The SEC sometimes requests a restatement after reviewing company filings. When auditors discover that previously issued financial statements contain material omissions or misstatements, GAAS requires that they advise the client to make appropriate disclosures, and to take the necessary steps to ensure this occurs (AICPA, 2002, Section AU 561).

Once identified, restatements are disclosed in several ways. Some are reported in a press release or series of press releases, some in Form 8-K (Current Events) filings with the SEC, and some by the filing of amended financials (10-Ks). The information provided in initial press releases and Form 8-Ks varies widely. A company may indicate that a restatement is possible, that it is probable but the impact is uncertain, or that it is necessary and quantify the changes. Additional details may be forthcoming in future press releases or in amended filings. The level of specificity, such as the accounting issues involved and the circumstances underlying the restatement, also varies.

2.2. Prior research

Our study draws on extant restatement research, which compares characteristics of restating and non-restating companies within certain periods from 1976 to 1994 (e.g., Kinney and McDaniel, 1989; DeFond and Jiambalvo, 1991; Sennetti and Turner, 1999). These studies document that restatement companies tend to be smaller, less profitable, slower growing, and less likely to have audit committees than their industry or control counterparts. They also have a higher frequency of audit

reports qualified for uncertainties, higher debt, fewer income-increasing GAAP alternatives, and more diffuse ownership.

Other concurrent research provides descriptive data on restating companies and restatement characteristics. For example, based on a sample of both earning announcement revisions and restatements of financials filed with the SEC from 1977 to 2000, Wu (2002), extending Moriarty and Livingston (2001), reports an increase in the frequency of earnings misstatements and a change in their nature (e.g., an increase in the proportion of revenue restatements and the recent appearance of in-process research and development (IPR&D) restatements).

Palmrose and Scholz (2004) examine the association of certain restatement and company characteristics with the likelihood of litigation, mostly shareholder class actions, against companies, management, boards of directors, outside auditors and others for a sample of 492 companies that announced restatements from 1995 to 1999. They include stock price changes for restatement announcements (and periods prior and subsequent to announcements) among the variables examined. They find a significant relation between litigation and negative market reactions to restatement announcements (and 6 months prior to announcements), although these results weaken in a subset of restatements with auditor defendants.

Our study extends the research on the relation between restatements and market returns. While Kinney and McDaniel (1989) report reactions not significantly less than zero in a 6-day window beginning the day before the announcement or filing of the correction, a number of more recent studies document significant negative average stock price reactions to restatement announcements. Dechow et al. (1996) report a −6 percent return for a subset of SEC enforcement actions with restatements from 1981 to 1992. For a sample of restatements from 1997 to 1999, Turner et al. (2001) document returns of −12 percent (revenue misstatements) and −5 (restructuring, impairment, and other misstatements). Additionally, estimated returns are −11 percent for 255 companies either revising earnings announcements or announcing restatements of financials from 1977 to 2000 (Wu, 2002), −10 percent for a sample of 689 public companies announcing restatements from 1997 to March 2002 (GAO, 2002), and −3.8 percent for 161 restatements of audited financials announced between 1997 and 1999 (Anderson and Yohn, 2002).

In sum, consistent with regulator concerns, extant research shows restatements as, on average, economically significant events, but with significant variation in the market response. Our study investigates the relation between restatement and company characteristics and the cross-sectional variation in stock market reactions to announcements.

3. Regression model and discussion of test and control variables

3.1. Overview

To explore the relation between returns and restatements, we estimate a regression that includes restatement and company characteristics expected to influence the

market reaction to restatement announcements. We consider information that restatements convey about changes in future company prospects as well as the risk/uncertainty of achieving them. Our approach relies on the discounted cash flow valuation in which a security's market price equals the present value of expected dividends or expected earnings (with some assumptions). In this framework, negative reactions to restatement announcements are caused by declines in future prospects (decreases in expected earnings) and/or increases in risk/uncertainty (increases in discount rates).

Risk/uncertainly likely increases and future prospects may well decrease when management integrity and competence are called into question. To capture these effects, we include indicator variables for fraud and the party attributed with identifying the misstatement (auditor, SEC, or company). To further assess the impact of the restatement on company prospects, we consider measures of the qualitative and quantitative significance of the restatement on previously reported results. Our measures include whether or not the restatement involves core earnings, the number of accounts affected (pervasiveness), the change in net income scaled by assets, and the number of years restated (persistence). Finally, we include control variables for returns over the prior 120 days, company size and leverage (the latter two interacted with the change in reported income).

Our empirical model can be summarized as follows:

$$\mathrm{CAR} = f(\text{fraud, auditor-attributed, SEC-attributed, company-attributed, restatement of core accounts, number of accounts affected, change in net income/assets, number of years restated, prior returns, size-materiality interaction, leverage-materiality interaction}).$$

3.2. Test variables

Because fraud means intentional, non-GAAP financial reporting, it indicates a lack of management integrity that we expect to be associated with a more negative stock price reaction, incremental to any other impacts from revising reported results. This may be due to an increase in the discount rate because fraud creates uncertainty about the reliability and credibility of management representations, which increases the perceived information asymmetry between management and stockholders. Further, fraud can decrease expected earnings because it indicates suboptimal investment and operating policies and it increases the likelihood of costly litigation and regulatory actions (e.g., Bonner et al., 1998; Palmrose and Scholz, 2004), costly management changes (Feroz et al., 1991), increased costs of internal monitoring (e.g., through changes in control systems, boards and audit committees) and regulatory scrutiny going forward. In turn, these factors can increase the risk associated with equity investments including whether the company will survive.

We classify fraud observations based on company disclosures of fraud (irregularities) or issuance of an SEC AAER. Although many of these firms acknowledge fraudulent activity in their initial announcements, some do not mention it until later in the restatement process. Similarly, while SEC investigations may be

commenced and disclosed at the time of the initial announcement or subsequently, any actual enforcement action (AAER) usually takes several years to eventuate (Feroz et al., 1991). These disclosure lags could bias against finding a negative market reaction to fraud on the initial announcement date. However, we expect that, on average, the content and context of the restatement announcement provide numerous signals for investors to expect or suspect fraud. And, we replicate our results using only press release information to identify fraudulent misstatements.

We include a second test variable to capture additional information the restatement reveals about management competence and integrity. This is a dummy variable for the party that identifies or discloses the need for a restatement. Although there is no requirement for companies to reveal this information, about 68 percent of our sample announcements provide reasonably clear attribution in their press releases or subsequent amended filings.[3] We use indicator variables for company, external auditor, and SEC-attributed restatements. Observations without attribution serve as a no-information baseline.

Attribution to outside parties signals that company monitoring functions failed not only to prevent, but also to identify and correct a material misstatement. Conversely, detection and revelation by the company provide some indication of relatively stronger internal controls and oversight by management, boards and audit committees. And, it may reduce the likelihood of top management involvement in creating the misstatement. This should mitigate some of the uncertainty that restatements otherwise generate over monitoring of the company and management credibility and reliability. (As a caveat, this discussion implies that attribution should be partitioned by source within the company, but we do not have the data to do so.)

To summarize, relative to the no-information baseline, we expect the incremental effect of company attribution to be positive, and outside party attribution, either auditor or SEC, to be negative. However, the reaction to restatements identified by the SEC may be attenuated if market participants perceive the issues as technical matters or judgment disagreements between the SEC and companies and/or their auditors. One example is issues that arise from SEC reviews of corporate filings, which companies choose not to fight (Pincus et al., 1988).

Next, we consider information conveyed by the restatement about the future prospects of the company. We expect that restatements affecting core income will be associated with more negative reactions. This is consistent with previous research using earnings response coefficients to investigate the market impact of accounting results, which indicates that more persistent operating income is associated with stronger market reactions (Kormendi and Lipe, 1987), and that the market reacts more strongly to surprises in on-going operating income than to one-time special items (Elliott and Hanna, 1996; Elliott et al., 1988; Strong and Meyer, 1987). Palmrose and Scholz (2004) find that core/revenue restatements are positively associated with shareholder litigation, while non-core are not, which suggests that investors regard restatements of core accounts as more serious. Their univariate

[3] DeFond and Jiambalvo (1991) found such information in only 22 percent (9 of 41) of their earnings overstatement sample. This could be because their sources were limited to footnote disclosures.

results also show a negative relation between core restatements and raw returns over a 3-day window surrounding restatement announcements.

Following Penman (2001, p. 384), we define core restatements as operating income derived from sales, pre-tax. Core restatements involve revenue, cost of sales, and on-going operating expenses. Non-core restatements involve special items, non-operating expenses, and merger-related items (e.g., misstatements of acquisition accruals, goodwill, and IPR&D). We base our determination of affected accounts mainly on footnote information from amended filings or press releases.

We also expect the market reaction to restatements to increase in the size, pervasiveness, and persistence of the misstatement. Each of these attributes likely affects investors' estimations of the magnitude (quantitative and qualitative materiality) of the restatement and, therefore, their expectations of subsequent performance. We focus on the income statement because of the SECs expressed concerns about earnings management (Levitt, 1998).

First, we include a variable that captures both the relative size of the restatement and the direction of its impact on net income. (Sensitivity analysis considers alternative measures, i.e., indicators for whether the restatement increases or decreases income and whether income becomes a loss.) We compute this variable by subtracting restated net income from originally reported income (summed over all restated periods) and scaling the difference by the total assets reported at the year-end immediately prior to the announcement of the restatement. This computation is similar to Feroz et al. (1991), who find a significant association between the dollar effect on income and the market response to announcements of SEC investigations.

Our second materiality measure captures the pervasiveness of the restatement within the income statement. We count the number of account groups that represent the focus of the restatement: revenue, cost of goods sold, on-going operating expenses, special items/one-time events, merger accounting, non-operating income accounts, and other items. Thus, this variable can range from one to seven. We use this measure instead of a strict count of line items affected because of the variation in number of income statement line items reported across companies. We expect this variable to be negatively associated with the market reaction.

Third, we include a variable for the persistence of the misstatement—the number of years' financials restated (where a restated quarter = 0.25). We expect a negative association between this variable and the market reaction.

3.3. Control variables

Along with the test variables, we include three variables to control for company characteristics that might affect market reactions to restatements. First, prior studies of market reactions to earnings announcements find stock price reactions to earnings news magnified for smaller firms/attenuated for larger firms (e.g., Collins et al., 1987; Freeman, 1987; Bhushan, 1989; O'Brien and Bhushan, 1990; El-Gazzar, 1998). That is, for a given change in income, there is a larger reaction for a small company than for a large company. Research attributes this effect to differences in the firms'

information environments, i.e., greater incentives for investors in larger firms to search for pre-disclosure information. Since restating previously reported earnings appears somewhat similar to announcing unexpected earnings, to capture this slope dependence on firm size, we include the interaction between firm size (the natural log of the book value of total assets reported at the last fiscal year end prior to the announcement) and our earnings change measure. However, since restatement announcements are not scheduled, there may not be pre-disclosure information searches surrounding the time of the announcement, and the result found with earnings announcements may not hold in our restatement setting.

Similarly, because market reactions differ across debt levels (e.g., see Dhaliwal et al., 1991; Ball et al., 1993; Dhaliwal and Reynolds, 1994; Fischer and Verrecchia, 1997; Billings, 1999; Core and Schrand, 1999), we include the interaction between the ratio of long-term debt to total assets (again, based on book values reported at the fiscal year-end prior to restatement) and our earnings change measure. We use debt to total assets instead of debt to equity to avoid problems with very small or negative equity.

Finally, investor reactions to bad news for firms with strong recent stock performance likely differ from weaker performers. So, we include buy and hold returns over 120 days prior to the restatement announcement (day −120 to day −1). Kinney and McDaniel (1989) document long-window negative returns over the period between the issuance of misstated quarterly results and 1 day prior to the revelation of the error correction. Palmrose and Scholz (2004) find a similar pattern. While Kinney and McDaniel (1989) conjecture that these negative returns may have caused auditors to look for restatements, the evidence is also consistent with some market anticipation of restatements.

4. Sample selection and summary statistics

4.1. Sample selection

We identify our sample primarily from searches in the Lexis-Nexis News Library and SEC Filing Library based on key-word searches for restatements (e.g., restat, revis, adjust, error). We expand our key words to recognize that some companies describe restatements in other ways (e.g., "responding to guidance from the SEC").

We include restatements for U.S. companies that made initial announcements between January 1, 1995 and December 31, 1999. Table 1 presents sample attrition and summary statistics for CARs (calculated as described in Section 4.2) and company size.

Combined, our sources identify 525 announcements of restatements or potential restatements. Of these, 33 companies eventually determine that restatements are not necessary. On average, these non-restating companies are larger and their restatement announcements have a less negative announcement effect than do the restating observations. To retain our focus on corrections of misstatements, we eliminate these observations from our analyses, leaving 492 companies that

Table 1
Sample attrition

	n[a]		Mean returns[b]	Assets ($M)[c]
All potential restatements[d]	525	Mean	−9.2%	1,243.9
(CAR $n = 449$, assets $n = 519$)		Median	−4.6%	93.7
Potential restatements that did not result in actual restatements[e]	(33)	Mean	−5.5%	3,896.0
(CAR $n = 28$, assets $n = 31$)		Median	−0.4%	193.1
Restatements	492	Mean	−9.5%	1,075.4
(CAR $n = 421$, assets $n = 488$)		Median	−5.1%	88.6
Restatements eliminated by missing data[f]	(89)	Mean	−16.3%	783.9
(CAR $n = 18$, assets $n = 85$)		Median	−12.5%	29.4
Restatements included in analysis	403	Mean	−9.2%	1,136.9
		Median	−4.6%	101.2

[a] Number of restatements or potential restatements identified in our searches. Summary statistics are provided only for observations with available data. Reduced sample sizes for CARs and assets for each group are noted parenthetically.

[b] Market-adjusted cumulative abnormal return (equally weighted index) over days 0 and 1, where day 0 is date the restatement or potential restatement is announced.

[c] Book value of total assets (in millions of dollars), measured at the fiscal year ending immediately prior to the restatement announcement.

[d] Announcements of restatements and potential restatements identified from searches of Lexis-Nexis news files and SEC filings from 1995 to 1999. Only restatements to correct misstatements are included.

[e] Announcements of potential restatements later determined to be unnecessary. CARs are significantly less negative that restatement CARs in non-parametric tests (t-statistic = 1.15, Mann–Whitney z-statistic = 1.77) Assets are significantly larger than for restatement companies (t-statistic = 1.86, Mann–Whitney z-statistic = 2.38).

[f] Restatements with missing data items, primarily CRSP returns. CARs are significantly more negative than for firms/observations with necessary data items (t-statistic = −1.64, Mann–Whitney z-statistic = −2.34). Assets are significantly lower in non-parametric tests (t-statistic = −0.73, Mann–Whitney z-statistic = −4.98).

eventually restate previously reported results.[4] This is the sample analyzed by Palmrose and Scholz (2004).[5] Attrition, due primarily to missing financial or return data, reduces the observations available for analysis to 403. Missing data tend

[4] We replicate our analyses including 27 of the 33 non-restating companies for which data are available. In these analyses, change in income, pervasiveness and number of years restated all equal zero for these observations. Results are substantially similar to our reported results.

[5] Comparing relevant periods, the Palmrose and Scholz (2004) restatement sample appears to be substantially larger than those in Anderson and Yohn (2002) and Wu (2002), and somewhat larger than the GAO's (2002).

to exclude companies with more negative reactions (t-statistic = −1.64, z-statistic = −2.34). Data-related attrition likely affects companies in more dire circumstances, as evidenced by the more severe reactions. Attrition also affects somewhat smaller companies, although the size difference finds significance only in non-parametric tests (z-statistic = −4.98). Thus, the sample firms in our primary analysis may be somewhat more stable and established than restatement companies in general. If so, this sample bias represents a limitation of our study.

The mean (median) book value of assets for our 403 sample companies, as reported at the fiscal year-end prior to the announcement, is $1,136.9 million ($101.2 million) compared to $2,912.2 million ($116.9 million) for all Compustat companies (measured at 1997 fiscal year-end). So, our restatement sample consists of somewhat smaller companies, consistent with results reported in prior studies (e.g., Kinney and McDaniel, 1989; Sennetti and Turner, 1999).

Previous research finds restating companies to be more highly levered compared to those not restating. However, this is not the case for our sample. The mean (median) ratio of long-term debt to total assets is 21 percent (6 percent) for our sample, compared to a mean (median) ratio of 22 percent (10 percent) for Compustat companies (again measured at 1997 fiscal year end). Another distinguishing characteristic of our sample is that 40 percent of the companies had an IPO within the three years prior to the restatement announcement.[6]

4.2. Calculation and description of abnormal returns

We use a market-adjusted model based on an equally weighted index (with dividends) to estimate abnormal returns. This model subtracts the CRSP market index return from a company's daily return to obtain the market-adjusted abnormal return (AR) for each day and company. The daily abnormal returns are summed to calculate the cumulative abnormal return (CAR) for a given time period.

Table 2 provides descriptive statistics for the CARs over four windows surrounding the initial restatement announcement. Because news releases dated on day 0 may not be released until after the close of trading, the reaction to some announcements is expected on day +1. Also, while the abnormal returns on day −1 could capture any early news leakage, Table 2 shows that abnormal returns on this day are quite small (mean −0.5 percent, median −0.4 percent). Thus, it appears that even if the market anticipates a restatement over a longer window, as previously discussed, the announcement effect occurs primarily on days 0 and +1.[7]

[6] Teoh et al. (1998) argue that IPO issuers can report unusually high earnings by adopting discretionary accounting accruals, which raise prior earnings relative to actual cash flow. They document that issuers with unusually high accruals in the IPO year experience poor stock return performance in 3 years thereafter. Also, Lang (1991) provides evidence in an IPO context on the uncertainty about the time-series process of earnings and stock price reactions to earnings.

[7] As sensitivity tests, we calculate CARs using the market-model method (equally weighted index) and size-adjusted returns, and also use the market-adjusted CAR over a 3-day reaction window −1 to +1 in our analyses. In all cases we obtain substantially similar results to those reported.

Table 2
Summary of cumulative abnormal returns (CARs) for over four event windows surrounding restatement announcements (day 0)[a]

	Event windows surrounding announcement on day 0			
	−1	0	1	0, 1
Market-adjusted CARs (%)[b]				
Mean	−0.5	−5.3	−4.0	−9.2
Standard deviation	6.2	13.9	12.5	18.0
(*t*-statistic)[c]	(−1.57)	(−7.70)*	(−6.29)*	(−10.27)*
First quartile	−2.8	−8.0	−7.3	−16.0
Median	−0.4	−1.6	−1.6	−4.6
Third quartile	2.2	1.3	2.1	0.7
(*z*-statistic)[c]	(−2.04)*	(−7.09)*	(−5.99)*	(−9.68)*

*Significant at 0.10 level or better.

[a] Sample is 403 announcements of restatements to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Announcements were made from 1995 to 1999.

[b] Market-adjusted CARs calculated using an equally weighted index.

[c] Null hypothesis for each window is CAR = zero. *T*-tests are two tailed. *Z*-statistics are based on Wilcoxon signed ranks tests.

As expected, CARs on both days 0 and 1 are significantly negative (see Table 2). So, the CAR over days (0,1) is quite large (mean −9.2 percent, median −4.6 percent) and significantly less than zero (*t*-statistic = −10.27, *z*-statistic = −9.68). This represents the dependent variable in our regressions.

The abnormal reaction at the 75 percent quartile for all windows is slightly positive, indicating a number of positive CARs surrounding restatement announcements. Indeed, 29 percent (115 of 403) of all day (0,1) CARs are non-negative. Announcement of a restatement seems unlikely to represent good news, since it reveals that management provided erroneous or fraudulent results. So, the existence of these positive returns suggests that: (1) the market anticipates some restatements, perhaps due to industry clustering around specific accounting issues, (2) some restatements have very little impact on market perceptions, or (3) for the subset of restatements announced in conjunction with earnings releases, other information in the release attenuates or subsumes the impact of the restatement. We consider each of these possibilities in our analysis.

4.3. Distribution of restatements by time and industry

Market anticipation of any given restatement announcement appears less likely if announcements do not tend to cluster by time and industry. So, this section discusses evidence on restatement timing and industry distribution. As background for this discussion, the annual number of restatements increases over the sample years, from 35 in 1995 to 174 in 1999, a five-fold increase. This is consistent with increases noted in other studies, e.g., Moriarty and Livingston (2001), Palmrose and Scholz (2004) and Wu (2002). Palmrose and Scholz (2004) estimate an increase in public companies

over the same time period of about 8 percent. A significant portion of the increase in our sample comes from the SEC initiative, beginning in late 1998, to restate IPR&D charges. Without the IPR&D group, 1999 has 108 restatements, slightly more than three times the number announced in 1995 (the sample has 75 restatements involving only IPR&D). Also, the percentage of restatements involving fraud decreases over the sample years from 37 percent in 1995 to 10 percent in 1999, suggesting that the increase in restatement frequencies may be due to greater SEC activism (considering activities other than enforcement) and more complex accounting rules and transactions, rather than an increase in fraudulent financial reporting.[8]

Table 3 provides a breakout of the number and percentage of sample observations across industry groups and calendar quarters. Restatement announcements in the first quarter of the calendar year (166, 41 percent) represent a plurality. As an aside, 44 percent of restatements are announced in the first *fiscal* quarter, as are 57 percent of all restatements attributed to auditors. This suggests the importance of year-end closing and/or external audits in identifying misstatements. However, this evidence does not argue for the market anticipating any given restatement.

Table 3 reports that more than half of all restatements are found in either the manufacturing or technology industries (31 and 26 percent, respectively) and that the distribution of restatement announcements across calendar quarters is not independent of industry ($\chi^2 = 35.99$). Further analysis (not shown) over the 20 calendar quarters in the sample finds a similar result ($\chi^2 = 227.7$). Upon examination, we find this result due mainly to IPR&D restatements, which are concentrated in manufacturing and technology and the first quarter of 1999. These two industry-quarter combinations account for 8.2 and 9.2 percent of the total sample, respectively, while the next highest percentage is only 2.7. Without the IPR&D restatements, the frequencies in these two industry-quarters drop to 3.7 and 2.4 percent. This suggests that market anticipation due to industry clustering is not likely to be an important factor in any reaction to restatement announcements, except perhaps for IPR&D restatements. Our sensitivity analysis considers the effect of this subset of restatements.

4.4. Summary statistics for test variables

Table 4 presents descriptive statistics and univariate results for our test and control variables. In all cases, parametric and non-parametric test results are consistent. About a fourth of the restatements (101/403) are announced in earnings releases. To help clarify the effect of restatement news, the table provides results for the entire sample and the subset of restatements not announced in earnings releases. Returns for the no-earnings news subsample are significantly more negative than the earnings release group (not shown) (-10 percent vs. -6 percent, t-statistic $= -2.30$, z-statistic $= -1.97$), consistent either with companies announcing more serious

[8] However, the frequency of fraud observations may change, particularly for more recent years, as criminal or SEC enforcement actions yet emerge on restatement companies that have not previously been identified with fraudulent financial reporting.

Table 3
Distribution of restatement sample by industry and announcement quarter

Industry[a]	Announcement quarter[b]								Total	
	1		2		3		4			
Agriculture, mining & construction	1	<1%	2	<1%	2	<1%	6	1%	11	3%
Manufacturing	57	14%	21	5%	19	5%	27	7%	124	31%
Technology	55	14%	23	6%	7	2%	21	5%	106	26%
Transportation	0	0%	1	<1%	2	0%	1	<1%	4	1%
Communication	5	1%	1	<1%	3	1%	2	<1%	11	3%
Utilities	1	<1%	2	<1%	2	<1%	1	<1%	6	1%
Wholesale and retail	15	4%	14	3%	5	1%	7	2%	41	10%
Financial services	15	4%	14	3%	8	2%	13	3%	50	12%
Services	17	4%	13	3%	7	2%	13	3%	50	12%
Total	166	41%	91	23%	55	14%	91	23%	403	100%

[a] Industries are defined by the following SIC codes: Agriculture, mining & construction = 0-1999, manufacturing = 2000-3999 (except codes assigned to technology), technology = 3570-3579 plus 7370-7379, transportation = 4000-4799, communications = 4800-4899, utilities = 4900-4999, wholesale/retail = 5000-5999, financial services = 6000-6999, services = 7000-8999 (except codes assigned to technology).

[b] Calendar quarters of announcements of 403 restatements made to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Restatements were announced from 1995 to 1999. The distribution across quarters is not independent of industry ($\chi^2 = 35.99$).

restatements alone, or with other information in the releases attenuating reactions. However, the no-earnings news subsample and all restatements exhibit similar patterns of returns for the model variables (Table 4), which lends weight to the latter interpretation. Because of the similarity, only results for the entire sample are discussed here.

Results in Table 4 are consistent with our conjecture that fraud is associated with more negative returns. Fraud observations (21 percent, 83 of 403) have an average CAR of −20 percent, significantly lower than the −6 percent average CAR for non-fraud observations (t-statistic = −5.10). Similarly, restatements involving core accounts (60 percent, 243 of 403) have significantly lower average CARs (−13 percent vs. −4 percent, t-statistic = −5.22).

However, results for our attribution variables appear inconsistent with our conjecture of externally initiated restatements being associated with more negative reactions. While on average the 72 restatements (18 percent of the sample) attributed to auditors have the most negative returns (−18 percent), the 96 SEC-initiated restatements (24 percent of the sample) have the *least* negative returns (−4 percent). But, our results have some similarities with Dechow et al. (1996). They find returns of −25 percent for 13 AAER firms where a problem identified by the auditor or an auditor dismissal represents the first announcement of accounting trouble, compared to −4 percent for 25 AAER firms where an SEC investigation represents the first announcement.

Further, returns for company-initiated restatements (−13 percent) are more negative than either the SEC or unattributed groups (returns of −5 percent). These preliminary results indicate that although significant differences exist across the

Table 4
Descriptive statistics for test and control variables

	All sample restatements[a]			Restatements not announced in earnings releases[b]		
	Number	Percent or mean	CAR days (0,1)	Number	Percent or mean	CAR days (0,1)
	403		−9.2%	302		−10.4%
Information about management[c]						
Fraud	83	21%	−20%	69	23%	−23%
No fraud	320	79%	−6%	233	77%	−7%
(*t*-statistic)			(−5.10)*			(−6.72)*
(*z*-statistic)			(−4.96)*			(−4.84)*
Restatement attributed to:						
Auditor	72	18%	−18%	56	19%	−20%
SEC	96	24%	−4%	76	25%	−4%
Company	107	27%	−13%	77	25%	−15%
Unattributed	128	32%	−5%	93	31%	−6%
(*F*-statistic)			(14.23)*			(12.44)*
(χ^2)			(34.03)*			(29.28)*
Materiality variables						
Core earnings	243	60%	−13%	183	61%	−14%
Non-core earnings	160	40%	−4%	119	39%	−5%
(*t*-statistic)			(−5.22)*			(−4.49)*
(*z*-statistic)			(−4.12)*			(−4.08)*
Pervasiveness						
1	290	72%	−7%	214	71%	−8%
2	68	17%	−13%	48	16%	−14%
3	27	7%	−23%	24	8%	−25%
4	15	4%	−16%	13	4%	−13%
5	0	0%	n/a	0	0%	n/a
6	3	1%	−17%	3	1%	−17%
7	0	0%	n/a	0	0%	n/a
(*F*-statistic)			(7.12)*			(5.91)*
(χ^2)			(18.76)*			(15.95)*
Change in net income/assets						
Overall mean		−2.4%			−3.2%	
Quintile means	80	−20.5%	−17%	60	−23.8%	−20%
	81	−3.2%	−15%	61	−3.9%	−16%
	81	−0.8%	−8%	60	−0.9%	−9%
	81	0.2%	−2%	61	0.1%	−3%
	80	12.5%	−4%	60	12.5%	−4%
(*F*-statistic)			(12.63)*			(10.68)*
(χ^2)			(37.18)*			(33.24)*
Number of years restated						
Overall mean		1.25			1.33	

Table 4 (*continued*)

	All sample restatements[a]			Restatements not announced in earnings releases[b]		
	Number	Percent or mean	CAR days (0,1)	Number	Percent or mean	CAR days (0,1)
Materiality variables (cont.)						
Quintile means	87	0.25	−5%	60	0.25	−6%
	59	0.50	−12%	40	0.50	−12%
	86	0.82	−11%	79	0.92	−13%
	91	1.56	−9%	69	1.73	−10%
	80	3.03	−10%	54	3.24	−11%
(*F*-statistic)			(1.48)			(1.29)
(χ^2)			(6.49)			(5.34)
Control variables						
Returns over prior 120 days (days −120, −1)						
Overall mean		−15%			−16%	
Quintile means	80	−71%	−12%	60	−73%	−11%
	81	−46%	−9%	61	−46%	−11%
	81	−28%	−10%	60	−28%	−12%
	81	−7%	−9%	61	−8%	−10%
	80	76%	−6%	60	74%	−9%
(*F*-statistic)			(1.23)			(0.30)
(χ^2)			(5.36)			(3.23)
Ln (total assets)						
Mean		4.9			5.0	
Median		4.6			4.8	
Long-term debt/total assets						
Mean		21%			23%	
Median		5%			7%	

* Difference between groups or across quintiles is significant at 0.10 level or better. *T*-statistics are two-tailed. Non-parametric results are based on the Mann–Whitney *z*-statistic (two-group comparisons) or the Kruskal–Wallis χ^2 (quintile comparisons).

[a] Announcements of 403 restatements to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Announced from 1995 to 1999.

[b] Subsample of 302 restatements that were announced independently of earnings releases.

[c] Variables are defined as follows (in table order). *Fraud*: SEC issued an enforcement action (AAER) or the company admitted the misstatement was due to fraud/irregularities. *Restatement attributed to auditor, SEC, management*: Restatement attributed to specified entity in press releases or amended filings, baseline case is unattributed. *Core earnings*: Restatements involving revenue, cost of sales or on-going operating expenses. *Non-core earnings*: Restatements of one-time items, merger accounting, non-operating gains and losses or other. *Pervasiveness*: number of account groups involved in restatement. The seven account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. *Change in net income/assets*: Restated income (loss) less originally reported income (loss) over restated period scaled by book value of assets reported at year end prior to restatement announcement. *Number of years restated*: Sum of periods restated, where a fiscal year = 1 and each additional quarter = 0.25. *Returns over prior* 120 *days*: Buy-and-hold abnormal returns over days −120 to −1. Ln(*total assets*): Natural log of book value of total assets reported at year end prior to announcement. *Long-term debt/total assets*: Book value of long-term debt divided by book value of total assets, both reported at year end prior to announcement.

groups, they do not appear solely related to increased (decreased) uncertainty associated with externally (internally) attributed restatements.

We also find mixed support for our quantitative and qualitative materiality measures. First, as expected, more negative changes in net income are associated with more negative returns. The average of the net income change/assets variable is −2.4 percent, ranging from a mean −20.5 percent for the lowest quintile to +12.5 percent for the highest.

A substantial number of restatements (142 or 35 percent) increase reported income. The mean and median CARs for all income-increasing restatements is negative (−2 and −1 percent), although significantly less so than income-decreasing restatements (mean −13 percent, *t*-statistic = 5.97). (These results are not reported in the table.) About half of the income-increasing restatements involve only IPR&D write-offs. The others are distributed across account groups. The mean CAR for the IPR&D group is not statistically distinct from the non-IPR&D group (−3 percent vs. −1 percent, *t*-statistic = −1.13).[9]

Next, results for our pervasiveness variable generally trend in the expected direction and are significant (*F*-statistic = 7.12). The majority of the restatements affect only one account (72 percent, 290 of 403). On average, these also have the least negative CARs (−7 percent). Restatements affecting two (17 percent, 68 of 403) and three (7 percent, 27 of 403) accounts have more negative average CARs of −13 percent and −23 percent, respectively. However, restatements affecting four or more accounts (5 percent, 18 of 403) have average CARs of about −16 percent.

Differences across number of years restated are not significant. Additional tests find no significant difference between restatements involving annual results and those affecting only interim reports. However, returns are significantly worse for restatements that impact more than one quarters' results (−10 percent vs. −5 percent, *t*-statistic = −2.50).

4.5. Descriptive statistics for control variables

The average prior 120-day return for the sample companies is −15 percent, with the highest quintile (average of 76 percent) showing the least negative reaction at −6 percent, and the lowest quintile (average of −71 percent) showing the most negative reaction at −12 percent. Although quintile means do not significantly differ, the weakly positive association appears inconsistent with market anticipation of restatement announcements, which would likely show a negative association between prior and announcement returns.

Finally, the mean (median) natural log of total assets is 4.9 (4.6) and the mean (median) debt/asset ratio for our sample is 21 (5) percent. Again, to control for different information environments for differently sized and levered firms, we interact these two variables with income change in our regressions.

[9] At first glance a negative return associated with an income *increasing* restatement may appear odd. However, restatements that increase previously reported income can result in lower future income. This, plus the fact that all restatements indicate materially erroneous bookkeeping, regulatory scrutiny (in the case of IPR&D), earnings management, or fraud may explain the negative reaction.

5. Regression results and discussion

5.1. Regression results

Results of the OLS regression model for the full sample are shown in Table 5, column 1. The full sample regression model is highly significant (F-statistic = 8.64, adjusted $R^2 = 17$ percent). Like the univariate tests, the regression results are consistent with fraud, more negative changes in reported income and pervasive restatements being associated with more negative returns. They also indicate that an auditor-initiated restatement has an incrementally negative effect.

Contrary to univariate results, the coefficient for core restatements is not significant beyond net income in the regression analysis.[10] Likewise unsupported are our conjectures regarding SEC-initiated restatements and restatements involving more years since the coefficients for these variables are insignificant. Contrary to our conjectures, but consistent with univariate tests, company-initiated restatements are associated with more negative reactions. None of the control variable coefficients obtain significance.

The second column of Table 5 reports results for the subset of restatements that are not announced in concurrent earnings releases ($n = 302$). They are similar to results for the entire sample with the exception of pervasiveness, which lacks significance at traditional levels (p-value = 0.14). The similarity between the full sample and this subset generally occurs throughout the alternative models used to test their sensitivity. However, this no-earnings release subset includes some restatements announced with earnings news other than earnings releases, such as earnings warnings and preliminary revenue results. As a sensitivity test we estimate the model excluding these observations. Results are substantially similar to those reported in column two, except that the size/earnings change control variable coefficient becomes significant (negative).

The third column in Table 5 includes restatements announced in earnings releases ($n = 101$). We add an earnings surprise variable to control for concurrent earnings news effects in this partition. We measure earnings surprise by dividing diluted earnings per share before extraordinary items for the current quarter less that for the

[10] Palmrose and Scholz (2004) find that core restatements are associated with a higher likelihood of litigation; their result is driven primarily by revenue restatements. When substituting revenue restatements for the core variable in our analysis, the coefficient is insignificant. Other results are unaffected. However, we do find that the coefficient for revenue restatements (but not core) is significant in an analysis excluding interim-only restatements. Anderson and Yohn (2002) also find a significant negative market reaction for revenue restatements of annual financials based on CARs over a 7-day window surrounding restatement announcements. Anderson and Yohn's model includes variables for various types of accounting restatements (of which only the coefficient for revenue obtains significance), a variable indicating whether the company disclosed the financial statement impact of the restatement in the announcement (negative and significant) (see Section 6.3), one for the interaction between the amount of the restatement and whether or not this amount is disclosed (not significant), and one indicating whether an outside party initiates the restatement (not significant).

quarter 1 year earlier, by price at the fiscal year end prior to the announcement. The model is weaker, though still significant (F-statistic = 3.86) and the earnings surprise variable coefficient is highly significant (positive). This is likely responsible for the higher adjusted-R^2 (26 percent). Fewer of the restatement test variable coefficients remain significant, i.e., only auditor-attributed and change in reported income. The size-earnings change control variable coefficient is also significant in this regression (negative).

Table 5
OLS regression results for all sample restatements and subsets that were/were not announced in earnings releases. Dependent variable is CAR over days (0,1)[a]

Independent variables:[b]	Expected sign	All sample restatements[c]		Restatements not announced in earnings releases[d]		Restatements announced in earnings releases[e]	
		Coef.	(t-stat.)	Coef.	(t-stat.)	Coef.	(t-stat.)
Information about management							
Fraud	−	−0.097	(−4.23)*	−0.108	(−4.14)*	−0.074	(−1.65)
Attributed to auditor	−	−0.087	(−3.39)*	−0.088	(−2.94)*	−0.100	(−2.20)*
Attributed to SEC	−	−0.007	(−0.29)	−0.007	(−0.25)	−0.006	(−0.13)
Attributed to management	+	−0.052	(−2.27)*	−0.059	(−2.20)*	−0.065	(−1.61)
Materiality							
Core earnings	−	−0.005	(−0.24)	−0.015	(−0.63)	−0.002	(−0.04)
Change in net income/assets	+	0.321	(2.52)*	0.245	(1.83)*	1.258	(1.91)*
Pervasiveness	−	−0.024	(−2.24)*	−0.017	(−1.49)	−0.034	(−1.38)
Number of years restated	−	0.013	(1.54)	0.015	(1.54)	0.011	(0.73)
Control							
Size-ni change interaction		−0.052	(−1.63)	−0.037	(−1.11)	−0.375	(−1.98)*
Leverage-ni change interaction		−0.020	(−0.06)	0.035	(0.10)	−0.153	(−0.10)
Return over prior 120 days		0.003	(0.28)	−0.003	(−0.23)	0.026	(0.94)
Earnings surprise			n/a		n/a	0.698	(4.23)*
Intercept		−0.014	(−0.68)	−0.025	(−1.02)	0.051	(1.26)
Model statistics							
n			403		302		101
Adjusted R^2			17%		19%		26%
F-statistic			8.64*		7.37*		3.86*

Table 5 (*continued*)

*Coefficient or model is significant at 0.10 level or better. Results are two-tailed.

[a] CARs calculated using market adjusted model and an equally weighted index.

[b] Variable definitions are as follows: *Fraud* = 1 if SEC issued an enforcement action (AAER) or the company admitted to the misstatement was due to fraud/irregularities, 0 otherwise. *Restatement attributed to auditor, SEC, management* = 1 if restatement was attributed to specified entity in press releases or amended filings, 0 otherwise. *Core earnings* = 1 if restatement involved revenue, cost of sales or operating expense accounts for on-going operations, 0 otherwise. *Change in net income/assets*: Restated income (loss) less originally reported income (loss) over restated period scaled by book value of assets reported at year end prior to restatement announcement. *Pervasiveness*: Number of account groups involved in restatement. Account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. *Number of years*: Sum of periods restated, where a fiscal year = 1 and each additional quarter = 0.25. *Size-ni change interaction*: Natural log of book value of total assets reported at year end prior to announcement, times change in net income/assets. *Leverage-ni Change interaction*: Book value of long-term debt divided by book value of total assets, reported at year end prior to announcement, times change in net income/assets. *Return over prior* 120 *days*: Buy-and-hold abnormal returns over days −120 to −1. *Earnings surprise*: Diluted earnings per share before extraordinary items for current quarterly report less same measure for year ago quarter, scaled by price at fiscal year end prior to announcement.

[c] Announcements of 403 restatements to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Restatements announced from 1995 to 1999.

[d] Subsample of 302 restatements announced separately from earnings releases.

[e] Subsample of 101 restatement announced in earnings releases.

5.2. Model discussion and sensitivity analyses

Variance inflation factor diagnostic statistics do not indicate multicollinearity as a problem (all VIFs are less than 2.0, except between interacted variables). Still, several significant relationships occur between our test variables. Table 6 presents χ^2 tests of association (Panel A), difference in means tests (Panel B) and correlations (Panel C), as appropriate, for the test and control variables in the model. We consider these relationships and other model sensitivity issues in this section.

5.2.1. Fraud

We conjecture that fraud increases perceived risk/uncertainty and so is associated with more negative returns. The fraud variable coefficient is highly significant and negative in the regression analysis ($t = -4.23$), consistent with this conjecture. However, results in Table 6 suggest a meaningful association between fraud and core restatements. While 21 percent of all restatements involve fraud (Table 4), fraud characterizes 33 percent of restatements affecting core accounts. Conversely, 95 percent of all fraud restatements involve core accounts ($\chi^2 = 53.1$, see Panel A.) These results appear consistent with findings of Entwistle and Lindsay (1994). We add a fraud/core interaction variable to assess this effect. In this model (results not shown), the interaction variable coefficient is negative and significant, but not that for fraud or core. Other test variable results are unaffected. This suggests that the

frequency of core accounts among the fraud restatements is a factor in the strong significance of fraud in the primary model. Finally, we obtain similar results (not shown) using only company admissions of fraud in press releases or amended filings to identify fraudulent misstatements.

Table 6
Relationships among test and control variables[a,b]

	Fraud		Core earnings	
	Count	Fraud %	Count	Core %
Panel A: χ^2 tests for binary variables				
Sample frequency[c]	83		243	
Core earnings	79	95%		
Fraud			79	33%
(χ^2)		(53.1)		(53.1)
Auditor attributed	26	31%	61	25%
SEC attributed	7	8%	28	12%
Management attributed	37	45%	88	36%
Unattributed	13	6%	66	27%
(χ^2)		(42.3)		(82.4)

Panel B: Means test results for binary/continuous variables[d]

	Perva-siveness	NI chg/assets	Number of years	Size interact	Leverage interact	Prior returns
Sample mean	1.57	−0.02	1.25	−0.05	0.00	−0.15
Fraud mean	1.89	−0.12	1.78	−0.43	−0.02	−0.34
(*t*-statistic)	(−2.8)	(4.7)	(−4.7)	(6.5)	(2.5)	(3.5)
Core earnings mean	1.82	−0.07	1.40	−0.24	−0.01	0.21
(*t*-statistic)	(−7.1)	(6.9)	(−3.6)	(7.1)	(4.1)	(3.6)
Auditor attributed	1.99	−0.09	1.34	−0.29	−0.01	−0.31
SEC attributed	1.49	0.03	1.54	0.19	0.00	0.06
Management attributed	1.69	−0.06	1.45	−0.20	−0.01	−0.24
(*F*-statistic)	(7.2)	(9.7)	(10.5)	(11.4)	(3.1)	(3.7)

Panel C: Pearson correlation coefficients for continuous variables (*significance levels in parentheses*)

	NI chg/assets	Number of years	Size-ni interact	Lev-ni interact	Prior returns
Pervasiveness	−0.22	0.23	−0.26	−0.21	−0.02
	(0.00)	(0.00)	(0.00)	(0.00)	(0.76)
NI change/assets		−0.07	0.90	0.58	0.08
		(0.19)	(0.00)	(0.00)	(0.09)
Number of years			−0.10	−0.09	−0.03
			(0.04)	(0.06)	(0.49)
Size-ni change interaction				0.43	0.06
				(0.00)	(0.22)
Leverage-ni change interaction					−0.01
					(0.84)

Table 6 (*continued*)

[a] Announcements of 403 restatements made to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Restatements were announced from 1995 to 1999.

[b] Variable definitions are as follows: *Fraud* = 1 if SEC issued an enforcement action (AAER) or the company admitted to the misstatement was due to fraud/irregularities, 0 otherwise. *Restatement attributed to auditor, SEC, management* = 1 if restatement was attributed to specified entity in press releases or amended filings, 0 otherwise. *Core earnings* = 1 if restatement involved revenue, cost of sales or operating expense accounts for on-going operations, 0 otherwise. *Change in net income/assets*: Sum of restated income less originally reported income for each restated period. Assets are book value of total assets reported at year end prior to the announcement. *Pervasiveness*: Number of account groups involved in restatement. Account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. *Number of years*: Sum of periods restated, where a fiscal year = 1 and each additional quarter = 0.25. *Size-ni change interaction*: Natural log of book value of total assets reported at year end prior to announcement, times change in net income/assets. *Leverage-ni change interaction*: Book value of long-term debt divided by book value of total assets, reported at year end prior to announcement, times change in net income/assets. *Prior returns*: Buy-and-hold abnormal returns over days −120 to −1.

[c] For baseline comparison, fraud is 21 percent of full sample and core is 60 percent. See Table 4.

[d] *T*-test comparison groups are fraud/no-fraud and core/non-core earnings. *F*-statistic is difference across auditor, SEC, management and unattributed. Two-tailed results are presented.

5.2.2. Restatement initiated by auditor, SEC or company

The negative relation between auditor-initiated restatements and abnormal returns is a robust result in our analysis. It is consistent with our conjecture that external identification of a problem indicates management's inability to properly monitor and control the company. But, the SEC-initiated variable, which also represents this construct, is consistently insignificant. Results in Table 6 show that the two attribution variables differ in their relation to other test variables (e.g., fraud, core accounts and net income effect).

As mentioned in Section 3, the SECs focus on technical accounting issues may attenuate the impact of the SEC-initiated variable. Indeed, more core restatements are attributed to auditors than the SEC (25 percent vs. 12 percent). As one test of this possibility, we eliminate the largest subset of SEC-initiated non-core issues, those with only IPR&D misstatements. Restatements of this particular account represent 33 percent of all SEC-initiated observations, although they also occur with less frequency among restatements attributed to management (8 percent) and auditors (6 percent). IPR&D restatements appear to have particularly benign characteristics, e.g., mostly income increasing (99 percent) and rarely associated with fraud (only 2 percent). Ten restatements that involve other accounts as well as IPR&D remain in the sample ($n = 328$). Results (not shown) are substantially similar to the original regression results. The only change is number of years restated, which has a positive and significant coefficient. Thus, the insignificance of the SEC-initiated variable cannot be attributed to the Commission's focus on one particular technical issue—IPR&D.

In an alternative sensitivity test we apply the model to restatements involving only core accounts, but again find no support for the hypothesis that an SEC-initiated

restatement represents a negative signal (results not shown). In a study that includes market reactions to various types of fraud, Karpoff and Lott (1993) document that reports of violations of regulations do not trigger significant returns (average −1 percent, $n = 24$), although reports of financial reporting fraud do (average −5 percent, $n = 11$). Thus, investors may view SEC intervention based on reviews of company filings as technical compliance issues, rather than fundamental financial reporting violations. However, an anticipation effect represents another possibility—i.e., information about the SECs interest in a company's financials may reach the market prior to the restatement announcement.

Contrary to our conjecture, restatements attributed to the company are usually associated with more negative returns. There are several possible explanations for this. Table 6 shows that these restatements have characteristics similar to those of auditor-initiated restatements (e.g., a higher percentage of fraud and core restatements than the overall sample and a more negative effect on net income). These relatively severe circumstances may outweigh any benefits derived from a signal of management's ability/willingness to self-monitor. Management taking credit for initiating some restatements actually detected by auditors represents another possibility. Finally, if company-attributed restatements result from investigations by quasi-external (independent) parties such as the audit committee, the more negative return would be consistent with our conjecture for external attribution.

5.2.3. *Materiality*

We conjecture that more material restatements have negative implications for companies' future prospects, and so will be associated with more negative returns. We use three variables to examine this relation. We find the effect on income (net income change/assets) consistently associated with more negative returns, but not the number of years restated. Thus, the market appears more concerned about the dollar impact than the length of time misstatements persist. Our third materiality measure, pervasiveness (number of accounts affected), is associated with more negative returns in the full sample.

We further explore the role of materiality with two additional analyses. Although restatements are unlikely to be good news, a restatement that increases previously reported income may be perceived as relatively better than one that decreases it. As noted previously, income-decreasing restatements have significantly more negative reactions than income-increasing or income-neutral. Similarly, Kinney and McDaniel (1989) find that restatements correcting overstatements (negative revisions of income) are associated with significantly negative returns, while returns for corrections of understatements do not significantly differ from zero. Also, in earnings pre-announcement settings, Kasznik and Lev (1995) and Skinner (1994) find differing results for good news and bad news announcements.

To assess whether the cross-sectional relation differs between the two groups of restatements, we separate our sample into an income-decreasing partition (corrections of overstatements) and a non-income-decreasing partition (corrections of understatements or reclassifications that do not affect income). Model results for the

income-decreasing subsample are similar to those for the full sample, except that the coefficient for pervasiveness loses significance, while that for number of years restated becomes significant (results not shown). For income-increasing restatements, the overall model is not significant (F-statistic = 0.72); and, only the auditor-initiated variable remains significant. These results provide additional evidence that the market reacts differently depending on the impact of the restatement on previously reported numbers.

We also replace the signed change in net income variable with two other variables: the absolute value of the change in net income scaled by assets and an indicator variable for a decrease in reported income. The two variables are negative and significant, indicating the importance of both the magnitude and direction of the change. Other variable results remain unaffected, except number of years restated, which has a positive and significant coefficient.

In SEC SAB 99 (SEC, 1999), crossing the income/loss threshold is among the qualitative considerations affecting materiality. So, we add an indicator variable to the original regression for whether the restatement changes reported income to a loss (1 = change to net loss, 0 = otherwise). The coefficient for this indicator variable is negative and significant; other results remain substantially similar (results not shown). Thus, there appears to be an incrementally negative effect when restatements cross the income/loss threshold.

5.3. Relation between prior market price decline and restatement attribution

As an aside, results in Table 6 appear consistent with the Kinney and McDaniel (1989) proposition that prior declines in market prices *cause* restatements, because auditors facing clients with declining stock prices are more likely to extend their work and identify/reveal known misstatements. Panel B shows the most negative prior returns for restatements initiated by the auditor. Even so, while the difference across the four groups is significant (p-value = 0.01), the difference between company and auditor initiated is not (p-value = 0.30). We conduct the same analysis for restatements announced in the first fiscal quarter (when audits are usually performed) and find similar results. Together, these results support both the Kinney and McDaniel proposition and the possibility that companies faced with already depressed stock prices find reasons to restate prior results (analogous, for example, to the "big bath" scenario).

6. Additional analyses

6.1. Increased uncertainty

Both univariate tests and regression analyses provide mixed evidence for our conjecture on an association between increased uncertainty/risk and more negative market reactions. The significant association between fraud and more negative

returns is supportive. However, the insignificant association for SEC-attributed and the negative association for company-attributed restatements are not.

To further explore the relation, we use two alternative measures of uncertainty. First we consider the dispersion of analyst earnings forecasts. Second we analyze changes in the bid–ask spread. Table 7 (Panel A) presents these results.

We use changes in the standard deviation of analyst forecasts to measure dispersion of analyst expectations. We calculate the difference between the standard deviation of the forecasts outstanding at the time of a restatement announcement and those outstanding 45 days after for a sample of 258. As shown in Table 7 (Panel A), both the mean and median dispersion measures increase significantly after the announcement. Importantly, the increase in dispersion is significantly and negatively correlated with the announcement returns (Pearson correlation coefficient −0.19, p-value 0.00). This is consistent with both restatements increasing uncertainty and an association between uncertainty and more negative restatement announcement returns. The dispersion increase is also associated with firm size and prior 120-day returns (negatively), but not with any of our test variables.

An increase in bid–ask spreads at the time of the restatement announcement is indicative of an increase in uncertainty (Bhattacharya and Spiegel, 1991). Thus, we anticipate that restatement announcements will be associated with increasing spreads and that the increase will be correlated with more negative stock price reactions.

We obtained bid–ask price quotes for 336 of our sample observations. We analyze the change from day −2 to day 1.[11] We calculate the change in the proportionate bid–ask spread, where the proportionate spread is the closing bid–ask spread divided by the share price on day −2 (see Bhattacharya and Spiegel, 1991; Lev, 1988). However, as shown in Table 7, there is not a significant change in the proportionate bid–ask spread surrounding the announcement date. Anderson and Yohn (2002) report an increase in bid–ask spreads surrounding the announcement of revenue recognition problems. But, we did not find this result for the revenue subset of our sample.

6.2. *Analyst earnings forecast revisions following announcement*

As an additional test of the association between returns and expectations of future performance, we analyze revisions of analyst earnings forecasts following the restatement announcement. We obtained analyst forecasts from I/B/E/S for 290 of our observations. We measure revisions by subtracting the mean annual earnings forecast outstanding 45 days after from the mean forecast extant at the announcement (both scaled by market price at the fiscal year end prior to the announcement). We repeat the analysis with median analyst forecasts with similar results (see Gu and Wu, 2002).

[11] We omit day −1 in addition to our reaction window (days (0,1)). The average closing spread shows a large increase on that day, suggesting that news leakage affects the spread even though price reactions are not significant.

Table 7
Analysis of additional uncertainty measures and earnings forecast revisions

	Before	After	*t*-statistic/ *z*-statistic	Correlation with CAR(0,1)	
				Coef	*p*-value
Panel A: Changes in uncertainty measures surrounding restatement announcements and their correlation with announcement returns					
Analysts' forecast dispersion ($n = 258$)[a]					
Mean	0.0162	0.0180	3.66*	−0.19	0.00*
Median	0.0059	0.0072	5.09*		
Proportionate bid–ask spread ($n = 336$)[b]					
Mean	0.0387	0.0372	−0.86	0.01	0.79
Median	0.0214	0.0192	−1.31		
Panel B: Analyst earnings forecast revisions surrounding restatement announcements and their correlation with announcement returns					
Mean forecasted earnings ($n = 290$)[c]					
Mean	0.0462	0.0431	−4.63*	0.17	0.00*
Median	0.0472	0.0432	−6.66*		

*Significant at 0.10 level or better. Paired *t*-tests and Wilcoxon signed ranks test results are reported. Pearson correlation coefficients are shown.

[a] Analyst forecast dispersion before is standard deviation of forecasted earnings extant at time of announcement. Dispersion after is standard deviation of forecasts outstanding 45 days of announcement. Includes all sample restatements with available I/B/E/S data and more than one forecast.

[b] Proportionate bid–ask spread is [(closing bid–closing ask)/closing price on day −2], before is measured on day −2 and after on day 1. Analysis includes all sample restatements with available bid–ask data.

[c] Mean forecasted earnings before is mean of all analyst forecasts extant on day of announcement, scaled by share price at the fiscal year end preceding the restatement announcement. Forecasted earnings after is mean of all forecasts 45 days after announcement, again scaled by fiscal year end share price. Includes all sample restatements with available I/B/E/S data. Median forecasted earnings are similar.

Table 7, Panel B confirms that mean analyst forecasts decline significantly subsequent to the announcement. The decline is significantly associated with more negative announcement returns (Pearson correlation coefficient = 0.17, *p*-value = 0.00). Forecast revisions are also associated with fraud (less negative), core earnings (more negative), size (less negative for larger companies) and prior 120 day returns (less negative for higher returns). The core result may be due to analysts excluding certain one-time (non-core) items from their forecasts (e.g., Philbrick and Ricks, 1991; Abarbanell and Lehavy, 2003).

In summary, two of our materiality measures in the Table 5 regression model (change in net income and pervasiveness) are consistent with an association between more material restatements and more negative reactions, while results in this section support an association between more negative revisions of future earnings expectations and more negative reactions. However, our only direct link between materiality and earnings expectations is that restatements of core earnings have significantly more negative forecast revisions.

6.3. Quantification of restatement effects in announcement

As previously mentioned, the timing of the revelation of certain restatement characteristics varies across restatements. Here we consider the effect of having (not having) some quantification of the restatement's impact on net income in the initial announcement. We partition the sample on this dimension because quantification generally represents one of the last items resolved. In fact, the market often does not know the precise dollar effect until the filing of amended statements. Thus, quantification in the initial restatement announcement likely indicates a more substantially complete revealed information set. As a caveat to this analysis, our quantified subset includes initial announcements with both estimated and final income-effect amounts. Some estimates may later be revised. If so, the initial announcement clearly did not present complete information. To the extent that these restatements are more similar to our non-quantified group, distinctions between the two groups will likely be obscured.

As shown in Table 8, the average market-adjusted abnormal return in the 2-day window is significantly *more negative* when the initial announcement *does not* include a quantification of the restatement's net income effect (−14 percent) than when it does (−6 percent) (t-statistic = 4.21).[12] This difference could be due to information set effects or to differences in the underlying characteristics of the subsets. That is, relatively small restatements, involving few accounts can be resolved and reported fairly quickly, while more complicated restatements defy quick resolution.

Non-quantified restatements eventually report slightly more negative net income changes than those quantified at the initial announcement; and, they have higher fraud rates and more pervasive restatements (see Panel A). Thus, announcements that do not provide quantification appear to be related to more serious restatements. This is consistent with evidence from earnings pre-announcement studies showing that managers faced with particularly bad earnings news tend to provide early warnings, and that the warnings tend to be qualitative in nature (Skinner, 1994).

The quantified/non-quantified regression model partitions (Table 8, columns 1 and 2) show differing relationships with the explanatory variables consistent with information content distinctions. For non-quantified announcements, the net income change variable losses significance, but auditor-initiated (plus fraud and pervasiveness) remain significant. On the other hand, for quantified announcements, the net income change variable is significant, while auditor-initiated is not (fraud and management-initiated are also significant).

These results appear consistent with investors using auditor attribution as a proxy for larger, more significantly negative net income effects when the dollar impact on net income is not yet known/revealed. Assuming that the initial announcement provides information about who identified the misstatement, this association seems

[12] When the non-quantified restatements are eventually quantified, there is another significant abnormal stock market reaction of −2.9 percent (t-statisitc = −2.44). This indicates that quantification provides additional value relevant information. However, the multivariate model is not significant when quantification date returns are used as the dependent variable.

reasonable. Auditors have responsibility for identifying material misstatements. Also, the risk-based and directional nature of auditing procedures makes it more likely that auditor-initiated restatements are income-decreasing (Nelson et al., 2002).

There also appears to be a penalty for the uncertainty associated with incomplete announcements. In the third regression in Table 8 (Panel B), we use all observations and add a dummy variable (non-quantified = 1, quantified = 0) to the basic model. It has a significant negative coefficient, while other results remain generally consistent. Thus, it appears that lack of quantification itself provides a negative signal, incremental to the other restatement characteristics.

Table 8
Analysis of effect of restatement quantification in initial announcement. Summary statistics for selected variables and OLS Regression results for dependent variable CAR (days 0,1).

	Non-quantified sub-sample[a]	Quantified sub-sample[b]	*t*-statistic	*z*-statistic
Panel A: Comparison of CARs and selected test variables between sub-samples (*two-tailed t-statistics*)				
n	167	236		
Mean abnormal return	−14%	−6%	4.21	3.65
Percent with fraud	40%	7%	na	66.47
Number of accounts	1.7	1.3	4.89	5.43
Change in net income/assets	−0.04	−0.01	1.24	3.75

Panel B: OLS Regression results

		Non-quantified sub-sample		Quantified sub-sample		Full sample[c]	
		Coef	(*t*-stat)	Coef	(*t*-stat)	Coef	(*t*-stat)
Independent variables:[d]							
Information about management							
Fraud	−	−0.069	(−1.92)*	−0.083	(−2.22)*	−0.083	(−3.43)*
Attributed to auditor	−	−0.126	(−2.73)*	−0.037	(−1.20)	−0.083	(−3.25)*
Attributed to SEC	−	−0.006	(−0.13)	−0.010	(−0.41)	−0.005	(−0.21)
Attributed to management	+	−0.053	(−1.18)	−0.056	(−2.31)*	−0.050	(−2.23)*
Materiality							
Core accounts restated	−	−0.033	(−0.70)	0.001	(0.04)	−0.004	(−0.21)
Change in net income/assets	+	0.178	(0.84)	0.670	(3.22)*	0.326	(2.56)*
Pervasiveness	−	−0.029	(−1.72)*	−0.006	(−0.41)	−0.021	(−1.96)*
Number of years	−	0.019	(1.35)	0.012	(1.20)	0.014	(1.74)*
Control							
Size-ni change interaction		−0.024	(−0.50)	−0.159	(−2.24)*	−0.050	(−1.55)
Leverage-ni change interaction		0.049	(0.09)	0.265	(0.60)	−0.058	(−0.18)
Return over prior 120 days		−0.003	(−0.08)	0.006	(0.64)	0.001	(0.14)
Not quantified		n/a		n/a		−0.032	(−1.72)*
Intercept		−0.015	(−0.32)	−0.029	(−1.26)	−0.012	(−0.57)
Model statistics							
Adjusted R^2			16.5%		9.3%		17.7%
F-statistic			3.99*		3.20*		8.21*

Table 8 (*continued*)

*Model or coefficient is significant at 0.10 level or better (two-tailed results).

[a] Subsample of 167 restatement announcements that did not include quantification of the effect of the restatement on previously reported income. See note c for description of full sample.

[b] Subsample of 236 restatement announcements that included quantification (actual or estimate) of the effect of the restatement on previously reported income. See note c for description of full sample.

[c] Announcements of 403 restatements made to correct misstatements of annual or quarterly financial reports previously filed with the SEC. Restatements were announced from 1995 to 1999.

[d] Variable definitions are as follows: *Fraud* = 1 if SEC issued an enforcement action (AAER) or the company admitted to the misstatement was due to fraud/irregularities, 0 otherwise. *Restatement attributed to auditor, SEC, management* = 1 if restatement was attributed to specified entity in press releases or amended filings, 0 otherwise. *Core earnings* = 1 if restatement involved revenue, cost of sales or operating expense accounts for on-going operations, 0 otherwise. *Change in net income/assets*: Sum of restated income less originally reported income for each restated period. Assets are book value of total assets reported at year end prior to the announcement. *Pervasiveness*: Number of account groups involved in restatement. Account groups are revenue, cost of sales, operating expenses, one-time/special items, merger-related, non-operating expenses and other. *Number of years*: Sum of periods restated, where a fiscal year = 1 and each additional quarter = 0.25. *Size-ni change interaction*: Natural log of book value of total assets reported at year end prior to announcement times change in net income/assets. *Leverage-ni change interaction*: Book value of long-term debt divided by book value of total assets, both reported at year end prior to announcement, times change in net income/assets. *Prior returns*: Buy-and-hold abnormal returns over days −120 to −1. *Not-quantified* = 1 if announcement did not include quantification, 0 if it did.

These findings do not give a clear explanation for the significantly negative results for the company-initiated variable in the full sample or quantified subsample. A clue may lie in the fact that more of the IPR&D restatements are unattributed (52 percent, compared to just 27 percent for non-IPR&D restatements). Although removing IPR&D restatements did not affect our results, it may be that companies simply do not provide much direct discussion of any restatement circumstances for issues perceived as minor. If so, attribution to the company likely accompanies discussion of more serious restatements. This represents an area for future research.

7. Summary and conclusions

In this study, we explain the determinants of the stock market reaction to restatement announcements. We find that, on average, the 403 firms in our sample experience an economically and statistically significant negative stock price reaction over a 2-day window of approximately 9 percent (median −5 percent).

We conjecture that restatements involving fraud and externally identified restatements are associated with more negative returns as they call into question management competence and integrity, which likely increases risk/uncertainty and may well decrease future company prospects. We find fraud and restatements attributed to the auditor consistently associated with more negative reactions.

However, we find no incremental negative effect for restatements attributed to the SEC; and, those attributed to the company generally are associated with more negative returns (all relative to unattributed restatements). Additional analysis of the content of restatement announcements suggests that auditor attribution proxies for materiality when the initial announcement fails to quantify the misstatements. This provides evidence that the content of the restatement announcement affects returns, with a penalty imposed for missing information.

Using a measure of analyst forecast dispersion as an alternative measure of increased uncertainty, we document a significant increase in the dispersion at the time of the restatement announcement (for a reduced sample), and identify a negative correlation between the change and market reactions. A similar analysis of changes in bid–ask spreads yields no significant results.

We also conjecture that restatements with more material revisions of future performance expectations (restatements that affect core earnings, with more negative changes in net income, affect more years and more accounts) are also associated with more negative reactions. We find this to be so for more negative changes in previously reported income and restatements affecting more accounts. We also report an incrementally negative return when restatements change prior reports of net income to a loss. Extending this analysis on a reduced sample with analyst forecasts, we document a significant downward revision in earnings forecasts following restatements and find a relationship between more negative revisions and more negative returns.

Overall, our results indicate that characteristics of the restatement, in addition to the fact of the restatement, are critical in determining the market response. This distinction generally has not been made in comments by the SEC or in coverage of restatements by the business press. The severe market reactions commonly remarked upon are due primarily to a subset of restatements that involved fraudulent activity and have large, negative income effects. In particular, one of the issues targeted by the SEC—income-increasing, non-core IPR&D restatements—appear to induce little market response. Our results suggest a greater investor concern over restatements that carry negative implications for management integrity than those due to more technical accounting issues.

Limitations of our study include potential biases related to the relative size of restating companies in our sample, which are smaller than the average Compustat company. Also, missing data eliminates restating companies from our sample that, on average, have more negative announcement reactions and are somewhat smaller than those with complete data.

Future research might investigate the relationship between post-announcement returns and subsequent releases of additional information. The relationship between who initiated the restatement and characteristics of restating companies represents another potential area for investigation. Corporate governance structure and auditor tenure, for example, may play a role in explaining why companies bring some restatements to light and auditors others. A more complete understanding of these relationships could provide evidence on monitoring mechanisms and costs.

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