

## **Internal Control Weaknesses and Information Uncertainty**

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## **Internal Control Weaknesses and Information Uncertainty**

### **Abstract**

Using a sample of 336 firms making reports required by the Sarbanes-Oxley Act, we examine the effect of mandated internal control weaknesses disclosures on information uncertainty for disclosing firms and for size- and performance-matched non-disclosing firms. We find a significantly negative (weakly positive) price response for disclosing (non-disclosing) firms consistent with resolution of information uncertainty in both groups. For disclosing firms we find that the negative market response to disclosure is exacerbated by conditions associated with higher inherent reporting risk, including auditor turnover and high-risk industry membership. However, we find that the negative market response to disclosure is mitigated when the firm has engaged a high quality auditor. In addition, we find that the negative market reaction for disclosing firms is dampened when the firm's previously reported earnings have an abnormally high accruals component. This result is consistent with the disclosure having lower information content when poor earnings quality has already been conveyed by high abnormal accruals.

**JEL Classification: G14, G18, G30**

**Keywords: earnings quality; information uncertainty; reporting credibility; Sarbanes-Oxley; regulation**

## **1. Introduction**

Recent accounting scandals have led to increased interest into the determinants and consequences of low financial reporting quality. A series of congressional inquiries into the integrity of financial reporting systems in the United States culminated with the passage of the Sarbanes-Oxley Act (SOX) in 2002. Among other provisions, SOX requires firms to identify and disclose material weaknesses in internal controls over financial reporting. One potential effect of these disclosures is a reduction of the average level of information uncertainty in the market. Easley and O'Hara (2004) shows that information uncertainty may be a non-diversifiable risk factor priced by investors. Therefore, regulation that reduces systematic information risk may reduce the average cost of equity and promote economic growth.

In this paper, we focus on the market response to mandated disclosures that provide information about the credibility of firms' financial reporting systems. First, we measure abnormal returns over the three-day window surrounding the disclosure event to determine whether the market response to disclosing (non-disclosing) firms is consistent with an increase (decrease) in perceived information uncertainty. Second, we examine factors expected to exacerbate or mitigate the market response to the disclosures, including audit quality, industry membership, auditor turnover, prior restatements and previous signals of low earnings quality. Third, we perform two tests to determine whether the negative market response is consistent with higher perceived information risk. Specifically, we evaluate whether the market's response to earnings announcements declines when weaknesses are disclosed, consistent with lower perceived informativeness of earnings. We also evaluate whether abnormal trading volume increases with disclosure, consistent with greater information uncertainty for disclosing firms.

Our study contributes to three important streams of research. The first is how the quality of financial disclosures affects the capital markets. Prior research has been subject to limited availability of meaningful proxies for financial reporting quality. For example, Botosan (1997) and

Botosan and Plumlee (2002) provide some evidence that the quantity of disclosures is negatively associated with the cost of equity for firms with low analyst following. However, inferences are limited to the extent that disclosure quantity does not capture disclosure quality. Similarly, the documentation of disproportionately negative reactions to financial report restatements is consistent with the pricing of increased information uncertainty (Hribar and Jenkins, 2004, Palmrose et al., 2004). However, restatement announcements confound information about future financial performance with information about the credibility of the firm's financial reporting system. In contrast, our setting allows us to evaluate the capital market effects of disclosures directly targeted at the quality of individual firm's financial reporting system separately from disclosures about financial performance.

Our study also contributes to research that investigates how auditor attestation affects the perceived credibility of financial reporting systems. Teoh and Wong (1993) finds that firms engaging high quality auditors have higher earnings response coefficients. Becker et al. (1998) finds that firms engaging high quality auditors have lower discretionary accruals. However, these results are consistent either with the selection of high quality auditors by high quality firms, or with the engagement of high quality auditors resulting in higher perceived earnings quality. In contrast, our setting allows us to examine the marginal effect of auditor type on the market reaction to an uncertainty-increasing event. Finding a positive effect of audit quality on information uncertainty in this setting is consistent with the engagement of high-quality auditors resulting in higher actual or perceived financial reporting quality.

Finally, our paper contributes to the stream of research assessing the effects of Sarbanes-Oxley provisions on the financial reporting environment, for which results have been mixed. Li et al. (2004) and Jain and Rezaee (2003) document a positive market reaction to the regulatory proposals culminating with the passage of SOX, consistent with SOX having a net beneficial effect on the quality of financial reporting. Consistent with these results, Jain et al. (2004) finds that information

uncertainty reflected in bid-ask spreads declined subsequent to SOX. In contrast, Cohen et al. (2004) finds no change in earnings informativeness following the passage of SOX and Bhattacharya et al. (2002) finds no significant market response to CEO and CFO certification requirement. Each of these studies primarily addresses perceived changes in the average information environment and all but Bhattacharya et al (2002) are based on anticipated rather than actual implementation of SOX. In contrast, our study focuses on the effect on firm-specific information uncertainty of disclosures about reporting quality resulting from implementation of SOX. Hence, our analysis can reveal significant individual effects that might cancel out in aggregate, and the power of our tests is potentially stronger.

Our paper contains the following results. First, we find a significantly negative (weakly positive) price response for disclosing (non-disclosing) firms consistent with resolution of information uncertainty in both groups. Second, for disclosing firms we find that the negative market response to disclosure is exacerbated by conditions associated with higher inherent reporting risk, including auditor turnover and high-risk industry membership. However, we find that the negative market response to disclosure is mitigated when the firm has engaged a high quality auditor. Finally, we find that the negative market reaction for disclosing firms is dampened when the firm's previously reported earnings have an abnormally high accruals component. This result is consistent with the disclosure having lower information content when poor earnings quality has already been conveyed by high abnormal accruals.

The rest of the paper is organized as follows. In the next section we provide background on SOX and discuss previous literature examining information risk. In Section 3 we describe our hypotheses and research design. In section 4 we describe our sample and provide descriptive statistics. We present results in Section 5, and additional analyses in Section 6. Section 7 contains a summary and our conclusions.

## **2. Background and prior research Background and prior research**

### *2.1 Regulation of internal accounting controls*

The Securities Acts of 1933 and 1934 give the Securities and Exchange Commission little authority over firms' operational matters or their internal accounting controls. Hence, regulatory oversight over firms' internal controls results from subsequent legislation enacted, generally in response to accounting scandals. The passage of the Foreign Corrupt Practices Act ("FCPA") in 1979 marks the first legislative effort to instill investor confidence in the quality of financial reporting by providing regulatory standards for internal accounting controls. The FCPA requires issuers to "make and keep books, records, and accounts, which, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the issuer." Although these provisions are consistent with the establishment and maintenance of an effective system of internal controls, the FCPA offers no materiality standard, and there is little authority for enforcement of the Act in the absence of evidence of other wrong-doing.

Regulatory authority over internal accounting controls is expanded by the passage of the Federal Deposit Insurance Corporation Improvement Act ("FDICIA") in 1991 in response to the large number of bank failures in the 1980s. In addition to requiring banks to establish and maintain a documented system of internal controls, pioneering provisions of FDICIA called for banks to assess and report on the adequacy of their internal controls, and for these controls to be subjected to independent audit.

The consequence of well-publicized accounting scandals, the Sarbanes-Oxley Act of 2002 ("SOX") expands the scope of regulatory oversight over internal controls to all public companies (rather than simply financial institutions), and relative to FDICIA, introduces new provisions emphasizing the certification and testing of internal controls by management and independent auditors. In particular, SOX significantly changes the information environment by providing for the establishment, maintenance and periodic certification in public reports of internal controls over

financial reporting, and by requiring firms to publicly disclose the nature and existence of any material weaknesses in internal controls over financial reporting.

Significant new reporting requirements for public companies and their independent auditors are summarized in Figure 1. Among the new requirements are Sections 302 and 404, which focus on internal control over financial reporting. Section 302, *Corporate Responsibility for Financial Reports*, requires CEOs and CFOs to certify in the company's quarterly and annual reports that:

- they reviewed the report,
- the report contains no misrepresentations,
- the financial information is fairly presented,
- they have reported any internal control weaknesses (including fraud) to the audit committee, and,
- they have reported any material changes in internal controls.

Under Section 404, *Enhanced Financial Disclosures, Management Assessment of Internal Controls*, both management and the company's independent auditor have increased responsibility with respect to internal controls. Specifically, Section 404 requires management to issue an "internal control report" in which they take responsibility for maintaining adequate internal controls and make assertions concerning their effectiveness. The company's auditor then must issue a separate opinion on management's assertions and the adequacy of the internal controls. We rely on these new reporting requirements and evaluate the information conveyed to investors by public disclosures of material internal control weaknesses.

## 2.2 *Prior research*

Our analyses of the information conveyed by disclosures of material weaknesses are related to three streams of research. The first includes research that investigates the market effects of the passage of the Sarbanes-Oxley Act in 2002 to assess whether the Act and its financial statement certification provisions are effective in reducing uncertainty about the quality of firms' financial reporting. Li et al. (2004) and Jain and Rezaee (2003) document a positive market reaction to the regulatory proposals that culminated with the passage of SOX, consistent with SOX having a net

beneficial effect on the quality of financial reporting. Jain et al. (2004) finds that information uncertainty reflected in bid-ask spreads declined subsequent to SOX. However, Cohen et al. (2004) finds no change in earnings informativeness following the passage of SOX, and Bhattacharya et al. (2002) finds no significant market response to the CEO and CFO certification requirement.

In contrast to these studies that evaluate the aggregate market effects of actual and perceived regulatory intervention associated with the passage of SOX, our setting enables us to examine the implications for individual firms of the implementation of a specific provision of the Act: the recently binding requirement to disclose material weaknesses.

A second body of research investigates how auditor characteristics and auditor actions affect the perceived credibility of financial reporting systems. For example, Teoh and Wong (1993) finds that firms engaging “BIG” auditors (a proxy for high quality auditors) have higher earnings response coefficients, and Becker et al. (1998) finds that firms engaging such auditors have lower discretionary accruals. The direction of causality is not clear from these studies. Firms with high quality financial reporting may engage high quality auditors. Alternatively, high quality auditors are better able to detect manipulations and their actions result in higher perceived earnings quality.

In contrast to prior work, our setting allows us to:

- 1) Examine the marginal effect of auditor type on the market reaction to an uncertainty-increasing event. Finding a positive effect of audit quality on information uncertainty while controlling for market perception of firms’ earnings quality is consistent with the engagement of high-quality auditors resulting in higher actual or perceived financial reporting quality.
- 2) Assess the information content of disclosures of internal control weaknesses both independently from auditor resignations, and for a wider range of control weaknesses.<sup>1</sup>

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<sup>1</sup> Prior research documents a negative market reaction to disclosures of material weaknesses in conjunction with auditor resignations reported under the requirements of FRR No 31 (SEC 1988) (e.g., DeFond et al. 1997, Whisenant et al. 2003, Beneish et al. 2005). In contrast to these studies we are able to assess the information content of disclosures of internal control weaknesses independently from auditor resignations. As well, the threshold for disclosure is significantly greater under FRR No 31 than SOX because FRR No 31 only requires disclosure about internal control weaknesses when such weaknesses are associated with auditor resignations.

The final stream of research to which we contribute attempts to document a connection between earnings quality and the stock market response to earnings or cost of capital. Easley, Hvidkjaer and O'Hara (2002) finds results consistent with the prediction that firms can reduce the cost of capital by increasing the precision of information, and Easley and O'Hara, (2004) shows that uncertainty about valuation parameters can affect firms' costs of capital. Development of this line of inquiry has been restricted by difficulties inherent in measuring the quality of earnings. For lack of better proxies to capture earnings quality, existing accounting research has tended to focus on the quantity of information, rather than the quality.

For example, Botosan (1997) and Botosan and Plumlee (2002) use the level of disclosure as a proxy for earnings quality. Botosan (1997) provides evidence suggesting a negative relation between the cost of equity capital and increased disclosure in annual reports for firms with low analyst following in the machine industry in 1990. However, after expanding the analysis to a sample of firms across industries and time, Botosan and Plumlee (2002) finds that the relation between disclosure level and cost of capital is not clear. In particular, they show a negative, positive, and no relation between disclosure level and cost of capital depending on disclosure type (i.e., annual report, quarterly and other reports, and investor relations). Moreover, their inferences must be qualified to the extent that quantity of information is not representative of information quality.

Francis et al.(2004) provide large sample evidence about the association between earnings quality and the cost of capital. However, Francis et al. (2004) acknowledge that their proxies for earnings quality cannot separate the effects associated with discretionary choices about reporting quality from the effects arising from uncontrollable factors associated with each firm's reporting environment. Hence, the cost of capital effects they document cannot be directly attributed to low reporting quality.

Palmrose et al. (2004) and Hribar and Jenkins (2004) document a significantly negative market reaction to restatement announcements. On average, the magnitude of the negative market

reaction is disproportionate to the size of the restatement, suggesting that low reporting credibility is costly, either due to increases in regulatory or legal costs or increases in perceived information risk. However, market reactions to restatements confound information about future financial performance with information about the credibility of the firm's financial reporting system. We contribute to research evaluating the market pricing of earnings quality by evaluating the market response to disclosures targeted at the quality of individual firm's financial reporting system separately from disclosures about financial performance.

### **3. Hypotheses and research design**

#### *3.1 Overview*

Easley and O'Hara (2004) show that the average cost of capital is increasing in the absolute level of information uncertainty and in informational heterogeneity among firms. Consequently, investors will demand higher returns from individual firms with greater information uncertainty. This suggests that firms making uncertainty-increasing disclosures will experience negative abnormal returns. In addition to this hypothesis, we assess whether mandated disclosure of private information about internal controls weaknesses creates an intra-industry information transfer.<sup>2</sup> That is, we assess whether the absence of material weakness disclosure for similar firms in the same industry is a signal that decreases uncertainty about the quality of non-disclosing firms' financial reporting. To examine whether there is evidence of such an information transfer, we match our experimental firms to two alternative control samples: (1) firms in the same industry matched on size (i.e., total assets at the end of 2003), (2) firms in the same industry matched on performance (i.e., lagged return on assets at the

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<sup>2</sup> Prior intra-industry information-transfer research studies stock-price reactions for multiple firms within an industry and interprets the price reactions to be indicative of the overall health of the industry or of shifts in the competitive balance within the industry. Prior research has investigated numerous such settings including announcements of earnings (e.g., Foster 1981), management forecasts of earnings (Baginski 1987), sales (e.g., Olsen, Dietrich, and Bernard 1985), industrial accidents (e.g., Bowen, Castanias, and Daley 1983), mergers (Eckbo 1983), and dividend changes (Firth 1996).

end of 2002). We expect the absence of material weakness disclosures for such firms to be uncertainty-reducing and to result in a positive stock market impact.

To examine the relation between market assessments of information risk and material weakness disclosures we compute cumulative abnormal returns for firms disclosing material weaknesses, as well as for size- and performance-matched control samples of non-disclosing firms.<sup>3</sup> Significant cumulative abnormal returns are consistent with disclosure events conveying information to the market that affects the market valuation of the firm.

We conduct three additional analyses. First, we regress cumulative abnormal returns on disclosure factors expected to influence the market reaction to material weakness disclosures. Following Palmrose et al. (2004) we maintain the assumption that security prices derive from the present value of expected future dividends or alternatively, expected future earnings. In this structure, a decline in price absent a decline in expected earnings is attributable to an increase in uncertainty, or risk. This analysis focuses on firms disclosing material weaknesses, and allows us to determine how the magnitude of the market response varies with factors expected to exacerbate or mitigate the level of information uncertainty.

Second, we relate abnormal returns over the three-day window surrounding quarterly earnings announcements to the magnitude of unexpected earnings and an indicator variable for material weakness disclosure. We include in the second set of analyses firms disclosing a material weakness together with samples of size and performance-matched firms. The second set of analyses follows Cohen et al (2004) and allows us to determine the effect of material weakness disclosures on earnings informativeness as well as to contrast the informativeness of earnings for disclosing and non-disclosing firms both before and after the disclosure.

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<sup>3</sup>We discuss the selection of event dates in Section 4 for the sample of firms disclosing material weaknesses. Event dates for matched firms correspond to the event date of the experimental firm to which each control firm is matched.

Our third set of analyses is designed to evaluate whether the market response to the disclosures and differences in earnings response coefficients across disclosing and non-disclosing firms are attributable to greater information uncertainty. Due to data limitations we use abnormal trading volume as our measure information uncertainty and assess whether this measure of uncertainty is higher for disclosing firms relative to non-disclosing firms both before and after the disclosure.<sup>4</sup>

### 3.2 Determinants of abnormal returns to material weakness disclosures

To examine the relation between abnormal returns and factors expected to exacerbate or mitigate the market response to material weakness disclosures we estimate the following equation:

$$CAR_{i,t} = \alpha_{i,t} + \beta_1 RESTATE_{i,t} + \beta_2 RESIGN_{i,t} + \beta_3 AQ_{i,t} + \beta_4 EM_{i,t} + \beta_5 INDUSTRY_{i,t} + \beta_6 CONTEXT_{i,t} + \varepsilon_{i,t} \quad (1)$$

We obtain stock return data from CRSP and measure size and market-adjusted cumulative abnormal returns over the three day window surrounding the material weakness disclosure by subtracting from individual firm daily returns the concurrent equally-weighted market return for other firms in the same market capitalization decile.

#### *Restatement*

To ascertain whether firms have previously restated financial reports, we search Lexis for restatement announcements for each of our sample firms and set RESTATE equal to one if the firm has announced a restatement of previously filed financial statement within the past five years, and zero otherwise. Extreme stock market reactions to restatements are consistent with a downward revision in reporting credibility as well as a downward revision in expected future earnings (Hribar and Jenkins, 2004; Palmrose et al., 2004). In addition, material restatements may be construed as

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<sup>4</sup> As discussed in Section 6, due to current data limitations we are unable to use as our proxy for information uncertainty changes in analyst forecast dispersion (Palmrose et al., 2004 and Hribar and Jenkins, 2004). Specifically, I/B/E/S and First Call data are not yet sufficiently populated with one- and two-year ahead forecast estimates for a meaningful calculation of post-disclosure dispersion. We plan to evaluate forecast dispersion as the data become available.

prima facie evidence of previous weaknesses over financial reporting (Hamilton and Trautmann, 2002). In the context of material weakness disclosures, we expect the coefficient on RESTATE to be positive because disclosure of material weaknesses subsequent to a restatement reflects negatively on the company's ability to remedy reporting deficiencies.

#### *Auditor resignation*

We review current reports on Form 8K and set RESIGN equal to one if the firm concurrently announces the departure of its auditor during the three-day event window, and zero otherwise. Market responses to auditor resignations are generally negative, consistent with a decline in perceived financial statement credibility (Beneish et al 2005, Shu 2000). Reportable events exacerbate the market response to auditor resignations (Whisenant et al. 2003). Hence, we expect auditor resignations to be negatively associated with abnormal returns over the event window.

#### *Disclosure context*

Material weaknesses can be disclosed within a variety of different SEC filings depending on the timing of detection relative to periodic filing requirements. Material weaknesses conveyed on current reports (Forms 8K and 6K) and 1933 Act filings (primarily registration statements) are likely to be perceived as most negative because these reports are non-routine and highlight the material weakness. Similarly, weaknesses disclosed in the quarterly reports are more likely to convey a greater sense of importance and urgency than weaknesses disclosed within the ponderous text of the annual reporting package. Therefore, we include indicator variables for disclosure context. We set CURR equal to one if the disclosure is made on a current report, and zero otherwise; REG is set equal to one if the disclosure is made on an a 1933 Act registration statement, and zero otherwise; and Q is set equal to one if the disclosure is made on a quarterly report, and zero otherwise. We expect each of these variables to have a negative coefficient that reflects the marginal negative effect of context relative to the annual reporting package.

### *Auditor quality*

High auditor quality can mitigate negative effects of increased information uncertainty, either because auditors improve the precision and credibility of financial disclosures (Francis et al. 2004; Palmrose et al. 2004 and Teoh and Wong 1993) or because well-capitalized audit firms provide potential indemnification against losses suffered due to potential misstatements (Bockus and Giger, 1998). Consistent with this literature we set audit quality equal to one when the audit firm is one of the big four and zero otherwise, and predict a positive coefficient.

### *Earnings management*

Consistent the findings of Francis et al. (2004) we assume (1) that share prices derive from estimates of unmanaged earnings, (2) that discount rates, reflecting information uncertainty, are higher for firms with lower earnings quality, and (3) that high abnormal accruals are associated with lower earnings quality. Hence, we expect high accruals to be positively related to abnormal returns around the announcement of internal control weaknesses. This finding would be consistent with the findings of Cohen et al (2004) that the level of earnings management is informative about the quality of earnings both before and after SOX. Because high abnormal accruals enable investors to type a firm as having low reporting quality, we posit that the material weakness disclosure will be less of a surprise when previous abnormal accruals are high. Therefore, we expect the coefficient on EM to be positive. Our proxies for earnings management include several measures of performance-matched abnormal accruals (Kothari et al. 2005). We provide details of the estimation in Table 7.

### *3.3 Association between material weakness disclosures and market response to earnings announcements*

We examine whether the relation between earnings and returns at the time of earnings announcements differs for firms disclosing material weaknesses relative to controls both prior and subsequent to the revelation of material weaknesses by disclosing firms. We consider the two samples of control firms previously described: one matched on industry/time-period and total assets

and one matched on industry/time-period and lagged ROA. To the extent that the price impact of unexpected earnings depends on uncertainty about the firms' earnings quality, we predict that the earnings surprise for disclosing firms will be less informative and result in a lower price impact.

To conduct our tests we specify three alternative forms of the relation between earnings and returns. First, we consider a widely used linear model:

$$UR_{i,t} = a_1 + a_2MWD + a_3AFT + b_1UE_{i,t} + b_2MWD * UE_{i,t} + b_3AFT * UE_{i,t} + b_4AFT * MWD * UE_{i,t} + \varepsilon \quad (2)$$

where:

- $UR_{i,t}$  = Size-adjusted returns in the three-day window surrounding the announcement date of quarterly earnings.
- $UE_{i,t}$  = difference in earnings before extraordinary items (Compustat Quarterly Data Item #76).
- $MWD$  = 1 if the firm discloses a material weakness; 0 otherwise.
- $AFT$  = 1 if the earnings announcement occurs after the disclosure of a material weakness; 0 otherwise.

We estimate Eq. 2 using all available observations for MWD firms and their matches over the period 1994-2004, and compare MWD firms to each of the matched samples separately. For this equation, our expectations translate into  $b_2 < 0$  and  $b_4 < 0$  respectively.

Prior research has proposed a number of reasons for departures from linearity in the earnings returns relation: (i) the stock price responses may vary according to the magnitude of the earnings surprise, (ii) the response for positive and negative surprises may be asymmetric, and (iii) the response might differ over time and across firms (among others, see Abdel-khalik (1990), Freeman and Tse (1992), Das and Lev (1992), Hayn (1995), Beneish and Harvey (1998), Lipe et al. (1998), Freeman et al. (2005).) We thus consider two alternative specifications, a modified quadratic and a modified square-root, specified in Eq. 3 and Eq. 4, respectively.

$$UR_{i,t} = a_1 + a_2MWD + a_3AFT + b_1UE_{i,t} + b_2MWD * UE_{i,t} + b_3AFT * UE_{i,t} + b_4AFT * MWD * UE_{i,t} + c_1 * UE_{i,t} * |UE_{i,t}| + c_2 * MWD * UE_{i,t} * |UE_{i,t}| + c_3 * AFT * UE_{i,t} * |UE_{i,t}| + c_4 * AFT * MWD * UE_{i,t} * |UE_{i,t}| + \varepsilon \quad (3)$$

$$\begin{aligned}
& a_1 + a_2 MWD + a_3 AFT + b_1 UE_{i,t} + b_2 MWD * UE_{i,t} + b_3 AFT * UE_{i,t} \\
UR_{i,t} = & b_4 AFT * MWD * UE_{i,t} + c_1 * |UE_{i,t}|^{1/2} + c_2 * MWD * |UE_{i,t}|^{1/2} \quad . \quad (4) \\
& c_3 * AFT * |UE_{i,t}|^{1/2} + c_4 * AFT * MWD * |UE_{i,t}|^{1/2} + \varepsilon
\end{aligned}$$

For these two specifications, the earnings response coefficient derives from an earnings response function that obtains from taking the partial derivative with respect to UE. Thus, for the modified-quadratic specification, our prediction that unexpected earnings will be capitalized into returns at a lower rate for MWD firms in the pre-disclosure period is akin to testing whether

$$b_2 MWD + 2c_2 * MWD * |UE_{i,t}| = 0, \text{ where } MWD \text{ and } MWD * |UE_{i,t}| \text{ are evaluated at the mean.}$$

Likewise, our prediction that unexpected earnings will be capitalized into returns at a lower rate for MWD firms after the disclosure of the material weakness is akin to testing that

$$b_4 MWD * AFT + 2c_2 * MWD * AFT * |UE_{i,t}| = 0, \text{ where } MWD * AFT \text{ and } MWD * AFT * |UE_{i,t}|$$

are also evaluated at the mean.<sup>5</sup>

### 3.4 Evidence of changes in information uncertainty subsequent to material weakness disclosure

Diamond and Verrecchia (1991) and Kim and Verrecchia (1994, 2001) show that trading volume reflects differences among investors' expectation revisions due to information asymmetry between managers and investors. Lower information asymmetry should result in lower abnormal trading volume around information releases. Alternatively, abnormal trading volume can be interpreted as reflecting differences across investors in interpreting information releases (Harris and Raviv, 1993).

<sup>5</sup>Similarly, for the square root model specification, our prediction that unexpected earnings will be capitalized into returns at a lower rate for MWD firms in the pre-disclosure period is akin to testing that  $b_2 MWD - 0.5c_2 * MWD * |UE|^{-1/2} = 0$  where MWD and  $MWD * |UE|^{-1/2}$  are evaluated at the mean, and our prediction that unexpected earnings will be capitalized into returns at a lower rate for MWD firms after the disclosure of the material weakness is akin to testing that  $b_4 MWD * AFT - 0.5c_4 * MWD * AFT * |UE|^{-1/2} = 0$  where  $MWD * AFT$  and  $MWD * AFT * |UE|^{-1/2}$  are also evaluated at the mean.

Over longer horizons significant increases in the amount of available information can increase the liquidity in the stock, which is reflected by a structural increase in normal trading volume (Diamond and Verrecchia, 1991 and Kim and Verrecchia 1994, 2001). In addition, richer information environments can lower the cost of information acquisition for analysts and increase their supply, resulting in an observable increase in analyst following (Healy, Hutton and Palepu, 1999).

To more directly assess whether material weakness disclosures result in changes in the information environment we compute long-range cumulative abnormal volume for disclosing firms and their matched counterparts before and after material weakness disclosures and evaluate differences. We obtain trading volume from CRSP and compute two measures of abnormal volume:

$$AXTURN_{i,t} = TURN_{i,t} - MTURN_{i,t} \quad (5)$$

$$AABVOL_{i,t} = (VOL_{i,t} - NORMVOL_{i,t}) / NORMVOL_{i,t} \quad (6)$$

where:

$TURN_{i,t}$	= Daily turnover for firm <sub>i</sub> on day t
$MTURN$	= equal-weighted market turnover for day t
$VOL_{i,t}$	= volume for firm <sub>i</sub> on day t
$NORMVOL_{i,t}$	= average daily volume for firm <sub>i</sub> over 200 day period ending with the beginning of the sixty day interval ending ten days before the first day of the event window.

Eq. 5 calculates average excess volume (MXTURN) and is measured prior (subsequent) to disclosure over the sixty day interval ending (beginning) ten days before (after) the event window.

Eq. 7 calculates average abnormal volume (AABVOL) and is also measured prior (subsequent) to disclosure over the sixty day interval ending (beginning) ten days before (after) the event window.

Ideally, we would evaluate changes in volume reactions to known information events, such as earnings releases in order to assess whether a structural shift has occurred. However, due to the recency of the disclosures, a significant portion of our sample has no earnings release subsequent to disclosure. Therefore we measure shifts in volume between sixty day periods that do not overlap the

event window. The validity of inferences about structural shifts in volume rests on the assumption that these arbitrary sixty day intervals contain a distribution of information events that is not correlated with MWD disclosure or non-disclosure. Hence the results must be interpreted with caution. We will limit our analysis to volume reactions around earnings releases as subsequent earnings releases occur in the first quarter of 2005.

As our final test of changes in the information environment we evaluate changes in analyst coverage between MWD and control firms subsequent to disclosure. We collect analyst forecasts from I/B/E/S and measure changes in analyst coverage for MWD firms and the control sample both in absolute terms (increase in number of analysts covering the stock) and as a percentage of coverage prior to the disclosure. Because analyst coverage is increasing in the richness of the information environment, we expect analyst coverage to decrease (increase) for MWD (control) firms.

#### **4. Data collection and sample descriptive statistics**

Material weakness disclosures are identified by making a full-text search of calendar-year 2004. We match documents containing the phrases “material weakness” and “internal control” within the same paragraph and matching the results to those filings listed by Compliance Week.<sup>6</sup> After culling observations comprising subsequent disclosures for the same firm, and filings containing only generic references to Sarbanes-Oxley reporting requirements, our sample consists of 523 unique firms. Of the 523 firms making disclosures, 187 firms are either not traded or are traded on the pink sheets. Panel A of Table 1 describes the 336 firms with available stock return data by month of filing and form type. The number of material weakness disclosures is highest in November, consistent with the third quarterly report (Form 10-Q) filing deadline for calendar year firms. The majority of disclosures are made in conjunction with 1934 Act Form 10-Q filings (162) and annual reports (78). However, current report disclosures (Forms 8-K and 6-K) comprise 63 filings and forms related to the 1933 Act (primarily registration statements) comprise 33 filings.

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<sup>6</sup> [www.complianceweek.com](http://www.complianceweek.com)

Stock returns and market capitalization are obtained from CRSP. Panel B of Table 1 shows that of the 336 firms for which stock returns are available on CRSP, 60% are traded on the National Market and 28% are traded on the New York Stock Exchange (NYSE). The remaining 12% are traded on the American Stock Exchange (ASE). The average market capitalization ranges from \$105 million to \$6,286 million and is largest for the NYSE, consistent with NYSE listing requirements.

Panel C of Table 1 shows the number of disclosures by industry. Industry groups with the largest representation in the sample include Durable manufacturers (23%) Computers (17%), Other (14%), Services (11%), and Retail (10%). Supplemental analysis, not tabulated, shows that durable manufacturers, service firms, and firms in the computer industry are disproportionately represented in the sample relative to the COMPUSTAT population.

Table 2, Panel A compares our sample firms (MWD) to the COMPUSTAT population in the year prior to the fiscal year preceding the disclosure of a material weakness (fiscal 2002). Relying on median comparisons, MWD firms are larger (in terms of assets, sales and market value of equity), less profitable (lower ROA and higher frequency of losses), and they experience slower sales growth. MWD firms have higher accruals (less negative) and are more likely to have reported income-decreasing special items. Panel B reports a comparison to a sample of control firms matched on industry, time, and total assets in 2002. Relative to size-matched controls, MWD firms are less profitable and more levered. They have higher accruals (less negative) and are more likely to have reported income-decreasing special items.

Finally, Panel C reports a comparison to a sample of control firms matched on industry, time (fiscal 2002), and lagged ROA. The comparison reveals that MWD firms are larger (in terms of assets and market value of equity), and that the matching on lagged ROA is partially successful (the mean ROA does not differ across samples but the median ROA of sample firms is lower). Of particular interest, mean and median accruals (total and current) do not differ across samples. This is

comforting as we subsequently compute abnormal accruals using the performance-matching procedure documented by Kothari et al. (2005).

## 5. Results

### 5.1 Market reaction to disclosure of material weaknesses

Table 3 reports statistics describing the market impact of disclosure of material weaknesses. In Panel A, the evidence indicates that material weakness disclosures had an adverse effect on firms' stock prices. On average, for the full sample, the three-day size-adjusted return of -1.50% is distinguishable from zero at the 10% level.<sup>7</sup> In addition, we find that material weaknesses first disclosed on current reports (Forms 8K and 6K) and 1933 Act filings (primarily registration statements) are perceived as most negative, consistent with these reports being non-routine and filed to highlight the material weakness. The results both uncontaminated and uncontaminated/winsorized samples reveal a similar pattern with a lower price impact (-0.76% and -0.77%).

We assess whether information transfers to matched firms in the same industry in Panel B. The results suggest that size-matched firms experience a significantly positive average stock price impact of 0.67% (p-value=0.044), but that price impact for performance-matched firms is not distinguishable from zero at conventional levels (mean 0.70%, p-value=0.104). Nevertheless, because the disclosures we study do not have a predictable pattern, it is possible that these weak evidence of information transfer stems from the fact that the absence of early disclosure does not mean absence of material weakness.

In Panel C, the evidence suggests that the impact of the material weakness disclosure is less adverse for firms audited by a Big Four auditor, and for firms with larger market capitalization. This

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<sup>7</sup> Because the 336 event dates occur on 137 different calendar days, there is clustering in event time that can result in a violation of independence across days. Indeed, the mean number of announcements per calendar day is approximately 2.4 and the median is 1. The positive skewness is in large part due to three calendar days in which there are 36, 22, and 11 firms disclosing material weaknesses. To address this issue, we create an equally weighted portfolio for each calendar day that contains two or more announcing firms. The mean three-day size-adjusted return over 137 observations is -2.41% (p-value .006) and the median is -1.40%. These results suggest that event day clustering does not affect the results.

evidence is consistent with such firm characteristics mitigating the uncertainty about the quality of financial reporting associated with the disclosure of a material weakness.

## 5.2 *Determinants of abnormal returns to material weakness disclosures*

Table 4 presents statistics from our regressions of cumulative abnormal returns on factors thought to exacerbate or mitigate the market response to material weakness disclosures. We find that the coefficient on prior restatements is insignificant, providing no evidence that restatements exacerbate negative market responses to material weakness disclosures. In contrast, the concurrent resignation of the firms' auditor has a significantly negative effect (coefficient=-0.029, t-statistic=-2.01). This result is consistent with prior research documenting an incremental negative response to auditor resignations of reportable events (Whisenant et al. 2003). As predicted, the coefficient on audit quality is significantly positive, suggesting that the engagement of a large audit firm mitigates the negative price impact of material weakness disclosures (coefficient=0.014, t-statistic=2.69). We interpret this result as consistent with large audit firms providing higher levels of assurance for a given level of firm reporting quality.<sup>8</sup>

Also as predicted, prior earnings management is positively and significantly associated with the market response to material weakness disclosures (coefficient=0.04, t-statistic=2.01). This finding is consistent with the notion that disclosure of a material weakness is less informative when poor earnings quality has already been conveyed by the presence of high abnormal accruals. Results show that the context of the disclosure has a marginally significant effect on the market reaction to the material weakness disclosure. Specifically, current reports and filings under the 1933 Act are associated with the largest negative response (coefficient=-0.013, t-statistic=-1.89; coefficient=-

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<sup>8</sup> Firm reporting quality is incorporated in the regression by our inclusion of EM. In supplemental analysis (not tabulated) we include firm size as an additional indicator of firm reporting quality and find that our audit quality variable is significantly positive at greater than the 0.05 level. Moreover, inferences on other variables are unchanged.

0.014, t-statistic=-1.70), consistent with weaknesses being perceived as more salient when reported on non-routine reports relative to periodic filings.

Three of the eleven industry controls are significantly negative: textiles, pharmaceuticals and services (coefficients of -0.028, -0.026, and -0.018; t-statistics of -2.12, -2.10 and -2.13). The significantly negative effects in the pharmaceutical and services categories are consistent with high litigation in these industries (Kaszniak and Lev 1995).

Overall, our model is significant and has reasonable explanatory power ( $R^2 = 5.9\%$ ). As well the intercept is indistinguishable from zero. In order to assess the effect of potentially influential observations, we estimate the model after transforming all continuous variables to ranks and present the results in the two left-most columns of Table 5. Although the results weaken for most variables, consistent with higher data granularity, the results are qualitatively similar indicating that outliers have little effect on our results.

Teoh and Wong (1993) shows that the clients of large auditors are larger than clients of small auditors. Despite our use of size-adjusted abnormal returns, the coefficient on audit quality may be overstated if magnitude of the market response to disclosure is systematically related to firm size. To examine this possibility we include size as a control variable in our regressions and find that it is not significant and that our inferences about the other independent variables are unchanged.

### *5.3 Association between material weakness disclosures and market response to earnings announcements*

We present the results of our estimations in Table 5. In Panel A, the linear model estimated by pooling the time-series for MWD firms and their ROA matches reveals that MWD firms have significantly a lower ERC than their controls: the coefficient on  $UE_{i,t} * MWD$  is significantly negative (-.0464) suggesting that while ROA matches have a pooled ERC of .1049, MWD firms have a pooled ERC of .0585. This suggests that earnings surprise for firms with material weakness disclosures are less persistent and have a lower price impact. The coefficient of the

$UE_{i,t} * MWD * AFT$  interaction is not significant, and we cannot reject the hypothesis that unexpected earnings are at the same rate for earnings announcements before and after the disclosure of a material weakness.<sup>9</sup>

When we estimate the linear model by pooling the time-series for MWD firms and their total asset matches we find that MWD firms have significantly a lower ERC than their controls. However, in this estimation, the coefficient of the  $UE_{i,t} * MWD * AFT$  interaction is negative and significant, suggesting that surprises arising from announcements after the disclosure of a material weakness are capitalized at a lower rate.

In Panel B, the estimation of the modified quadratic specification yields mixed results. We are only able to reject the hypotheses of equality in the estimation with ROA matches, and only for the comparison suggesting that the price response to earnings surprises for MWD firms is lower (F-stat p-value=0.0631).

In Panel C, both estimations with the modified square root specification suggest that the price response to earnings surprises for MWD firms is lower than that of their matches. In addition, the estimation with assets matches reveals that MWD surprises after the disclosure of the material weakness have a lower price impact (F-stat p-value=0.0298).

In sum, we view the evidence as suggesting that MWD earnings surprises have lower price impacts. We view this finding as consistent with market participants facing more uncertainty about the quality of MWD firms' earnings.

#### *5.4 Evidence of changes in information uncertainty subsequent to disclosure*

Table 6 presents the results of tests evaluating whether significant changes occurred in the information environment subsequent to disclosures of material weaknesses. Consistent with the

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<sup>9</sup> We also considered in the analysis two additional variables: the spread in yields between Moody's Baa and Aaa rated bonds to captures time-series variation in the expected risk premium (Fama and French (1989)), and the ratio of market to book value as a cross-sectional proxy for earnings persistence (Collins and Kothari (1989)). Neither variable enhanced the specification of the model.

higher accruals of disclosing firms signaling poor earnings quality, Panel A of Table 6 shows that average turnover (ATURN) and excess turnover (AXTURN) is higher for disclosing firms prior to disclosure of their weaknesses. Subsequent to disclosure all measures of trading volume increase for both groups of firms, although the increase in excess turnover for matched sample firms is not significant. These results suggest that the level of information uncertainty increased for all firms subsequent to disclosure, which is inconsistent with the disclosures creating a richer information environment. However, the increases in AXTURN and AABVOL were significantly larger for disclosing firms compared to non-disclosing firms, which is consistent with disclosing firms having higher perceived levels of information risk subsequent to disclosure.

Overall, our volume tests provide weak evidence that disclosure increased the level of information uncertainty for disclosing firms. Our findings are inconsistent with a decline in information uncertainty for non-disclosing firms. However, these results must be interpreted with caution as our interval tests cannot rule out potential confounds that may be correlated with MWD. For example, MWD firms may have a different number of disclosure events subsequent to disclosure than the control group. As additional data become available we will structure more powerful tests that help to eliminate competing explanations, including an analysis of volume responses to earnings releases and of changes in analyst forecast dispersion and costs of capital (Hribar and Jones, 2004).

Panel B of table 6 presents changes in analyst coverage subsequent to disclosure. The change in analyst coverage of disclosing firms is negative, but not significant. Analyst coverage for non-disclosing firms is positive and marginally significant. These tests provide weak support for the hypothesis that the level of information uncertainty decreased for non-disclosing firms.

## **6. Additional analyses**

### *6.1 Evidence of earnings management in MWD firms prior to disclosure*

Our maintained hypothesis that prior earnings management conveys a meaningful signal about low earnings quality suggests that earnings management and material weakness disclosures

should be positively related. Accordingly, we should find that abnormal accruals are higher for disclosing firms than non-disclosing firms; we test this proposition and present the results in Table 7.

In Panel A of Table 7, we report the means for four alternative estimates of performance-matched abnormal accruals for the years 1998 through 2003, as well as the average of the aggregate over all the years. A striking feature of the evidence is that average raw performance-matched accruals (Accruals for MWD firm less Accruals for its match) is positive in all years as well as in the aggregate. The mean raw performance-matched accruals in years 1998, 1999, and 2000 (2.84, 3.05 and 4.58 percent of total assets) are significantly positive, whereas the corresponding means in 2001, 2002, 2003 (2.00, 2.03 and 1.42 percent of total assets) are not distinguishable from zero. Indeed, the evidence suggests that MWD firms have engaged in income-increasing earnings management in 1998-2000, but not in 2001-2003. The pattern of increasing performance-matched total accruals is consistent with the evidence in Cohen et al. (2004) that earnings management intensifies in the late 1990s and declines with regulatory intervention associated with the passage of SOX in 2001-2002.

The results for the sum of performance matched raw accruals across all six years are positive and significant (mean 27.28 percent, p-value=0.062), and 63.4% of the observations comprising this average are positive. We interpret the evidence as indicating that, on average, MWD firms engaged in income-increasing earnings management from 1998 to 2000, and that these discretionary actions have not reversed in 2001-2003. For the remaining measures of abnormal total accruals, we observe a similar pattern although we only reject the hypothesis that the abnormal accruals are distinct from zero on average for the sum across all six years in the analysis.

Table 7, Panels B and C present similar statistics for current accruals and components of current accruals. In Panel B, the evidence suggests a similar pattern of higher earnings management in the early years analyzed, and an absence of reversals in the aggregate across all years. Panel C also reveals a similar pattern for performance-matched changes in receivables and inventory. In sum, the accruals evidence suggests that firms that disclose material weaknesses are more likely to have

engaged in income-increasing earnings management prior to disclosure. This supports the notion that material weakness disclosures are positively related to low earnings quality associated with prior earnings management. Taken together with the finding that the market response to material weakness disclosures is negatively related to the extent of prior earnings management, our results suggest that material weakness disclosures convey less, but incrementally significant information about poor earnings quality, relative to high abnormal accruals alone.

## **7. Summary and conclusions**

We find that investors respond to disclosures about financial reporting quality in ways consistent with such disclosures resolving information uncertainty. Specifically, firms making mandated disclosures of material weaknesses experience negative abnormal returns in response to the disclosure. Disclosing firms also experience higher abnormal trading volume subsequent to disclosure. Each of these results is consistent with material weakness disclosures resulting in an increase information uncertainty subsequent to disclosure.

Material weakness disclosures also have an effect on non-disclosing firms consistent with predictions of information-transfer models. Performance- and size-matched non-disclosing firms experience significantly positive market reactions to news conveyed by disclosing firms. However, non-disclosing firms also experience a significant increase abnormal trading volume subsequent to disclosure.

We evaluate determinants of abnormal returns to material weakness disclosures and find evidence that audit quality mitigates negative responses to disclosure. In addition, negative market responses are dampened by evidence of earnings management. Additional analysis provides evidence that this counter-intuitive result results from a positive association between earnings management prior to the material weakness disclosure. This result suggests that material weakness disclosures have less information content when low financial reporting quality has already been conveyed to the market by earnings management.

We find that auditor turnover exacerbates the response to material weakness disclosures, consistent with auditor turnover conveying incrementally negative information uncertainty with respect to financial reporting. In addition, we find that membership in high-risk industry groups exacerbates negative market response to material weakness disclosures. Finally, we find that reporting context is an important determinant of market reaction to the disclosures: market reaction is more negative when weaknesses are conveyed on current reports or registration statements, relative to routine filings.

Our study contributes to three important streams of research, including the effect of Sarbanes-Oxley on the information environment, the effect of the information uncertainty on the pricing of equity securities and the effect of auditor attestation on the credibility of reporting. Our study has several important limitations. First, data limitations prevent us from implementing preferred measures of information uncertainty. Hence we cannot rule out certain competing explanations for our results. We plan to implement these measures as additional data become available in the first quarter of 2005. Second, the effect of Sarbanes-Oxley on the information environment will continue to evolve as specific provisions are implemented. This creates significant opportunities for additional research.

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**Figure 1**  
**The History of Sarbanes-Oxley**

<b>The Sarbanes-Oxley Act (“SOX”)</b>	<b>July 30, 2002</b> President Bush signs SOX into law.	SOX revolutionizes the rules of corporate governance, disclosure and financial reporting for all SEC registrants.
<b>Sections 101 &amp; 103 – Public Company Accounting Oversight Board and Auditing standards</b>	Section 101 of SOX creates the Public Company Accounting Oversight Board (“PCAOB”).	Section 103 charges the PCAOB with establishing auditing and related attestation, quality control, ethics, and independence standards and rules to be used by registered public accounting firms in the preparation and issuance of the audit report.
<b>Section 906 – White collar crime penalty, corporate responsibility for financial reports</b>	Section 906, effective immediately upon passage, is the one of three sections of SOX requiring certification.	Under 906, management must certify that 10Ks and 10Qs are fairly stated and are in compliance with the Securities and Exchange Act of 1934. Knowing and/or willful wrongdoing is subject to fines and imprisonment.
<b>Section 302 – Corporate responsibility for financial reports</b>	<b>August 29, 2002</b> Issued by the SEC on August 27, 2002, the rule becomes effective on August 29, 2002.	Executives must certify that: <ul style="list-style-type: none"> <li>• they reviewed the report,</li> <li>• the report contains no misrepresentations,</li> <li>• the financial information is fairly presented,</li> <li>• they have reported any internal control weaknesses (including fraud) to the audit committee, and</li> <li>• they have identified material changes in internal controls.</li> </ul>
<b>Auditing Standard No. 2 – An Audit of Internal Control over Financial Reporting Performed in Conjunction with an Audit of Financial Statements</b>	<b>June 17, 2004</b> Issued by the PCAOB on March 9, 2004, the SEC approves Audit Standard No. 2 on June 17, 2004.	Auditing Standard No. 2, effective for audits of internal control over financial reporting required by Section 404(b), requires that the auditor’s report on internal control over financial reporting include the auditor’s opinion on management’s assessment of the effectiveness of internal control over financial reporting as well as the auditor’s independent assessment of the effectiveness of the company’s internal control over financial reporting.
<b>Section 404 – Management assessment of internal controls</b>	<b>November 15, 2004</b> The SEC implements the rule on May 27, 2003 and extends the compliance dates on February 24, 2004.	Under 404(a), management of the company must supply an “internal control report” that takes responsibility for adequate internal controls and assesses the effectiveness of the controls over financial reporting. Under 404(b), the company’s auditor must attest to, and report on, management’s assessment of internal controls. Companies have 90 days from the end of their fiscal year to comply. November 15, 2004 marks the start for companies with market capitalization greater than \$75 million. July 15, 2005 marks the start for companies with less than \$75 million market capitalization.

**Table 1**  
**Full sample of material weakness disclosures**

**Panel A – Month of report and SEC form type**

<i>Month</i>	<i>Quarterly Report</i>	<i>Annual Report</i>	<i>Current Report</i>	<i>1933 Act Reports</i>	<i>N</i>	<i>Percent</i>
January	3	2	4	5	14	4.17
February	2	1	4	1	8	2.38
March	1	11	4	2	18	5.36
April	1	9	3	1	14	4.17
May	13	4	2	3	22	6.55
June	3	10	6	5	24	7.14
July	5	5	5	2	17	5.06
August	29	1	8	2	40	11.90
September	5	11	4	3	23	6.85
October	10	7	10	4	31	9.23
November	78	2	7	3	90	26.79
December	12	15	6	2	35	10.42
<i>N</i>	162	78	63	33	336	100.00
<i>Percent</i>	48.21	23.21	18.75	9.82	100.00	

**Panel B – Exchange listing and market capitalization at disclosure date**

<i>Exchange</i>	<i>N</i>	<i>Market Capitalization (in thousands of dollars)</i>				
		<i>Mean</i>	<i>Median</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Std. Dev.</i>
NASDAQ	198	448,696	171,995	1,984	9,236,204	983,061
NYSE	95	6,286,027	991,728	26,454	243,213,117	26,414,153
ASE	43	104,743	38,373	4,027	899,268	164,395

**Table 1 (concluded)**  
**Full sample of material weakness disclosures**

**Panel C – Industry composition of sample**

<i>Industry</i>	<i>SIC codes</i>	<i>N</i>	<i>Percent of firms in the sample</i>	<i>Percent of firms in the Compustat population</i>
Mining and construction	1000-1999, except 1300-1399	7	2.08	2.39
Food	2000-2111	4	1.19	1.80
Textiles, printing, and publishing	2200-2799	11	3.27	2.97
Chemicals	2800-2824, and 2840-2899	9	2.68	1.48
Pharmaceuticals	2830-2836	13	3.87	5.06
Extractive industries	2900-2999, and 1300-1399	10	2.98	2.97
Durable manufacturers	3000-3999, except 3570-3579, 3670-3679	78	23.21	15.69
Computers	7370-7379, 3570-3579, and 3670-3679	59	17.56	12.06
Transportation	4000-4899	26	7.74	5.54
Retail	5000-5999	35	10.42	7.72
Services	7000-8999, except 7370-7379	38	11.31	8.79
Other		46	13.69	33.53
		336	100.00	100.00

**Table 2****Comparisons of sample firms to Compustat population and size- and performance-matched control samples****Panel A – Sample firms compared to Compustat population**

	<i>MWD Firms</i>				<i>Performance-matched sample</i>				<i>Difference</i>	
	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
<i>Assets</i>	400	8,129	74,356	238	14738	4,049	32,488	151		+
<i>Sales</i>	400	2,048	8,864	138	14738	1,344	6,915	89		+
<i>MV of Equity</i>	384	1,653	10,654	107	13123	1,442	8,216	73		+
<i>Return on Assets</i>	400	-0.119	0.360	-0.008	14738	-0.091	0.335	0.009		-
<i>Current Ratio</i>	358	2.401	2.748	1.626	11915	2.530	4.172	1.620		
<i>Leverage</i>	360	0.559	0.648	0.485	12033	0.578	0.863	0.476		
<i>Sales Growth</i>	400	0.135	1.001	0.003	14738	0.303	2.672	0.044		
<i>Special Items</i>	398	-0.115	0.474	-0.003	14478	-0.098	1.947	0.000		-
<i>Loss</i>	400	0.535	0.499	1.000	14738	0.426	0.495	0.000	+	+
<i>Total accruals</i>	400	-0.129	0.214	-0.060	14738	-0.179	0.273	-0.073	+	+
<i>Current accruals</i>	400	-0.047	0.151	-0.006	14738	-0.078	0.200	-0.010	+	+

+ (-) Characteristic of MWD sample significantly higher (lower) than that of control at the 5% level for a two-tailed test.

++ (-) Characteristic of MWD sample significantly higher (lower) than that of control at the 10% level for a two-tailed test.

Table 2 (continued)

Comparisons of sample firms to Compustat population and size- and performance-matched control samples

Panel B – Sample firms compared to size-matched control sample

	<i>MWD Firms</i>				<i>Performance-matched sample</i>				<i>Difference</i>	
	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
<i>Assets</i>	400	8,129	74,356	238	400	7,023	60,235	246		
<i>Sales</i>	400	2,048	8,864	138	400	1,558	6,237	161		
<i>MV of Equity</i>	384	1,653	10,654	107	369	2,547	12,033	121		
<i>Return on Assets</i>	400	-0.119	0.360	-0.008	400	-0.069	0.254	0.008	-	-
<i>Current Ratio</i>	358	2.401	2.748	1.626	350	2.431	2.135	1.821		--
<i>Leverage</i>	360	0.559	0.648	0.485	348	0.468	0.337	0.413	+	+
<i>Sales Growth</i>	400	0.135	1.001	0.003	400	0.325	4.903	0.012		
<i>Special Items</i>	398	-0.115	0.474	-0.003	400	-0.184	2.212	0.000		-
<i>Loss</i>	400	0.535	0.499	1.000	400	0.448	0.498	0.000	+	+
<i>Total accruals</i>	400	-0.129	0.214	-0.060	400	-0.158	0.241	-0.065	++	
<i>Current accruals</i>	400	-0.047	0.151	-0.006	400	-0.069	0.174	-0.010	+	

+ (-) Characteristic of MWD sample significantly higher (lower) than that of control at the 5% level for a two-tailed test.

++ (--)-Characteristic of MWD sample significantly higher (lower) than that of control at the 10% level for a two-tailed test.

**Table 2 (concluded)**

**Comparisons of sample firms to Compustat population and size- and performance-matched control samples**

**Panel C – Sample firms compared to performance-matched control sample**

	<i>MWD Firms</i>				<i>Performance-matched sample</i>				<i>Difference</i>	
	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
<i>Assets</i>	400	8,129	74,356	238	400	3,389	14,502	156		+
<i>Sales</i>	400	2,048	8,864	138	400	1,854	8,963	113		
<i>MV of Equity</i>	384	1,653	10,654	107	369	2,129	11,828	73		+
<i>Return on Assets</i>	400	-0.119	0.36	-0.008	400	-0.122	0.367	0.005		--
<i>Current Ratio</i>	358	2.401	2.748	1.626	357	2.407	2.752	1.686		
<i>Leverage</i>	360	0.559	0.648	0.485	353	0.646	1.127	0.473		
<i>Sales Growth</i>	400	0.135	1.001	0.003	400	0.188	2.123	0.03		
<i>Special Items</i>	398	-0.115	0.474	-0.003	394	-0.329	2.714	0		-
<i>Loss</i>	400	0.535	0.499	1	400	0.478	0.5	0		
<i>Total accruals</i>	400	-0.129	0.214	-0.06	400	-0.15	0.239	-0.063		
<i>Current accruals</i>	400	-0.047	0.151	-0.006	400	-0.057	0.172	-0.006		

+ (-) Characteristic of MWD sample significantly higher (lower) than that of control at the 5% level for a two-tailed test.

++ (--)-Characteristic of MWD sample significantly higher (lower) than that of control at the 10% level for a two-tailed test.

**Variable definitions (all data are from 2002):**

Assets = Compustat Data Item #6. Sales = Compustat Data Item #12. MV of equity = the product of Compustat Data Item #24 and Compustat Data Item #25. Return on assets= Income before ext. items (Compustat Data Item #18) divided by Assets. Current ratio = current Assets (Compustat Data Item #4) divided by current liabilities (Compustat Data Item #5). Leverage = current liabilities (Compustat Data Item #5) plus long-term debt (Compustat data item #9) divided by assets. Sales growth = percentage change in sales. Special items = Compustat Data Item #17. Loss = 1 if income before ext. items is negative; 0 otherwise. Total accruals = - ( $\Delta AR$ [#302] +  $\Delta INV$ [#303]+  $\Delta AP$ [#304] +  $\Delta TAX$  [#305] +  $\Delta OTH$  [#307]+  $DEP$  [#125])/Total Assets.<sub>1</sub>[#6], and Current accruals = Total accruals +  $DEP$ [#125]/ total assets.<sub>1</sub>[#6].

**Table 3**

**Size-adjusted cumulative abnormal returns calculated over the three-day window surrounding the disclosure date**

**Panel A – Cumulative abnormal returns by report type**

<i>Report Type</i>	<i>Full Sample</i>			<i>Uncontaminated Sample</i>			<i>Uncontaminated and winsorized at 1% and 99%</i>		
	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>
Current Report	62	<b>-2.40%</b>	0.000	62	<b>-1.33%</b>	0.009	62	<b>-1.32%</b>	0.009
Annual Report	78	-0.78%	0.424	76	-0.21%	0.618	76	-0.23%	0.570
Quarterly Report	162	<b>-1.29%</b>	0.014	156	<b>-0.71%</b>	0.005	156	<b>-0.72%</b>	0.004
1933 Act Report	33	-1.50%	0.095	33	<b>-0.012%</b>	0.088	33	<b>-1.17%</b>	0.089
All Reports	336	<b>-1.41%</b>	0.000	327	<b>-0.76%</b>	0.000	327	<b>-0.77%</b>	0.000

**Panel B – Cumulative abnormal returns for size-matched and performance-match samples**

<i>Report Type</i>	<i>MWD Sample</i>			<i>Size-matched sample</i>			<i>Performance-matched sample</i>		
	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>
Current Report	62	<b>-2.40%</b>	0.000	60	<b>1.83%</b>	0.016	48	0.12%	0.879
Annual Report	78	-0.61%	0.464	70	0.76%	0.134	62	0.87%	0.240
Quarterly Report	162	<b>-1.29%</b>	0.014	141	0.40%	0.452	134	0.62%	0.295
1933 Act Report	33	-1.50%	0.095	34	-0.40%	0.742	30	1.68%	0.457
All Reports	336	<b>-1.41%</b>	0.000	305	<b>0.67%</b>	0.044	274	0.70%	0.104

**Table 3 (concluded)**

**Size-adjusted cumulative abnormal returns calculated over the three-day window surrounding the disclosure date**

**Panel C – Cumulative abnormal returns by auditor type and firm size**

	<i>Full sample</i>			<i>Uncontaminated sample</i>			<i>Uncontaminated and winsorized at 1% and 99%</i>		
	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>	<i>N</i>	<i>Mean</i>	<i>p-value</i>
<b><i>MWD firms:</i></b>									
Big-Four auditor	261	-0.49%	0.021	254	-0.50%	0.017	254	-0.51%	0.012
Small auditor	75	-1.55%	0.001	73	-1.66%	0.001	73	-1.66%	0.001
<i>Difference</i>		<b>1.06%</b>	**		<b>1.16%</b>	**		<b>1.15%</b>	**
Top 50% - size	168	-0.50%	0.024	164	-0.52%	0.201	164	-0.52%	0.020
Bottom 50% - size	168	-0.94%	0.003	163	-1.00%	0.002	163	-1.02%	0.001
<i>Difference</i>		<b>0.44%</b>	*		<b>0.48%</b>	*		<b>0.50%</b>	*

\*, \*\* denote t-test for differences of means significant at the 10% and 5% level, respectively.

**Table 4**  
**Summary statistics for cumulative abnormal returns regressions**

$$CAR_{i,t} = \alpha_{i,t} + \beta_1 RESTATE_{i,t} + \beta_2 RESIGN_{i,t} + \beta_3 AQ_{i,t} + \beta_4 EM_{i,t} + \beta_5 INDUSTRY_{i,t} + \beta_6 CONTEXT_{i,t} + \varepsilon_{i,t}$$

	<i>Ranks</i>				
	<i>Pred.</i>	<i>Coef.</i>	<i>t-statistic</i>	<i>Coef.</i>	<i>t-statistic</i>
<i>Intercept</i>	–	0.001	0.18	<b>4.618</b>	7.47**
<i>RESTATE</i>	–	-0.005	-1.01	0.001	0.00
<i>RESIGN</i>	–	<b>-0.029</b>	-2.01**	-1.102	-1.07
<i>AQ</i>	+	<b>0.014</b>	2.69***	<b>0.745</b>	1.95**
<i>EM</i>	+	<b>0.004</b>	2.01**	0.087	1.59
<i>CONTEXT=CURR</i>	–	<b>-0.013</b>	-1.89*	<b>-0.918</b>	-1.86*
<i>CONTEXT=REG</i>	–	<b>-0.014</b>	-1.70*	-0.502	-0.83
<i>CONTEXT=10Q</i>	–	-0.008	-1.48	-0.561	-1.39
<i>INDUSTRY=MINING</i>	?	-0.006	-0.36	-0.843	-0.74
<i>INDUSTRY=FOOD</i>	?	0.013	0.68	1.770	1.20
<i>INDUSTRY=TEXTILES</i>	?	<b>-0.028</b>	-2.12**	<b>-1.928</b>	-2.05**
<i>INDUSTRY=CHEMICALS</i>	?	-0.025	-1.48	-1.494	-1.23
<i>INDUSTRY=PHARM</i>	?	<b>-0.026</b>	-2.10**	<b>-2.344</b>	-2.64***
<i>INDUSTRY=EXTRACTIVE</i>	?	-0.002	-0.12	0.220	0.16
<i>INDUSTRY=DURABLE</i>	?	-0.006	-0.85	-0.525	-1.07
<i>INDUSTRY=COMPUTERS</i>	?	0.014	1.45	0.881	1.31
<i>INDUSTRY=TRANSPORT</i>	?	0.002	0.20	-0.086	-0.12
<i>INDUSTRY=RETAIL</i>	?	-0.002	-0.25	0.020	0.03
<i>INDUSTRY=SERVICES</i>	?	<b>-0.018</b>	-2.13**	<b>-1.370</b>	-2.23**
Adj. R <sup>2</sup>		0.059%		0.040%	

t-statistics are in parenthesis.

\*, \*\*, \*\*\* denote significance at the 10%, 5% and 1% level, respectively (two-tailed test).

Results are qualitatively similar when size, measured as the log of market value of equity, is included in the regressions.

**Table 5**

**The earnings-return relation with linear, modified quadratic, and modified square root specifications over the period of 1994-2004**

**Panel A – Linear Model**

$$UR_{i,t} = a_1 + a_2MWD + a_3AFT + b_1UE_{i,t} + b_2MWD * UE_{i,t} + b_3AFT * UE_{i,t} + b_4AFT * MWD * UE_{i,t} + \varepsilon$$

	<i>Estimated with performance matches</i>			<i>Estimated with size matches</i>		
	<i>Coefficient</i>	<i>p-value</i>		<i>Coefficient</i>	<i>p-value</i>	
<i>Intercept</i>	<b>0.005</b>	(0.000)	***	<b>0.005</b>	(0.000)	***
<i>MWD</i>	-0.001	(0.404)		-0.001	(0.595)	
<i>AFT</i>	0.001	(0.772)		-0.002	(0.577)	
<i>UE</i>	<b>0.105</b>	(0.000)	***	<b>0.099</b>	(0.000)	***
<i>UE*MWD</i>	<b>-0.046</b>	(0.001)	***	<b>-0.040</b>	(0.007)	***
<i>UE*AFT</i>	-0.027	(0.565)		<b>0.190</b>	(0.017)	**
<i>UE*MWD*AFT</i>	0.041	(0.488)		<b>-0.176</b>	(0.043)	**
<i>Adjusted R<sup>2</sup></i>	0.58%					
<i>F-value</i>	22.16					
<i>p-value</i>	(0.001)					

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% level, respectively. All estimations have 21,317 firm-quarter observations.

**Variable Definitions:**

*UR<sub>i,t</sub>* = size-adjusted returns in the three-day window surrounding the announcement date of quarterly earnings.

*UE<sub>i,t</sub>* = difference in earnings before extraordinary items (Compustat Quarterly Data Item #76).

*MWD* = 1 if the firm discloses a material weakness; 0 otherwise.

*AFT* = 1 if the earnings announcement occurs after the disclose of a material weakness; 0 otherwise.

**Table 5 (continued)**

**The earnings-return relation with linear, modified quadratic, and modified square root specifications over the period of 1994-2004**

**Panel B – Modified Quadratic**

$$a_1 + a_2 MWD + a_3 AFT + b_1 UE_{i,t} + b_2 MWD * UE_{i,t} + b_3 AFT * UE_{i,t}$$

$$UR_{i,t} = b_4 AFT * MWD * UE_{i,t} + c_1 * UE_{i,t} * |UE_{i,t}| + c_2 * MWD * UE_{i,t} * |UE_{i,t}| +$$

$$c_3 * AFT * UE_{i,t} * |UE_{i,t}| + c_4 * AFT * MWD * UE_{i,t} * |UE_{i,t}| + \varepsilon$$

	<i>Estimated with performance matches</i>		<i>Estimated with size matches</i>	
	<i>Coefficient</i>	<i>p-value</i>	<i>Coefficient</i>	<i>p-value</i>
<i>Intercept</i>	<b>0.00498</b>	(0.000)	<b>0.00461</b>	(0.000)
<i>MWD</i>	-0.00127	(0.391)	-0.0007903	(0.583)
<i>AFT</i>	0.00057966	(0.893)	-0.00286	(0.494)
<i>UE</i>	<b>0.18861</b>	(0.000)	<b>0.26925</b>	(0.000)
<i>UE*MWD</i>	<b>0.06155</b>	(0.040)	-0.0191	(0.542)
<i>UE*AFT</i>	0.12919	(0.238)	0.15705	(0.302)
<i>UE*MWD*AFT</i>	-0.143	(0.297)	-0.16985	(0.324)
<i>UE<sub>it</sub>* UE<sub>it</sub> </i>	<b>-0.15168</b>	(0.000)	<b>-0.34788</b>	(0.000)
<i>UE<sub>it</sub>* UE<sub>it</sub> *MWD</i>	<b>-0.19728</b>	(0.000)	-0.00106	(0.984)
<i>UE<sub>it</sub>* UE<sub>it</sub> *AFT</i>	-0.22643	(0.148)	0.04572	(0.872)
<i>UE<sub>it</sub>* UE<sub>it</sub> *AFT*MWD</i>	<b>0.3378</b>	(0.078)	0.06517	(0.830)
<i>Adjusted R<sup>2</sup></i>	1.48%			
<i>F-value</i>	32.47			
<i>p-value</i>	(0.001)			

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% level, respectively. All estimations have 21,317 firm-quarter observations.

**Variable Definitions:**

- UR<sub>it</sub>* = size-adjusted returns in the three-day window surrounding the announcement date of quarterly earnings.
- UE<sub>it</sub>* = difference in earnings before extraordinary items (Compustat Quarterly Data Item #76).
- MWD* = 1 if the firm discloses a material weakness; 0 otherwise.
- AFT* = 1 if the earnings announcement occurs after the disclose of a material weakness; 0 otherwise.

**Table 5 (concluded)**

**The earnings-return relation with linear, modified quadratic, and modified square root specifications over the period of 1994-2004**

**Panel C – Modified Square Root**

$$a_1 + a_2 MWD + a_3 AFT + b_1 UE_{i,t} + b_2 MWD * UE_{i,t} + b_3 AFT * UE_{i,t}$$

$$UR_{i,t} = b_4 AFT * MWD * UE_{i,t} + c_1 * |UE_{i,t}|^{1/2} + c_2 * MWD * |UE_{i,t}|^{1/2}$$

$$c_3 * AFT * |UE_{i,t}|^{1/2} + c_4 * AFT * MWD * |UE_{i,t}|^{1/2} + \varepsilon$$

	<i>Estimated with performance matches</i>			<i>Estimated with size matches</i>		
	<i>Coefficient</i>	<i>p-value</i>		<i>Coefficient</i>	<i>p-value</i>	
<i>Intercept</i>	<b>0.00573</b>	(0.000)	***	<b>0.00579</b>	(0.000)	***
<i>MWD</i>	-0.0007688	(0.612)		-0.0008674	(0.557)	
<i>AFT</i>	-0.00627	(0.351)		-0.00357	(0.600)	
<i>UE</i>	<b>0.14402</b>	(0.000)	***	<b>0.14549</b>	(0.000)	***
<i>UE*MWD</i>	-0.03678	(0.044)	**	<b>-0.03828</b>	(0.038)	**
<i>UE*AFT</i>	-0.07381	(0.132)		0.13035	(0.118)	
<i>UE*MWD*AFT</i>	0.03659	(0.546)		<b>-0.16716</b>	(0.065)	*
<i>UEit<sup>1/2</sup></i>	<b>-0.07008</b>	(0.000)	***	<b>-0.09987</b>	(0.000)	***
<i>MWD * UEit<sup>1/2</sup></i>	-0.02795	(0.225)		0.00192	(0.935)	
<i>AFT* UEit<sup>1/2</sup></i>	<b>0.11051</b>	(0.004)	***	0.07256	(0.137)	
<i>AFT*MWD* UEit<sup>1/2</sup></i>	0.01409	(0.728)		0.04472	(0.338)	
<i>Adjusted R<sup>2</sup></i>	0.93%					
<i>F-value</i>	21.27					
<i>p-value</i>	(0.001)					

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% level, respectively. All estimations have 21,317 firm-quarter observations.

**Variable Definitions:**

- UR<sub>i,t</sub>* = size-adjusted returns in the three-day window surrounding the announcement date of quarterly earnings.
- UE<sub>i,t</sub>* = difference in earnings before extraordinary items (Compustat Quarterly Data Item #76).
- MWD* = 1 if the firm discloses a material weakness; 0 otherwise.
- AFT* = 1 if the earnings announcement occurs after the disclose of a material weakness; 0 otherwise.

**Table 6**

**Panel A**

**Abnormal volume changes subsequent to material weakness disclosure**

<i>Variable</i>	<i>Sixty-day period preceding Disclosure</i>		<i>Sixty-day period subsequent to disclosure</i>		<i>Difference—Subsequent period less preceding</i>	
	<i>Mean</i>	<i>p-value</i>	<i>Mean</i>	<i>p-value</i>	<i>Mean</i>	<i>p-value</i>
<b><i>MWD firms:</i></b>						
Turnover (ATURN)	7.73%*	0.000	8.54%*	0.000	0.81%	0.000
Excess Turnover (AXTURN)	-0.02%*	0.831	0.64%*	0.000	0.66%*	0.000
Abnormal Volume (AABVOL)	0.01	0.631	0.89*	0.000	0.88*	0.000
<b><i>Performance-matched firms</i></b>						
Turnover (ATURN)	6.98%	0.000	7.57%	0.000	0.59%	0.000
Excess Turnover (AXTURN)	-0.66%	0.001	-0.42%	0.001	0.24%	0.136
Abnormal Volume (AABVOL)	-0.00	0.687	0.22	0.001	0.22	0.000

\* denotes significant difference from performance-matched sample mean over sixty-day period preceding disclosure at the 5% level.

**Variable Definitions:**

- ATURN*** = Daily volume of shares traded divided by number of shares outstanding.
- AXTURN*** = Daily turnover for each firm minus daily market turnover.
- AABVOL*** = Daily volume minus average volume over 200 day period ending 70 days before the event date, divided by average volume over 200 day period ending 70 days before the event date.

**Panel B**

**Changes in analyst following subsequent to material weakness disclosure**

	<i>N</i>	<i>Average analyst following in forecast period preceding disclosure</i>	<i>Average analyst following in forecast period subsequent to disclosure</i>	<i>Difference—subsequent period less preceding</i>	<i>Percent difference—difference divided by preceding</i>
<i>MWD firms</i>	88	7.05	6.93	-.1136	-.0126
<i>Size-matched firms</i>	106	7.30	7.39	.0849	.0398*
<i>Performance-matched firms</i>	68	8.22	8.13	-.0882	-.0056

\*denotes a significant difference from the MWD sample at the 10% level.

**Table 7**  
**Performance-matched accruals for sample firms over the period of 1998-2003**

**Panel A – Total accruals**

<i>Model</i>	1998 (N=313)	1999 (N=336)	2000 (N=367)	2001 (N=387)	2002 (N=400)	2003 (N=425)	All Years (N=425)	% >0
<i>Raw</i>	<b>0.0284</b> (0.04)	<b>0.0305</b> (0.05)	<b>0.0458</b> (0.05)	0.0200 (0.33)	0.0203 (0.15)	0.0142 (0.29)	<b>0.2728</b> (0.06)	<b>63.4%**</b>
<i>Jones</i>	0.0788 (0.15)	0.0224 (0.15)	0.0284 (0.21)	0.0096 (0.64)	0.0188 (0.21)	0.0069 (0.62)	<b>0.2628</b> (0.07)	<b>54.5%*</b>
<i>DSS</i>	0.0810 (0.15)	0.0192 (0.22)	0.0274 (0.23)	0.0113 (0.58)	0.0173 (0.24)	0.0036 (0.80)	<b>0.2516</b> (0.07)	<b>63.2%**</b>
<i>Beneish</i>	0.0856 (0.13)	0.0246 (0.13)	0.0307 (0.18)	0.0096 (0.64)	0.0219 (0.15)	0.0057 (0.68)	<b>0.2836</b> (0.07)	<b>58.0%**</b>

p-values are in parenthesis.

\*,\*\* denote significance at the 10% and 5% level, respectively (two-tailed test).

**Panel B – Current accruals**

<i>Model</i>	1998 (N=313)	1999 (N=336)	2000 (N=367)	2001 (N=387)	2002 (N=400)	2003 (N=425)	All Years (N=425)	% >0
<i>Raw</i>	<b>0.0301</b> (0.01)	<b>0.0226</b> (0.06)	<b>0.0356</b> (0.03)	0.0161 (0.16)	0.0108 (0.30)	0.0152 (0.14)	<b>0.2225</b> (0.06)	<b>58.3%**</b>
<i>Jones</i>	<b>0.0191</b> (0.09)	0.0184 (0.11)	<b>0.0310</b> (0.05)	0.0152 (0.23)	0.0092 (0.39)	0.0101 (0.35)	<b>0.1765</b> (0.06)	<b>60.6%**</b>
<i>DSS</i>	<b>0.0221</b> (0.06)	0.0155 (0.19)	<b>0.0272</b> (0.10)	0.0147 (0.25)	0.0094 (0.38)	0.0071 (0.51)	<b>0.1616</b> (0.07)	<b>59.2%**</b>
<i>Beneish</i>	<b>0.0272</b> (0.02)	0.0196 (0.12)	<b>0.0332</b> (0.05)	0.0130 (0.31)	0.0116 (0.29)	0.0094 (0.38)	<b>0.1931</b> (0.06)	<b>61.1%**</b>

p-values are in parenthesis.

\*,\*\* denote significance at the 10% and 5% level, respectively (two-tailed test).

**Table 7 (concluded)**  
**Performance-matched accruals for sample firms over the period of 1998-2003**

**Panel C – Component of current accruals**

<i>Component</i>	1998 (N=313)	1999 (N=336)	2000 (N=367)	2001 (N=387)	2002 (N=400)	2003 (N=425)	All Years (N=425)	% >0
Change in AR	<b>0.0261</b> (0.004)	<b>0.0227</b> (0.01)	<b>0.0245</b> (0.01)	0.0071 (0.30)	0.0033 (0.60)	0.0089 (0.14)	<b>0.1538</b> (0.05)	<b>59.9%**</b>
Change in INV	0.0010 (0.84)	0.0039 (0.35)	<b>0.0094</b> (0.03)	0.0007 (0.82)	0.0017 (0.57)	0.0036 (0.16)	<b>0.0358</b> (0.07)	<b>59.4%**</b>
Change in AP	-0.0049 (0.39)	<b>-0.0107</b> (0.10)	-0.0032 (0.56)	0.0081 (0.11)	0.0020 (0.63)	-0.0029 (0.46)	<b>-0.0169</b> (0.22)	53.3%

p-values are in parenthesis.

\*,\*\* denote significance at the 10% and 5% level, respectively (two-tailed test).

***Variable Definitions:***

For each MWD firm, we identify a performance-matched firm based on industry membership [two digit SIC], period, and lagged ROA. We estimate performance-matched abnormal accruals as the difference between an accrual measure for the MWD firms and the corresponding measure for its match. We compute accruals as using COMPUSTAT data (numbers in parentheses) as **Total Accruals** = - ( $\Delta$ AR[#302] +  $\Delta$ INV[#303] +  $\Delta$ AP[#304] +  $\Delta$ TAX [#305] +  $\Delta$ OTH [#307] + DEP [#125])/Total Assets.<sub>t-1</sub> [#6], and **Current Accruals** = Total Accruals + DEP[#125]/ Total Assets.<sub>t-1</sub> [#6].

We estimate unexpected total and current accruals using three models:

**1 - The Jones (1991) model** relates total accruals (defined above) to the change in sales (#12) and the level of gross property, plant and equipment (#8) and is written as  $Total\ accruals_{it} = a_i + b_i \Delta Sales_{it} + c_i PPE_{it} + u_{it}$  (all variables deflated by lagged total assets). We estimate the model cross-sectionally using all firms in a given two-digit SIC code industry and year. We make one-year ahead forecasts of expected accruals as  $Expected\ accruals_{it+1} = \alpha_i + \beta_i (\Delta Sales_{it+1}) + \gamma_i PPE_{it+1}$ , where the Greek letters reflect estimates of the model coefficients in the prior year. We estimate unexpected total accruals as the difference between total accruals and expected accruals, and use the difference between unexpected accruals for the MWD and for its match as **Performance-Matched Total Accruals (Jones)**. We estimate unexpected **current** accruals by estimating the model after dropping the PPE variable.

**2 - The DSS modification:** Jones' model as modified by Dechow, Sloan and Sweeney (1995) is the same as the Jones model in the estimation period. The modification introduced by DSS is the subtraction of the change in receivables (#2) from the change in sales in the prediction period so that expected accruals are given by:  $Expected\ accruals_{it+1} = \alpha_i + \beta_i (\Delta Sales_{it+1} - \Delta Receivables_{it+1}) + \gamma_i PPE_{it+1}$ . We estimate unexpected total accruals as the difference between total accruals and expected accruals, and use the difference between unexpected accruals for the MWD and for its match as **Performance-Matched Total Accruals (DSS)**. We estimate unexpected current accruals by estimating the model after dropping the PPE variable.

**3 - The Beneish (1998) model** relates total accruals (defined above) to the change in cash sales and the level of gross property, plant and equipment (#8) and is written as  $Total\ accruals_{it} = a_i + b_i \Delta CashSales_{it} + c_i PPE_{it} + u_{it}$  (all variables deflated by lagged total assets). We estimate the model cross-sectionally using all firms in a given two-digit SIC code industry and year. We make one-year ahead forecasts of expected accruals as  $Expected\ accruals_{it+1} = \alpha_i + \beta_i (\Delta Cash\ Sales_{it+1}) + \gamma_i PPE_{it+1}$ , where the Greek letters reflect estimates of the model coefficients in the prior year. We estimate unexpected total accruals as the difference between total accruals and expected accruals, and use the difference between unexpected accruals for the MWD and for its match as **Performance-Matched Total Accruals (Beneish)**. We estimate unexpected **current** accruals similarly by estimating the model after dropping the PPE variable. Change in AR =  $-\Delta AR$  [#302] for MWD firm less corresponding measure for control. Change in INV =  $-\Delta INV$  [#303] for MWD firm less corresponding measure for control. Change in AP =  $-\Delta AP$  [#304] for MWD firm less corresponding measure for control.