Predicting earnings management: The case of earnings restatements

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ABSTRACT

This paper examines the usefulness of accounting information in predicting earnings management. We investigate a comprehensive sample of firms from 1971-2000 that restated annual earnings. We find that firms restating earnings have high market expectations for future earnings growth and have higher levels of outstanding debt. We also find that a primary motivation for the earnings manipulation is the desire to attract external financing at a lower cost. Furthermore, our evidence suggests that restating firms have been attempting to maintain a string of consecutive positive earnings growth and consecutive positive quarterly earnings surprises. Together, our evidence is consistent with capital market pressures acting as a motivating factor for companies to adopt aggressive accounting policies. Finally, we document that information in accruals, specifically, operating and investing accruals, are key indicators of the earnings manipulation that lead to the restatement. Collectively, the evidence suggests that market participants can gain substantial value from a careful consideration of information in financial statements.

1. Introduction

The purpose of this paper is to examine the usefulness of accounting information in predicting earnings management. Specifically, we investigate a comprehensive sample (1971-2000) of firms that were forced to restate earnings. We focus on earnings restatement firms as they represent an ideal setting to examine earnings management. Given the substantial costs of undertaking investigations, the Securities Exchange Commission is likely to only undertake investigations for firms where the probability of success for a restatement is fairly high (Dechow, Sloan and Sweeney, 1996). Therefore, it is reasonable to assume that earnings restatement firms can be characterized as firms who knowingly and intentionally engaged in earnings manipulation.

The importance of earnings restatements is evident by the strong market reaction to the announcement that a company intends to restate previously released earnings. Examples of firms that experienced a large market reaction to their earnings restatements include MicroStrategy, Cendant and Sunbeam. In the seven-day period around the announcement of the restatement, these three firms lost more than $23 billion (combined) in market value (Turner, Dietrich, Anderson and Bailey, 2001). Furthermore, firms that restate earnings are more likely to be subject to costly class action lawsuits (Jones and Weingram, 1997). Clearly, any information that can help predict the earnings management behavior of restatement firms will be of value to capital market participants.

The popular press is replete with examples of firms whose earnings and income recognition policies have pushed the bounds of generally accepted accounting principles (e.g. Tyco, Elan, Enron, Global Crossing). In recent years there has been an increased attention to the quality of reported earnings (Levitt, 2000). It is safe to say that firms that

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are subsequently forced to restate earnings are examples of firms with low quality earnings. Our ability to predict these "extreme" examples of poor quality earnings will be useful in identifying measures of earnings quality more broadly construed.

We compare a sample of 440 restatement firm-year observations to all other firm years with available *Compustat* data. This sampling procedure avoids the problems associated with nonrandom matched samples for infrequent events like earnings restatements (e.g., Palepu, 1986 and Zmijewski, 1984). Similar to previous research, we find a large negative market reaction at the announcement of the earnings restatement (negative 11% over a three-day window). We test whether the incidence of earnings manipulation for the sample of restatement firms can be explained by previously suggested motivations for earnings management.

We find that restatement firms have higher market multiples (both price to earnings and market to book ratios. We also find some evidence that debt covenants (as proxied by leverage) are a motivation for aggressive accounting policies of restatement firms. We find strong evidence that restatement firms appear to be attempting to attract external financing at a lower cost. Specifically, restatement firms raise additional cash from equity markets around the time of the alleged manipulation.   Finally, we also provide evidence that restatement firms had reported longer strings (when compared to non-restatement firms) of consecutive positive quarterly earnings surprises and consecutive quarters of positive earnings growth in the period leading up to the alleged manipulation. Together this evidence suggests that restatement firms were subject to significant capital market pressures at the time of the alleged manipulation.

We then undertake a comprehensive analysis of accruals for restatement firms. Previous research examining SEC enforcement actions has found that accrual information is a key determinant of the earnings manipulation (Dechow, Sloan and Sweeney, 1996 and Bradshaw, Richardson and Sloan, 2001). We find that restatement firms have very large accruals in the years of alleged manipulation. Furthermore, the information in accruals is not limited to working capital accruals. Information about the likelihood of earnings restatements is also found in investing accruals and accruals relating to non-current assets. Collectively, our results suggest that information contained in various parts of accruals can be useful in predicting the earnings management behavior of restatement firms.

The findings in this paper fit into a large literature on earnings management. While previous research has found earnings restatements and SEC Enforcement Actions to be costly events (e.g., Feroz and Park, 1991 and Palmrose, Richardson and Sholz, 2002), little research has examined the determinants of the alleged underlying earnings manipulation. We examine a broad range of potential motivations for the alleged manipulation resulting in the restatements. Our findings complement and extend the findings in Dechow, Sloan and Sweeney (1996). They find evidence of abnormally high accruals for a sample of 66 firms subject to SEC enforcement actions (Figure 1, DSS). Similar to our findings DSS also find evidence that attracting external financing at a lower cost is a significant motivation for the alleged manipulation resulting in SEC enforcement actions. Our analysis of the 440 earnings restatement firms for the period 1971-2000 confirms these results for a larger, more comprehensive sample. Our sample includes SEC enforcement actions along with many other firms whose alleged

manipulations were not as severe to warrant an enforcement action. Thus, our findings increase the generalizability of past research examining SEC enforcement actions. Furthermore, our result that restatement firms are engaging in aggressive accounting to maintain a pattern of (i) consistently meeting analyst earnings targets and (ii) consistently reporting increases in quarterly earnings is a new finding in the literature. Consistent with the discussion in Dechow and Skinner (2000) this result suggests that capital market incentives are an important consideration when examining earnings management.

Section 2 describes our sample selection procedure, discusses potential incentives for engaging in aggressive accounting practices that lead to earnings restatement and describes our variable measurement. Section 3 discusses empirical results, while section 4 concludes.

2. Sample selection and variable measurement

In this section we describe the procedure for identifying firms that restate earnings and introduce variables that are expected to be associated with earnings management. Specifically, we describe how restatement firms differ from other publicly traded firms and also develop hypotheses for reasons that firms would engage in aggressive accounting practices that lead to earnings restatements.

2.1 Sample selection

Our sample of earnings restatements is based on an extensive keyword search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Inform databases covering the years 1971 to 2000 inclusive. The keywords were "restatement,"

"restate," "restated," "restates," and "restating." The search was limited to U.S. listed firms. The collection does not include restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

Following the approach in Bradshaw, Richardson and Sloan (2001), we identify earnings restatements that involve SEC filed annual reports (10K) only. We exclude restatements that relate only to the manipulation of interim quarterly earnings since the effect of these manipulations could be reversed in a subsequent quarter and may have no impact on annual earnings. We also eliminate the restatements related to one-time errors or misapplication of accounting policies. These restatements are not related to earnings manipulation activity (Wu, 2002). Finally, earnings restatements that relate to in-process research and development write-offs are excluded from our sample. This is because these restatements are unrelated to the type of accounting quality issues that we are trying to examine.

Insert table 1 here

Our sample includes 225 firms covering 440 firm-years for the period 1971-2000 (Table 1, panel A). The majority of firms are forced to restate earnings for one or two years. 136 of the 225 firms restated one year of their annual reports, 76 companies restated two years of annual reports (Table 1, Panel B). However, there are a few firms that restated for more than four years of financial statements. Heinz was required to restate eight years of financial statements. Earnings restatements are spread throughout the time period but there is some clustering toward the end of the sample period (Table 1,

Panel C). This could be due to several factors. First, databases have richer information in recent years. Second, the SEC has become more active under certain regimes (such as Levitt) and hence the number of restatements may vary with the SEC Commissioner.

For the empirical tests that follow, we examine firm characteristics in the year if the alleged manipulation, not in the year that restatement was announced. This is an important distinction as the restatement announcement is made considerably later than the alleged manipulation. For our sample, the mean (median) number of days between the end of the fiscal year of alleged manipulation and the restatement announcement date is 454 (564) days.

2.2 Potential motivations for earnings management of restatement firms

In this section we outline motivations for earnings management. Our sample of earnings restatement firms represents a set of firms for which it is reasonable to assume that management intentionally and knowingly engaged in earnings management. Feroz et al (1991) and Dechow, Sloan and Sweeney (1996) point out how the SEC is resource constrained and hence will only pursue the most egregious examples of earnings management where the probability of a successful investigation is the highest. The SEC is similarly financially constrained for its investigations into earnings restatements. This makes earnings restatements an ideal setting to examine earnings management. We therefore examine a variety of previously suggested motivations for earnings management to see if they can explain the earnings management behavior of restatement firms.

The academic literature has offered a plentitude of reasons for earnings manipulation. Traditionally, academic research on earnings management has focused on incentives provided by explicit contractual arrangements, such as bonus plans and debt covenants (e.g., Watts and Zimmerman, 1986 and Dechow and Skinner, 2000). Dichev and Skinner (2002) provide evidence of the extensive use of accounting-based covenants in private debt contracts. Specifically, firms are typically required to maintain pre-specified interest coverage and liquidity ratios. Various measures of earnings are included in these covenants. Together these covenants create an incentive for managers to increase reported earnings, especially when close to covenant violations. Violations of debt covenants are generally considered to be costly events that managers wish to avoid (DeFond and Jiambalvo, 1994). It is important to note that income-increasing incentives are not limited only to avoiding covenant violations. Private debt contracts also have in place a variety of performance pricing features whereby firms receive lower rates based on financial ratios (Beatty, Ramesh and Weber, 2002). Therefore, managers generally face income-increasing incentives with outstanding debt. We therefore examine whether restatement firms have higher leverage than non-restatement firms.

Our research design involves comparing restatement firm-years to non-restatement firm-year observations. This leads to a very large sample for analysis. As such it is quite costly to obtain firm-specific contracts. Consequently, we do not have data on the debt covenants in place for our sample of firms.[1] Instead we use a simple measure, *Leverage*, to capture the impact of debt contracting on earnings management.

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[1] Existence of bonus plans can provide incentives for management to manage earnings. However, it is not feasible to hand collect compensation contract details for all firms in our sample period (1971-2000).

Specifically, we measure *Leverage* as the sum of short-term debt (COMPUSTAT item 34) and long-term debt (item 9), deflated by end of year total assets (item 6).[2]

In recent years, heightened capital market pressure has created an additional incentive for firms to engage in earnings manipulation. Firms are under increasing pressure to maintain earnings momentum and hence market valuations (e.g., Barth, Elliot and Finn, 1999 and Myers and Skinner, 2002), and beat analyst targets (e.g., Burgstahler and Eames, 2001, and DeGeorge, Patel and Zeckhauser, 1999). We therefore investigate capital market incentives to engage in earnings management in this paper. We measure four different variables that are related to capital markets incentives. First, we identify whether restatement firms have raised external funds. Second, we use a measure of the ex ante need for financing. Even though a firm was not active in the current year they may require additional financing in future years. Third, we examine the historical trend in EPS growth to identify firms who are seeking to maintain EPS growth. Fourth, we examine the pattern of quarterly earnings surprises leading up to the period of alleged manipulation.

Our first two measures relate to the need to access external capital markets. The argument is that firms could be engaging in earnings management to portray a more optimistic picture of future potential before going to capital markets to raise external funds. Our first measure, *Finance Raised* is the sum of additional cash raised from the issuance of common and preferred stock (item 108) and the issuance of long-term debt (item 111), deflated by average total assets. This captures the extent to which the firm

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[2] All firm characteristics and motivation variables are measured at the time of the alleged earnings manipulation that caused the subsequent restatement. For example, company XYZ is forced to restate earnings for fiscal year end 1995. This restatement is announced in March of 1997. We measure leverage

was active in external capital markets. Our second measure, *Ex-Ante Financing Need* is an indicator variable equal to one if the firm's free cash flow is less than –0.1, and zero otherwise. Similar to Dechow, Sloan and Sweeney (1996) we calculate free cash flow as cash flow (difference between earnings and total accruals as defined in section 2.3) less the average capital expenditure (item 128) over the last three years, deflated by average total assets. This measure captures the extent to which the firm *may* be in need of external financing even though they have not accessed the debt and equity markets that year.

Our third measure, *EPS Growth*, identifies firms who have reported consistent growth in EPS in recent years. These firms face pressure from capital markets to continue the trend in reporting growing earnings. Myers and Skinner (2002) and Barth, Elliot and Finn (1999) report strong evidence of negative market reactions to firms that break strings of earnings increases. We measure *EPS Growth* two ways. First, we use an indicator variable equal to one if the firm reported increases in EPS for the last four quarters and zero otherwise (*EPS Growth1*). Second, we use a count measure that counts the number of quarters of consecutive EPS growth (*EPS Growth2*). The second variables captures up to eight consecutive quarters of positive earnings growth. For example, company XYZ reports EPS of $0.50 in Q1 of 1994, $0.55 in Q2 of 1994, $0.60 in Q3 of 1994, $0.63 in Q4 of 1994 and $0.80 in Q1 of 1995. For company XYZ in Q1 of 1995, *EPS Growth1* would be equal to 1 as there is consecutive EPS growth across the five quarters (current and four previous quarters). *EPS Growth2* would be equal to 4 as there have been four quarters of consecutive EPS growth. If company XYZ had reported an

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for the fiscal year end 1995, *not* in 1997. Our aim is to identify the characteristics and motivation at the time that the aggressive accounting policies were adopted.

EPS of $0.54 in Q3 of 1994 instead of $0.60 then in Q1 of 1995, *EPS Growth1* would be equal to zero, and *EPS Growth2* would be equal to 2. It should be clear that the second measure has more variation and will generate a more powerful test. All EPS numbers are split adjusted to ensure comparability through time.

Our fourth capital market pressure variables, *STRING*, captures the number of consecutive quarterly positive earnings surprises. We focus our analysis on those firms reporting small positive forecast errors as there is a large concentration of firms reporting earnings that exactly meet or slightly exceed analyst targets (e.g., Burgstahler and Eames, 2001). We consider a firm to have reported a small positive earnings surprise if actual earnings exceeds the analyst target by no more than 3 cents (our results are insensitive to changing this requirement to 1, 2, 4, 5 cents or using all positive forecast errors). We measure *STRING* two ways. First, we use an indicator variable equal to one if the firm reported positive growth in EPS for four or more quarters (*STRING1*). Second, we use a count measure that counts the number of quarters of consecutive positive earnings surprises (*STRING2*). The second variable captures up to eight consecutive quarters of small positive earnings surprises. For example, company XYZ reports a forecast error of +1 cents in Q1 of 1994, +3 cents in Q2 of 1994, +1 cent in Q3 of 1994, and +2 cents in Q4 of 1994. For company XYZ in Q4 of 1994, *STRING1* would be equal to 1 as there are four consecutive quarters of small positive forecast errors. *STRING2* would be equal to 4 as there have been four quarters of consecutive small positive forecast errors. If company XYZ had reported a forecast error of -1 cent (i.e., fell short of analyst target by 1 cent) in Q2 of 1994 instead of +3 cents then in Q4 of 1994, *STRING1* would be equal to zero, and *STRING2* would be equal to 2. Similar to the measures of EPS growth above

our second measure is likely to generate more powerful tests due to the additional variation.

The forecast errors that we examine in the paper are calculated using I/B/E/S data. Baber and Kang (2002) report that forecast errors collected by data providers such as First Call, Zacks and I/B/E/S are rounded to the nearest cent after making retroactive and cumulative stock split adjustments. They claim that this data-processing artifact compresses analyst forecast errors for firms that have experienced stock splits. Specifically, firms experiencing several stock splits (e.g., Dell, Cisco, Oracle, Disney) would have smaller forecast errors in the earlier part of our sample. To overcome this issue we use a new I/B/E/S dataset that is "free" from this stock-split problem. We use earnings estimates and actual earnings before the split adjustment is made – so our forecast error is not subject to the problems outlined in Baber and Kang (2002).

We also examine several firm characteristics that may describe restatement firms. These additional measures include performance measures, market-based measures of growth expectations and firm size. Firm performance can often be a primary reason for management to engage in earnings manipulation via aggressive income recognition techniques (DeAngelo, DeAngelo and Skinner, 1994). Despite the fact that separating poor performance from discretionary accrual choices is a difficult task, we examine the reported earnings for restatement firms to see if poor performance could be driving aggressive accrual choices. The problem with looking at reported earnings however is that reported earnings already incorporate the impact of accrual choices. In the following section we also examine accrual choices directly.

We examine both the earnings to price ratio and the book to market ratio to examine the market's perceptions of future growth. We use the reciprocals as they allow us to keep negative earnings observations and they also lead to less skewness. Prior research suggests that growth stocks are particularly sensitive to stock price, especially around earnings announcements (Skinner and Sloan, 2002). We therefore expect that firms trading at substantial multiples of earnings and book value (i.e., low earnings to price and low book to market firms) will be under the greatest pressure to adopt aggressive accounting policies to deliver the anticipated growth in earnings.

Finally, we examine firm size as a determinant of earnings management. It is often argued that larger firms are subject to closer scrutiny by the investment and analyst community. Firm size has been shown to be associated with analyst following (Bhushan, 1989) and institutional holdings (Gompers and Metrick, 2001). Hence, capital market pressures are greater for larger firms leading to the adoption of aggressive accounting policies. We therefore expect that restating firms will be larger than non-restating firms.

All of our empirical analysis examining firm characteristics and potential motivating factors are conducted on raw data as well as industry adjusted data. For the industry adjustment we deduct the median value of the variable for the respective industry grouping.[3] This adjustment is performed every year so the resulting variable is adjusted for the median firm in the same industry group in the same year. We conduct the industry-year adjustment in an attempt to control for variation in the variables that is due to industry association and temporal trends.

2.3 Using accrual information to predict earnings management behavior of restatement firms

In this section we describe how accrual information can be useful to identify restatement firms. Prior research documents that firms with high accruals are more likely to be subject to SEC Enforcement Actions (Dechow, Sloan and Sweeney, 1996). Firms subject to SEC Enforcement Actions can be characterized as having adopted aggressive accounting policies. Firms forced to restate earnings are also firms that have typically inflated revenue or inventory balances (Wu, 2002). Similar to SEC Enforcement Actions, it is therefore reasonable to expect that accruals will help predict the likelihood of earnings restatements.

We use the approach developed in Richardson, Sloan, Soliman and Tuna (2002) for measuring total accruals and its components. We investigate three types of business activities a firm is engaged in: (i) current operating activities, (ii) non-current operating activities, and (iii) financing activities. We refer to the resulting accrual categories as the change in non-cash working capital (ΔWC), the change in net non-current operating assets (ΔNCO) and the change in net financial assets (ΔFIN):

$$\text{Accruals} = \Delta\text{WC} + \Delta\text{NCO} + \Delta\text{FIN}$$

ΔWC is measured as the change in current operating assets, net of cash and short-term investments, less the change in current operating liabilities, net of short-term debt. These accruals form the core of Sloan's (1996) measure of accruals. The major underlying components are trade accounts receivable, inventory and accounts payable.

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[3] Reported results use Fama and French (1997) industry groupings. Results are unaffected by using 2 and 3 digit SIC groupings. Using 4 digit SIC groupings leads to insufficient observations in many industry groups.

Accounts receivable and inventory are frequently alleged to be tools for earnings manipulation (Dechow, Sloan and Sweeney, 1996).

ΔNCO is measured as the change in non-current assets, net of long-term investments and advances, less the change in non-current liabilities, net of long-term debt. The major underlying components of this category of accruals are PP&E, intangibles, deferred taxes and post-retirement liabilities. The benefits associated with intangible assets are particularly difficult to measure and items like capitalized software development costs are frequently alleged to be tools for earnings manipulation. ΔFIN is measured as the change in short-term and long-term investments less the change in short-term and long-term debt.

We then further separate the aforementioned components into their asset and liability subcomponents:

$$\text{Accruals} = \Delta COA - \Delta COL + \Delta NCOA - \Delta NCOL + \Delta STI + \Delta LTI - \Delta FINL$$

ΔCOA and ΔCOL denote the change in current operating assets and current operating liabilities, respectively, which sum to the change in working capital accruals (ΔWC). ΔNCOA and ΔNCOL denote the change in non-current operating assets and non-current operating liabilities, respectively, which sum to the change in non-current operating accruals (ΔNCO). Prior research has found that substantial variation in accruals is driven by the asset side, in particular inventory and receivable accruals (Thomas and Zhang, 2002 and Hribar, 2002). ΔSTI and ΔLTI and ΔFINL denote the change in short-term investments, long-term investments and financial liability, respectively, which sum to the change in net financial assets (ΔFIN).

Dechow, Sloan and Sweeney (1996) find that firms subject to SEC Enforcement Actions reported significantly large positive accruals in the year of the alleged manipulation. The accruals examined in that paper were limited to working capital type accruals. Richardson et al. (2002) find that information contained not only in working capital accruals, but also other accruals are useful in predicting the likelihood of SEC Enforcement Actions. They find that accruals related to long term investments contain information incremental to operating accruals in predicting the likelihood of SEC Enforcement Actions. We therefore expect information in non-current operating accruals and investing accruals will contain information about the likelihood of earnings restatements.

3. Results

In this section we provide our empirical analysis. First, we document evidence that the announcement of the earnings restatement is accompanied by large negative returns. It is clearly an event that capital market participants are interested in. Second, we examine a variety of incentives for why firms engage in the aggressive accounting practices that results in the earnings restatement. Third, we examine the ability of accrual information to predict the earnings manipulation underlying the restatement.

3.1 Announcement returns to earnings restatements

Figure 1 plots average cumulative returns of firms that announced earnings restatements over −120 days to +120 days relative to the announcement. Consistent with evidence in prior literature, our sample of earnings restatements announcements result in

negative stock price reactions (Griffin, Grundfest and Perino, 2001 , and Wu, 2002).

Restatement firms lose on average 25 percent of market value over the period examined and this is concentrated in a narrow window surrounding the announcement of the restatement. Some classic examples of these restatement firms include Cendant, MicroStrategy and Sunbeam. These three firms lost more than $23 billion in the week surrounding their respective restatement announcements. The restatement event is clearly an event that capital market participants should be interested in predicting.

Insert figure 1 here

3.2 Incentives for earnings management of restatement firms

Panel A of table 2 compares characteristics of firms that restate earnings with characteristics of non-restatement firms. Restatement firms have significantly lower *Earnings to Price* than non-restatement firms (0.057 vs. 0.104, t-statistic –6.32). *Book to Market* for restatement firms is also lower than that of non-restatement firms (0.554 vs. 0.857, t-statistic –13.42). This provides evidence that restatement firms tend to be high growth firms. These firms are under great pressure to inflate earnings to meet or beat analysts' expectations and hence avoid the "torpedo effect" documented by Skinner and Sloan (2002). Restatement firms are not different from non-restatement firms with respect to profitability or size. Core earnings are similar for restatement and non-restatement firms. However, it is important to note that core earnings already include income increasing accrual choices undertaken by management. In the next section we examine these accrual choices directly.

Panel B of table 2 replicates the analysis in panel A with industry-adjusted figures. Industry-year adjusted variables are calculated by deducting the median value for the respective variable. We sort all variables into industry groups each year and use the median value for the industry-year group as a benchmark to identify whether firm characteristics are unusual. Restatement firms have lower industry-adjusted Book to Market than non-restatement firms (0.009 vs. 0.140, t-statistic –6.61). Earnings to Price loses its statistical significance once it is adjusted by the industry median. Again there is no evidence that restatement firms are different in terms of market capitalization or reported earnings at the time of the alleged manipulation that caused the subsequent restatement.

Insert table 2 here

Table 3 examines the factors that could have motivated the firms in undertaking aggressive accounting practices that have resulted in the later earnings restatements. We find that restatement firms have attracted more external financing than non-restatement firms (0.256 vs. 0.147, t-statistic 6.86).[4] We also find that restatement firms had more frequent external financing needs than non-restatement firms, evidenced by the higher *Ex-Ante Financing Need* (0.41 vs. 0.31, chi-square 15.92). This suggests that 41 percent of restatement firms were in need of additional financing in the year of alleged manipulation compared to 31 percent of non-restatement firms. As presented in panel B of Table 3, industry-year adjustments do not affect the significance of the differences in *Finance Raised* and *Ex-Ante Financing Need.* This evidence supports the argument that

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capital market pressures could be motivating firms to undertake aggressive accounting practices that result in earnings restatements. We also find that restatement firms have higher industry-year-adjusted leverage than non-restatement firms (0.069 vs. 0.028, t-statistic 4.76). This is consistent with explicit contracts providing incentives for the firms to engage in earnings management.

Finally, table 3 provides evidence on the historical growth in EPS and forecast errors for restatement and non-restatement firms. There is strong evidence that restatement firms have reported consistent increases in quarterly earnings and have consistently reported small positive forecast errors in the period leading up to the alleged manipulation. Together with the evidence in table 2 which showed these firms were priced at high multiples, this suggests that restatement firms were subject to intense capital market pressure to maintain earnings growth and reporting earnings that met or exceeded analyst expectations. 11.1 (6.1) percent of restatement (non restatement) firms reported four quarters of positive growth in earnings. Similarly, 9.8 (5.1) percent of restatement (non restatement) firms reported four consecutive quarters of small positive earnings surprises. The average restatement firm reports nearly 2 quarters of consecutive earnings growth and 1.35 quarters of small positive earnings surprises. These are significantly greater than the corresponding values for non-restatement firms – 1.3 quarters of earnings growth and less than one quarter of consecutively beating analyst targets. The results are similar for the industry adjusted analysis reported in panel B of table 3. Given the substantial costs of reporting an earnings figure less than the previous quarter (e.g., Barth, Elliot and Finn, 1999) or less than an analyst earnings target (e.g.,

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[4] The *Finance Raised* variable has a large mean value due to some firms with large secondary offerings. The median value for this variable is only 4 percent of assets (i.e., 0.04). Tests of median difference still

Skinner and Sloan, 2002) and the fact that the market penalty for missing either target is increasing in the extent to which firms have been able to beat these targets previously (Barth, Elliot and Finn, 1999) it is clear that the management of restatement firms were particularly sensitive about the stock market response to adverse earnings news. These capital market incentives are likely a key determinant in the decision of managers of restatement firms to engage in aggressive accounting practices.

Insert table 3 here

3.3 Ability of accrual information to predict earnings management of restatement firms

In this section we present the results related to how accruals of restatement firms are different from those of non-restatement firms. Table 4 shows that the restatement firms have larger total accruals than non-restatement firms. Total accruals amount to 8.7 percent of average total assets in restatement firms, whereas they represent 3.9 percent of the average assets for non-restatement firms (t-statistic 4.50). It is important to note that our total accrual measure is very different from the working capital accrual measures used in previous papers (e.g., Sloan, 1996). In contrast to previously used measures of accruals, our measure of total accruals has a positive mean as we include both the originating asset acquisition accruals as well as the negative depreciation accrual.

Insert table 4 here

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reveal a difference between restatement firms and non-restatement firms.

When we break total accruals down to its first level components, ΔWC, ΔNCO, ΔFIN, we find similar results. Working capital accruals represent 4 percent of average total assets of restatement firms, whereas they represent 1.7 percent of average total assets of non-restatement firms (t-statistic 3.43). ΔNCO amounts to 11.6 percent of the average total assets of restatement firms and 4 percent of the average total assets of non-restatement firms (t-statistic 7.96). ΔFIN is −0.069 for restatement firms and −0.021 for non-restatement firms (t-statistic 4.58). This is due to the fact that restatement firms have much larger $\Delta FINL$ (0.078 vs. 0.026, t-statistic 5.73).

Decomposition into the asset and liability components of accruals yields similar results. Restatement firms have larger ΔCOA (0.093 vs. 0.041), ΔCOL (0.053 vs. 0.024), $\Delta NCOA$ (0.126 vs. 0.050), $\Delta NCOL$ (0.01 vs. 0.007), $\Delta FINA$ (0.009 vs. 0.005), and $\Delta FINL$ (0.078 vs. 0.026) than non-restatement firms, with all differences statistically significant except the difference in the $\Delta FINA$. We find that the statistical insignificance of the difference in $\Delta FINA$ is because the change in short-term investments (ΔSTI) component of $\Delta FINA$ is not different across restatement firms and non-restatement firms (0.001 vs. 0.003, t-statistic −0.51). However, change in long-term investments (ΔLTI) component of $\Delta FINA$ is significantly larger for restatement firms than non-restatement firms (0.009 vs. 0.002, t-statistic 2.57).

Table 5 tabulates the results of our logistic regressions identifying the role of accrual information in identifying the earnings management behavior of restatement firms. Our primary regression is as follows:

$$RESTATE = \gamma_0 + \gamma_1 TACC_t + \upsilon_{t+1} \qquad (1)$$

RESTATE is an indicator variable equal to one if the firm-year is a restatement

firm-year and zero otherwise. *TACC* is as defined earlier. We also perform additional

regressions breaking *TACC* down into its components. Consistent with the results

presented in Table 4, we show in Table 5 panel A that total accruals are positively

associated with the likelihood of observing an earnings restatement. The coefficient of

1.24 on *TACC* can be interpreted as follows. The lower (upper) quartile values for *TACC*

in our sample is –0.02 (0.10). The inter-quartile change in the independent variable,

TACC, leads to an increase in the dependent variable from –5.815 to –5.666. The

dependent variable in the logistic regression is a log-odds ratio. So the aforementioned

change can be equivalently expressed as a change in the probability of restatement from

0.002979 to 0.003447. This represents a 16 percent increase in the probability of an

earnings restatement. Figure 2 depicts the relation between the earnings restatement

event and the level of total accruals reported in the year of alleged manipulation. We

group all firm-year observations into ten equal sized portfolios based on the level of total

accruals. We then report the relative frequency of earnings restatements across each of

these ten groups. It is clear that there is a concentration of earnings restatements in the

group of firms reporting the highest level of total accruals.

Insert Figure 2 here

It is important to note that any analysis of relatively infrequent events (e.g.,

earnings restatements, SEC enforcement actions, bankruptcy etc.) will be subject to

classification errors. This is certainly true in our setting. Many firms that report high

levels of accruals will be incorrectly classified from our model as earnings restatement firms. However, this does not lessen the significance of the finding that earnings restatement firms are concentrated in the set of firms reporting the highest level of accruals. Thus, reported accruals can be considered a useful "red flag", indicating an increased likelihood of earnings management activities that have generated temporarily high (and non-sustainable) current earnings.

Panel B of table 5 presents the results of the logistic regression using the first level decomposition for total accruals. We show that ΔWC and ΔNCO are both positively associated with the likelihood of earnings restatements, whereas ΔFIN does not provide significant information in predicting earnings restatements (Wald χ^2 11.19, 62.83 and 0.01 respectively).

Insert table 5 here

Table 5 panel C shows the result of logistic regression using the next level of decomposition. Here, we see that it is the ΔCOA component of ΔWC, and $\Delta NCOA$ component of ΔNCO that are useful in predicting the likelihood of earnings restatements (Wald χ^2 11.82 and 34.26 respectively). $\Delta FINA$ and $\Delta FINL$ are both statistically insignificant.

Panel D of table 5 shows the final level of decomposition where $\Delta FINA$ is broken down to ΔSTI and ΔLTI. In this level of decomposition, ΔCOA component of ΔWC, and $\Delta NCOA$ component of ΔNCO are still useful in predicting the likelihood of earnings restatements (Wald χ^2 11.87 and 36.01 respectively). Furthermore, ΔLTI also provides

significant incremental information in predicting earnings restatements over and above that is provided by the other components of total accruals (Wald χ^2 8.62).

We have also replicated all logistic regressions by including both earnings-price and book-market ratios as additional independent variables. We do this for several reasons. First, evidence earlier in the paper suggested that high growth firms are subject to intense capital market pressures creating an incentive to undertake aggressive accounting policy choices. Second, growing firms are also likely to be experiencing growth in net operating assets giving rise to large accruals. To control for this growth impact on accruals we include *Earnings-to-Price* and *Book-to-Market* as separate regressors. The results from these additional (unreported) logistic regressions provide similar results to those reported in table 5. Firms with high total accruals are more likely to experience earnings restatements and the key accrual components are the change in working capital and change in non-current operating assets (with the results concentrated in the asset accounts). Furthermore, long-term investments also continue to be a strong predictor of earnings restatements even after controlling for growth. As expected the growth variables, *Earnings to Price* and *Book to Market*, load up strongly negative in these additional regressions, consistent with the earlier results that high growth firms are more likely to experience earnings restatements.

Finally, we have also examined the market's reaction to the announcement of the earnings restatement as a function of accrual information. We run the following regression (untabulated):

$$RETURN_t = \delta_0 + \delta_1 TACC_t + \eta_t \qquad (5)$$

RETURN is the market-adjusted three-day return centered on the announcement date for the restatement. The coefficients from the above regression are δ_0 = -0.099 and δ_1 = -0.082. The adjusted R^2 from the regression is 0.007. The coefficients can be interpreted as follows. The intercept suggests that the average three-day return for a firm with zero total accruals is about negative 10 percent. The slope coefficient suggests that an inter-quartile change in *TACC* (from –0.02 to 0.10) would be associated with an additional one percent loss in market value at the time of the restatement announcement. This monotonic relationship between the accruals and the stock price reaction at the announcement of earnings restatements suggests that firms with the highest accruals experience the largest negative stock price reaction at the announcement or earnings restatement. This evidence shows that accrual information is not only useful in predicting the earnings management behavior of restatement firms, but also is associated with the extent of stock price reaction at the earnings restatement announcement. Additional regressions (unreported) reveal that *ΔWC* (in particular the asset component) is the key component of *TACC* that explains variation in announcement returns.

4. Conclusion

In this paper we examine the usefulness of accounting information in predicting the earnings management behavior of restatement firms. Earnings restatement firms represent a powerful setting to examine earnings management. The SEC undertakes investigations of firms for which there is a high probability of successfully identifying earnings management. We know that the managers of our sample of restatement firms were intentionally inflating reported earnings.

We examine two types of incentives for firms to undertake aggressive accounting practices: (i) contracts, and (ii) capital market pressures. We find that explicit contracts could be motivating companies to manage earnings, because there is evidence that restatement firms have higher leverage than non-restatement firms. We find more compelling evidence consistent with the argument that firms undertake aggressive accounting practices due to capital market pressures. We show that restatement firms are on average high growth firms, have more frequent external financing needs, and raise larger amounts of cash. Furthermore, we find that restatement firms have reported consistent positive earnings growth and small positive forecast errors in the quarters leading up to the alleged manipulation. Together these findings suggest that these firms were under significant capital market pressures to engage in aggressive accounting practices to deliver earnings growth to satisfy market expectations.

We document that information in accruals is useful in predicting the earnings management behavior of restatement firms. We find that restatement firms report much larger accruals at the time of the alleged manipulation compared to non-restatement firms. Finally, we find that the stock price reaction to the announcement of earnings restatements is associated with the magnitude of the accruals. Firms that have the highest accruals experience the largest stock price decline when they announce an earnings restatement.

The results we present in this paper are important. Given the substantial costs associated with earnings restatements, the value of careful analysis of financial statement information, in particular information in accruals, should not be ignored by investors.

Careful consideration of information contained in financial statements is of value to capital market participants in identifying aggressive earnings management.

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TABLE 1
Earnings restatements for the period 1971-2000.
This sample is after requiring data from *Compustat*.

Panel A: Number of observations in the sample

Number of Firms Restating Earnings	255
Number of Firm-Year Restatements	440

Panel B: Distribution of restatement-years across firms

Number of Years Restated	Number of Firms
1	136
2	76
3	27
4	12
5	3
8	1

Panel C: Temporal distribution of earnings restatements

Year of Restatement	Number	Year of Restatement	Number
1971	1	1986	11
1972	1	1987	14
1973	1	1988	15
1974	1	1989	13
1975	1	1990	14
1976	1	1991	15
1977	4	1992	13
1978	7	1993	23
1979	6	1994	17
1980	6	1995	19
1981	8	1996	34
1982	12	1997	62
1983	8	1998	76
1984	10	1999	34
1985	12	2000	1

Restatement firms are identified by an extensive search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Info databases covering the years 1971 to 2000 inclusive. The key words were "restatement," "restate," "restated," "restates," and "restating." The search was limited to U.S.-listed firms. The collection does not include the restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

Number of Years Restated refers to the number of 10K filing(s) affected by each earnings restatement.

Year of Restatement is the fiscal year for which earnings are restated.

TABLE 2

Characteristics of firms at the time of the alleged manipulation that precipitated the restatement. The sample includes 440 restatement firm-years and 133,208 non-restatement firm-years over the period 1971-2000.

Panel A: Firm characteristics

Variable	Restatement Firms	Non-Restatement Firms	T-test
Earnings to Price	0.057	0.104	-6.32**
Book to Market	0.554	0.857	-13.42**
Net Income	-0.011	0.003	-1.69*
Core Earnings	0.048	0.054	-0.76
Market Value	930	894	0.24

Panel B: Industry-year adjusted firm characteristics

Variable	Restatement Firms	Non-Restatement Firms	T-test
Earnings to Price	-0.024	-0.020	-0.63
Book to Market	0.009	0.140	-6.61**
Net Income	-0.045	-0.035	-1.26
Core Earnings	-0.024	-0.025	0.12
Market Value	824	792	0.22

** (*) Indicates significance at better than the 1% (5%) level for one tail tests.

Restatement firms are identified by an extensive search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Info databases covering the years 1971 to 2000 inclusive. The key words were "restatement," "restate," "restated," "restates," and "restating." The search was limited to U.S.-listed firms. The collection does not include the restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

Industry-year adjusted variables are calculated by deducting the median value for the respective variable. We sort all observations into industry groups each year and use the median value for the industry-year group as a benchmark to identify whether firm characteristics are unusual.

Earnings to Price is calculated as income from continuing operations (item 178) divided by market capitalization at the end of the fiscal year (item 25 * item 199).
Book to Market is calculated as the book value of equity (item 60) divided by market capitalization at the end of the fiscal year (item 25 * item 199). Firm years with negative book value of equity are coded as missing.
Net Income is calculated as net income (item 172) deflated by average total assets.
Core Earnings is calculated as income from continuing operations (item 178) deflated by average total assets.
Market Value is the market capitalization of the firm at the end of the fiscal year (item 25 * item 199).

TABLE 3

Motivating factors for the alleged manipulation. The sample includes 440 restatement firm-years and 133,208 non-restatement firm-years over the period 1971-2000.

Panel A: Firm characteristics

Variable	Restatement Firms	Non-Restatement Firms	T-test or χ^2 test
Finance Raised	0.256	0.147	6.86**
Ex-Ante Financing Need	0.41	0.31	15.92**
Leverage	0.257	0.258	-0.10
EPS Growth1	0.110	0.061	12.22**
EPS Growth2	1.97	1.31	4.92**
STRING1	0.098	0.051	14.89**
STRING2	1.35	0.93	3.25**

Panel B: Industry-year adjusted firm characteristics

Variable	Restatement Firms	Non-Restatement Firms	T-test or χ^2 test
Finance Raised	0.202	0.010	6.64**
Ex-Ante Financing Need	0.26	0.16	28.80**
Leverage	0.069	0.028	4.76**
EPS Growth2	0.98	0.34	1.58**
STRING2	0.88	0.67	4.87**

** (*) Indicates significance at better than the 1% (5%) level for one tail tests.

Restatement firms are identified by an extensive search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Info databases covering the years 1971 to 2000 inclusive. The key words were "restatement," "restate," "restated," "restates," and "restating." The search was limited to U.S.-listed firms. The collection does not include the restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

Industry-year adjusted variables are calculated by deducting the median value for the respective variable. We sort all observations into industry groups each year and use the median value for the industry-year group as a benchmark to identify whether firm characteristics are unusual.

Leverage is calculated as short term debt (item 34) plus long term debt (item 9) deflated by end of year assets (item 6).
Finance Raised is the sum of additional cash raised from the issuance of common and preferred stock (item 108) and the issuance of long-term debt (item 111). This variable is deflated by average total assets.
Ex-Ante Financing Need is an indicator variable equal to one if the firm's free cash flow is less than –0.1, and zero otherwise. Similar to Dechow, Sloan and Sweeney (1996) we calculate free cash flow as Cash

Flows less the average capital expenditure (item 128) over the last three years, deflated by average total assets.

EPS Growth1 is an indicator variable equal to one if the firm has reported consecutive increases in EPS for the last four quarters and zero otherwise.

EPS Growth2 counts the number of quarters of consecutive EPS growth.

Both *EPS Growth1* and *EPS Growth2* use EPS in the current quarter and the previous eight quarters where data is available. For example, company XYZ reports EPS of $0.50 in Q1 of 1994, $0.55 in Q2 of 1994, $0.60 in Q3 of 1994, $0.63 in Q4 of 1994 and $0.80 in Q1 of 1995. For company XYZ in Q1 of 1995, *EPS Growth1* would be equal to 1 as there is consecutive EPS growth across the five quarters (current and four previous quarters). *EPS Growth2* would be equal to 4 as there have been four quarters of consecutive EPS growth. If company XYZ had reported an EPS of $0.54 in Q3 of 1994 instead of $0.60 then in Q1 of 1995, *EPS Growth1* would be equal to zero, and *EPS Growth2* would be equal to 2. All EPS numbers are split adjusted to ensure comparability through time.

STRING1 is an indicator variable equal to one if the firm has reported consecutive small positive forecast errors for the last four quarters and zero otherwise.

STRING2 counts the number of consecutive quarters with small positive forecast errors.

Both *STRING1* and *STRING2* use forecast errors in the current quarter and the previous eight quarters where data is available. For example, company XYZ reports a forecast error of +1 cents in Q1 of 1994, +3 cents in Q2 of 1994, +1 cent in Q3 of 1994, and +2 cents in Q4 of 1994. For company XYZ in Q4 of 1994, *STRING1* would be equal to 1 as there are four consecutive quarters of small positive forecast errors. *STRING2* would be equal to 4 as there have been four quarters of consecutive small positive forecast errors. If company XYZ had reported a forecast error of -1 cent (i.e., fell short of analyst target by 1 cent) in Q2 of 1994 instead of +3 cents then in Q4 of 1994, *STRING1* would be equal to zero, and *STRING2* would be equal to 2. Forecast data are obtained from the I/B/E/S files and are free of the "split" problem as described in Baber and Kang (2002).

TABLE 4

Ability of financial statement information to predict the earnings restatements. Analysis of accrual components for earnings restatement firms compared to non-restatement firms. The sample includes 440 restatement firm-years and 133,208 non-restatement firm-years over the period 1971-2000.

Test of differences on various accrual components

Variable	Restatement Firms	Non-Restatement Firms	T-test
TACC	0.087	0.039	4.50**
ΔWC	0.040	0.017	3.43**
ΔNCO	0.116	0.044	7.96**
ΔFIN	-0.069	-0.021	4.58**
ΔCOA	0.093	0.041	6.21**
ΔCOL	0.053	0.024	4.95**
ΔNCOA	0.126	0.050	8.05**
ΔNCOL	0.010	0.007	2.01*
ΔFINA	0.009	0.005	0.88
ΔFINL	0.078	0.026	5.73**
ΔSTI	0.001	0.003	-0.51
ΔLTI	0.009	0.002	2.57*

** (*) Indicates significance at better than the 1% (5%) level.

Restatement firms are identified by an extensive search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Info databases covering the years 1971 to 2000 inclusive. The key words were "restatement," "restate," "restated," "restates," and "restating." The search was limited to U.S.-listed firms. The collection does not include the restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

TACC is total accruals from the balance sheet approach. It is calculated as ΔWorking Capital (ΔWC) + ΔNon-Current Operating (ΔNCO) + ΔFinancial (ΔFIN). This can be equivalently written as (ΔCOA - ΔCOL) + (ΔNCOA - ΔNCOL) + (ΔFINA - ΔFINL). All balance sheet method accrual variables are deflated by average total assets.

ΔWC is defined as WC_t - WC_{t-1}. Where WC = Current Operating Assets (COA) - Current Operating Liabilities (COL) where COA=Current Assets (Compustat Item #4) - Cash and Short Term Investments (STI) (Compustat Item #1). COL=Current Liabilities (Compustat Item #5) - Debt in Current Liabilities (Compustat Item #34).
ΔCOA is change in current operating assets defined as COA_t - COA_{t-1}.
ΔCOL is change in current operating liabilities defined as COL_t - COL_{t-1}.

ΔNCO is defined as NCO_t - NCO_{t-1}. Where NCO = Non-Current Operating Assets (NCOA) - Non-Current Operating Liabilities (NCOL) where NCOA = Total Assets (Compustat item #6) - Current Assets

(Compustat Item #4) - Investments and Advances (Compustat Item #32). NCOL = Total Liabilities (Compustat Item #181) - Current Liabilities (Compustat Item #5) – Long-term debt (Compustat Item #9). ΔNCOA is change in non-current operating assets defined as $NCOA_t$ - $NCOA_{t-1}$.
ΔNCOL is change in non-current operating liabilities defined as $NCOL_t$ - $NCOL_{t-1}$.

ΔFIN is defined as FIN_t - FIN_{t-1}. Where FIN = Financial Assets (FINA) - Financial Liabilities (FINL). FINA = Short Term Investments (STI) (Compustat Item #193) + Long Term Investments (LTI) (Compustat Item #32). FINL= Long term debt (Compustat Item #9) + Debt in Current Liabilities (Compustat Item #34) + Preferred Stock (Compustat Item #130).
ΔFINA is change in financial assets defined as $FINA_t$ - $FINA_{t-1}$.
ΔFINL is change in financial liabilities defined as $FINL_t$ - $FINL_{t-1}$.
ΔSTI is change in short term investments.
ΔLTI is change in long term investments.

TABLE 5
Logistic Regressions of Earnings Restatements on Total Accruals and its Components.
The sample includes 440 restatement firm-years and 133,208 non-restatement firm-years
over the period 1971-2000.

Panel A: LOGISTIC regressions for Total Accruals

(1) $RESTATE = \gamma_0 + \gamma_1 TACC_t + \upsilon_{t+1}$

	γ_0	γ_1	Wald χ^2	P value
Coefficient	-5.79	1.24	28.47	0.001
Wald χ^2	12480	28.47		

Panel B: LOGISTIC regressions for Initial Balance Sheet Decomposition

(2) $RESTATE = \gamma_0 + \gamma_1 \Delta WC_t + \gamma_2\ \Delta NCO_t + \gamma_3\ \Delta FIN_t + \upsilon_{t+1}$

	γ_0	γ_1	γ_2	γ_3	Wald χ^2	P value
Coefficient	-5.93	1.37	2.28	0.02	111.92	0.001
Wald χ^2	10963	11.19	62.83	0.01		

Panel C: LOGISTIC regressions for Extended Balance Sheet Decomposition

(3) $RESTATE = \gamma_0 + \gamma_1\ \Delta COA_t - \gamma_2\ \Delta COL_t + \gamma_3\ \Delta NCOA_t - \gamma_4\ \Delta NCOL_t + \gamma_5\ \Delta FINA_t$
$- \gamma_6\ \Delta\ FINL_t + \upsilon_{t+1}$

	γ_0	γ_1	γ_2	γ_3	γ_4	γ_5	γ_6	Wald χ^2	P value
Coefficient	-5.98	1.36	-0.57	1.85	0.49	0.43	-0.16	139.11	0.001
Wald χ^2	10322	11.82	0.89	34.26	0.23	0.93	0.23		

Panel D: LOGISTIC regressions for Extended Balance Sheet Decomposition ($\Delta FINA$ breakdown)

(4) $RESTATE = \gamma_0 + \gamma_1\ \Delta COA_t - \gamma_2\ \Delta COL_t + \gamma_3\ \Delta NCOA_t - \gamma_4 \Delta NCOL_t + \gamma_5\ \Delta STI_t$
$+ \gamma_6\ \Delta LTI_t - \gamma_7\ \Delta\ FINL_t + \upsilon_{t+1}$

	γ_0	γ_1	γ_2	γ_3	γ_4	γ_5	γ_6	γ_7	Wald χ^2	P value
Coefficient	-5.99	1.36	-0.59	1.89	0.65	-0.13	2.31	-0.09	147.31	0.001
Wald χ^2	10288	11.87	0.95	36.01	0.43	0.07	8.62	0.07		

Restatement firms are identified by an extensive search of the Lexis-Nexis Business, Dow-Jones Interactive Publications Library and ABI/Info databases covering the years 1971 to 2000 inclusive. The key words were "restatement," "restate," "restated," "restates," and "restating." The search was limited to U.S.-listed firms. The collection does not include the restatements related to stock splits, dividend distributions, discontinued operations, merger and acquisitions, change of accounting periods, and application of new accounting principles or policies, such as adoption of new FASB statements.

RESTATE is an indicator variable equal to one if the firm-year observation is subject to an earnings restatement and zero otherwise.

TACC is total accruals from the balance sheet approach. It is calculated as ΔWorking Capital (ΔWC) + ΔNon-Current Operating (ΔNCO) + ΔFinancial (ΔFIN). This can be equivalently written as (ΔCOA - ΔCOL) + (ΔNCOA - ΔNCOL) + (ΔFINA - ΔFINL). All balance sheet method accrual variables are deflated by average total assets.

ΔWC is defined as WC_t - WC_{t-1}. Where WC = Current Operating Assets (COA) - Current Operating Liabilities (COL) where COA=Current Assets (Compustat Item #4) - Cash and Short Term Investments (STI) (Compustat Item #1). COL=Current Liabilities (Compustat Item #5) - Debt in Current Liabilities (Compustat Item #34).
ΔCOA is change in current operating assets defined as COA_t - COA_{t-1}.
ΔCOL is change in current operating liabilities defined as COL_t - COL_{t-1}.

ΔNCO is defined as NCO_t - NCO_{t-1}. Where NCO = Non-Current Operating Assets (NCOA) - Non-Current Operating Liabilities (NCOL) where NCOA = Total Assets (Compustat item #6) - Current Assets (Compustat Item #4) - Investments and Advances (Compustat Item #32). NCOL = Total Liabilities (Compustat Item #181) - Current Liabilities (Compustat Item #5) – Long-term debt (Compustat Item #9).
ΔNCOA is change in non-current operating assets defined as $NCOA_t$ - $NCOA_{t-1}$.
ΔNCOL is change in non-current operating liabilities defined as $NCOL_t$ - $NCOL_{t-1}$.

ΔFIN is defined as FIN_t - FIN_{t-1}. Where FIN = Financial Assets (FINA) - Financial Liabilities (FINL). FINA = Short Term Investments (STI) (Compustat Item #193) + Long Term Investments (LTI) (Compustat Item #32). FINL= Long term debt (Compustat Item #9) + Debt in Current Liabilities (Compustat Item #34) + Preferred Stock (Compustat Item #130).
ΔFINA is change in financial assets defined as $FINA_t$ - $FINA_{t-1}$.
ΔFINL is change in financial liabilities defined as $FINL_t$ - $FINL_{t-1}$.
ΔSTI is change in short term investments.
ΔLTI is change in long term investments.

CF is cash flows from the balance sheet approach. It is calculated as NI - TACC. NI is calculated as Net Income (Compustat Item #172) deflated by average total assets.

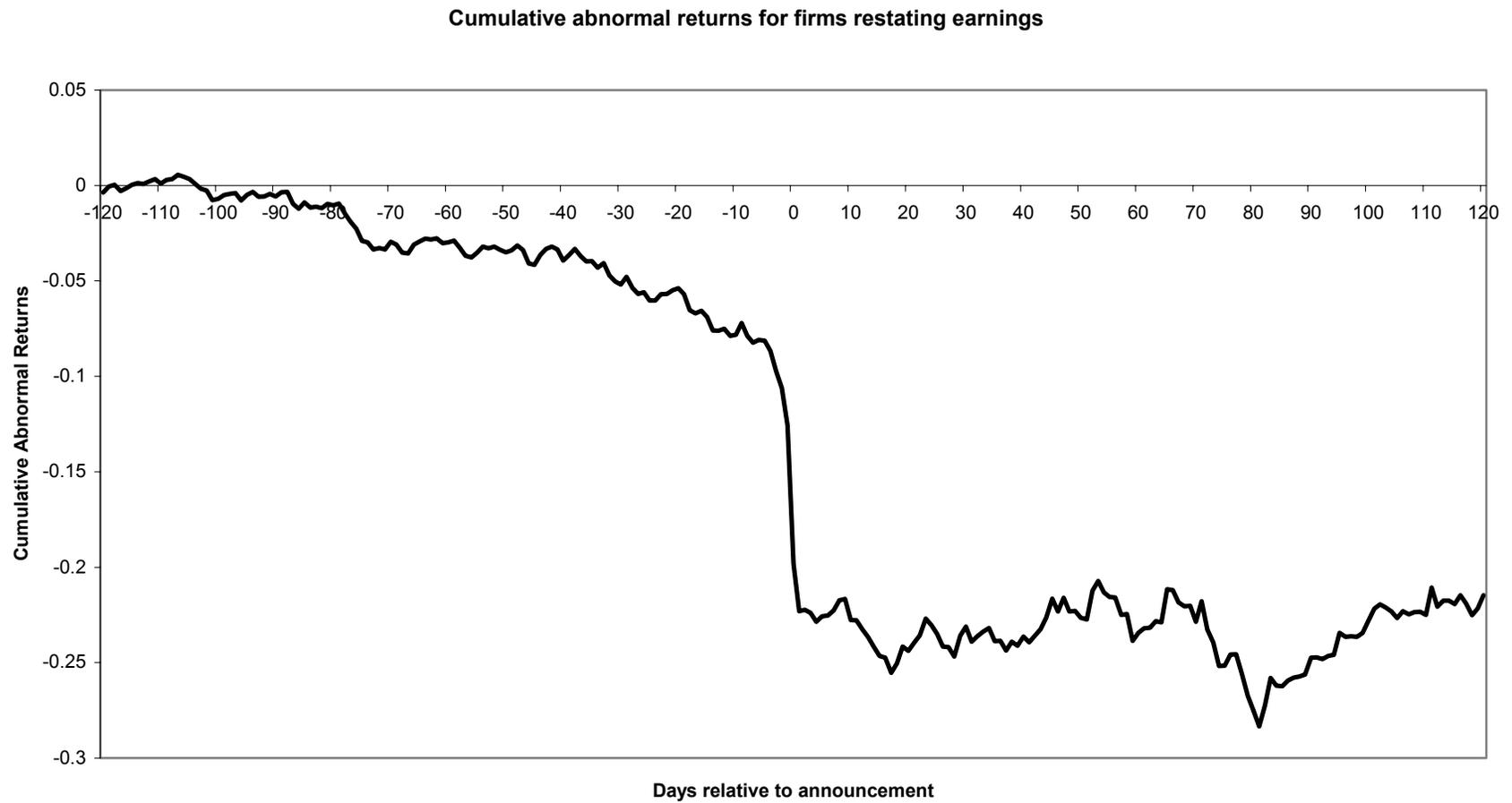**Cumulative abnormal returns for firms restating earnings**

Figure 1: This figure shows cumulative abnormal returns for firms subject to earnings restatements for the period 1971-2000. The return period starts 120 days prior to the earnings restatement date and continues until 120 days after the restatement date. The stock returns are adjusted for the value weighted with dividend index.
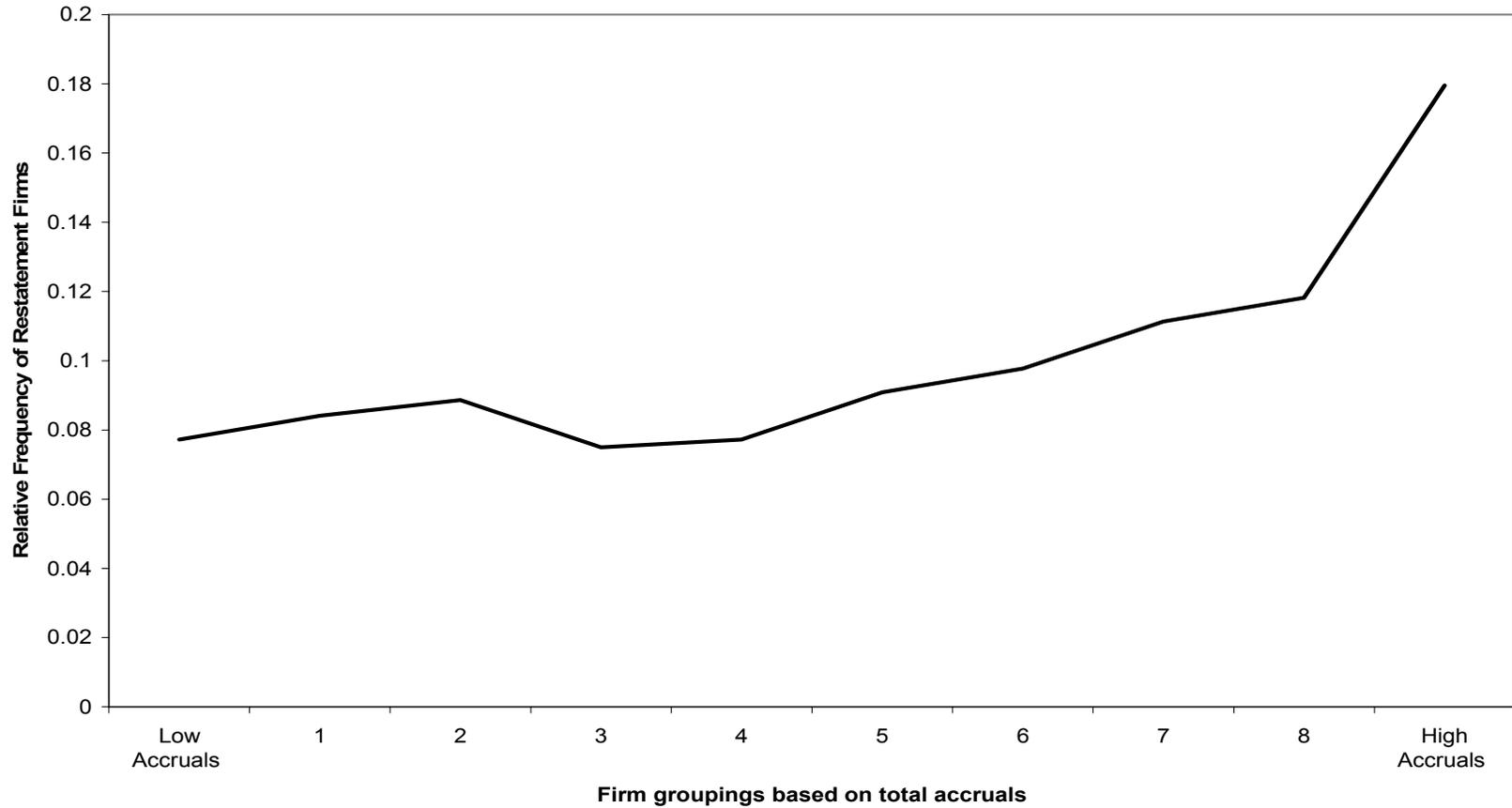
Relative Frequency of Restatement Firms

Figure2: This figure shows the relative frequency of our sample of 440 earnings restatement firms as a function of total accruals. Total accruals are measured using the balance sheet approach as described in the notes to table 4 above. Firm-year observations are grouped into ten equal sized portfolios and the relative frequency of earnings restatements is plotted across these ten groups.