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After a Restatement: Long-Run Market and Investor Response[*]

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Abstract

We examine returns in a long window surrounding earnings restatements. We find statistically significant positive returns in the six months after negative restatement announcements, especially in the 3-6 month window using several alternate measures. Results suggest these returns are not a result of traditional risk factors or a permanent shift in cost of capital. We relate returns to analyst forecast variables to examine the driver of positive medium-term returns. Analyst forecast dispersion increases around the announcement and decreases 3-6 months after, consistent with an initial increase and subsequent decrease in firm-specific uncertainty and information risk, which would lead to positive returns in the 3-6 month window after the announcement. Analyst forecast errors do not become overly negative or subsequently drift upwards, inconsistent with an investor overreaction and correction explanation for the pattern in post-announcement returns. Finally, we examine changes in institutional ownership. Transient and quasi-indexing institutions sell before the announcement but buy after, and the event-time trading of dedicated (transient and quasi-indexing) institutions has some positive (negative) predictive ability for future returns. Together, results suggest transient and quasi-indexing institutions are less willing to tolerate restatement-period increases in information risk and uncertainty, helping drive a strong negative reaction and later recovery.

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Introduction

A large literature has focused on investor and market anticipation of accounting restatements, and their immediate reaction to restatement announcements. Though Palmrose, Richardson, and Scholz (2004) find a -9.2% reaction to a restatement on the day of and day after the restatement and Hribar, Jenkins and Wang (2004) show that some institutional investors are able to anticipate restatements up to a quarter prior to the initial restatement announcement, the literature has largely neglected the market's response in the longer period (e.g., one year) following a restatement announcement.[1]

Restatements often call into question the credibility of a firm's prior financial statements, and are often accompanied by allegations of securities fraud. Restatements not only cause investors and analysts to reassess the firm's future earnings prospects but also to lose confidence in the quality of reported earnings. In addition, firms and managers face real consequences to restatement announcements. Hribar and Jenkins (2004) find that restatements lead to decreases in expected future earnings. Srinivasan (2005) shows that after a restatement board members face higher rates of turnover. Desai, Hogan and Wilkins (2006) show that managers also face higher turnover and poorer job prospects after a restatement.[2] Yet, prior work has not looked at longer-term returns following these announcements (in particular, in the year following the announcement). This is surprising since the market response during this window is relevant to understanding restatements, changes in information risk over time, and to understanding market and investor valuation of a firm's information environment.

Given the short-run effects of a restatement on liquidity, cost of capital, and firm value, as well as the recent increase in restatements (Wu, 2005, Scholz, 2008, among others), managers and investors need to understand the long-run implications of a restatement announcement on firm value. Researchers evaluating the impacts of restatements must also account for any systematic non-zero market reactions post-announcement. In this paper, we examine the effect of restatements on returns over a long horizon – specifically, in the year following the restatement. Examining returns over a larger window allows for a clearer perspective on whether stocks

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[1] While Hribar and Jenkins (2004) examine potential change in a firm's cost of capital after a restatement, they focus on earnings-forecast-based measures of cost of capital, and do not examine returns or investor reactions following the restatement. Hribar, Jenkins and Wang (2004) examine institutional investor reactions to restatements from the GAO database, but pool all restatements regardless of cause or whether they are positive or negative news events. We focus on those restatements which are most likely to have negative implications for a firm – i.e. negative restatements, not caused simply by accounting rule changes.

[2] See also Anderson and Yohn (2002), Livnat and Tan (2004), Owers, Lin, and Rogers (2002), and Hirschey, Palmrose, and Scholz (2003), among others.

"recover" from negative restatement announcements or, alternatively, exhibit negative price drift (or no drift at all). More generally, restatement announcements present a discrete event in which information risk may change, given that the public information put forth by the firm is now in question. This setting allows us to examine the pricing effects, and investor responses, to changes in information risk. We directly examine analyst forecast properties around the restatement, as well as the trading of different categories of institutional investors.

Consistent with prior literature, we find significantly negative abnormal returns in the month preceding a negative earnings restatement announcement and in the 3-day announcement window. Examining long-run returns, i.e., returns in the year following the restatement announcement, we find positive returns in the one through six months following the announcement. While the positive returns are not of the same magnitude as the pre-event and event-period negative returns, they are still large, amounting to roughly 5-10% over the three-months in the 3-6 month window after the announcement. Abnormal returns remain significantly positive over the 3-6 month window using the Fama-French 3-factor model, the Carhart 4-factor model, the characteristic-based approach of Daniel, Grinblatt, Titman, and Wermers (1997) or a matched-firm approach. These results show that prices rebound from the market's initial reaction. A manager who judged the cost of a restatement by the restatement-period return alone would miss an important piece of the evaluation, and an investor evaluating a restatement firm should be aware of the very real possibility of future positive abnormal returns.

We further link our restatement data to analyst forecast data in order to examine whether our documented result indicates investor mis-reaction or an increase in information risk. We find little difference in forecast pessimism between the restatement firms and a comparison sample, i.e. analyst forecasts do not become overly negative, nor do they drift upwards 3-6 months after the restatement. We do find significant increases in restatement firm analyst forecast dispersion around the restatement, and subsequent decreases in dispersion 3-6 months after the restatement, even when compared with the benchmark sample. Thus, our analyst forecast results suggest that the return pattern, i.e. the strongly negative response to the restatement followed by significantly positive abnormal returns 3-6 months after the restatement, is likely driven by changes in information risk and uncertainty, rather than by investor overreaction to the negative news.[3] Directly linking post-restatement returns in the 3-6 month window to concurrent changes in forecast dispersion and level, we find that forecast dispersion explains a statistically and

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[3] These results are qualitatively consistent with Wilson (2008) who shows that earnings response coefficients (a proxy for earnings informativeness) decline after a restatement, but return to pre-restatement levels within a year of the restatement.

economically significant portion of the positive returns. While there is a significant correlation between returns and changes in forecast levels, this correlation does not explain the positive abnormal returns experienced by restatements firms. Cross-sectional variation in our primary return results also supports the information risk and uncertainty explanation for our pattern: the pattern is strongest among growth stocks, for which earnings information is more important, and for restatements involving the SEC.

In addition to examining long run returns, we examine the trading of different type of institutions around the earnings restatement. Investors may have different reactions to the increase in information uncertainty around the time of the restatement announcement, and to the subsequent decrease. Using the institutional investor classification of Bushee (1998), we examine the responses of dedicated, transient and quasi-indexer institutions.[4] We hypothesize that institutions flee the company before/immediately after the restatement announcement when information uncertainty increases, but return several months later, as uncertainty is resolved and the information environment improves. We find that dedicated institutions, that tend to have more concentrated and longer-term holdings of stock than do other institutions, sell restating firm shares gradually over a two year period around the restatement, but sell insignificantly from quarter to quarter or when compared to trading of matched firm shares. In contrast, transient and quasi-indexing institutions sell significantly prior to the announcement but purchase significantly in the months around and after the restatement. The event-time trading of dedicated institutions is positively related to future returns, suggesting that firms they maintain holdings in are the ones that experience the most positive returns after the announcement. The event-time trading of transient and quasi-indexing institutions has weakly negative predictive ability for future returns. The significance of our return results does vary depending on the abnormal return measure used, giving some insight as to what factors might be driving the return difference. Overall, it appears that dedicated institutions, that likely have more private information, may be willing to tolerate higher information uncertainty, while transient and quasi-indexing institutions may be sacrificing positive returns due to a lower tolerance for information risk. The selling and subsequent

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[4] Ke and Petroni (2003) find that trades of institutional investors predict breaks in strings of earnings surprises, El-Gazaar (1998) shows that institutional investors are able to synthesize and trade on pre-disclosure information, Griffin (2005) provides evidence that insiders, short sellers, and managers trade significantly before a restatement, and Hribar, Jenkings, and Wang (2004) find that while more passive institutional traders reduce their (quarterly) holdings after a restatement, the more active institutions (or those with a shorter investment horizon and greater turnover) significantly reduce their holdings in the restating firm at least one quarter before the restatement. While Hribar, Jenkings, and Wang (2004) examine ownership, they do not look at either returns or ownership in the long-run after the restatement, and they do not directly connect ownership changes and returns.

purchasing by transient and quasi-indexing institutions, together with the return reversal and the direct relationship between these institutions' trading and returns, suggest that these two groups are partially responsible for the more negative market reaction initially, and the subsequent market rebound.

This paper has broad relevance across the accounting and finance literatures. Our results are important to understanding restatements, in showing that there is a systematic return pattern post-restatement that must be accounted for in measuring the full impact of a restatement. The question of how information risk impacts security prices and investor trading is of broad interest, as evidenced by the large body of current work on the topic.[5] This paper further increases our understanding of institutional investor behavior. For example, prior literature almost completely ignores quasi-indexing investors; nonetheless, because they hold almost half of all shares outstanding in restating firms, they may have a significant impact on the market, and we find that they trade actively around these restatement events.

The remainder of the paper is organized as follows. Hypotheses are developed in Section 2. Section 3 describes the data. Results for returns, analyst forecasts, and institutional investor reactions are given in Section 4, and Section 5 concludes.

2 Hypothesis Development

We seek to understand how the market responds to a restating firm *after* a restatement is announced. A restatement can increase uncertainty in publicly available information about a firm by calling into question the firm's reporting quality. While the restated data itself may indicate that the firm is of lower quality than previously thought (e.g., informing investors that earnings-per-share were \$1.11 instead of \$1.26 in the prior year), a large part of the negative response to a restatement likely results from the indirect implications for the quality of information, quality of management, and quality of internal controls. Therefore, a restatement might impact a firm for

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[5] A large body of recent empirical work suggests that information risk is a priced risk factor (e.g. Easley, Hvidkjaer and O'Hara, 2002). A large literature uses accrual quality as a proxy for information risk (Francis, LaFond, Olsson, Schipper, 2005, Lambert, Leuz, and Verrecchia, 2006, and Aboody, Hughes, and Liu, 2005, among others). However this literature has not achieved consensus on whether information risk is priced (see, for example, Cohen, 2006, Core, Guay, and Verdi, 2006 or Liu and Wysocki, 2006) and has been criticized because accrual quality may not be a satisfactory proxy for information risk. Our paper instead captures returns and trading around a discrete event which likely changes information risk.

much longer than the days immediately after it is announced (see Palmrose, Richardson, and Scholz, 2004 for a detailed examination of the 2-day window response to restatement announcements).

If a company has lost investor trust, investors may be reluctant to buy shares until the stock price is "sufficiently" low. If these doubts are not fully incorporated into price immediately, the firm's stock would experience negative price drift. Conversely, a company may take action to address the doubts and concerns a restatement raises, and investors may respond positively to these actions in the period after a restatement. If investors do not adjust initially for the potential future actions of management, or simply overreact to the negative signal, we might find an average positive price drift. A gradual reduction in uncertainty or information risk over time would similarly result in positive drift. From both an investor and manager viewpoint, it is important to understand how the market responds to a restating firm over the long run; i.e., the *total* impact of a restatement and what investors and management can expect, and possibly do, following a restatement announcement.

In the subsections that follow, we describe specific predictions for returns, analyst forecast characteristics, and the relationship between the two. We then discuss different types of institutional investors and why these particular groups might respond differently to restatements.

2.1 Post-Event Returns

We first examine returns after a restatement announcement. If investors underreact to the negative news implied by a restatement announcement, then we would expect to see continued negative abnormal returns after the announcement. If, however, investors overreact to the negative announcement, prices should correct over the long run and we should observe positive abnormal returns after the announcement.[7] In addition to possible investor mis-reaction, changes in risk that are not captured by our abnormal returns could also create abnormal returns. Easley and O'Hara (2004) develop a rational-expectations model in which information risk affects cost of capital. A clear empirical implication of their model, as they discuss, is that a firm with higher

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[7] Papers on under-reaction to accounting events like earnings surprises, analyst recommendations, or cash flow news include Bernard and Thomas (1989) and Brown and Pope (1996) or Bjerring, Lakonishok, and Vermaelen (1983) and Michaely, Thaler, and Womack (1995), as well as Cohen, Gompers, and Vuolteenaho (2002), among others. Papers that focus on over-reaction or negative serial correlation in prices include DeBondt and Thaler (1985 and 1987) as well as Lakonishok, Shleifer, and Vishny (1994) who note over-reaction to sales growth. Daniel, Hirshleifer, and Subrahmanyam (1998) create a model to explain short-term under-reaction and long-run reversal.

levels of private information and/or lower levels of public information will have higher expected abnormal returns. They further discuss how changes in information risk, for example due to firm disclosures, can impact the firm's stock returns. Kravet and Shevlin (2007) show that restatements are associated with an increase in the sensitivity of asset returns to information risk, and this increase is at least partly responsible for the negative price reaction when a restatement is announced. If this increase in priced idiosyncratic risk remains indefinitely, we should observe sustained positive abnormal returns using our standard models. However, if priced idiosyncratic risk decreases, we should observe positive abnormal returns only in the medium-term, until information risk returns to pre-restatement levels. The following table summarizes the predicted effects:

Negative Market Reaction at the Time of the Restatement Announcement	
Underreaction	*Negative* matched-firm abnormal returns *sometime in the year* following the restatement announcement, specifically while average expectations are revised downwards
Overreaction	*Positive* matched-firm abnormal returns *sometime in the year* following the restatement announcement, specifically while average expectations are revised upwards
Increase in (Priced) Information Risk/Idiosyncratic Risk	
Sustained	*Positive* matched-firm abnormal returns *during the entire year* following the restatement announcement
Temporary	*Positive* matched-firm abnormal returns *sometime in the year* following the restatement announcement, specifically while information risk/idiosyncratic risk returns to normal

Because these conditional predictions vary, we state our first hypothesis in the null form:

H10: Post-announcement abnormal returns are zero.

Section 3.2 describes the methods used to calculate abnormal returns. The primary methods are a matched-firm abnormal return and portfolio-based Fama-French/Carhart 4-factor abnormal returns, however we also use characteristic-adjusted returns and firm-specific 4-factor abnormal returns.

Among the four possibilities, the return predictions for market underreaction and sustained increase in information risk are unique. Negative returns after the restatement announcement indicate that the market underreacted to the initial announcement, or failed to anticipate further negative news related to the announcement. If returns remain significantly positive for a period of years after the restatement, this indicates a permanent shift in the firm's cost of capital. Note that the return predictions for market overreaction and temporary change in information risk are

identical. Thus, if we observe a positive matched-firm abnormal return sometime in, and not throughout, the year following the restatement announcement, we will need to conduct additional tests to relate these returns directly to overreaction or information risk.

If investors overreact, firms face a higher penalty at the time of announcement than warranted, but the market corrects as time goes on. If investors overreact, they would have overly negative expectations for the firm following the restatement announcement. Analyst earnings forecasts can be used as a proxy for investor expectations, thus an overreaction should reveal itself in two ways: analyst earnings forecasts should drop significantly around the earnings restatement, and the level of earnings forecasts after the restatement announcement should be significantly below the final realization of earnings. The correction of this overreaction would reveal itself in expectations becoming less negative over the course of the following year. Given the previously documented "walk-down" in analyst forecasts (Richardson, Teoh and Wysocki, 2004), we may not see an actual increase in analyst forecasts, but we should see less of a decrease than expected. Thus to test the investor overreaction explanation, we examine analyst forecast levels, and we compare these levels to those for the matched sample of firms as described in Section 3.2. We develop the following prediction, stated as H2a:

> **H2a: If medium-term positive post-restatement-announcement returns are driven by investor overreaction, we will see overly negative earnings forecasts immediately after the restatement announcement, which subsequently correct.**

Alternatively, the initial negative response may be due to higher information risk or firm-specific uncertainty associated with the restatement, which reduces over the course of the following months. A sustained higher level of risk would lead to higher returns in the long run, to compensate investors for assuming the risk. However, a shorter-term increase would result in positive returns only while information risk is higher, and while it decreases to normal levels.

An increase in firm-specific risk or uncertainty could take a variety of forms, which are likely to vary across firms. However, regardless of the form of uncertainty, analyst forecast dispersion will provide a summary statistic for firm-specific uncertainty. In particular, if uncertainty about the firm's future performance increases, forecasts are likely to fall in a larger range and dispersion will increase. Even if fundamental uncertainty remains the same, if information risk increases, analyst forecast dispersion will increase as well. This is because analysts generate their forecasts based on both public and private information. If information risk, which pertains to the reliability of public information, increases then analysts will rely more on their private

information. The analysts' lower reliance on the common public signal will by definition increase forecast dispersion. Zhang (2006), in a paper focusing on the pricing of information risk, also uses forecast dispersion to proxy for information uncertainty. Connecting this to post-announcement returns, if positive post-announcement returns are driven by an announcement-period increase in uncertainty and/or information risk which subsequently decreases, we should find an increase in forecast dispersion around the restatement announcement, with a subsequent decrease over the following year. While to the best of our knowledge there are no particular time patterns in forecast dispersion, we again compare with the matched sample of firms to control for any potential time patterns. Thus, we develop a second prediction, stated as H2b:

> **H2b: If medium-term positive post-restatement-announcement returns are driven by changes in information risk, or firm-specific uncertainty, we will see higher forecast dispersion immediately after the restatement announcement, which subsequently decreases.**

Finally, we can directly relate changes in forecast optimism and forecast dispersion, our proxies for market reaction and information uncertainty respectively, to returns. In particular, if positive post-announcement returns are driven by a correction of negative overreaction, then the concurrent change in earnings forecast optimism should be related to at least a portion of the positive returns. Similarly, if positive post-announcement returns are driven by information uncertainty, the concurrent decrease in forecast dispersion should be related to the positive returns. Thus, we develop a third prediction:

> **H2c: If medium-term positive post-restatement-announcement returns are driven by investor overreaction that corrects (firm-specific uncertainty which decreases), the concurrent increase in forecast optimism (decrease in forecast dispersion) will be related to the positive returns.**

It is important to keep in mind that just as with any other factor which affects cost of capital, *changes* in the level of risk affect returns. Kravat and Shevlin, 2007 show that loadings on an information risk factor increase after a restatement and this change explains a portion of the negative returns around a restatement. Similarly, a decrease in information risk after the announcement would drive positive returns over the corresponding window. Note also that the investor overreaction and increased risk/uncertainty explanations for any positive returns are not mutually exclusive. It could be that investors overreact and, in addition, firms experience an increase in information uncertainty. These analyst-based tests are designed to test each

explanation individually, and should identify if there is support for both explanations or if one particular pattern, average overreaction or increased dispersion, dominates.

2.2 Institutional Investor Response

There are several reasons to examine the institutional investor response surrounding restatements. Despite the growing literature on the relationship between information risk and returns, we do not know how institutions view this risk. Restatements provide an ideal setting to examine this question given that restatements are discrete events that result in an increase in the uncertainty of firm information. Institutional investors vary in their investing strategies and behaviors, as documented by prior literature. Employing the widely used "transient," "dedicated," and "quasi-indexer" categories of Bushee (1998),[9] we might expect very different responses to restatements, and particularly to the increase in information risk. We can also examine what types of returns institutions may earn (or sacrifice) because of their response around these events.

Institution categorizations are determined based on factor analysis and cluster analysis. Institutions are clustered based on portfolio diversification, turnover, and sensitivity of changes in ownership to earnings information. As Bushee (1998) describes, "'transient' institutions have the highest turnover, highest use of momentum strategies, and relatively high diversification. 'Dedicated' institutions have high concentration, low turnover, and almost no trading sensitivity to current earnings. 'Quasi-indexers' exhibit high diversification and low turnover, consistent with index-type, buy-and-hold behavior. Quasi-indexers also exhibit contrarian-trading tendencies, which are consistent with most buy-and-hold value strategies."

The difference in portfolio concentration and turnover may have a significant impact on how these institutional investors respond to a restatement. Dedicated investors, owning shares in fewer firms and holding them for longer periods of time, would likely have the most private information. Thus the increase in uncertainty of publicly available information should impact a dedicated investor less. In addition, dedicated investors might be more willing and able to play a corporate governance-monitoring role through the period of the restatement. If they are willing to accept the higher risk and responsibility associated with remaining with the firm, they may earn a

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[9] The transient/dedicated/quasi-indexing institutional classification, originally developed by Brian Bushee, is widely used in the accounting literature. See papers at http://credit.wharton.upenn.edu/faculty/bushee/Research.html for details (papers that use these data include Bushee and Noe, 2000, and Bushee, 2001, among others).

return premium for doing so. But, dedicated investors may be less willing to accept additional risk related to the restatement, given their less diversified portfolio.

Transient institutions trade more actively, holding securities for a shorter period of time. Bushee (2001) shows that transient institutions overweight short-term earnings information and underweight long-term information, thus sacrificing potential returns. Similarly, transient institutions may overweight the current negative signal of the restatement announcement, and underweight the potential improvements the firm may make following the restatement. If so, transient institutions would sell shares more strongly before and upon the announcement of a restatement. They may, however, repurchase shares if the firm later improves.[10]

Quasi-indexer institutions tend to hold securities for a long period of time, with an average holding period between that of transient and that of dedicated institutions. At the same time, they hold a much larger number of stocks than either of the other two groups. Because of this, they are likely to engage in less private information acquisition on each firm, and have a weaker relationship with firm management, than dedicated investors. As such, the information uncertainty or higher information risk would have a larger impact on quasi-indexer institutions than on dedicated institutions. It is important to note that there is very little prior literature on the trading strategies or behaviors of quasi-indexer institutions so it is more difficult to make predictions for their behavior.

Ultimately, the exact trading behavior is an empirical question, but clearly the dimensions on which these three groups are defined are likely to lead to different trading behavior around a restatement announcement. We attempt to answer 1) How do different types of institutions trade before and after a restatement announcement?; and 2) What types of returns do these institutions earn, given the strategies they display? In particular, if transient institutions flee the restating firm and then later repurchase shares, while dedicated institutions hold the firm's shares throughout the restatement period, do dedicated institutions earn a premium for doing so?

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10 Prior literature supports these arguments. Burns, Kedia, and Lipson (2006) find a positive relation between ownership by transient institutions and the occurrence and magnitude of financial restatements. Their results suggest that the presence of transient institutional investors creates strong incentives to manage earnings. Bushee and Noe (2000) indicate that firms with higher disclosure quality, as measured by the Association for Investment Management and Research (AIMR) ratings of disclosure, have greater institutional ownership, and that improvements in disclosure quality are shown to produce contemporaneous increases in ownership primarily by transient-type institutions. Thus even though transient institutions may indirectly create pressure on firms to manage earnings, transient institutions seem to particularly value high quality public information when making their investment decisions.

3 Data

3.1 Restatements Data

As a pre-test, we first conducted searches on the full set of sources available through Factiva for 40 known restatements identified by the GAO and Audit Analytics databases. The first announcement of the restatement (or potential restatement) was almost always a press release from the company in either PR Newswire or BusinessWire, but in a few cases the press release or announcement appeared in Dow Jones News Service and not in the other newswires. Based on our pre-test, we construct our primary database to include hand-collected restatements data from PR Newswire, Business Wire, and Dow Jones News Service articles. We search for articles with variants of the root words "restate," "revise," or "amend" in the headline or lead paragraph as well as in the same paragraph as variants of the root words "income," "profit," "earnings," "revenues," or "sales," for NYSE firms from 1993 through 2002.[13]   This yields 5295 press releases from the two newswires and 3638 articles from Dow Jones News Service (which often provided non-NYSE articles in the original search). All articles on NYSE firms were read in their entirety. All press releases and similar articles that contained a true restatement announcement (as opposed to past financial results restated in the article for comparison purposes) were coded for a collection of variables, including the cause for the restatement and certain keywords. See the Appendix for an example of a restatement announcement press releases.

We include restatement announcements that were made simultaneously with earnings announcements or other company announcements. Dow Jones original content articles and summaries of press releases clearly made elsewhere are excluded, with only press release or "press release-style" articles included. If press releases are made on different days as new information about a restatement becomes available, then the different day's press releases are coded separately.[14]

We identify a total of 534 restatement announcements.[15] 113 of the announcements are

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[13] We hand collect our data because many restatements in GAO are inconsequential and many of the restatements that we locate are missing in Audit Analytics. Furthermore, while we limit our sample to NYSE firms, doing so is likely to mitigate any results we find since NYSE firms are larger, and more stable. Finally, we end our sample in 2002 to avoid the effects of Sarbanes Oxley.

[14] Results are robust to including only the first press release pertaining to a given restatement, and estimates of statistical significance throughout the paper allow for within-firm correlations.

[15] To compare these numbers with publicly available restatement databases, we examine the number of restatements for NYSE companies identified in the GAO database and Audit Analytics. Audit Analytics identifies 618 restatements for NYSE companies for the period from February 1, 2001 through the end of 2005, 65 of which occur

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combined with earnings announcements and the rest, 421, are separate. 419 of the 534 announcements include some reference to restatement or accounting problems in the title itself, with 22% of the sample lacking any reference to the restatement in the headline. Examining only restatements with announcements featured in Dow Jones or newswires is likely to capture only significant restatement events, as is our goal. This idea is consistent with a recent paper: Swanson, Tse, and Wynalda (2008) find that the significance of returns around a restatement is related to the prominence with which the restatement announcement is featured in the press.

Table 1 Panel A shows restatements by year and stated cause for the full sample. Possible causes include (i) new accounting standard or interpretation, (ii) voluntary change in accounting method, (iii) error, (iv) fraud, irregularity, investigation, or review, (v) change in estimates, (vi) no cause or explanation provided, and (vii) other.[16] Looking at the totals by year, one can see that the number of restatements climbs during the sample period beginning in 1995 (1993 and 1994 have a large number of restatements tied to SFAS 106 and SFAS 109).[17] Another trend is noticeable: The percentage of articles mentioning fraud, irregularity, or an investigation as causes increases dramatically from between 2 and 8% in the early period (1993-1996) to between 7 and 32% in the late period (post-1996).

We also categorize restatements as negative, positive, or mixed. A restatement is categorized as negative if the effect of the restatement on the financial statements is negative – for example, the restatement decreases net income or revenue for the restated periods. If we categorize the restatement as mixed, either several changes occur, such that the "negative" and "positive" changes offset each other, or there is not enough information provided to determine the direction of the news. An example of the former case would be a movement of income across periods with

in the last 11 months of 2001 and throughout 2002. In comparison to these 65 restatements, we find 187 restatement announcements pertaining to 147 unique firms during the last 11 months of 2001 and throughout 2002. The GAO database identifies 272 NYSE restatements for 1997 through June 2002. We find 347 restatement announcements pertaining to 265 unique firms for 1997 through June 2002. Thus, it appears that we identify over twice as many restatements as the Audit Analytics database and roughly the same number as the GAO database. However, while we identify roughly the same number as the GAO database, we appear to have fewer technical restatements, and more non-technical restatements.

[16] Many of the restatements categorized under "other" are related to litigation settlements or court rulings. At least one is the result of a subsidiary restating and at least one is because a certain stock was reclassified as preferred stock. Another example is a restatement due to an FDA ruling that affected previously reported revenues.

[17] The FASB's Statement of Accounting Standard (SFAS) No. 106, implemented in December 1992 for most firms, requires all companies providing post-employment benefits to recognize the future costs of benefits in advance. Under SFAS 106, companies need to disclose the net periodic cost's elements, the assumptions employed, a sketch of the substantive plan, the plan assets' types and amounts, the impact of the increase in the assumed health care trend rates on the accumulated post-retirement benefit obligation and service cost. Under SFAS 109, a current or deferred tax liability or asset is recognized for the current or deferred tax consequences of all events that have been recognized in the financial statements or tax returns, measured on the basis of enacted tax law.

total income remaining the same. As can be seen in Table 2, 58.8% of the restatements are unambiguously negative, and the event period return for "negative" restatements is -3.08% over the three-day window, significant at the 1% level. While the return to "positive" restatements is insignificantly positive (1.22%, $t = 1.17$), it is significantly higher than the returns around both "negative" and "mixed" restatements ($t = $ -3.65 and -1.64 respectively), significant at the respective 1% and 10% levels. In the remainder of the paper we focus on negative restatements.[18]

We make two additional restrictions to the dataset. First, we exclude restatements that are driven by changes in accounting rules or interpretations. These restatements are limited in scope to the implementation of the particular new accounting policy. Restatements driven by a new accounting rule are unlikely to increase information uncertainty or change perceptions of firm management by the same degree as negative restatements with non rule-change causes. For example, Srinivasan (2005) finds higher turnover for audit committee members of negative restatement firms than for control firms, but not for those of positive restatement firms or "technical restatement" firms whose restatements were driven by changes in accounting rules or interpretations. For our data, there are 33 negative restatements in the rule-change category, with an insignificant average event period (-1, 1) return of -0.82%, compared to an average event-period return of -3.08% for the other 281 negative restatements. Finally, we require that the security of the restatement firm is NYSE common stock with active trading in the window around the earnings announcement. We drop stocks that had fewer than 0.26% of shares outstanding traded in the three-day window around the restatement announcement, with the cutoff chosen such that we exclude the 10% with the lowest trading volume in the three-day window. This restriction serves two purposes: It ensures that the securities are sufficiently liquid for the returns values to be meaningful and ensures that the market perceives the restatement announcement to be an informative event.

In Table 1 Panel B, we show causes for the primary sample; negative non-technical restatements with active common stock trading around the announcement. The distribution of causes for negative restatements differs from the distribution for all restatements as the categories

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[18] Given the nature of accrual accounting, a reduction in reported past performance may translate into an increase for the future. For example, revenue that was not earned in the previous year as was previously reported, will now be reported in the future when the earning process is complete. Just as with any earnings surprise, lower earnings than expected usually has a negative implication for the future of the firm, since the lower earnings is more generally informative about the past and current state of the firm and their business. However, given the possibility of a shift of income from past periods to future periods, and the possibility that markets fail to adjust their expectations for this shift, we conduct additional untabulated tests to determine if post-restatement-announcement positive returns are concentrated around future quarterly or annual earnings announcement dates. We find no evidence that returns are concentrated around these dates.

of "Error," "Voluntary Change in Accounting Method," "Fraud, Irregularity, Investigation or Review" and "Other" tend to have more negative restatements than other categories.[19]

Finally, Table 3 presents descriptive statistics for the 238 restatements in the main sample. The table presents firm size (measured as total assets), sales, cash flow, net income, book-to-market ratio and price-to-earnings ratio. The table also presents the same statistics for all NYSE common stock firms for the year 1998, the middle year in our sample period, as a benchmark. The restatement firms are smaller than the average NYSE firm, with average size (total assets) of 7,748 million dollars for the restatement firms comparing to 27,250 for the NYSE firms. However median size differs by less: roughly 50%. Similarly, sales, cash flow and net income are lower for the restatement firms. Proportional to total assets, the restatement firms produce a higher level of sales and lower net income. While the restatement firms are somewhat smaller from the average NYSE firm, they are of a significant size and exhibit fairly standard valuation ratios.

3.2 Market Reaction Data

We match the restatements data to three sets of market reaction data. First, we examine returns. Second, we link restatements data to analyst earnings forecasts. Third, we examine changes in institutional ownership in the restating firm. We obtain raw returns and delisting data from CRSP. For our primary sample of 238 restatements, twenty-six firms delist in the first year after the restatement. Eleven of these delist due to mergers while fifteen are simply dropped. For securities that delist during our sample period, we use CRSP delisting returns when available (delisting returns are available for 22 of the 26 delistings, and average -0.14) and substitute a return of -0.3 when the CRSP delisting return is unavailable (Shumway, 1997 and Shumway and Warther,1999).[20] As a robustness check we substitute the worst-case return of -1 when the CRSP

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[19] Because we will be considering return reactions around restatement announcements, and particularly because most firms have December fiscal year-ends, we check whether restatement announcements are clustered in a particular month. We find no strong pattern. While 26 of the 238 announcements fall in February, 31 fall in November, 32 in August, and 28 fall in March. Overall, there is no obvious pattern to when announcements occur so this possibility is unlikely to have any impact on our return results.

[20] Shumway (1997) and Shumway and Warther (1999) show a "delisting bias" that occurs if missing CRSP delisting returns are treated as 0. This bias has arguably been reduced due to subsequent projects by CRSP to add to historical delisting data (CRSP (2001)), reducing the number of missing values. By substituting -0.3 or -1 as the most conservative value for missing delisting returns, we address the potential bias that would result from ignoring the missing delisting returns. See also Beaver, McNichols and Price III (2007) who show that tests of market efficiency are sensitive to the inclusion of delisting firm-years.

delisting return is unavailable, and all results are similar. To calculate abnormal returns, as described below, we obtain market return data from CRSP, and market, size, book-to-market, and momentum factor returns from Ken French's data library. We use CRSP and Compustat data, and build upon return calculation programs available through Eventus and through the Wharton Research Data Services (WRDS) SAS sample program library, to determine firm characteristics and calculate daily DGTW benchmark portfolio returns and matched-firm returns.

We use two primary abnormal return methods. First, controlling for pre-restatement characteristics (size, book-to-market, and return momentum), we calculate matched-firm abnormal returns. We follow Daniel, Grinblatt, Titman, and Wermers, 1997 (DGTW) to assign securities annually to 25 portfolios based on five groups of firm size and book-to-market ratio. The full DGTW method places securities into 125 portfolios, using prior return momentum as the third characteristic. However this momentum characteristic may not capture the full extent of negative pre-restatement returns, both because the characteristic portfolios are constructed once per year and restatement firms may experience unusually negative returns. Thus, for each firm in our restatement sample, we take the set of common stock in the same size and book-to-market portfolio and calculate returns for the window (-252, -22) relative to the restatement firm's announcement date. We match within size/book-to-market portfolios based on these returns. We eliminate the worst 1% of matches, as in some cases even the nearest return match still differs significantly (for example for one firm the nearest match has returns that differ by over 80%).[21] Restatement firm abnormal returns are taken as the difference between the restatement firm's returns and the matched firm's returns.

Second, we construct calendar time portfolios and conduct a Fama-French 4-factor abnormal return analysis on these portfolio returns. This method controls for *realized* post-event risk factor loadings, rather than pre-event characteristics or factor loadings. To construct the portfolios we add or remove stocks on a daily basis based on whether they have a recent restatement announcement. For example, to capture returns occurring 3-6 months after a restatement announcement is made, we create a portfolio which purchases securities three months after a restatement announcement is made, and then sells the securities at the end of the sixth month after the announcement was made. We value-weight the portfolio for the primary results presented in the paper.[22] Once the portfolios are constructed, daily portfolio returns are regressed on the Fama-French 4-factors of market, size, book-to-market and momentum, to determine the

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[21] Alternatively, we eliminate the worst 5% of matches and results are similar.
[22] Alternatively, we construct equally-weighted portfolios and results are similar.

portion of the portfolio raw returns attributable to each risk factor. We estimate the following equation:

$$R_{it} - Rf_t = \alpha_i + \beta 1_i(Rm_t - Rf_t) + \beta 2_i SML_t + \beta 3_i HML_t + \beta 4_i MOM_t + \varepsilon_{it}, \qquad (1)$$

where R_{it} is the return of portfolio i on day t, Rm_t is the return of the market portfolio on day t, Rf_t is the risk-free rate on day t, and *SML*, *HML*, and *MOM* are the size, book-to-market and momentum factors respectively. The estimated values of β capture the realized risk factor loadings – the effect that the given risk factor has on the post-restatement firm. The estimated value of α_i captures the remaining abnormal return.

Two additional abnormal return tests are used for robustness tests. Results are discussed briefly. First, we calculate characteristic-adjusted returns using the exact DGTW method, i.e. matching each restatement firm to one of 125 portfolios based on size, book-to-market and momentum. Second, we calculate firm-specific four factor loadings using up to five years of data ending one month before the restatement announcement (trading day -22), and use these factor loading estimates to calculate abnormal returns.

To conduct the tests for investor overreaction and increased firm-specific uncertainty described in Section 2.2, we link the restatement and matched firms to analyst forecast data, for forecasts of annual earnings. We use IBES Summary analyst forecast data files as we are interested in the longer-term time-trend in forecasts, rather than any specific detailed data. We focus on forecasts six months before and after the restatement announcement date, all pertaining to the same fiscal year, specifically pertaining to the first annual earnings announcement expected at least six months after the restatement announcement date. This ensures that all forecasts have similar horizons. Because there are general time-trends in forecasts, we use the matched sample (matched on size, book-to-market and prior returns as described above) as a control for general time trends. To capture analyst (and thus market) optimism or pessimism about the firm, we use normalized forecast mean error: average analyst forecast in a given month, minus the actual realized value of earnings for the corresponding period. We normalize by share price six months before the restatement announcement so that the normalizing price is not affected by any of the returns patterns of interest or by the restatement announcement. We then focus on "abnormal" forecast error, restatement firm normalized error minus matched firm normalized error. To capture uncertainty about the firm we use the abnormal standard deviation of analyst forecasts, also normalized by share price six months prior to the restatement announcement. Zhang (2006) also uses standard deviation of analyst forecasts normalized by

prior stock price to proxy for information uncertainty.

Finally, to determine changes in institutional ownership, we begin with data from Thompson Financial's CDA/Spectrum database. All institutional investment managers managing more than $100 million in equity must report their holdings quarterly, for all holdings of at least 10,000 shares or $200,000 in market value, in Form 13f. Occasionally, an institution will fail to make a given quarterly report. We make adjustments for institutions that fail to report in a given quarter by averaging the institution's adjacent holdings. We match the holdings data from 13f with data which classifies institutions into the categories of "transient", "dedicated" and "quasi-indexer," based on their portfolio holdings and trading behavior, calculated using the cluster and factor-analysis of prior-calendar-year holdings, as described in Bushee (1998).[23] Results are similar if we use current year definitions, as categories are highly persistent. We measure institutional holding for each firm-quarter for four groups of institutions: all institutions regardless of classification, transient institutions, dedicated institutions and quasi-indexer institutions.[24] We determine percentage of shares held by dividing the reported share holdings by shares outstanding determined using both 13f and CRSP data. We then focus on changes in percentage of shares held by each group, as a measure of each group's net trading over the quarter.[25]

4 Results

4.1 Returns

We begin by examining raw returns following restatement announcements. Figure 1 shows mean and median cumulative raw returns for a year prior to and a year following the restatement announcement, relative to day 0. Beginning roughly seven months before the restatement announcement, firms begin to experience negative raw returns on average. Average returns continue to be negative for at least one month after the restatement announcement, with cumulative post-announcement returns remaining negative for roughly 3-4 months. Median

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[23] We thank Brian Bushee for providing the institution classification data.

[24] Note that "all institutions" may be more than the sum of the three categories, as some institutions are not classified due to limited data.

[25] It is important to remember one limitation of this data: we capture the net change across all institutions in a given category over a full quarter. If net ownership decreases, it could be that one institutional investor bought shares, while several others sold a larger number of shares, or it could be that several institutions bought mid-quarter but sold a larger amount later in the quarter. We are unable to determine within-quarter trading. However, we can still learn a large amount from quarterly ownership data and discuss our results and their implications in section 4.3.

returns display a similar, but dampened, pattern. Both mean and median returns are negative in the months preceding the restatement; however, the negative returns appear skewed. Median cumulative returns over the year before the restatement are about zero, indicating that the restatements are not strongly anticipated for all firms. Additionally, both mean and median returns begin to increase starting 1-2 months after the restatement announcement and continue to be positive for at least a year.[26] On average, it takes approximately 1 year for stock prices to return to the level they were roughly one to two months preceding the restatement announcement. Median prices recover much sooner, reaching the prior-year peak roughly six months after the restatement is announced. In untabulated analyses, we examine changes in market value of equity, which yields inferences similar to those made using cumulative returns.

Table 4, panel A, shows cumulative raw returns for several windows surrounding the restatement announcement, with the average taken across restatement announcement events. While, the cumulative returns are significantly negative in both the month-long trading period leading up to the restatement anouncement, as well as the 3-day window around the announcement: -4.80% and -3.95% respectively, our focus is on returns for one year following the restatement announcement. Returns beginning approximately 60 trading days after the restatement announcement are significantly positive. Specifically, in days (64, 126), returns are a statistically significant 4.93%. We do not find significance in the 1 − 3 month period or 6-12 month period following the restatement announcement.

Table 4, panel B, and Table 5, present results for abnormal returns as described in Section 3.2, to test hypothesis H10. Table 4, Panel B, shows results for matched-firm abnormal returns. As can be seen from Panel B, the matched-firm abnormal returns follow a similar pattern to the raw returns. In particular, in the month preceding the restatement, returns are -4.33% (t = -2.97) and in the window of the announcement, the average abnormal return is -3.70% (t = -3.64). But we see a significantly positive return in months 3-6. Specifically, average abnormal returns during the (64, 126) day window are 4.50%, with a t-statistic of 1.98. Standard DGTW characteristic-adjusted returns yield similar results, with slightly more positive returns in the (22, 63) and (64, 126) periods (2.56%, t=1.61, significant at the 11% level, and 4.96%, t=2.60,

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[26] These results are somewhat in contrast to those found in Scholz, 2008, who reports negative market adjusted returns in most years over the (2, 252) window following restatements. This difference may occur for several reasons, including the difference in sample period and restatement types included, the return window studied, and the sample of stocks. We use NYSE firms that tend to be larger, traded more frequently and have more information disseminated about them, relative to the universe of stocks. Thus firms in our sample may recover more quickly and more strongly from a restatement announcement. The returns we find for our sample are also somewhat different than the returns Desai et. al. 2006 find for their very specific set of firms. They find extended poor post-restatement performance for those firms that are heavily shorted in advance of the restatement.

respectively). Firm-specific 4-factor abnormal returns, calculated from pre-announcement factor loading estimates, also yield similar results, with abnormal returns of 4.3% in the (64, 126) period, t=1.87. We also examine firm-specific 3-factor abnormal returns (i.e., controlling for market risk, size and book-to-market but not for momentum), and find that the longer-term returns remain positive: 4.6% ($t = 2.08$) for the (64, 126) period.

Given these results, we can see that the positive raw returns in the 3-6 month post-announcement window are incremental to any returns we would expect given the characteristics and risk exposure of the firms before the restatement announcements. Nonetheless, it could still be the case that the post-announcement returns are driven by a change in risk characteristics signaled by the restatement. In order to explore this possibility, we calculate Fama-French 4-factor abnormal returns on post-announcement portfolios. If the "alpha" from the portfolio, the average return that is not explained by the risk factors, is significantly greater than zero, we conclude that the restatement announcement has a significant impact on the event firm's stock return. This analysis also provides a greater understanding of the economic magnitude of our results. Portfolios are created by purchasing a stock at the start of the first day of the given window relative to the restatement announcement date, holding the stock through the window, and selling it at the end of the last day of the window. The portfolio returns represent the return that an investor could realize if they followed this trading approach, before adjusting for transaction costs.

Table 5 presents the results. Because the portfolio returns weight events differently from a traditional event study, Panel A displays the average daily raw portfolio returns, in basis points. The pattern of returns is quite similar as the event-time raw returns shown in Table 4, with negative significant returns in the (-21, -2) and (-1, +1) windows, and positive significant returns in the (64, 126) window. Panel B displays daily portfolio returns, in basis points, net of the risk free rate, which also shows a significantly positive return in the (64, 126) window.   Panel C reports results of estimating equation (1), i.e. estimating ordinary least squares regressions with net portfolio returns as the dependent variable and $Rm_t\text{-}Rf_t$, SML, HML, and MOM as explanatory variables. The factor loadings are informative about changes in risk from before the restatement announcement to after the announcement. While the factor loadings on $Rm_t\text{-}Rf_t$, SML and HML remain similar after the restatement, the loading on MOM, the returns momentum factor, becomes significantly more negative after the restatement. The loading on MOM is -0.4585 in the (64, 128) window, but -0.1950 in the mirroring pre-restatement window (-128, -64). The two differ significantly, at the 1% level. As shown in Panel C, even after controlling for

these post-restatement factor loadings, abnormal returns are significantly positive in months 3-6 following the surprise. In particular, the alpha estimate is both statistically and economically significant at 0.1075, with $t = 2.38$, translating to returns of 7% over the three-month window.

We conduct two important robustness tests for the portfolio-based abnormal returns. First, to ensure that the portfolio return results are not driven by days on which there are only one or two stocks in the portfolio, we estimate the same regressions restricting the sample to days on which the portfolio contains three or more securities. This eliminates 653 days for the (64, 126) portfolio. Results are similar, though the returns are slightly lower, with an alpha estimate of 0.085, $t = 1.79$, translating to a return of 5.5%. (Requiring at least four securities in the portfolio results in 1,438 portfolio-days for the (64, 126) window, with an alpha estimate of 0.098, $t = 1.93$.) Second, we construct equally weighted portfolios similarly to the value-weighted portfolios. Using this method, we find an alpha estimate of 0.087, $t = 2.25$, translating into abnormal returns of 5.6% in the (64, 126) window, once controlling for the market, size, book-to-market and momentum factors.

Overall, the results from Tables 4 and 5 show clear and significant positive abnormal returns for a period after the restatement announcement. We fail to find evidence of market underreaction to the negative restatement announcement. In addition, because positive returns do not continue past six months after the restatement, we fail to find evidence of a permanent shift in priced information risk (or more generally, priced risk that is not captured by the market, size, book-to-market and momentum risk factors). However, we do find evidence consistent with both market overreaction and with a temporary increase in priced information risk.[27]

To ensure that the pattern we document is truly driven by "negative, non-rule-change" restatements, i.e. the set that we believe will be most likely to generate negative overreactions and increases in uncertainty about the firm, we examine whether we find a similar pattern among positive restatements or those that are caused directly by a change in accounting rules. We do not find a similar pattern among either of these two groups of restatements.[28]

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[27] These results contrast with returns around both dividend omissions and asset write-offs. Michaely, Thaler, and Womack (1995) show that returns remain negative for three years after dividend omissions and Bartov, Lindahl and Ricks (1998) show that returns remain negative for two years after write-offs. However, both dividend omissions and asset write-offs are likely to occur when a firm revises its expectations of future performance downwards.

[28] Positive restatements are not related to any significant return pattern – raw and market adjusted returns are roughly zero in magnitude for all periods from six months prior to the restatement to six months after. And while raw returns are significantly positive in the period of six to twelve months after the restatement, market adjusted returns are statistically insignificant. Rule change restatements are followed by positive raw and market adjusted returns beginning from day 2, which are fairly steady for the year following the restatement, and statistically significant in

Overall, our return results show significantly positive raw and abnormal returns three to six months after a restatement announcement. Thus the average impact of the restatement is not as negative as might be thought based solely on the pre- and announcement-period returns. Two remaining explanations for the results, an "overreaction", in which investors' initial reaction to a restatement is too negative and prices later re-adjust, and a short-term increase in firm-specific uncertainty and information risk that subsequently decreases, are tested in section 4.2.

4.2 Analysis of Post-Restatement Positive Returns

Section 4.1 documents strong and consistent evidence of positive returns after a restatement announcement, consistently statistically significant in the three to six month window, and ranging from 4-7% in magnitude. In this section, we conduct three sets of tests to better understand the post-announcement positive returns. First, we test the overreaction and changing firm-specific uncertainty explanations by examining analyst earnings forecasts errors and forecast dispersion, as described in Section 2.1. Second, we examine returns around subsequent earnings announcement dates, to test whether positive returns are concentrated around these information events, or whether they tend to begin after the events. Third, we examine returns for sub-samples of restatement announcements, based upon restatement, announcement, and firm characteristics. While it is difficult to specify exactly which characteristics might drive investors to overreact or which will increase uncertainty by the largest amount, it can still be informative to examine variation across these sub-samples, more than as a mere "robustness check." We discuss the specific characteristics examined, as well as the results, later in this section.

Analyst Forecast Error and Analyst Forecast Dispersion. In analyzing the relationship between analyst forecast variables and returns, we restrict the sample to the set of restatement firms with at least 2 analysts covering the firm from month -6 to month +6 relative to the restatement announcement, and at least 2 analysts covering the matched firm over the same time

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the periods (2, 21), (22, 63) and (64, 126) for raw returns and (2, 21), (22, 63) and (127, 252) for market adjusted returns. As these results are not risk-adjusted, this simply suggests that the set of firms which restated due to accounting rule changes had slightly higher expected returns than the average firm in the market. For comparison, recall that for our main sample, we find significantly negative returns around the restatement announcement, using both raw and market-adjusted measures, and significantly positive returns only in the window of (64, 126) following the restatement.

period.[29]

Figure 2 displays abnormal analyst forecast error and abnormal forecast dispersion, calculated as described in Section 3.2 for forecasts of annual earnings that are expected to be announced some time after month +6, for six months before and after the restatement announcement. Abnormal earnings forecast errors, displayed in Figure 2, are generally positive for restatement firms, both before and after the restatement announcement. The magnitude of the difference between restatement firms and the matched firms is around 0.01-0.02. This translates to a 20-40 cent earnings-per-share (EPS) difference in forecast errors for a $20 stock. However, these values are not statistically significant. Looking at the trend over time, we find a gradual decrease in relative forecast error. If analysts overreact to the restatement announcement, we would expect a dramatic decrease around the time of the restatement announcement. If analysts subsequently corrected their overreaction, we would expect an increase in the abnormal error over the months following the announcement, given that we are correcting for the general "walk-down in earnings forecasts" pattern by benchmarking with the matched sample. Instead, we see neither a particularly pronounced drop in month 0, nor an increase in the months that follow.

It is important to note that for our sample around 30% of outstanding forecasts are revised for each stock in a given month (both across the full sample of forecasts, and averaging the per-stock forecast update rate across stocks). This suggests that there is significant room for change in average forecast error and forecast dispersion if analyst views have changed. In addition, while the rate of forecast revisions is extremely similar for the restatement and matched firms in almost all months, the two rates do differ in the restatement announcement month. On average 41% of the outstanding forecasts are revised for restatement firms, while 34% of forecasts are revised for matched firms in the same month on average, with the difference of 6% being significant at the 10% level. The level of coverage also remains similar for both sets of firms: we do not find any significant increase or decrease in analyst coverage around or after the restatement announcement, for restatement firms relative to matched firms, or any clear pattern in coverage. Thus there is ample forecast updating to allow dispersion and mean to change; yet, it is unlikely that changes in analyst coverage itself will impact forecast dispersion for either group.

Looking to analyst forecast dispersion, we see that the abnormal forecast dispersion is roughly zero, or slightly negative, prior to the restatement announcement, but becomes positive

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[29] Results are almost identical if we restrict to the subsamples with 3 or 4 analysts covering the restatement and matched firm. Results are similar but somewhat weaker if we restrict to the subsample with 8 analysts covering both firms, as the sample size is reduced to only 59 restatements.

after the announcement, increasing in months 1 and 2, and then subsequently declining. The positive values of abnormal forecast dispersion in months 2 and 3 are statistically significant, as are the increases from month -1 to months 2 and 3 and the decreases from months 2 and 3 to month 5. The decreases from months 2 and 3 to month 6 are not statistically significant; however p-values are 12% and 13% respectively. Thus the pattern of forecast dispersion is consistent with an increase in firm-specific uncertainty around the restatement announcement, which subsequently declines over months 3-5. Because these are month-end analyst forecast characteristics, this maps to 3.5 to 5.5 months after the restatement date, on average.

Finally, we relate returns in the (64, 126) day window after the restatement (3-6 months) with concurrent changes in abnormal forecast error and abnormal forecast dispersion. We use the change in analyst variables from month 2 to month 6, i.e. starting on average two weeks before the 3-6 month return window and ending on average two weeks after the end of the returns window. Results are displayed in Table 6. The sample size for this test is less than half of the primary sample, due to the requirements for analyst coverage of both the restatement and matched firm. However, we find statistically significant results with this reduced sample.

Panel A presents results for raw returns, while Panel B presents results for matched-firm abnormal returns.[30] Both return measures are significantly positive over the (64, 126) window for this subsample of the data; raw returns are 6.07% while abnormal returns are 5.33%.

The second column in each panel shows the relationship between abnormal change in forecast error and returns. The estimated coefficient on abnormal change in forecast error – our proxy for average belief revision – is positive in both panels, but significant only for matched-firm abnormal returns. The third column shows the relationship between returns and abnormal change in forecast dispersion. The coefficient on change in forecast dispersion – our proxy for changes in information risk – is negative in both panels, but significant only for raw returns. Finally, when including both change in forecast error and forecast dispersion, we find a significantly positive relationship between returns and error, and a significantly negative relationship with dispersion.

These results are not consistent with analyst overreaction driving the positive post-announcement returns. If the positive return during the 3-6 month window were due to a correction of investors' overreactions, we would expect a positive relation between change in

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[30] Untabulated results using DGTW characteristic-adjusted returns and firm-specific 4-factor abnormal returns are similar.

forecast error and concurrent returns, as we find. However, we would also expect an average increase in forecast error over the window. As seen in Figure 2, we instead see a decrease in forecast error on average.

The results are consistent with changes in information risk driving post-announcement positive returns. The negative coefficient on change in forecast dispersion shows that it is the firms that experience the biggest drop in forecast dispersion that experience the most positive returns. In addition, since the average forecast dispersion decreases over the 3-6 month window, the change in forecast dispersion explains a portion of the average positive abnormal return over the period.

Overall, the pattern of forecast error and forecast dispersion around the restatement, and the direct relationship between post-restatement returns and changes in error and dispersion, suggest that the return pattern, i.e. the strongly negative response to the restatement followed by significantly positive abnormal returns 3-6 months after the restatement, is related to changes in information risk and uncertainty, rather than to investor overreaction to the negative news.

Earnings Announcements Following Restatement Events. A variety of events may occur in the six months after a restatement is announced, to reduce firm-specific uncertainty and information risk and to drive positive returns. For example, from prior literature, we know that restatement firms often make changes to their board and to management (Srinivasan, 2005, Desai et. al., 2006), and these changes could drive positive returns. Firms could make conscious changes to their internal control systems or disclosure policies and communication strategies. Or uncertainty could simply reduce with the passage of time. We do not attempt to find the specific events which drive changes in uncertainty and positive returns for each of our sample firms – in fact events could vary across firms, with one firm changing their board, another firm changing their communication strategy, and a third firm simply doing nothing. However, there is one information-related event that clearly occurs for all of our sample firms: subsequent quarterly earnings announcements. We ask two questions regarding earnings announcements: First, are the positive returns we document concentrated more strongly around subsequent earnings announcements? Second, do the positive returns begin after subsequent earnings announcements?

We examine both the first quarterly earnings announcement following the restatement announcement and the quarterly announcement occurring three to six months after the restatement announcement. For the first question, we examine returns in windows around the

earnings announcement dates, to see if positive returns are concentrated in these periods. In untabulated results, we fail to find any concentration of returns. For example, in the (-10, +10) window around earnings announcements falling within the three to six month window, we find positive returns of 1.3% on average, 30% of the return found over the (64, 126) window. However 21 trading days fall into this window, 33% of the trading days in the larger window. Similarly, for narrower windows, we find that the portion of positive return over the earnings announcement window matches the portion of trading days falling within that window.

For the second question, whether the positive returns we find begin after earnings announcements, we compare returns in the 10 trading days before subsequent earnings announcements with returns in the 10 trading days after the respective earnings announcement. In untabulated results, we fail to find evidence of the positive returns beginning only after earnings announcement dates. For example, over the window (-10, -1) relative to the earnings announcement date, the average raw return is 1.3% while the return after the earnings announcement, over the (1, 10) window, is lower, at -0.6%.

Results by Restatement and Firm Characteristics. To gain additional insight on the post-announcement returns, we examine returns for sub-samples of the primary restatement sample, based on a variety of restatement, announcement and firm characteristics. Table 7 presents the results.[31] While the table presents results for raw and matched-firm abnormal returns, we also present two additional measures of abnormal returns, DGTW characteristic-adjusted returns and firm-specific 4-factor abnormal returns. Because many of the subsamples are small, there is some variation in results across abnormal return methods, and the matched-firm abnormal returns method results in the smallest sample.

The return pattern we find is of similar magnitude in the years before 2000, i.e. 1993-1999, during which period the market experienced generally positive returns, and in the period of 2000-2002, during which the market experienced generally negative returns. While the matched-firm abnormal return is not significant in the 2000-2002 period, with p-value of 12%, it is significant using characteristic-adjusted returns or 4-factor abnormal returns.

Two potentially very different causes for a restatement are "Fraud" and "Voluntary Change."

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[31] As a "robustness check" of the primary return results, it is interesting to note that of the 92 sub-sample – return-measure combinations examined and displayed in Table 9, only 4 have negative return estimates. Of those 4, none are significant. And, of the 88 variations with positive returns, 57 (65% of the positive estimates and 62% of all sub-sample return estimates examined) are statistically significant.

We might expect "Fraud" to be particularly negative. On the other hand, a voluntary change may be difficult to interpret, given that this is the self-reported cause the firm is providing. However the results reveal very little variation along these cause dimensions.

We find that SEC involvement or an SEC investigation is related to dramatically higher post-announcement returns than for the full sample. Raw returns in the 3-6 month window are 17.8% for the SEC-involvement subsample (21 observations) and 23.2% for the SEC investigation subsample (14 observations) compared to 3.1% for restatements with no mention of SEC involvement. The differences between the two SEC subsamples and the full sample are statistically significant, with t-statistics of 1.77 and 1.95 for SEC-involvement and SEC-investigation, respectively. It seems reasonable to assume that restatements with admitted SEC involvement or investigations are a more negative signal and increase uncertainty by a greater amount. We examine announcement-period returns and find that average announcement-period returns are not lower for the SEC-related restatement announcements, but this is driven by a few observations, and median returns are significantly lower. Median returns in the (-1, +1) announcement window are -0.6% for announcements with no mention of the SEC, -2.0% for those announcing some SEC involvement, and -4.1% for those announcing SEC investigations .We also find higher post-announcement return estimates for restatements that affect revenue and those which affect more than one fiscal year. However, while the return estimates are consistently higher than for the non-"Revenue Affected" and "Only One Fiscal Year Affected" subsamples, the differences are not statistically significant.

We find mixed results for subsamples based on how the announcement is presented by the firm, specifically whether the announcement provides numerical estimates of the restatement effect and whether the restatement is mentioned in the press release headline. It is difficult to interpret both of these subsamples as they could suggest that the firm is trying to obscure the restatement and restatement information, or they could indicate that the restatement is a more minor one, which does not merit a detailed announcement.

The return pattern appears similar for small and large firms (with the group earning higher returns switching depending on which abnormal return measure is used), however there is a consistent difference across high and low book-to-market firms, with low book-to-market firms, or "growth"/"glamour" firms, earning the higher returns during the 3-6 month window. The difference between the low and high book-to-market firms is statistically insignificant for raw, characteristic-adjusted, and matched-firm abnormal returns, however the firm-specific 4-factor adjustment seems to magnify the difference between the two groups, and with this measure the

difference is statistically significant ($t = 2.30$).

To better understand this difference, we compare the announcement-window (-1, +1) returns of low and high book-to-market firms, and find that low book-to-market growth/glamour firms earn more negative announcement-window returns. The differences are not statistically significant, but are large in magnitude: Low book-to-market stocks earn raw returns of -5.5% in the three-day window around the restatement announcement, while high book-to-market, or value, stocks earn raw returns of -2.5%. Thus it appears that the same group is earning the more negative returns at the announcement date, and then earning the more positive returns later. This is consistent with both a stronger overreaction for growth/glamour stocks and with a larger increase in information risk for growth/glamour stocks, which subsequently resolves. The results we find for growth and value stocks are consistent with related work on the importance of earnings to growth stocks. Skinner and Sloan (2002) find that the market has too high earnings expectations for growth stocks, and that negative earnings surprises largely explain the lower average returns of growth stocks. Given the apparent importance of earnings information for growth stocks, it would not be surprising if the earnings-related information environment is more important to investors in growth firms as well.

Overall, we find that the positive return pattern is quite consistent across a variety of subsamples. However the positive post-announcement returns, in months 3-6, are strongest for the set of restatements that report SEC involvement, or more specifically SEC investigations. Return estimates are higher for restatements that affect revenue and which affect multiple years' financial statements; however differences for these two subsamples are not statistically significant. Finally, the return pattern appears to be strongest for low book-to-market, or "growth"/"glamour," stocks, which earn more negative restatement-window returns, when compared with high book-to-market "value" stocks.

While it is difficult to determine whether a given characteristic will increase uncertainty more, it seems reasonable to believe that SEC involvement and investigations indicate higher uncertainty restatements. It also seems reasonable that restatements which affect the core account of revenue, and which affect more years of financial statements will increase information uncertainty by a greater amount – they are likely to indicate a bigger drop in the quality of the publicly available financial statements. The increase in financial statement-related information uncertainty may impact growth firms more, given the particular importance of earnings-related information for these firms. In each of these cases, we also find that the same firms that experience a larger price drop at the time of the restatement announcement experience a stronger

recovery afterwards. Together with the analyst forecast error and forecast dispersion results that clearly link the positive returns to concurrent decreases in forecast dispersion, a proxy for information risk, these cross-sectional return results seem to support the hypothesis that positive post-restatement-announcement realized returns are driven by post-announcement reductions in information risk and firm-specific uncertainty, following the initial announcement-period increase in these risks, however on their own these cross-sectional results could also be attributed to market overreaction for certain types of restatements and firms.

4.3 Institutional Investor Trading

In this section, we explore two questions related to institutional investor trading around restatements: 1) How do different types of institutions trade before and after a restatement announcement? 2) What types of returns do these institutions earn, given the strategies they display? Transient institutions typically trade actively in stocks, dedicated institutions tend to "buy and hold" a smaller number of securities for longer periods, and quasi-indexers usually follow a near-index strategy. Figures 3-6 show the mean and median percentage of firm shares held by institutions at the start of each quarter surrounding the restatement announcement, for all institutions, regardless of category (Figure 3), and for each of the three institution categories individually (Figures 4-6). Quarter 0 represents the quarter the restatement announcement is made, thus Quarter 0 holdings are reported prior to the restatement announcement and Quarter 1 holdings are reported on or after the restatement announcement.

Figure 3 shows that overall institutional ownership (as a percentage of shares) drops in the year before the restatement. However institutional ownership recovers somewhat in the quarter prior to the restatement and in the quarter of the restatement.[32] Share ownership increases even more in the year following the restatement announcement (quarters 1-5), possibly explaining a portion of the recovery in returns. Figures 4 and 5 indicate that the post-announcement increase in ownership, shown in Figure 3, is driven by transient institutional investors and quasi-indexers. In contrast, Figure 6 shows that dedicated institutions more gradually decrease their holdings

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[32] These results are generally consistent with those of Li, Radhakrishnan, Shin, and Zhang (2006) and Larson (2008). Li, Radhakrishnan, Shin and Zhang (2006) show that, before Reg FD, transient institutions exhibit abnormal selling of stocks in restating firms one to two quarters before the restatement is publicly announced, however they do not exhibit this anticipatory selling after Reg FD. Larson (2008) finds that transient institutions sell shares of fraud firms the quarter prior to the fraud becoming public, examining a primarily pre-Reg FD sample covering 1982-2005. Neither show pre-restatement repurchasing, however. We do not speculate as to the cause of this difference in results beyond the difference in the samples of interest.

around the restatement announcement, with no significant post-announcement buying. (While the median dedicated ownership is often 0, due to the small number of dedicated institutions, higher percentiles (e.g. 60, 75, 90) follow a similar pattern to the mean, decreasing steadily both before and after the restatement announcement.) These patterns are qualitatively similar for overall ownership, transient ownership and quasi-indexer ownership, if we examine "abnormal" institutional ownership, relative to matched firms, as matched for the abnormal return and analyst forecast analyses in Sections 4.1 and 4.2. However the decrease in ownership for dedicated institutions largely disappears when benchmarked against the matched sample.

The qualitative patterns displayed in figures 3-5 also exhibit statistical significance. The decrease in ownership from Quarter -3 to Quarter -1 is statistically significant for both quasi-indexer and transient institutions (t = 2.83 and 2.09 respectively). The increases in transient institutional ownership from Quarter -1 to the Quarters 0 through 5 are significant (with t-statistics ranging from 2.35to 4.37) while the increase in ownership from Quarter 0 to Quarters 3 through 5 is also significant (with t-statistics ranging from 1.85 to 2.13). The increase in quasi-indexer ownership from Quarter -1 to each of Quarters 3 through 5 is significant (with t-statistics ranging from 1.92 to 2.04), although the increase from Quarter 0 is insignificant (with t-statistics around 1.5). Overall, the decrease and subsequent increase in ownership by these two groups is statistically significant. In figure 6, we see a decrease in average ownership by dedicated institutions in each quarter from just under one year prior to the announcement (Quarter -3) through slightly less than one year after the announcement (Quarter +4). This decrease is statistically significant over the two-year span, but not from quarter to quarter (t = 2.21 for the decrease in ownership from Quarter -3 to Quarter +4). However this decrease is much smaller and insignificant if benchmarked against the matched sample. The absolute level of dedicated ownership decreases from 7.6% of shares outstanding to 5.8% of shares, but benchmarked ownership decreases from 3.5% to 3.1%.

The results for transient and quasi-indexer institutions suggest that they are unwilling to assume higher information risk surrounding the restatement announcement. Instead, they sell shares of restating firms before the restatement announcement occurs. Both groups later purchase shares of the restating firm, possibly after information uncertainty has decreased once again. This is consistent with the more myopic investing behavior of transient institutions, and with less private information acquisition by quasi-indexers. Since transient institutions tend to be momentum traders and quasi-indexers tend to be contrarians (Bushee, 1998), their similar behavior is unlikely to be driven by similar strategies regarding past returns. The behavior of

dedicated institutions is more difficult to interpret. Their selling appears to be driven primarily by returns, rather than by the restatement, given the insignificant difference in trading between the restatement and matched samples for dedicated institutions. This may be related to a higher tolerance for an increase in the uncertainty of public information. In the next two tests, we examine the returns that follow from the trading strategies of each of the three institutional investor groups.

We first examine average returns following restatement announcements conditional on whether the change in ownership surrounding the restatement announcement (from three quarters prior to one quarter after), by transient, dedicated, or quasi-indexing institutions, is positive or negative.[33] Essentially, we are comparing the returns on those stocks that a given type of institution "buys" vs. the returns on those stocks that a given type of institution "sells," based on whether total net buying or selling dominates. Second, we relate post-announcement abnormal returns to the exact value of each type of institution's pre- and announcement-period change in ownership. We focus on returns at least three months after the announcement, as our ownership change measure, based on quarterly reporting, may overlap with earlier periods.

Though it would be interesting to relate post-announcement returns with contemporaneous post-announcement trading, particularly for the three to six month period in which we expect that transient and quasi-indexer purchasing is related to the positive abnormal returns, this exercise is complicated by data limitations. Changes in institutional ownership are measured quarterly, and do not systematically align with the post-announcement return windows. Nonetheless, comparing announcement-period change in ownership to later returns can help us understand whether one particular group of investors drives the apparent return reversal by testing whether the stocks they sell more strongly are the ones that later experience a return reversal. In particular, since we theorize that transient and quasi-indexing institutions are more strongly affected by increases in information risk, it is the same set of firms that they will want to sell most strongly around the restatement that should experience the highest returns post-restatement, when the information risk decreases again. The opposite is true for dedicated institutional investors.

Table 8 shows abnormal returns for subsamples based on whether share ownership by a particular category of investors increased or decreased in the one-year period surrounding the restatement, i.e. whether institutions (of a particular type) were net buyers or net sellers of the

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[33] In examining the relationship between institutional trading and returns, we focus on changes in holdings from three quarters prior to the restatement announcement to the end of the quarter of the announcement (i.e. over a one year period). We include a lengthy period before the restatement to include any effects of institutions anticipating the restatement announcement.

given stock. As discussed below, results differ depending on the abnormal return measure used, and so all three alternate measures are presented. We interpret the results, including the difference in results, below.

Panel A shows the results using firm-specific 4-factor abnormal returns, Panel B shows the results using DGTW characteristic-adjusted returns, and Panel C shows results using matched-firm abnormal returns.[34]   The left hand side of the table shows returns around announcements for which institutions were net buyers. Focusing on 4-factor abnormal returns in Panel A, the stocks purchased by dedicated institutions earn significantly positive returns in the (64, 126) period while the stocks purchased by transient and quasi-indexing institutions earn insignificantly positive returns of a lower magnitude. The stocks purchased by transient institutions and quasi-indexers earn significantly negative returns in the (127, 252) period, while the stocks purchased by dedicated institutions earn insignificantly negative returns of a smaller absolute magnitude. The magnitudes of the returns for each group's purchased stocks show an economically meaningful difference. In the (64, 126) period, the window for which we find significantly positive abnormal returns, stocks purchased by transient investors earn a 3.62% return, stocks purchased by quasi-indexers earn 3.79% and stocks purchased by dedicated institutions (a smaller number of stocks than for the other two groups of institutions) earn 10.07% returns, a difference of over 6% returns in the three-month window. The results using characteristic-adjusted returns, displayed in Panel B, are similar, in that dedicated institutions earn more positive returns on their purchases than the other two institution groups, in magnitude. However the differences between the three groups are smaller and all three groups earn statistically positive returns in the (64, 126) window. The differences are even smaller using matched-firm abnormal returns. The right hand side of the table shows returns surrounding announcements for which institutions are net sellers. The differences in returns between the three groups are even stronger than for the firms that experience an increase in ownership. The stocks *sold* by both transient and quasi-indexing institutions earn insignificantly positive abnormal returns, 4.10% and 5.18% over the (64, 126) period respectively using the 4-factor abnormal returns, with return estimates also positive for the other two return measures. Thus, by selling these stocks, the institutions have lost this potential return. In contrast, the stocks sold by dedicated institutions earn insignificantly negative returns, with 4-factor abnormal returns of -3.04% and -8.06% in the (64, 126) and (127, 252) periods respectively. In addition, the difference in 4-factor abnormal returns between stocks sold by transient and dedicated institutions is statistically significant over

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[34] In untabulated tests we examine whether the stocks purchased or sold by each investor group differ in terms of characteristics such as size, book-to-market, accounting income, etc. We find no significant differences.

the (127, 252) period ($t = 1.72$) using the 4-factor measure while the difference in returns between stocks sold by quasi-indexing institutions and those sold by dedicated institutions is significant in both periods ($t = 1.71$ and 1.95). The differences are smaller and insignificant for characteristic-adjusted returns and matched-firm abnormal returns, but consistently in the same direction.

The difference in results between 4-factor adjusted returns and characteristic-adjusted and matched-firm abnormal returns may be a result of the variation in firms' risk levels within the DGTW portfolios. If institutions are able to select stocks within a characteristic-group that in fact are lower risk, they would earn higher risk-adjusted returns. For example, if dedicated institutions purchase a restatement firm that is small and earns similar returns to its same-size category group, but is in fact less risky than the typical small firm (i.e. has lower exposure to the SMB risk factor), they would earn positive abnormal returns as measured by the 4-factor adjusted returns but not as measured by the characteristic-adjusted returns and matched-firm abnormal returns (since the matched firm is simply another firm chosen from the characteristic portfolio).

One obvious difference between the three measures is the recency with which momentum is measured. 4-factor abnormal returns base momentum adjustments on a 5-year loading estimate, characteristic-adjusted returns base momentum adjustments on the prior July's momentum measure, and matched-firm abnormal returns base the momentum adjustment on returns just prior to the restatement announcement. Thus a portion of the difference in results is likely due to changing return momentum.

For our second test of the returns earned by institutions' trading surrounding restatements we regress post-announcement abnormal returns on pre- and announcement-period changes in the percent of shares owned by each of the three categories of institutional investors. The results, displayed in Table 9, show that there is generally a positive relationship between changes in dedicated institutional ownership and future returns, with significantly positive coefficients for both 4-factor abnormal returns and characteristic-adjusted returns for the (64, 126) and (127, 252) periods, but insignificant estimates for matched-firm abnormal returns. In contrast, there is a zero relationship between transient institutions' and quasi-indexing institutions' changes in ownership and returns over the (64, 126) period, and a significantly negative relationship with returns over the (127, 252) period using either 4-factor or characteristic-adjusted abnormal returns. The differences between the relationship with future returns for dedicated institutions' changes in ownership and the other two groups are consistently negative and are statistically significant for two of the six comparisons in the (64, 126) period (transient vs. dedicated, 4-factor

abnormal returns, $t = 1.74$, and quasi-indexer vs. dedicated, characteristic-adjusted returns, $t = 1.83$) and strongly significant for all four of the comparisons for the (127, 252) period for 4-factor and characteristic-adjusted returns (with t-statistics ranging from 2.2 to 3.2).

The results displayed in Tables 8 and 9 suggest that institutional trading dynamics could generate the return pattern we find in Section 4.1. Specifically, the positive post-announcement returns may be due to the less discriminating selling of shares by transient and quasi-indexing institutions ahead of the restatements, and their later purchasing of shares in these firms, or both the trading and return patterns may be driven by the changes in firm-specific uncertainty. The difference in behavior across institution groups is likely to be at least partially a result of each group's tolerance for increased information risk and their abilities and willingness to play a corporate governance role in the restating firm, particularly given that the difference only strengthens when we look at abnormal ownership levels, benchmarked against the matched sample.

Dedicated institutions are likely to engage in more private information acquisition and maintain closer relationships with firm managers given their large, long-term, concentrated holdings. An increase in the uncertainty of public information may have a smaller effect on them, as their private information and relationships give them an advantage in predicting future performance of the firm. We find some evidence that dedicated institutions better predict which firms will recover from a restatement, based on the positive relationship between their trading and future returns. Similarly, transient and quasi-indexer institutions may reduce their ownership of all the restatement firms because they are unwilling to assume the additional information risk and engage in their own private information acquisition. They can later purchase shares of the firms that, *ex post*, appear to be making a strong recovery. In waiting for the *ex post* results, however, transient and quasi-indexer institutions may miss some of the return benefits that dedicated institutions gain.

To further examine this explanation, it would be extremely helpful to know whether transient and quasi-indexers are in fact "copying" the trades of dedicated institutions, which would provide strong support for dedicated institutions' information advantage. While we cannot determine the cause of institutions' trades, we can test whether post-restatement trading of transient and quasi-indexer institutions is correlated with the earlier restatement-window trading of dedicated institutions. We examine the correlations between transient and quasi-indexer institutions' 2-3 quarter net buying (i.e. for the quarter starting 3-6 months after the restatement) and the restatement window net buying of dedicated institutions, as defined for Tables 8 and 9, as

change in ownership from 3 quarters before the restatement to 1 quarter afterwards. For transient institutions, the correlation is positive, 0.06, but insignificant. For quasi-indexers, the correlation is higher, 0.12, and statistically significant. In fact, the relationship between event-window dedicated trading and post-restatement quasi-indexer trading remains significant even after controlling for the past restatement firm returns (and thus the potential for momentum or contrarian trading). Thus we find evidence consistent with quasi-indexers' trading following dedicated institutions' trading with a lag, further supporting the idea that dedicated institutions have more private information about restatement firms.

5 Conclusion

We provide strong and consistent evidence that despite significant negative returns in the month preceding a negative earnings restatement announcement and in the 3-day announcement window, restatement firms experience significantly positive returns in the 3-6 months after a restatement announcement. These positive abnormal returns are statistically significant and consistently above 4% over the three-month window using a variety of methods to control for expected returns and risk factors, and are significant for a variety of subsamples. Linking restatement data to analyst forecast data, we provide evidence that the return pattern is driven by changes in information risk and/or firm-specific uncertainty, measured using forecast dispersion, rather than by overall investor overreaction to the negative news, measured using forecast errors. The positive returns are strongest for restatements involving the SEC and for growth firms, and may be somewhat stronger for revenue-related restatements and multi-year restatements than others, however return estimates are positive in almost all subsamples examined.

We also examine institutional investor trading around the restatement announcements. When we break institutions into transient, dedicated, and quasi-indexing institutions based on their investing strategies, we find that dedicated institution trading prior to and surrounding the restatement announcement has more positive predictive ability for future returns than the trading of transient and quasi-indexing institutions, with economically and statistically significant differences for 4-factor and characteristic-adjusted returns. We document pre-announcement selling and subsequent post-announcement purchasing by transient and quasi-indexing institutions. Coupled with the return pattern we document, these results indicate that transient and quasi-indexing institutions' trade mirrors the general return pattern. The results also point to the dramatic difference in how dedicated institutions react surrounding an increase in information

risk. The results suggest that dedicated institutions, which in general have larger and more concentrated holdings, are more willing to tolerate increases in public information uncertainty, and earn a return premium for holding stocks during periods with higher levels of uncertainty.

While this paper greatly increases our understanding of the long-run market reaction to restatement announcements, an event that increases firm-specific uncertainty and information risk, this paper also raises many questions for future research. Future research may center on the changes firms make in the 6 months after a restatement -- changes to their disclosure policies, investor relations and communications, firm management or board of directors, control systems, and overall corporate governance. Such research falls in line with a recent working paper by Gordan et. al. (2008) who find that greater management credibility accumulated prior to the restatement lessens the negative market reaction surrounding the restatement. Additionally, many events could be taking place following a restatement that lead to the recovery in returns, but these events are likely to be different for each firm.

It may also be interesting to extend this study to the post-Sarbanes Oxley period. In response to the recent increase in corporate fraud, Section 404 of the 2002 Sarbanes-Oxley Act requires that companies have outside auditors review their internal controls, and that CEOs and CFOs certify financial statements. This regulation, and the heightened market sensitivity to accounting issues that accompanied it, led to a 28% increase in restatements between 2003 and 2004 (J. Floyd, Huron Consulting), but many of these were not the result of fraud. Future research may examine whether the reversal that we uncover continues in later periods, particularly for major restatements, and whether dedicated institutional investors continue to earn higher returns around these events than their more diversified colleagues. Almost no prior research has examined the impact of quasi-indexer institutions. While these institutions tend to follow a "buy-and-hold" strategy on average, our study shows that they trade actively in certain situations. Given the large holdings of this category (roughly 60% of all institutions from 1983-2002 are quasi-indexers (Bushee, 2004)), future research may consider when, why and how quasi-indexers trade, and their impact on both returns and firms themselves.

Regardless of what future research may tell us to further our understanding of post-restatement performance, changes in information risk and firm-specific uncertainty, it is clear that the long-run implications of restatements are not nearly as bad as they might have seemed from the event-window market response alone.

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Appendix

Example of a News Release:

Oil-Dri to Restate Prior Quarters, Revises Earnings Estimate for Fiscal 2000

CHICAGO, July 24 /PRNewswire/ - Oil-Dri Corporation of America (NYSE: ODC) announced today that reported financial results for each of the first three quarters of its fiscal year ending July 31, 2000, will be restated, reducing income by $0.23 per fully diluted share for the nine months ended April 30, 2000.

At senior management's request, Oil-Dri's auditors and counsel have reviewed certain accounting matters and reported the results of their review to the Audit Committee of the Board of Directors. The report indicated that the company had not recognized the impact on pricing and promotional allowances caused when a customer changed from buying directly from Oil-Dri to purchasing through wholesalers. This required reduction of revenues by $624,000 in the second quarter and $176,000 in the third quarter. Additionally, a review of trade spending showed that the company's accruals for marketing expenses should be increased, resulting in increased expenses of $350,000 for each of the quarters, a total of $1,050,000 for the nine-month period.

As a result, fully diluted earnings per share have been reduced by $0.04 in the first quarter ended October 31, 1999, $0.12 in the second quarter ended January 31, 2000, and $0.07 in the third quarter ended April 30, 2000.

The company intends to file amended quarterly statements with the Securities and Exchange Commission.

"I am very disappointed in the need to restate our earnings," said Dan Jaffee, President and Chief Executive Officer. "However, we believe that the control and accounting issues related to these matters have now been dealt with at all levels. With the restatement and the external cost pressures we continue to experience, we anticipate that earnings for the year will be between $0.47 and $0.57 per fully diluted share before the $0.15 pre-tax charge taken in the second quarter.

"Revenues in the first two months of the fourth quarter have been strong," continued Jaffee. "We have taken aggressive steps to improve our efficiencies and lower our costs, and while these initiatives have not been able to completely offset dramatic cost increases in fiscal 2000, we anticipate that they will help improve profitability in the new fiscal year, beginning August 1, 2000."

This release contains certain forward-looking statements regarding the company's expected performance for future periods and actual results for such periods may materially differ. Such forward-looking statements are subject to uncertainties, which include, but are not limited to, competitive factors in the consumer market; the level of success of new products; changes in planting activity and overall agricultural demand; changes in market conditions and the overall economy, and other factors detailed from time to time in the company's annual report and other reports filed with the Securities and Exchange Commission.

Oil-Dri Corporation of America is the world's largest manufacturer of cat litter and a leading supplier of specialty products for industrial, automotive, agricultural and fluids purification markets.

Table 1: Restatements By Year and Stated Cause

This table presents the distribution of restatement announcements across the sample years of 1993 through 2002, and over the reported cause of the restatement. Single announcements can have multiple causes if multiple causes are claimed in the restatement announcement. The "Total" column shows the total number of restatement announcements claiming the given cause, over the full sample period. The "Total Restatement Press Releases, Any Cause" row presents the total number of restatement announcements in the given year. The "%" column is the percentage of all restatements which report the given cause as one of the causes for the particular restatement. Panel A shows the number of restatements in each category including all restatement announcements in the full database, while Panel B shows the number of restatements in each category limiting to the primary sample of negative restatement announcements.

Panel A. Full Database

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total	%
New Accounting Standard or Interpretation	32	4	2	1	1	6	5	3	19	2	75	14.04%
Voluntary Change in Accounting Method	3	14	4	7	9	20	32	11	24	36	160	29.96%
Error	7	2	4	1	3	9	14	4	14	25	83	15.54%
Fraud, Irregularity, Investigation or Review	8	2	0	2	7	11	11	15	17	32	105	19.66%
Change in Estimates	2	2	1	1	2	1	4	3	1	3	20	3.75%
No Cause or Explanation Provided	8	3	1	6	4	10	14	8	8	15	77	14.42%
Other	6	2	5	9	5	13	15	11	11	25	102	19.10%
Total Restatement Press Releases, Any Cause	54	26	17	24	27	56	79	54	82	115	534	

Panel B. Main Sample

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total	%
Voluntary Change in Accounting Method	1	4	2	2	3	13	13	5	9	17	69	28.99%
Error	5	2	2	1	0	8	6	4	7	15	50	21.01%
Fraud, Irregularity, Investigation or Review	7	2	0	2	6	7	10	7	10	20	71	29.83%
Change in Estimates	0	2	0	0	1	0	0	2	0	1	6	2.52%
No Cause or Explanation Provided	5	3	0	2	2	2	6	5	5	5	35	14.71%
Other	3	1	4	0	2	9	5	8	10	18	60	25.21%
Total Restatement Press Releases, Any Cause	16	12	8	6	12	30	32	26	35	61	238	

Table 2: Restatement Counts and Event Period Returns, By Restatement Direction

This table presents the number of restatements and average cumulative raw return, including any delisting returns, over the announcement event period of event days -1 through 1, for three subsets of the full restatement database: "negative change," "mixed," and "positive change," defined based on the effects of the restatement on prior financial results. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlations. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

	Number of Restatements	Event-Period Cumulative Return	t-statistic
Negative Change	314	-0.0308	-3.65***
Mixed	145	-0.0157	-1.64*
Positive Change	75	0.0122	1.17

Table 3: Descriptive Statistics

This table presents descriptive statistics for the main sample of restatement announcement firms, for negative restatement announcements from 1993 through 2002 with non-rule-change causes, and for a benchmark sample of New York Stock Exchange (NYSE) securities, as of 1998 (the middle year in the restatement sample). Size (total assets), Sales, Cash Flow and Net Income are all as reported on the most recent annual report, and book to market ratio is calculated by comparing size with market capitalization. Price to earnings ratio compares stock price to earnings per share, for the subsample of firms with positive earnings.

	Main Sample		NYSE, 1998	
	Mean	Median	Mean	Median
Size (Total Assets)	7,748	1,622	27,250	3,010
Sales	6,168	1,105	8,708	1,959
Cash Flow	453	96	1,149	226
Net Income	125	23	723	125
Book to Market Ratio	0.57	0.50	0.09	0.46
Price to Earnings Ratio	41.97	18.45	33.3	17.7
Observations	238		2,393	

Table 4: Average Returns around Negative Restatement Announcements

This table presents cumulative raw returns and abnormal returns around restatement announcements. The sample is limited to "negative change" restatement announcements with actively trading common stock, with delisting returns included if a security delists. The sample contains 238 restatement announcements. Panel A presents cumulative raw returns. Panel B presents abnormal returns, calculated by subtracting the return of a matched firm from the restatement firm's return. The matched firms are drawn from NYSE common stock in the same DGTW size/book-to-market portfolio, matching among that group based on which firm has the closest returns in the (-252, -22) period before the restatement announcement. T-statistics are given below averages. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlations. The symbols *,**, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Panel A. Raw returns

	(-21, -2)	(-1, +1)	(2, 21)	(22, 63)	(64, 126)	(127, 252)
Cumulative raw return	-0.0480***	-0.0395***	-0.0102	0.0229	0.0493**	0.0171
T-stat	-3.21	-3.58	-0.70	1.35	2.38	0.60
Observations	238	238	238	234	230	226

Panel B. Matched-firm abnormal returns

	(-21, -2)	(-1, +1)	(2, 21)	(22, 63)	(64, 126)	(127, 252)
Mean	-0.0433***	-0.0370***	0.0054	0.0252	0.0450**	-0.0232
T-stat	-2.97	-3.64	0.36	1.21	1.98	-0.72
Observations	200	200	200	198	194	192

Table 5: Calendar-time Portfolio Returns Around Negative Restatement Announcements

This table presents calendar-time portfolio returns for portfolios formed around negative restatement announcements. Portfolios are created by purchasing a stock at the start of the first day of the given window (noted in event-time trading days), holding the stock through the window, and selling it at the end of the last day of the window. Portfolios are value-weighted across firms. Panel A displays raw portfolio returns. Panel B displays portfolio returns net of the risk free rate. Panel C reports results of ordinary least squares regressions with net portfolio returns as the dependent variable. MktMinRf, SML, HML, and Mom represent the market excess return, size, book-to-market and momentum factors respectively. T-statistics are given below coefficient estimates. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlations. The symbols*, **, and ***, indicate significance at the 0.10, 0.05 and 0.01 levels respectively.

Panel A. Portfolio raw return in Event Window

	(-21, -2)	(-1, +1)	(2, 21)	(22, 63)	(64, 126)	(127, 252)
Mean	-0.2567***	-1.1945***	0.0012	-0.0420	0.1341***	-0.0145
T-stat	-2.76	-3.36	0.01	-0.74	2.68	-0.40
Observations	1,720	547	1,718	2,216	2,402	2,631

Panel B. Portfolio Excess Return in Event Window

	(-21, -2)	(-1, +1)	(2, 21)	(22, 63)	(64, 126)	(127, 252)
Mean	-0.2730***	-1.2101***	-0.0150	-0.0583	0.1179**	-0.0305
T-stat	-2.93	-3.40	-0.16	-1.02	2.36	-0.83
Observations	1,720	547	1,718	2,216	2,402	2,631

Panel C. Dept. Variable: Event Window Portfolio Return

	(-21, -2)	(-1, +1)	(2, 21)	(22, 63)	(64, 126)	(127, 252)
Mkt - Rf	1.2827***	0.4367	1.0196***	1.2480***	1.0301***	0.8736***
	10.60	1.00	8.54	17.90	16.30	20.70
SMB	0.5722***	0.5444	0.5362***	0.2578***	0.2016**	0.1145**
	3.55	0.87	3.24	2.68	2.34	2.01
HML	0.5676***	0.4770	0.5031**	0.5721***	0.4361***	0.0189
	2.90	0.66	2.55	4.95	4.14	0.27
Mom	-0.0441	-0.4294	-0.4024***	-0.3715***	-0.4585***	-0.5175***
	-0.46	-1.22	-4.11	-6.45	-8.73	-14.20
Alpha	-0.2864***	-1.2458***	0.0002	-0.0629	0.1075**	-0.0346
	-3.22	-3.46	0.00	-1.24	2.38	-1.14
Observations	1,720	547	1,718	2,216	2,402	2,631
R^2	0.0976	0.0057	0.0748	0.2117	0.1911	0.3188

Table 6: Analyst Forecast Properties around Negative Restatement Announcements

This table presents results from regressions of returns on analyst forecast properties. The dependent variables are, in Panel A, cumulative raw returns over the (64, 126) trading day window after restatement announcements and, in Panel B, matched-firm abnormal returns over the (64, 126) trading day window, calculated by subtracting the returns of a firm matched by size, book-to-market and pre-announcement-date returns from the restatement firm returns.   The analyst forecast variables are abnormal measures where the value for the matched firm is subtracted from the value for the restatement firm. Forecast error is the difference between the earnings per share forecast and the final realization of earnings per share, normalized by share price six months prior to the restatement announcement. Forecast dispersion is the standard deviation of forecasts normalized by share price six months prior to the announcement. The change in each value is calculated from month 2 to 6, where month 0 is the first I/B/E/S summary file report date after the restatement announcement date. Thus the change is calculated on average over the window of 2.5 to 6.5 months after the restatement announcement. The sample is restricted to firms with at least two analysts covering the restatement firm and matched firm for the year surrounding the restatement. T-statistics are given below coefficient estimates. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlations. The symbols *, **, and ***, indicate significance at the 0.10, 0.05 and 0.01 levels respectively.

Panel A. Raw returns

Abnormal change in forecast error		1.0936		1.2760**
		1.25		2.12
Abnormal change in forecast dispersion			-6.1499**	-6.3701***
			-2.33	-2.98
Constant	0.0607**	0.0634**	0.0485*	0.0513**
	2.3	2.35	1.96	2.06
Observations	109	109	109	109
R^2	0	0.0167	0.0877	0.1104

Panel B. Matched-firm abnormal returns

Abnormal change in forecast error		3.8301***		3.9793***
		2.79		2.78
Abnormal change in forecast dispersion			-4.5281	-5.2149***
			-1.59	-3.31
Constant	0.0533*	0.0629**	0.0444	0.0530*
	1.77	2.18	1.42	1.87
Observations	109	109	109	109
R^2	0	0.1569	0.0364	0.205

<u>Table 7: Post-Restatement 3-6 Month Returns, By Restatement and Firm Characteristics</u>
This table presents post-restatement-announcement raw and abnormal returns, over the trading days (64, 128) after the announcement, i.e. three to six months after a restatement announcement. Each row presents the post-announcement returns for the particular sub-sample. "Full Main Sample" is provided as a benchmark, and consists of negative restatement announcements with non-rule-change causes. Each row below consists of the subset of Full Main Sample which satisfies the given criteria. Before 2000 and 2000-2002 consist of the restatement announcements which happened during the given years. Stated Cause sub-samples describe subsamples of announcements in which the announcement provides or does not provide the given cause as one of the factors leading to the restatement. Investigations and SEC Involvement captures the type of investigation or SEC involvement described in the restatement announcement. Restatement Effects describes the predicted effect of the restatement that is described in the announcement, i.e. whether revenue will be affected, and the number of periods affected by the restatement. Announcement characteristics describes further characteristics of the restatement announcement – in particular whether number estimates (including ranges) for the magnitude of the restatement effects are provided or not, and whether the announcement headline includes a mention of the restatement. Finally, firm characteristics subsamples contain the subsample of restatement announcements whose firms have above or below median market value or book-to-market ratio, when compared against the other restatement announcement firms in the sample. "Raw Returns" presents cumulative raw returns, "Matched-Firm" presents cumulative abnormal returns where the returns on a firm matched on size, book-to-market, and pre-announcement-date returns are subtracted from restatement firm returns, "Characteristic-adjusted" presents cumulative abnormal returns calculated using the DGTW size/book-to-market/momentum matched portfolio method, and "4-factor" presents abnormal returns calculated using restatement-specific factor loading estimates calculated over a five year window ending 1 month before the restatement announcement. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlation. Returns which are significant at the 10% level using a 1-tailed test for positive returns are shown in bold.

	N	Raw Returns	Matched-Firm	Characteristic-Adjusted	4-Factor
Full Main Sample	230	**0.0444**	**0.0450**	**0.0496**	**0.0430**
Before 2000	117	**0.049**	0.0422	**0.061**	**0.0535**
2000-2002	113	**0.0396**	**0.0483**	**0.0367**	0.032
Stated Cause					
Fraud/Irregularity/Investigation Identified as a Cause	170	**0.0480**	**0.0570**	**0.0500**	**0.0433**
Fraud/Irregularity/Investigation Not Identified as a Cause	60	0.0342	0.0096	0.0483	0.0421
Voluntary Change in Method Identified as a Cause	163	**0.0362**	**0.0466**	**0.0504**	**0.0432**
Voluntary Change in Method Not Identified as a Cause	67	**0.0643**	0.0411	**0.0476**	0.0426
Investigations and SEC involvement					
No Investigation Mentioned	195	**0.0463**	**0.0501**	**0.0465**	**0.0401**
Investigation Mentioned	35	0.0340	0.0161	**0.0664**	0.0601
No Mention of SEC Involvement	209	**0.0310**	**0.0427**	**0.0399**	**0.0310**
SEC Involvement of Some Type	21	**0.1782**	0.0651	**0.1381**	**0.1610**
SEC Investigation	14	**0.2315**	0.1063	**0.2099**	**0.2322**
Restatement Effects					
No Revenue Effect Stated	190	**0.0384**	**0.0475**	**0.0474**	**0.0351**
Revenue Affected	40	0.0731	0.0322	0.0603	0.0825
Only One Fiscal Year Affected	157	0.0234	**0.0413**	**0.0418**	0.0288
More Than One Fiscal Year Affected	73	**0.0896**	0.0536	**0.0676**	**0.0735**
Announcement Characteristics					
No Numbers Provided	19	-0.0277	**0.0885**	0.0061	-0.0163
Some Numbers Provided	211	**0.0509**	**0.0414**	**0.0538**	**0.0478**
Announcement Headline Does Not Mention Restatement	41	0.0175	-0.0423	0.0213	0.0032
Announcement Headline Does Mention Restatement	189	**0.0503**	**0.0636**	**0.0559**	**0.0518**
Firm Characteristics					
Small Firms: Below Median MV	117	**0.0623**	**0.0471**	**0.0610**	0.0320
Large Firms: Above Median MV	113	0.0259	0.0427	0.0375	**0.0547**
"Growth"/"Glamour": Below Bedian Book-to-Market	122	**0.0533**	**0.0549**	**0.0717**	**0.0835**
"Value": Above Median Book-To-Market	104	0.0230	0.0333	0.0225	-0.0186

Table 8: Average Abnormal Returns for Subsamples Based on Event-period Change in Institutional Ownership

This table presents average abnormal returns around negative restatement announcements, conditional on whether the change in ownership levels from the first quarterly ownership report after the restatement announcement relative to one year prior are positive or negative, for each of three institution categories: Transient, dedicated and quasi-indexing. Panel A presents 4-factor abnormal returns calculated using firm-specific factor loading estimates from five years of data ending one month prior to the restatement announcement. Panel B presents characteristic-adjusted returns calculated by subtracting the returns of the DGTW size/book-to-market/momentum matched portfolio from the restatement firm's returns. Panel C presents matched-firm abnormal returns where the returns on a firm matched on size, book-to-market, and pre-announcement-date returns are subtracted from restatement firm returns. T-statistics and number of observations are reported below the averages. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlation. The symbols *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels respectively.

Panel A. 4-factor abnormal return

		positive change in ownership		negative change in ownership	
		(64, 126)	(127, 252)	(64, 126)	(127, 252)
Transient	average	0.0362	-0.1067**	0.0410	0.0547
	t-stat	1.08	-2.44	1.26	1.01
	Observations	105	105	104	100
Dedicated	average	0.1007***	-0.0362	-0.0304	-0.0826
	t-stat	2.76	-0.78	-0.92	-1.41
	Observations	78	76	90	88
Quasi-indexing	average	0.0379	-0.1153**	0.0518	0.0655
	t-stat	1.32	-2.53	1.48	1.35
	Observations	99	98	115	112

Panel B. Characteristic-adjusted return

		positive change in ownership		negative change in ownership	
		(64, 126)	(127, 252)	(64, 126)	(127, 252)
Transient	average	0.0624**	-0.0312	0.0304	0.0508
	t-stat	2.22	-0.89	1.14	1.13
	Observations	96	96	87	86
Dedicated	average	0.1057***	-0.0047	-0.0011	-0.0320
	t-stat	3.49	-0.15	-0.04	-0.59
	Observations	68	67	78	78
Quasi-indexing	average	0.0787***	-0.0463	0.0254	0.0570
	t-stat	3.20	-1.27	0.86	1.39
	Observations	91	90	98	98

Panel C. Matched-firm abnormal return

|		positive change in ownership		negative change in ownership	
		(64, 126)	(127, 252)	(64, 126)	(127, 252)
Transient	average	0.0507	-0.0453	0.0326	0.0091
	t-stat	1.55	-1.04	0.98	0.19
	Observations	92	92	84	82
Dedicated	average	0.0820**	0.0256	-0.0048	-0.0571
	t-stat	2.31	0.67	-0.15	-0.89
	Observations	67	66	75	74
Quasi-indexing	average	0.0836**	-0.0534	0.0169	-0.0050
	t-stat	2.38	-1.14	0.51	-0.11
	Observations	87	86	95	94

Table 9: Regressions of Abnormal Returns on Changes in Institutional Ownership

This table presents results from ordinary least square regressions of abnormal returns on changes in institutional ownership, for negative restatement announcements. "4-factor abnormal returns" are calculated using firm-specific factor loading estimates from five years of data ending one month prior to the restatement announcement. "Characteristic-adjusted returns" are calculated by subtracting the returns of the DGTW size/book-to-market/momentum matched portfolio from the restatement firm's returns. "Matched-firm abnormal returns" are calculated where returns on a firm matched on size, book-to-market, and pre-announcement-date returns are subtracted from restatement firm returns. Changes in percentage of shares owned by each institution group (transient, dedicated and quasi-indexer) is measured as the percentage owned at the end of the quarter of the restatement announcement (0-3 months after the restatement announcement) minus the percentage owned one year earlier. T-statistics are given below coefficient estimates. Standard errors are robust to heteroskedasticity and arbitrary within-firm correlations. The symbols *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels respectively.

| Changes in percentage of shares owned by:	4-factor abnormal return		DGTW Characteristic-adjusted return		Matched-firm abnormal return	
	(64, 126)	(127, 252)	(64, 126)	(127, 252)	(64, 126)	(127, 252)
Transient Institutions	-0.0007	-0.0050**	0.0010	-0.0032*	0.0000	-0.0001
	-0.39	-2.47	0.62	-1.9	0.01	-0.06
Dedicated Institutions	0.0042*	0.0081**	0.0037*	0.0069*	0.0021	0.0045
	1.94	2.29	1.83	1.73	0.96	0.95
Quasi-indexing Institutions	0.0003	-0.0031*	0.0000	-0.0022*	0.0006	-0.0018
	0.17	-1.77	-0.0043	-1.9	0.40	-1.08
Constant	0.0504**	-0.0175	0.0526***	0.0183	0.0494**	-0.0232
	2.25	-0.53	2.85	0.73	2.19	-0.74
Observations	227	223	202	201	194	192
R^2	0.0175	0.0599	0.0321	0.0623	0.0086	0.0160

Figure 1

Figure 1 graphs cumulative raw returns (plotted on the Y-axis) around announcements of earnings restatements, over -252 through +252 trading days surrounding the announcement date (day 0). The sample contains 238 negative restatement announcements from 1993 through 2002, for firms with actively traded NYSE common stock, and excludes restatements driven by accounting rule or interpretation changes.

Cumulative Raw Return Relative to Restatement Announcement Date

Trading Days in Event Time (average 21 trading days per month)
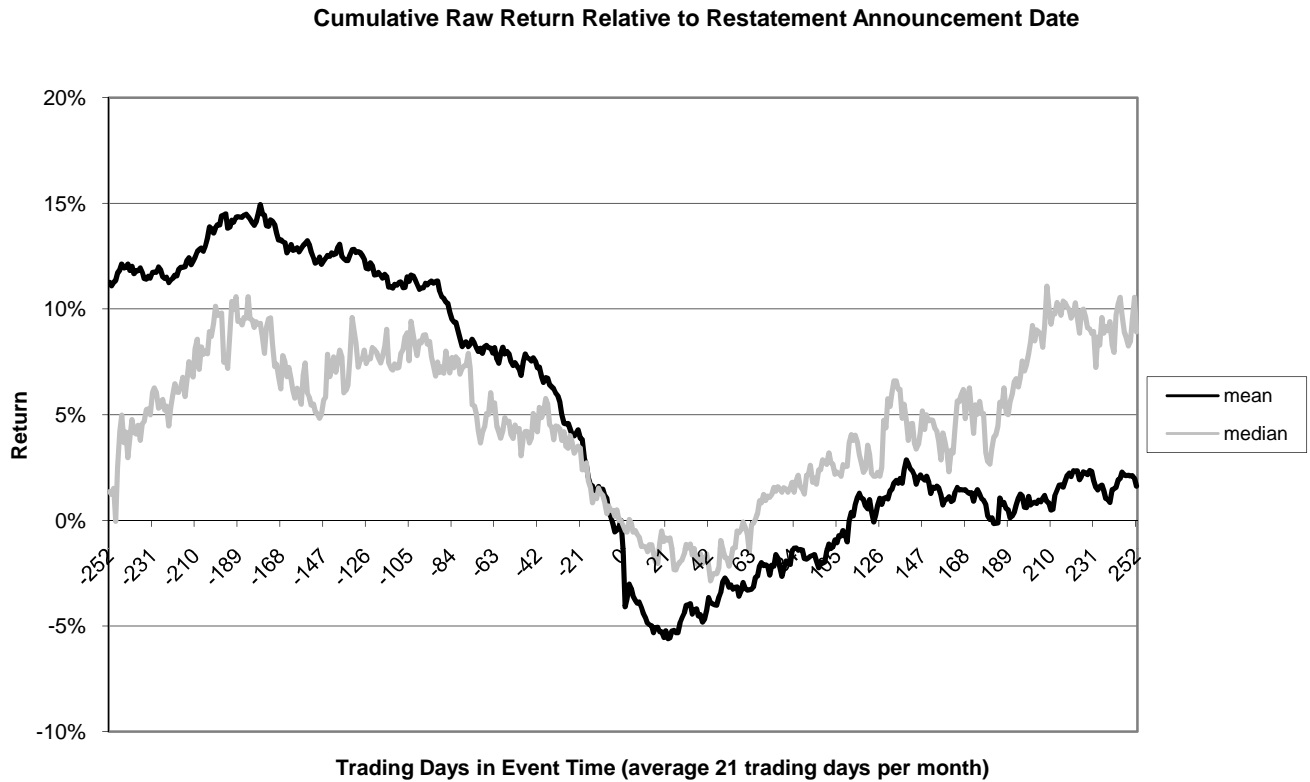
Figure 2

Figure 2 graphs month-end abnormal forecast error and forecast dispersion for restatement firms in the months surrounding restatement announcements, for six months before and after the announcement date. Month 0 is the month in which the restatement announcement occurs. Forecast error is measured as average forecast minus realized EPS value, normalized by share price six months prior to the restatement announcement date. Forecast dispersion is measured as standard devaition of forecasts, normalized by share price six months prior to the restatement announcement date. For both variables, abnormal values are the difference between the variable value for the restatement firm compared to the value for a matched firm, matched on size, book-to-market and prior returns.

End-of-Month Earnings Forecast Characteristics

Month, relative to restatement announcement quarter
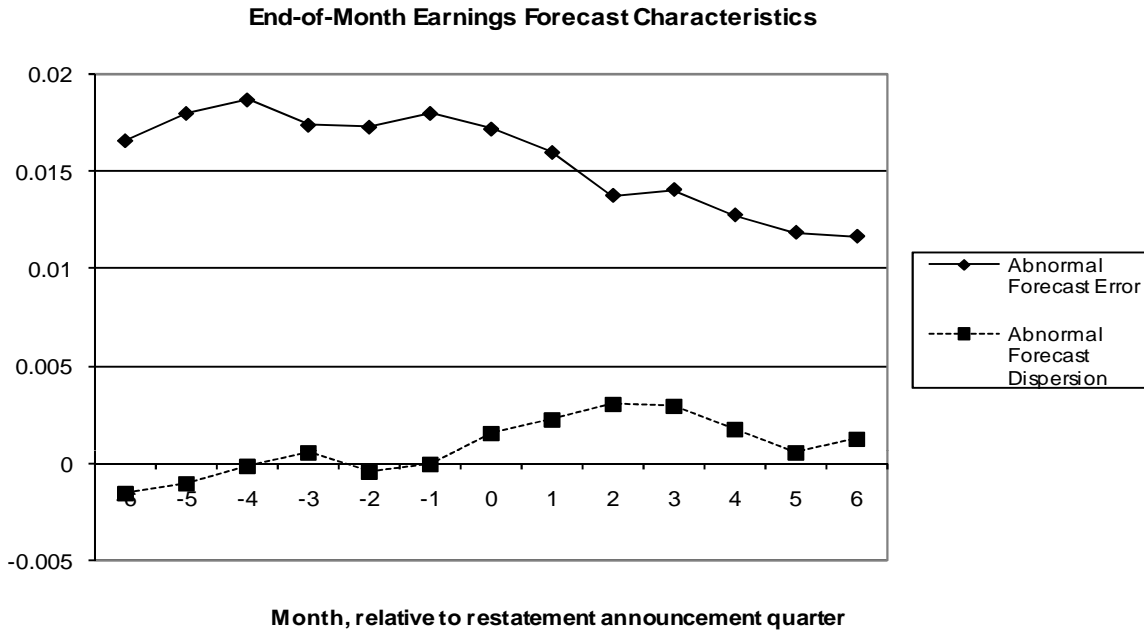
Figure 3

Figure 3 graphs the percentage of shares owned by institutions (plotted on the Y-axis) in the quarters surrounding restatement announcements, for just over one year before and after the announcement date. Quarter 0 is the last quarterly institutuional ownership reporting date prior to the announcement date, and Quarter 1 is the first quarterly ownership reporting date after the announcement.
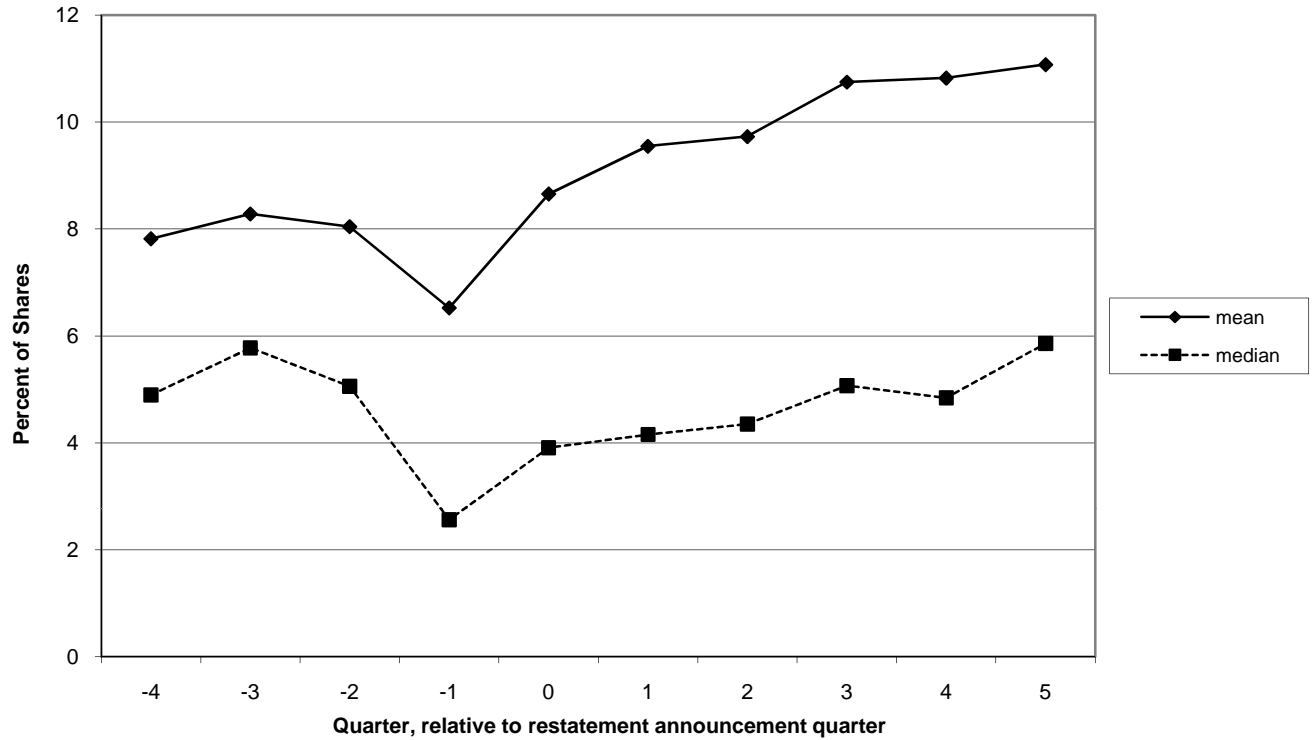
Beginning-of-Quarter Level of Institutional Ownership
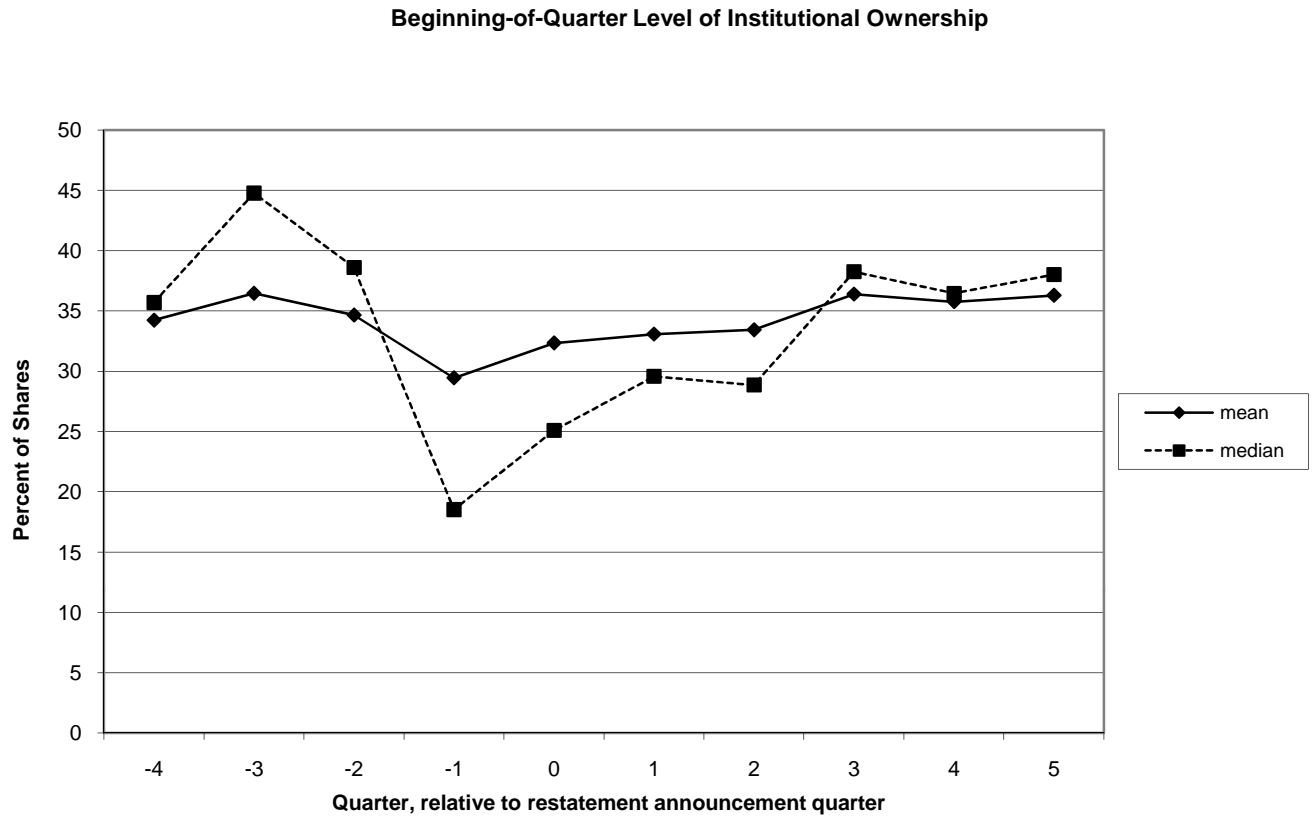
Figure 4

Figure 4 graphs the percentage of shares owned by transient institutions (plotted on the Y-axis) in the quarters surrounding restatement announcements, for just over one year before and after the announcement date. Quarter 0 is the last quarterly institutuional ownership reporting date prior to the announcement date, and Quarter 1 is the first quarterly ownership reporting date after the announcement.
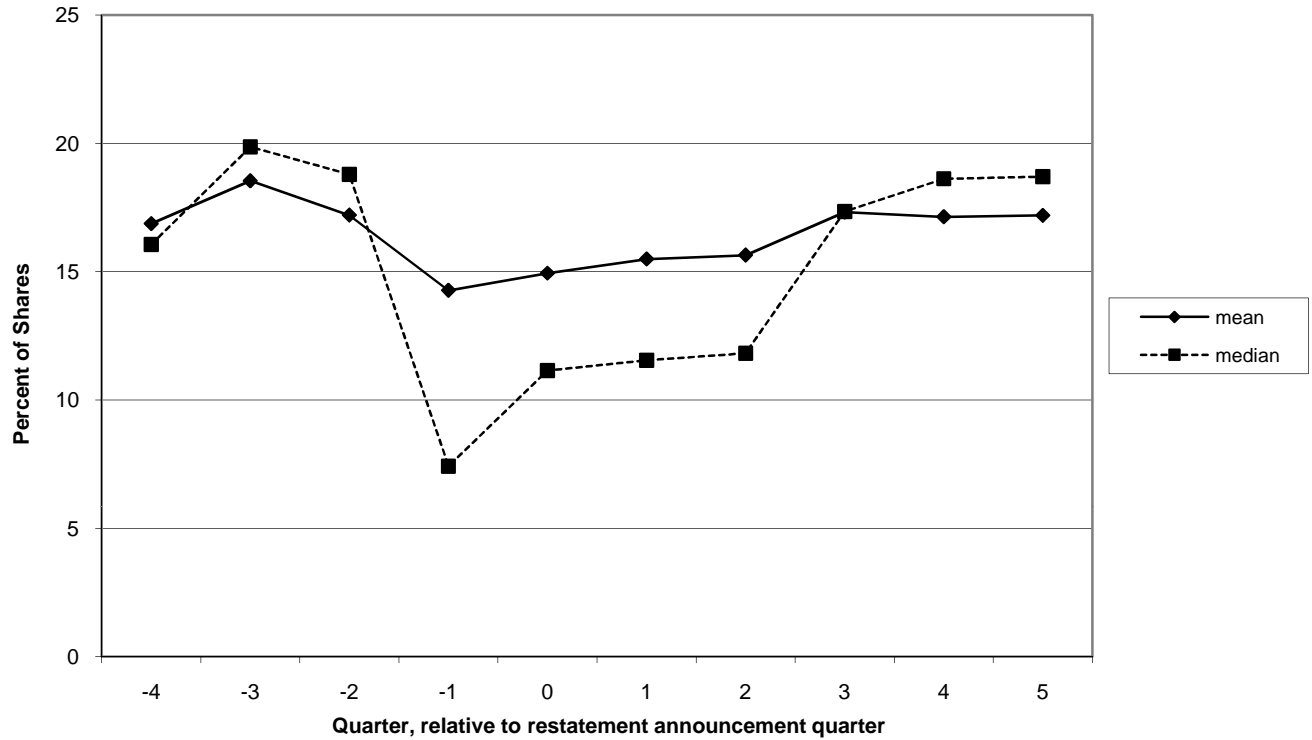
Beginning-of-Quarter Level of Institutional Ownership, Transient Institutions

Figure 5

Figure 5 graphs the percentage of shares owned by quasi-indexing institutions (plotted on the Y-axis) in the quarters surrounding restatement announcements, for just over one year before and after the announcement date. Quarter 0 is the last quarterly institutuional ownership reporting date prior to the announcement date, and Quarter 1 is the first quarterly ownership reporting date after the announcement.

Beginning-of-Quarter Level of Institutional Ownership, Quasi-indexing Institutions

Figure 6

Figure 6 graphs the percentage of shares owned by dedicated institutions (plotted on the Y-axis) in the quarters surrounding restatement announcements, for just over one year before and after the announcement date. Quarter 0 is the last quarterly institutuional ownership reporting date prior to the announcement date, and Quarter 1 is the first quarterly ownership reporting date after the announcement.

Beginning-of-Quarter Level of Institutional Ownership, Dedicated Institutions