

**Investor Perceived Earnings Quality and
Disclosure of Internal Control Weaknesses**

by
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ABSTRACT

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This study investigates whether disclosures of material weaknesses in a firm's internal control over financial reporting are associated with lower investor perceived earnings quality. I measure investor perceived earnings quality by a market returns based representation of earnings quality called e-loading developed by Ecker et al. (2006). My empirical tests use sample firms that disclosed at least one material weakness from August 2002 to October 2005. The cross-sectional univariate analysis shows that firms disclosing internal control material weaknesses have lower investor perceived earnings quality than matched firms that disclose no internal control problems. However, further cross-sectional multivariate regression analysis reveals that after controlling for firm characteristics, only disclosures of company-level material weaknesses have an incremental impact on investor perceived earnings quality, while disclosures of the less pervasive account-specific material weaknesses do not have a measurable effect on perceived earnings quality. From intertemporal within-firm analysis, I find no evidence that firms experienced a change in their perceived earnings quality after their first disclosure of internal control material weaknesses as per SOX 302 or 404. In contrast, I find that firms experienced an increase in perceived earnings quality after they received

their first unqualified SOX 404 audit report indicating remediation of previously disclosed material weaknesses. This suggests that, although investors did not find the initial SOX disclosures of internal control weaknesses to be incrementally informative, the legislation motivated firms to remediate weak controls; moreover, the SOX-induced improvement in weak internal controls enhanced investors' perception of the offending firms' financial reporting quality.

Key words: perceived earnings quality; internal control; material weakness; e-loading; Sarbanes Oxley Act; SOX 302; SOX 404.

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DEDICATION

I dedicate this thesis to my father, JiFu He, and my mother, Shuzhen Wang.

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CHAPTER 1. INTRODUCTION

This study investigates whether disclosures of material weaknesses in a firm's internal control over financial reporting are associated with lower investor perceived earnings quality. I measure investor perceived earnings quality using a market returns based representation of earnings quality called e-loading that was developed by Ecker, Francis, Kim, Olsson, and Schipper (2006).

Earnings quality is a major dimension of financial reporting quality as earnings constitute a premier source of firm-specific information (Francis, LaFond, Olsson, & Schipper, 2004, p. 968). Issues relating to companies' financial reporting quality and internal control over financial reporting (ICOFR) have attracted attention both within and beyond the accounting community in recent years due to a series of high profile accounting scandals and the consequent passage of the Sarbanes-Oxley Act of 2002 (SOX) in the US. SOX has been cited as the most important securities legislation in the US since the 1930s (Prentice, 2007). Its chief objective is to protect investors by improving the accuracy and reliability of corporate disclosures. Of the reforms SOX has called for, regulators state that the provisions related to internal control "have the greatest potential to improve the reliability of financial reporting" (Nicolaisen, 2004). Reliability is thought to be an important contributor to investor perceived earnings quality because reliability has long been among the qualitative characteristics of useful information in the Conceptual Framework of the Financial Accounting Standards Board (Statement of Financial Accounting Concepts No. 2, 1980).

Two provisions of SOX, Sections 302 and 404, mandate the assessment and disclosure of a company's ICFR. Section 302 requires management to evaluate their firm's internal control on a quarterly basis and disclose their conclusions about the effectiveness of internal control in periodic (quarterly and annual) financial statements. In addition, Section 302 mandates that chief executive officers and chief financial officers make explicit certifications regarding the effectiveness of internal control in periodic financial reporting. Appendix 1 presents two examples of disclosures and certifications as per Section 302. The example of Microsoft Corporation shows effective internal control and the example of General Motors Corporation illustrates deficient internal control.

Section 404 requires management to provide an annual report assessing their firm's ICFR as of the fiscal year end. This section also requires external auditors to perform annual audits of client firms' internal control and to issue opinions regarding the effectiveness of the internal control system. Appendix 2 provides two examples of the management and the audit reports as per Section 404. In the example of Microsoft Corporation, the management and the auditor report effective internal control; in the example of General Motors Corporation, the management and the auditor disclose deficient internal control.

Despite regulators' high expectations, SOX 302 and 404 have fomented intense controversy since their promulgation mainly because of substantial costs associated with implementing the provisions. In particular, Section 404 has been criticized as "the most expensive and most burdensome piece of Sarbanes-Oxley" (Atkins, 2005). The SEC initially estimated the annual costs of implementing Section 404 to be approximately \$91,000 per company (SEC, 2003). Actual costs appear to be much higher, however. For example, in the third year of implementing Section 404 when compliance costs have

already dropped significantly compared to the first two years due to increased efficiencies and reduced documentation, a company on average still incurs 2.9 million US dollars in compliance fees (Financial Executives International, 2007). Besides direct out-of-pocket compliance costs, companies also incur indirect opportunity costs of diverting managerial attention from critical business decisions concerning operating, investing, and financing activities of the firm (Bryan & Lilien, 2005; Solomon & Bryan-Low, 2004).

Many companies and business associations have complained about the costs related to the internal control reporting requirements and have called for the amendment and even abolishment of such requirements (Ogneva, Subramanyam, & Raghunandan, 2007; American Electronics Association, 2005; Financial Executives International, 2005b). Given the considerable costs involved in complying with the regulations, it is imperative to evaluate the benefits of required internal control disclosures.

SOX internal control provisions likely provide useful information to a broad array of stakeholders, such as investors, financial analysts, and creditors. My study focuses on the potential informational benefits to investors, whom the SOX purports to protect. I investigate whether required disclosures of material weaknesses in internal control as per Sections 302 and 404 are useful to investors by empirically examining (1) cross-sectionally, whether such disclosures are associated with investor perception of a firm's earnings quality and (2) intertemporally, whether disclosures of firms' internal control status is related to within-firm changes in investor perception of earnings quality.

My study differs from prior research on the association between internal control and accruals/earnings quality in that prior research examines firms' *actual* earnings quality based on reported accounting numbers, while my study focuses on firms' *perceived* earnings quality based on market returns. It is important to investigate the issue

of perceived earnings quality because perceptions are what motivate people to participate in or withdraw from the capital market, and perceptions were the target of the Sarbanes-Oxley Act that aimed to restore investor confidence, as can be inferred from the very title of the act: *An act to protect investors by improving the accuracy and reliability of corporate disclosure*. Investors' confidence stems from their perception of information quality of the market (Lev, 1988).

Although prior research on the relation between internal control deficiencies and cost of equity has investigated the related issue of information risk to investors under the setting of SOX internal control regulations, results provided by this stream of research are inconclusive and further research is needed to better understand investor perception of information risk under SOX internal control provisions. My study differs from and augments prior research in that I address a similar research question from a different perspective and hence provide additional evidence to the continuing discussion on the relation of internal control deficiencies and information risk.

In addition, perceived earnings quality under the SOX setting is worth investigating because it is difficult to assess changes in a firm's actual earnings quality over short periods by using currently available measures of actual earnings quality. To the extent that actual and perceived earnings quality are related, studying the effect of perceived earnings quality has the potential to shed light on both issues. Therefore, research on changes in perceived earnings quality can provide valuable information to capital market participants who wish to gauge the impact of SOX 302 and 404 on financial reporting quality. In all, my study contributes to the literature by providing evidence relevant to the ongoing debate about the costs and benefits of SOX internal control provisions.

My empirical tests use sample firms that disclosed at least one material weakness from August 2002 to October 2005. The cross-sectional univariate analysis shows that firms disclosing internal control material weaknesses have lower investor perceived earnings quality than year-industry-size matched firms that disclose no internal control problems. However, further cross-sectional multivariate regression analysis reveals that after controlling for firm characteristics, only disclosures of company-level material weaknesses have an incremental impact on investor perceived earnings quality, while disclosures of the less pervasive account-specific material weaknesses do not have a measurable effect on perceived earnings quality. From intertemporal within-firm analysis, I find no evidence that firms experienced a change in their perceived earnings quality after their first disclosure of internal control material weaknesses as per SOX 302 or 404. In contrast, I find that firms experienced an increase in perceived earnings quality after they received their first unqualified SOX 404 audit report indicating remediation of previously disclosed material weaknesses. This suggests that, although investors did not find the initial SOX disclosures of internal control weaknesses to be incrementally informative, the legislation motivated firms to remediate weak controls; moreover, the SOX-induced improvement in weak internal controls enhanced investors' perception of the offending firms' financial reporting quality.

The dissertation proceeds as follows. A review of the institutional setting and relevant research leading to the development of my hypotheses comes next. This is followed by a chapter describing sample selection and research design. The fourth chapter provides the results of empirical tests. The last chapter concludes and provides a brief discussion of the implications of my findings.

CHAPTER 2. LITERATURE REVIEW

2.1. Institutional background

2.1.1. SOX internal control provisions

Auditing Standard (AS) No. 2 (Public Company Accounting Oversight Board, 2004) defines a company's internal control over financial reporting as "a process designed ... to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles" (paragraph 7).

Policymakers intended to enhance financial reporting reliability and restore investor confidence by enacting the internal control provisions stipulated in the SOX. In his speech at the 11th Annual Midwestern Financial Reporting Symposium, Donald Nicolaisen, the then-Chief Accountant of the U.S. Securities and Exchange Commission (SEC), expressed the following view on the new internal control regulations:

[G]iven the massive financial scandals, decline in market capitalization and resulting loss of investor confidence in our markets, I believe that, of all of the recent reforms, the internal control requirements have the greatest potential to improve the reliability of financial reporting. Our capital markets run on faith and trust that the vast majority of companies present reliable and complete financial data for investment and policy decision-making. Representing to the world that a company has in place an appropriate control system, free of material weaknesses, that gathers, consolidates, and presents financial information strengthens public confidence in our markets and encourages investment in our nation's industries. (Nicolaisen, 2004)

Two provisions of SOX are related to companies' internal control over financial reporting. The first, Section 302, requires senior management to evaluate their company's internal controls on a quarterly basis, and make explicit certifications regarding the effectiveness of those controls in periodic (quarterly and annual) financial statements. SEC interim rules related to Section 302 became in effect on August 29, 2002 and is

applicable to all SEC filers. Punitive actions against dishonest reporting are stipulated in Section 906, which imposes criminal penalties for officers who knowingly provide untruthful certifications¹.

The second SOX internal control provision is Section 404. This section requires that a company's annual financial reports include a management internal control report evaluating the effectiveness of the company's ICOFR as of the fiscal year end. Section 404 also requires the external auditor to conduct an annual audit of the client firm's internal control. In the annual audit report, the auditor must express two opinions as per AS No. 2: (1) an opinion on management's assessment of internal control, and (2) the auditor's own opinion on the effectiveness of the client's internal control system². SOX 404 became effective for fiscal years ending on or after November 15, 2004. So far, the audit requirement of SOX 404 is only applicable to accelerated filers, a category of filers that generally comprises public companies with a market capitalization of at least 75 million dollars³. For non-accelerated filers, Section 404 becomes effective for fiscal years ending on or after December 15, 2007 for the management's assessment report, while the auditor's attestation report is deferred until fiscal years ending on or after June 15, 2010 (SEC, 2010).

¹ Under Section 906 of SOX, officers who knowingly certify a statement that does not comport with legal requirements face up to one million dollars of fines and/or ten years of imprisonment, and for a "willfully" false certification, the maximum penalty is five million dollars of fines and/or 20 years of imprisonment.

² The auditor is required to express only one opinion, i.e., the auditor's own opinion on the effectiveness of the client's internal control system, as per AS No.5, which has superseded AS No. 2 since 2007. I am citing AS No. 2 as it is the governing rule for the time period examined in my study.

³ An accelerated filer is a company that meets the following conditions: (i) had a worldwide market value of at least \$75 million as of the last business day of its most recently completed second fiscal quarter; (ii) has been subject to the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 for a period of at least twelve calendar months; (iii) has filed at least one annual report pursuant to section 13(a) or 15(d) of the Act; and (iv) is not eligible to use Forms 10-KSB and 10-QSB for its annual and quarterly reports. (The Securities Exchange Act of 1934. Rule 12b-2.)

Appendices 1 and 2 provide the examples of Microsoft Corporation and General Motors Corporation illustrating reporting of effective internal control and deficient internal control, respectively, under SOX 302 and 404. The charts below summarize the main information.

An example of effective internal control: Microsoft Corp.

	SOX 302 (Source: 10Q as of Mar. 31, 2007)	SOX 404 (Source: 10K as of Jun. 30, 2007)
Mgmt.	<ul style="list-style-type: none"> • Disclosure controls and procedures are effective. • There were no changes in ICOFR during the reported quarter. 	<ul style="list-style-type: none"> • ICOFR was effective as of the fiscal year end. • There were no changes in ICOFR during the quarter ended Jun. 30, 2007.
Auditor	N/A	<ul style="list-style-type: none"> • Management’s assessment that the company maintained effective ICOFR as of the fiscal year end is fairly stated. • In our opinion, the company maintained effective ICOFR as of the fiscal year end.

An example of deficient internal control: General Motors Corp.

	SOX 302 (Source: 10Q as of Jun. 30, 2006)	SOX 404 (Source: 10K as of Dec. 31, 2006)
Mgmt.	<ul style="list-style-type: none"> • Disclosure controls and procedures were not effective. • Management identified a material weakness and a significant deficiency in ICOFR. • There was a change in ICOFR: the transition of some IT support services. 	<ul style="list-style-type: none"> • ICOFR was not effective as of the fiscal year end. • There were control deficiencies that constituted material weaknesses.
Auditor	N/A	<ul style="list-style-type: none"> • Several material weaknesses have been identified. • Management’s assessment that the company did not maintain effective ICOFR as of the fiscal year end is fairly stated. • In our opinion, the company has not maintained effective ICOFR as of the fiscal year end.

SOX 302 and 404 mandate that companies publicly disclose *material weaknesses* in their internal control over financial reporting. AS No. 2 identifies three levels of internal control deficiencies. Listed in the ascending order of severity, they are control deficiencies, significant deficiencies, and material weaknesses. Specifically,

A *control deficiency* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis (AS No.2, paragraph 8).

A *significant deficiency* is a control deficiency, or combination of control deficiencies, that adversely affects the company's ability to initiate, authorize, record, process, or report external financial data reliably in accordance with generally accepted accounting principles such that there is more than a remote likelihood that a misstatement of the company's annual or interim financial statements that is more than inconsequential will not be prevented or detected (AS No.2, paragraph 9).

A *material weakness* is a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected (AS No. 2, paragraph 10).

The above definitions show that the three types of internal control deficiencies differ in the severity level of a misstatement that likely will not be prevented or detected by the controls. A *control deficiency* is related to ordinary misstatement, a *significant deficiency* is linked to a “more than inconsequential” misstatement, and a *material weakness* is connected to a “material” misstatement. Disclosures of the first two types of less severe internal control deficiencies are voluntary.

My study focuses on disclosures of material weaknesses for two reasons. First, these constitute the most severe type of internal control deficiencies and therefore are most likely to have an impact on investors' perception of earnings quality. Second, focusing on mandatory disclosure of material weaknesses helps to avoid issues of self-selection related to voluntary disclosure (Doyle, Ge, & McVay, 2007b).

2.1.2. Precursors of SOX 302 and 404

Sections 302 and 404 of SOX are the first broad based legal requirements mandating public disclosure and audit of internal control effectiveness. Prior to SOX, similar requirements were only enforced on large banks as per the Federal Deposit Insurance Corporation Improvement Act of 1991 (Altamuro & Beatty, 2006).

For many US companies, the attention directed at internal control over financial reporting is not new (Hermanson, 2000). Prior to the passage of the Sarbanes-Oxley Act in July 2002, the Foreign Corrupt Practices Act of 1977 required public companies to set up and maintain accounting internal controls to safeguard corporate assets and facilitate GAAP-based financial reporting. In 1978, the Cohen Commission, a blue ribbon group convened by the American Institute of Certified Public Accountants (AICPA), recommended that management provide a report of their evaluation of the firm's internal controls. Later, the Treadway Commission (1987), a private group sponsored by five accounting organizations, recognized the importance of internal controls and proposed to improve them. In 1992, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) issued a framework that developed the concept of good internal controls (Prentice, 2007; Ghosh & Lubberink, 2006). Despite the interest in internal control over financial reporting, however, companies were not required to publicly disclose their internal control deficiencies in the pre-SOX era, except when they filed Form 8-K subsequent to an auditor change (Krishnan J. , 2005). Under the absence of mandatory disclosure requirement, very few companies ever made public reports on

internal controls voluntarily pre-SOX even though auditing standards allowing such a report were passed in the early 1990's⁴.

Evaluation of internal controls over financial reporting was an important component of the auditing process long before SOX was enacted. Before SOX, auditing standards required auditors to obtain a sufficient understanding of ICQFR in order to properly plan the audit of financial statements (Knechel, Salterio, & Ballou, 2007, pp. 227-228). However, pre-SOX audit standards did not require auditors to formally evaluate the effectiveness of ICQFR or to issue opinions on this matter in the audit reports.

2.1.3. Costs of implementing SOX internal control provisions

SOX 302 and 404 have fomented debate since their promulgation despite regulators' good intentions because compliance with these internal control provisions entails substantial costs. In particular, Section 404 has been identified as "the most expensive and most burdensome piece of Sarbanes-Oxley" (Atkins, 2005). The costs associated with SOX 302 and 404 consist of not only direct out-of-pocket compliance costs but also indirect opportunity costs of diverting managerial attention from the critical business decisions concerning operating and investing activities of the firm (Bryan & Lilien, 2005; Solomon & Bryan-Low, 2004).

The SEC initially estimated the annual costs of implementing Section 404 to be approximately \$91,000 per company (SEC, 2003). Actual costs proved much higher, however. According to a series of surveys conducted by the Financial Executives International (FEI), total costs for Section 404 compliance averaged \$4.4 million per

⁴ Statement on Standards for Attestation Engagements (SSAE) No. 2, *Reporting on an Entity's Internal Control over Financial Reporting*, issued in May 1993.

company for the first year (Financial Executives International, 2005a), \$3.8 million for the second year (Financial Executives International, 2006), and \$2.9 million for the third year (Financial Executives International, 2007). Although the costs declined significantly in the second and third years due to increased efficiencies and reduced documentation, compliance was still much more expensive than the SEC initially estimated. Similarly, surveys conducted by the Charles River Associates International documented exorbitant Section 404 implementation costs. The survey, released in spring 2006, reported that in the first year of implementing Section 404, smaller companies (with market capitalization between \$75 million and \$700 million) incurred an average of \$1.2 million in total costs and larger companies (with market capitalization over \$700 million) spent an average of \$8.5 million; in the second year, on average smaller companies spent \$860,000 and larger companies \$4.8 million (Charles River Associate International, 2006, p. 3).

Many companies and business associations have complained about the costs related to the internal control reporting requirements and have called for the amendment and even abolishment of such requirements (Ogneva, Subramanyam, & Raghunandan, 2007; American Electronics Association, 2005; Financial Executives International, 2005b). Given the considerable costs involved in complying with these regulations, it is necessary to evaluate the benefits of required internal control disclosures.

2.2. Prior literature and motivation of the study

Debate about costs and benefits of SOX 302 and 404 and the general availability of internal control data as a result of implementing the new regulations have spawned research in the area of internal control over financial reporting. The rapidly growing literature has investigated the following topics.

1. Effects of SOX on internal control strength from a theoretical perspective (Patterson & Smith, 2007).
2. Determinants of internal control weaknesses and characteristics of firms reporting internal control deficiencies (Doyle, Ge, & McVay, 2007a; Ashbaugh-Skaife, Collins, & Kinney, 2007; Ge & McVay, 2005; Bryan & Lilien, 2005).
3. Whether weak internal controls are associated with poor accruals/earnings quality (Doyle, Ge, & McVay, 2007b; Ashbaugh-Skaife, Collins, Kinney, & LaFond, 2008; Bédard, 2006; Altamuro & Beatty, 2006; Brown, Strohm, & Wompener, 2006; Chan, Farrell, & Lee, 2008; Gong, Ke, & Yu, 2009; Lu, Richardson, & Salterio, 2009).
4. Whether markets react negatively to disclosures of internal control deficiencies (Hammersley, Myers, & Shakespeare, 2008; De Franco, Guan, & Lu, 2005; Beneish, Billings, & Hodder, 2008; Ashbaugh-Skaife, Collins, Kinney, & LaFond, 2009; Cheng, Ho, & Tian, 2006; Lopez, Vandervelde, & Wu, 2006; Kim & Park, 2008; Gupta & Nayar, 2007; Krishnan, Sami, & Zhou, 2007).
5. Whether internal control weaknesses are associated with higher cost of equity (Ashbaugh-Skaife, Collins, Kinney, & LaFond, 2009; Ogneva, Subramanyam, & Raghunandan, 2007; Beneish, Billings, & Hodder, 2008).
6. Whether internal control weaknesses are associated with higher cost of debt (Kim, Song, & Zhang, 2009a; Elbannan, 2008).
7. Internal control and external auditor related issues, including whether firms with internal control deficiencies incur higher audit fees (Raghunandan & Rama, 2006; Bedard, Hoitash, & Hoitash, 2007a; Bedard, Hoitash, & Hoitash, 2007b; Eldridge & Kealey, 2005; Kinney & Marcy, 2009), whether firms with internal control

problems are more likely to change auditors (Krishnan & Visvanathan, 2007; Ettredge, Heintz, Li, & Scholz, 2007), and whether material weaknesses in internal control are associated with longer audit delay (Ettredge, Li, & Sun, 2006).

8. Whether internal control strength is positively associated with quality of corporate governance, especially quality of the audit committee (Krishnan J., 2005; Krishnan & Visvanathan, 2007; Bedard, Hoitash, & Hoitash, 2007c; Zhang, Zhou, & Zhou, 2007; Goh, 2009; Hoitash, Hoitsh, & Bedard, 2009; Stephens, 2009; Hoitash, Hoitash, & Johnstone, 2009).
9. Other miscellaneous topics, including whether internal control effectiveness is positively associated with executive compensation (Henry, Shon, & Weiss, 2007; Hoitash, Hoitash, & Johnston, 2007), whether material weaknesses in internal control are negatively associated with analyst forecast accuracy (Xu & Tang, 2008; Kim, Song, & Zhang, 2009b), whether companies receiving adverse SOX 404 opinions experience higher rates of CFO turnover (Li, Ettredge, & Sun, 2008), whether internal control quality is positively associated with accounting conservatism (Goh & Li, 2008), and whether an adverse auditor's opinion on internal control is associated with shareholder dissatisfaction (Ye & Krishnan, 2008).

My study investigates the relation between investor perceived earnings quality and disclosure of internal control weaknesses. Among extant internal control related studies, the research on accruals/earnings quality and on cost of equity are the most relevant to my study.

2.2.1. Extant research on accruals/earnings quality

First, I review pertinent studies regarding accruals/earnings quality. Doyle, Ge, & McVay (2007b) examine the association between accruals quality and internal control weaknesses using 705 firms that disclosed at least one material weakness from August 2002 to November 2005. Employing the modified Dechow and Dichev (2002) accruals quality model, Doyle et al. find that weak internal controls are associated with relatively low accruals quality, as measured by poor mapping of current accruals into past, present, and future cash flows. In addition, they find that this association between weak internal controls and lower accruals quality is driven by weakness disclosures that relate to overall company-level controls but not to more auditable, account-specific weaknesses. Furthermore, in their analysis by reporting regime, they find that results still hold for Section 302 disclosures but become much weaker or even disappear for Section 404 disclosures. Doyle et al. propose several possible explanations for the weaker results for the Section 404 subgroup: (1) The increased scrutiny of a full internal control audit mandated under Section 404 and the requirement for auditors to express opinions on the effectiveness of clients' internal controls likely cause auditors to be unduly cautious in identifying material weaknesses. This lower materiality threshold could result in many reported Section 404 material weaknesses that are not indeed related to financial reporting problems.⁵ (2) Ambiguities existing under Section 302 likely cause many firms to choose not to report less serious material weaknesses under SOX 302 era, therefore resulting in a reported SOX 302 sample that is more severe in nature and more correlated with poor

⁵ This explanation also sheds light on an interesting finding reported by Glass Lewis & Company (2005, p. 3): 87% of the firms disclosing a material weakness in early 2005 when they were first subject to SOX 404 stated that their internal controls were effective in the immediately previous quarter under SOX 302.

accruals quality. (3) Biases exist in the present Section 404 sample as small firms (non-accelerated filers) are not yet required to comply with Section 404 as of the time of the study.

Ashbaugh-Skaife, Collins, Kinney, & LaFond (2008) investigate the effect of internal control deficiencies (ICDs) and their remediation on accruals quality by conducting both cross-sectional and intertemporal tests with various samples of firms disclosing ICDs during firms' 2003 to 2005 fiscal year reporting periods. In cross-sectional analysis they find, similar to the main finding of Doyle et al. (2007b), that accruals of ICD firms map less reliably into past, current, and future cash flows. They also find that ICD firms have larger magnitudes of absolute, positive and negative abnormal total and current accruals relative to non-ICD firms in the year of disclosing internal control deficiencies. As abnormal accruals are thought to suggest opportunistic earnings management, they interpret their findings as showing that the accruals of ICD firms are noisier and less reliable than the accruals of firms with no reported internal control problems. In addition, they find that firms whose auditors confirm remediation of previously reported internal control deficiencies exhibit smaller magnitudes of absolute, positive and negative abnormal accruals relative to firms that do not remediate their control problems. Using intertemporal change tests, they document that firms whose internal control audit opinions deteriorate from unqualified to adverse experience a significant increase in the absolute value of abnormal accruals and that firms whose internal control audit opinions improve from adverse to unqualified experience a marginally significant decrease in the absolute value of abnormal accruals. In contrast, firms identified as having internal control problems that subsequently receive an adverse SOX 404 audit opinion exhibit no significant change in the magnitude of abnormal

accruals. Overall, Ashbaugh-Skaife et al. (2008) conclude that the quality of internal control is positively associated with the quality of accruals.

Using abnormal total and current accruals as measures of earnings quality and investigating internal control disclosures under both SOX 302 and 404, Bédard (2006) finds that firms' absolute level of abnormal accruals increases in the year they disclose internal control weaknesses. He interprets this as indicating an increase in earnings quality and as suggesting that in the internal control weaknesses disclosure year, management reverses, voluntarily or at the auditor's request, prior accruals that were too large. Comparing Section 302 and 404 disclosures, he finds that the magnitude of abnormal accruals is larger for Section 302 disclosures, suggesting that the nature and significance of problems are more severe for Section 302 disclosures. For companies reporting effective internal controls under SOX 404, he finds a decrease in the magnitude of abnormal accruals in the year of their first report, suggesting that the formal internal control assessment process required by Section 404 motivates companies to improve their earnings quality.

Whereas these prior studies examine firms' *actual* earnings quality based on reported accounting numbers, my study focuses on firms' *perceived* earnings quality based on market returns. It is important to investigate the issue of perceived earnings quality because perceptions are what motivate people to participate in or withdraw from the capital market, and perceptions were the target of the Sarbanes-Oxley Act that aimed to restore investor confidence, as can be inferred from the very title of the act: *An act to protect investors by improving the accuracy and reliability of corporate disclosure*. Investors' confidence and willingness to participate in equity markets stem from their perception of information quality (Lev, 1988).

The issue of perceived earnings quality under the SOX setting is worth investigating also because it is difficult to assess changes in a firm's actual earnings quality over short periods by using currently available measures. Given the high costs of complying with SOX 302 and 404, many capital market participants are interested to know the changes in financial reporting quality following the new regulations. However, limitations of currently available measures of actual earnings quality make it difficult to address this issue. The commonly used accruals quality measure developed by Dechow and Dichev (2002) requires a long time series of earnings and cash flow data to evaluate the reliability of mapping of a firm's accruals into its cash flows. For example, Doyle et al. (2007b) use nine years (1995-2003) of data to calculate this accruals quality measure. Such a data requirement makes it impracticable to use this measure to assess earnings quality changes from one year to the next.

Abnormal accruals calculated from variations of Jones' (1991) model are the other commonly used earnings quality proxies and can be implemented with cross-sectional data. However, these measures lead to inconsistent inferences under the setting of SOX internal control regulations. For example, regarding the similar finding⁶ that firms have larger absolute level of abnormal accruals in the year when they disclose internal control weaknesses, Ashbaugh-Skaife et al. (2008) and Bédard (2006) provide conflicting interpretations. The former regard this as an unfavorable sign of poor earnings quality while the latter considers it a favorable signal of earnings quality improvement, suggesting that management reverses, voluntarily or at the auditor's request, prior

⁶ The major difference between the finding of Ashbaugh-Skaife et al. (2008) and that of Bédard (2006) is that the former result is based on cross-sectional analyses to compare deficient firms with control firms, while the latter result is obtained from time-series tests to compare firms before versus during the disclosure year.

accruals that were too large. Therefore, considering the difficulty of obtaining convincing evidence regarding changes (or lack of changes) in actual earnings quality during the recent years post-SOX, research on changes in market perceived earnings quality provides valuable information to capital market participants who wish to gauge the impact of SOX internal control provisions on financial reporting quality.

2.2.2. Extant research on cost of equity

Extant research on internal control and cost of equity comprises three primary papers. Ashbaugh-Skaife, Collins, Kinney, & LaFond (2009) investigate the effect of SOX internal control deficiencies on firm risk and cost of equity by examining firms filing under SOX 302 or 404. After controlling for other risk factors, they report that firms with internal control deficiencies have significantly higher idiosyncratic risk (measured by the standard deviation of the residuals from regressing a firm's excess monthly returns on the excess monthly returns of the market), systematic risk (measured by beta), and cost of equity (measured by *Value Line's* expected rate of return). In addition, they find that auditor-confirmed remediation of previously disclosed internal control deficiencies are followed by a statistically significant decline in the cost of equity that range from 50 to 150 basis points. Overall, they posit and provide evidence that ineffective internal control results in less reliable financial reporting, thus increasing investors' information risk and the cost of equity.

Ogneva, Subramanyam, & Raghunandan (2007) also investigate the association between cost of equity and internal control effectiveness but obtain evidence contrary to the Ashbaugh-Skaife et al. (2009) findings. Focusing on firms that provide internal control disclosures under SOX 404 for the first time, they find higher costs of equity (measured by multiple proxies) for firms disclosing material weaknesses in internal

controls than for firms disclosing no material weaknesses. However, the differences in cost of equity vanish after controlling for firm characteristics associated with internal control weaknesses and for analyst forecast bias. Ogneva et al. conclude that internal control weaknesses identified under Section 404 are not, on average, directly associated with higher implied cost of equity.⁷

Beneish, Billings, & Hodder (2008) examine the effect of internal control weakness disclosures under SOX 302 and 404 on disclosing firms' stock prices, forecasted earnings per share, and cost of equity. They document that Section 302 disclosures are associated with size-adjusted cumulative abnormal stock returns of -1.8% and -2.3% in the three days surrounding the disclosures for the full sample of 330 firms and for the selected sample of 180 firms that have no confounding news release, respectively. They decompose the abnormal price changes of the SOX 302 full sample into cash flow effects (proxied by analyst forecast revision) and risk effects (proxied by cost of equity), and report a significant abnormal increase in cost of equity of 68 basis points for disclosing firms. In contrast, they find no market response to Section 404 disclosures and no evidence of cost of equity changes. They attribute their lack of statistically significant findings for Section 404 disclosures to the already rich information environment for big firms (accelerated filers), a lower threshold of material weaknesses for Section 404 disclosure as suggested by Doyle et al (2007b), or insufficient statistical power of their tests.

⁷ Ashbaugh-Skaife et al. (2009) argue that the research design of Ogneva et al. (2007) suffers from a sample misclassification look-ahead bias that contributes to their finding of no significant relation between ineffective internal control and cost of equity.

Overall, prior studies on cost of equity related to SOX 302 and 404 present mixed results regarding the relation between costs of equity and internal control deficiencies. My study is closely related to this stream of research in that fundamentally we all try to address the same underlying issue – whether internal control problems are related to higher information risk to investors. Given the inconclusive results provided by extant cost of equity studies, further research is needed to better understand this important issue.

My study differs from and augments prior research in that I address a similar research question from a different perspective. Regulators are interested in the impact of SOX on investor perceptions of earnings quality because higher perceived earnings quality has the potential to encourage investors to participate in the equity market even if it does not lower firms' costs of capital. Hence, I provide important additional evidence to the ongoing debate about internal control deficiencies and information risk.

2.3. Theory and hypothesis development

By definition, a company's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting. Earnings quality is the focal point of financial reporting quality as earnings constitute a premier source of firm-specific information (Francis, LaFond, Olsson, & Schipper, 2004). Investors, analysts, senior executives, and boards of directors regard earnings as the single most important item in the financial reports issued by public companies (Degeorge, Patel, & Zeckhauser, 1999). Empirical research (Biddle, Seow, & Siegel, 1995; Francis, Schipper, & Vincent, 2003; Liu, Nissim, & Thomas, 2002) shows that investors refer to earnings more than any other summary measure of firm performance, such as dividends,

cash flows, or variants of earnings (for example, EBITDA).⁸ Survey results (Graham, Harvey, & Rajgopal, 2005) also suggest that managers regard earnings as the key metric evaluated by investors and analysts.⁹

Weak internal control over financial reporting can impair a firm's earnings quality in two ways. One way is by allowing unintentional errors due to ineffectual policies, inappropriate procedures, ineffective information systems, inadequate training and skills of accounting personnel, or a perverse management attitude of being unconcerned about internal controls. Unintentional errors stemming from weak internal control may relate to: inventory counting, recording, and pricing errors that lead to misreporting of inventory on hand and related cost of sales; omission of items due to failure to record credit sales/purchases; undue variation in bad debt estimation as a result of accepting new customers with unsatisfactory credit; mistakenly capitalizing items that should be expensed and vice-versa; and inappropriate accounting estimates related to inventory obsolescence allowances (Ashbaugh-Skaife, Collins, Kinney, & LaFond, 2008; Doyle, Ge, & McVay, 2007b; Bédard, 2006; Knechel, Salterio, & Ballou, 2007).

The other way deficient internal control over financial reporting can weaken a firm's earnings quality is by facilitating intentional earnings management, because a lax control environment allows discretion to manage earnings and provides opportunity for fraud (Doyle, Ge, & McVay, 2007b; Ashbaugh-Skaife, Collins, Kinney, & LaFond, 2008). Prior literature shows that managers have various incentives to manipulate earnings, such as to maximize compensation (Healy, 1985), to ensure job security

⁸ EBITDA is the abbreviation for Earnings Before Interest, Taxes, Depreciation and Amortization.

⁹ The empirical evidence of Biddle et al. (1995), Francis et al. (2003) and Liu et al. (2002) and the survey results of Graham et al. (2005) are initially cited by Francis et al. (2004) to support their contention that earnings is a premier source of firm-specific information.

(Fudenberg & Tirole, 1995), to influence capital market pricing (Murphy, 1985; Rangan, 1998; Teoh, Welch, & Wong, 1998), and to relax debt covenant constraints (Watts & Zimmerman, 1978) or regulatory constraints based on accounting numbers (Jones, 1991; Cahan, 1992). Under a lax control system, management's indifference towards internal control, lack of segregation of accounting duties, and ineffective reviews and monitoring can all facilitate intentional earnings management.

Unintentional errors and intentional earnings management lead to noise and bias in accounting numbers and impair the information quality of accounting earnings. Theoretical work by Holthausen and Verrecchia (1988) predicts that investors react less strongly to accounting earnings that they consider to be inaccurate or unreliable. Analytical work by Easley & O'Hara (2004) and Lambert, Leuz, & Verrecchia (2007) proposes that information risk, the risk caused by poor information quality, contains a nondiversifiable component that is priced by the market.

The preceding analysis leads to my first hypothesis, stated in alternative form:

H1: Firms disclosing internal control material weaknesses (ICMW) have lower investor perceived earnings quality than firms not disclosing any internal control deficiencies (ICD).

There are various types of material weaknesses in internal control, such as account-specific problems, deficient revenue-recognition policies, lack of segregation of duties, lack of training for accounting personnel, deficiencies in the period-end reporting process and accounting policies, inappropriate accounting reconciliation, and inappropriate tone of senior management (Ge & McVay, 2005). The effects of different types of internal control deficiencies on financial reporting are likely to be viewed differently.

A firm's external auditor can sometimes compensate for a client's weak internal control by conducting substantive testing. Indeed, one of the external auditor's key responsibilities is to compensate for a client firm's deficient internal control system by performing adequate substantive testing to ensure the accuracy and reliability of the firm's reported accounting numbers (Simunic, 1980; Lu, Richardson, & Salterio, 2009). However, it is very difficult for auditors to effectively "audit around" severe control weaknesses related to a firm's overall control environment. For example, Moody's Investors Service, the world's leading provider of corporate bond credit ratings, expresses its view on the "auditability" of different types of internal control material weaknesses as follows:

We are less concerned about material weaknesses that relate to controls over specific account balances or transaction-level processes. We refer to these material weaknesses as "Category A" material weaknesses. In most cases, we believe that the auditor can effectively "audit around" these material weaknesses by performing additional substantive procedures in the area where the material weakness exists. We expect to give companies reporting Category A material weaknesses the benefit of the doubt and not take any related rating action... Other material weaknesses relate to company-level controls such as the control environment or the financial reporting process. These material weaknesses, which we refer to as "Category B" material weaknesses, may result in us bringing a company to rating committee to determine whether a rating action is necessary. We are concerned about these material weaknesses because we question the ability of the auditor to effectively "audit around" problems that have a pervasive effect on a company's financial reporting. Also, Category B material weaknesses call into question not only management's ability to prepare accurate financial reports but also its ability to control the business. (Doss & Jonas, 2004, p. 1)

Consistent with Moody's suspicion about auditors' effectiveness in auditing around severe company-level material weaknesses in internal control, four audit partners and one senior manager who participated in a study by Hammersley et al. (2008) identify several types of company-level weaknesses as less auditable from an auditor's point of view, such as lack of key personnel, evidence of management override of controls or

integrity issues, problems with financial statement closing procedures, and insufficient documentation or policies to support transactions or adjusting entries. Hammersley et al. (2008) document that firms disclosing internal control weaknesses that are less auditable experience lower market returns measured over a three-day event window containing the disclosures. However, it is not clear whether the lower market return is caused by high information risk, by high expected costs to remediate the severe internal control weakness, or by investors' concern about management's ability to control the business.

Doyle et al. (2007b) find that lower *actual* accruals quality is associated with severe company-level material weaknesses but not with more auditable, account-specific material weaknesses. On the basis of extant literature, I expect that the similar association and lack of association would also hold for perceived earnings quality. Therefore, my second hypothesis is:

H2: A. Firms disclosing company-level material weaknesses (CLMW) in internal control have lower investor perceived earnings quality than firms not disclosing any internal control deficiencies (ICD).

H2: B. There is no difference in perceived earnings quality between firms disclosing account-specific material weaknesses (ASMW) and firms not disclosing any internal control deficiencies (ICD).

Besides leading to cross-firm variation, it is also expected that disclosure about a firm's internal control strength will lead to within-firm changes in investor perceived earnings quality if the disclosure provides new information to the market. H3 and H4, which are developed below, relate to such within-firm changes.

Analytical work by Verrecchia (2001) demonstrates that disclosure of information about firm value is related to changes in the activities of investors who strive to maximize

their individual welfare in capital market settings. Manifestations of changes in aggregate investor actions include stock price change, trading volume, and market liquidity change. However, if a disclosure provides no new information to the markets, changes in investor activities are not expected to follow such a disclosure.

Ecker et al. (2006) find that when firms announce restatements, file lawsuits, or delist due to bankruptcy, their perceived earnings quality measured by e-loading deteriorates in the year when such events occur, putatively because those events indicate poor earnings quality. However, it is not clear whether and to what extent the newly mandated disclosure of internal control weaknesses has information content and thus can affect investors' perception of financial reporting quality. Doyle et al. (2007a) and Ashbaugh-Skaife, Collins, & Kinney (2007) find that firms disclosing internal control deficiencies as per SOX 302 and 404 generally exhibit some distinct characteristics. They tend to be smaller, younger, financially weaker, more complex, growing rapidly, and undergoing restructuring. If firms with internal control weaknesses are systematically different from firms with satisfactory internal controls and those differences are publicly observable, new information contained in the mandated disclosure of internal control weaknesses would be quite limited. To the extent that investors have anticipated firms' potential internal control problems based on visible firm characteristics and have already impounded that anticipation into their perception of financial reporting quality, disclosure of internal control weaknesses does not provide much, if any, new information to the market and investor perceived earnings quality would not be expected to change upon such disclosure.

It is an empirical question whether and to what extent disclosure of internal control weaknesses contains new information about a firm's financial reporting quality. Therefore, I state the third hypothesis in null form:

H3: Firms disclosing internal control material weaknesses experience no change in investor perceived earnings quality.

Although it is not clear whether initial public disclosure of internal control weaknesses provides incremental information to the market, it is reasonable to assume that the first audit report under SOX 404 reporting correction of previously disclosed material weaknesses releases positive new information to investors. Investors may have expected that firms will eventually remediate the deficiencies since public disclosure of weaknesses imposes great pressure on companies; however, high uncertainty exists as to when and to what extent a firm can effectively correct the weaknesses. Hence, the message of remediation from an auditor's report provides investors with the needed assurance for them to positively revise their prior perception. Upon receiving the good news of remediation, investors are expected to view firms as having improved earnings quality. Therefore, my fourth hypothesis, stated in alternative form, is:

H4: Firms disclosing remediation of internal control material weaknesses experience an increase in investor perceived earnings quality.

CHAPTER 3. DATA, SAMPLE SELECTION, AND RESEARCH DESIGN

3.1. Data and sample selection

My empirical tests start with 1,210 sample firms provided by Doyle, Ge, & McVay (2007b) supplemented with relevant information from Audit Analytics, an on-line market intelligence service, and 10K Wizard, a search engine for SEC filings. Doyle et al. collected the sample firms by searching 10KWizard.com (10-Ks, 10-Qs, and 8-Ks) using the key phrases “material weakness” and “material weaknesses” for the time period from August 1, 2002 to October 31, 2005. They identified 1,210 firms that disclosed at least one material weakness in ICOFR during the sample period. The authors provide data relating to the 1,210 sample firms at their websites.¹⁰ Data related to detailed coding of material weakness types were obtained from the authors via request. Data regarding firms’ correction of material weaknesses as demonstrated by an unqualified SOX 404 audit report are from Audit Analytics.

The daily return data of *AQfactor* used to calculate the measure of perceived earnings quality are provided by Ecker et al. (2006) at Frank Ecker’s website.¹¹ The data related to the Fama-French three-factor model are from Kenneth R. French’s on-line data library.¹² Firms’ daily market return data are from the Center for Research in Security Prices (CRSP) and companies’ accounting data are from Compustat North America.

¹⁰ The links are <http://faculty.washington.edu/geweili/ICdata.html> and <http://www.business.utah.edu/display.php?module=facultyDetails&personPageId=3374&personId=1373&orgId=962&fromOrg=962>.

¹¹ The link is http://faculty.fuqua.duke.edu/~fecker/EFKOS_2006.htm. The most recent *AQfactor* data of year 2006 were obtained from the author Frank Ecker via request.

¹² The link is http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

To ensure the accuracy of the event dates when firms disclose internal control material weaknesses for the first time, I cross-check event dates from the Doyle, Ge, & McVay (DGM) dataset and the dates obtained from Audit Analytics (AA). Specifically, I collect sample firms that disclose internal control material weaknesses for the first time from AA for the period from August 1, 2002 to December 31, 2006¹³, and then compare event dates of the DGM sample with those of the AA sample.

[Insert Table 1 about here]

Table 1 presents details of the event date verification process. As shown in Panel A of this table, among the 1,210 sample firms from DGM, 242 companies do not have the needed identification information of CIK, GVKEY, and/or PERMCO and hence are excluded from the sample. For the remaining 968 firms, I compare their event dates with the AA sample dates. The comparison reveals a large discrepancy between the two samples. For 457 out of the 968 firms, DGM and AA provide a different event date regarding a firm's first disclosure of internal control material weakness under SOX, 129 firms are not covered in the AA sample, and only 382 firms have the same event dates from DGM and AA. Simple statistics regarding the event date difference of the 457 firms that have inconsistent dates from two sources shows that the difference (calculated as $DATE_DIFF = AA \text{ date} - DGM \text{ date}$) ranges from -898 days to 1315 days, with the mean of 82 days and the median of 26 days¹⁴.

¹³ I use a slightly longer time period for the AA sample collection in order to cover the situation where AA records a firm with a later event date beyond October 2005, the ending point of DGM sample.

¹⁴ Possibly reasons for the discrepancy include: AA does not include Form 8K in its internal control data collection, while 8K is an important source of companies' initial disclosure of material weaknesses; AA does not collect a complete set of Forms 10K/A or 10Q/A for some companies; AA contains some coding errors; and DGM contains some data errors due to manual collection. The errors in event dates have little negative impact on Doyle et al. (2007b) as the study mainly uses several years of annual accounting data to

In view of the large discrepancy in event dates¹⁵, I verify the correct dates via 10K Wizard. Specifically, for each of the 968 firms that have the required identification information, I use 10K Wizard to search for all the firm's SEC filings that contain the key phrase "material weakness" or "material weaknesses" from 2001 to the event dates provided by DGM and AA. I then read through the SEC filings to identify the earliest date a company discloses internal control weaknesses. As shown in Panel B of Table 1, 10 of the 968 firms are removed due to erroneous identification information. Another 10 firms are excluded as their first disclosure dates are before August 2002 when SOX internal control provisions became effective. I do not find disclosure of material weaknesses for four companies and therefore exclude them from the sample. The whole date verification process leads to a sample of 944 firms that serves as the starting point for identifying various samples relating to specific hypotheses.

[Insert Table 2 about here]

Table 2 reports the detailed sample selection process for the four hypotheses. For H1, 61 firms are excluded because they receive an unqualified SOX 404 audit opinion during the three-quarter testing period (0, 270), where 0 is the date when a firm discloses material weaknesses for the first time under SOX. As discussed in the next section about the study's research design, I require three quarters of daily stock return data to measure a firm's perceived earnings quality after the firm's first disclosure of weaknesses. Those 61 firms are excluded to avoid the possible confounding effect of favorable disclosure

investigate firms' accrual quality and the results hence are not sensitive to firms' first date of disclosing internal control weaknesses.

¹⁵ Errors in the dates of companies' first public disclosure of internal control problems under SOX are not rare. For example, Ashbaugh-Skaife, Collins, & Kinney (2007) obtain their initial sample of internal control deficiency firms from *Compliance Week*, a popular source of SOX internal control data, and find that approximately 39% of their sample firms disclosed an internal control problem in an earlier SEC filing than the one reported in *Compliance Week* (Ashbaugh-Skaife, Collins, & Kinney, 2007, p. 177).

regarding remediation of weaknesses during the testing period. In the remaining observations for H1, 147 firms are either not covered by the CRSP Daily Stock File or do not have adequate daily stock return data (at least 100 daily returns in three quarters) required by the tests, and 27 firms do not have needed Compustat data to construct the matched sample. After excluding those firms, I obtain 709 sample firms for H1 univariate tests. As 67 of the 709 firms do not have required data for control variables, I obtain 642 sample firms to conduct H1 multivariate regression analysis.

The total sample of H2 is similar to that of H1, except that one firm without the DGM code of material weakness type is excluded. This results in a sample of 708 firms for H2 univariate tests and a sample of 641 firms for multivariate tests. Among the 708 firms, 250 have company-level weaknesses and 458 have account-specific weaknesses. Among the 641 firms, 226 have company-level weaknesses and 415 have account-specific weaknesses.

For H3 testing, starting from the initial sample of 944 firms, I remove 61 firms that receive an unqualified SOX 404 audit opinion during the three-quarter testing period (0, 270) for the reason discussed previously. I also exclude 120 firms that disclose any other non-material weakness deficiencies in internal control during the three-quarter testing period (-270, 0). As discussed in the next section about research design, I test H3 by comparing firms' perceived earnings quality three quarters before and after their first public disclosure of internal control material weaknesses. As some firms disclose non-material weakness deficiencies such as significant deficiencies and control deficiencies during the three-quarter testing period prior to their first material weakness disclosure, I exclude those 120 firms in order to create a more powerful test free from the possible dilutive effect of negative internal control disclosures that are similar to the first material

weakness disclosure in nature albeit milder in severity. The data related to firms' disclosure of any other internal control deficiencies except material weaknesses are from Audit Analytics. Last, I remove 147 firms that either are not covered by the CRSP Daily Stock File or do not have adequate daily stock return data required by the tests. These procedures generate a final sample of 616 firms for H3 testing.

The sample selection process for H4 also starts with the initial sample of 944 firms. I collect from Audit Analytics the firms that received their first unqualified SOX 404 audit report during year 2004 to 2006 after filing material weaknesses. The unqualified SOX 404 report serves as an unambiguous signal indicating remediation of previously disclosed internal control weaknesses. 483 firms that did not receive such a report are removed. Another 57 firms are excluded due to a time lag of less than three quarters between the date of receiving their unqualified audit report and the date of first filing their material weaknesses. This is because I use three quarters of daily stock return data before and after the remediation disclosure to estimate investor perceived earnings quality in the periods pre- and post-disclosure of remediation. For the same reason, I also remove 11 firms that disclosed material weaknesses again under SOX 302 during the three quarters after receiving their unqualified audit report. Furthermore, due to data availability of *AQfactor* (up to December 29, 2006) that I use to calculate perceived earnings quality, I exclude 77 firms that receive clean audit reports after March 31, 2006 to ensure that sample firms have three quarters of post-remediation *AQfactor* data for the tests. Finally, I obtain 301 sample firms for H4 testing after removing 15 firms that either are not covered by the CRSP Daily Stock File or do not have adequate daily stock return data.

3.2. Research design

3.2.1. The measure of investor perceived earnings quality

I use a market returns based measure called e-loading to proxy for investors' perception of earnings quality. The e-loading measure was developed by Ecker et al. (2006). It is the slope coefficient obtained from a regression of a firm's daily excess returns in year T on a factor-mimicking portfolio capturing earnings quality, controlling for other factors known to affect returns (market risk premium, size, and book-to-market ratio). Researchers have recently begun to use this new measure to examine research questions pertaining to investor perceptions of earning quality. Chen, Shevlin, & Tong (2007) apply e-loading to investigate whether market perceived earnings quality changes in a dividend change setting. They find that dividend initiating and dividend increasing firms exhibit a decrease in their e-loadings, reflecting an improvement in perceived earnings quality, while dividend decreasing firms exhibit an increase in the e-loading, suggesting a deterioration in perceived earnings quality. The explanation for such changes is that dividend initiating/increasing firms exhibit more stable earnings than before and less uncertainty of future earnings. In contrast, dividend decreasing firms tend to be investing in new projects and hence there is more uncertainty associated with predicting the payoffs and the future cash flows related to the new projects. To my knowledge, my study is the first to use e-loading to examine perceived earnings quality in the setting of internal control disclosures.¹⁶

The basis of e-loading is a firm's accrual quality that Dechow and Dichev (2002) measure as the extent to which current accruals map into past-, current-, and future-period

¹⁶ Beneish et al. (2008) use e-loading as a criterion to construct the matched sample in their study. They do not apply e-loading to directly test perceived earnings quality.

cash flows. One role of accruals is to shift or adjust the recognition of cash flows over time so that accounting earnings better measure firm performance than cash flows do. However, accruals contain inaccuracy as they require assumptions about and estimations of the amounts, timing, and uncertainty of unrealized future cash flows. Dechow and Dichev (2002) argue that the quality of accruals and earnings is negatively associated with the magnitude of estimation errors in accruals. They develop an empirical measure of accrual quality as the standard deviation of the residuals from firm-specific regressions of the change in working capital on past, present, and future cash flows from operations.

Francis, LaFond, Olsson, & Schipper (2004) find that among seven earnings attributes they investigate, accrual quality is “the dominant attribute in terms of cost of equity effects” (p. 1006). They propose that accrual quality has the most direct link to information risk as it captures variation in the pay-off structure that investors are interested in. Thornton (2007) further illustrates this point by using an example: suppose that management announces that dividend payouts will depend on earnings. Although this may be the firm’s true payout policy, management will eventually need cash flows to pay the dividends. Therefore, a tighter mapping of earnings into cash flows should enhance investors’ perception of the reliability of management’s announced payout policy and facilitate investors’ prediction of the amounts, timing, and uncertainty of the future cash flows they are interested in.

In the first step of their derivation of e-loading, Ecker et al. (2006) measure accounting-based earnings quality by employing the modified Dechow and Dichev’s (2002) accrual quality model:

$$TCA_{j,T} = \alpha_{0,j} + \alpha_{1,j}CFO_{j,T-1} + \alpha_{2,j}CFO_{j,T} + \alpha_{3,j}CFO_{j,T+1} + \alpha_{4,j}\Delta REV_{j,T} + \alpha_{5,j}PPE_{j,T} + v_{j,T} \quad (1)$$

where $TCA_{j,T}$ is firm j 's total current accruals in year T ; $CFO_{j,T-1}$ ($CFO_{j,T}$, $CFO_{j,T+1}$) is firm j 's cash flow from operations in year $T-1$ (T , $T+1$); $\Delta REV_{j,T}$ is firm j 's change in revenues between year $T-1$ and year T ; and $PPE_{j,T}$ is firm j 's gross value of property, plant, and equipment in year T . All variables are scaled by average assets.

Ecker et al. estimate equation (1) in annual industry cross-sections for each of the 48 Fama and French (1997) industries with at least 20 firms in an industry-year. These estimations produce firm-year residuals $\hat{v}_{j,T}$. The accounting-based earnings quality metric for firm j in year T is the standard deviation of firm j 's residuals over the past five years, $AQ_{j,T} = \sigma(\hat{v}_{j,T})$, $T = T-5, \dots, T-1$. Large (small) values of $AQ_{j,T}$ correspond to poor (good) accrual quality.

Next, Ecker et al. construct an accrual quality factor-mimicking portfolio in a way similar to how Fama and French (1993) construct the factor-mimicking portfolios of SMB (small minus big size) and HML (high minus low book-to-market). Specifically, Ecker et al. assign firms to AQ deciles on the first day of each month m based on the firm's most recent value of AQ known prior to m . Firms with the smallest (largest) AQ values are placed in the first (tenth) decile. That is, the first decile is composed of firms with the best accrual quality while the tenth decile is made up of firms with the poorest accrual quality. Ecker et al. then calculate the average daily return for each decile. The AQ factor-mimicking portfolio, AQ_{factor} , equals the difference between the daily returns of the poorest AQ deciles (deciles 7 to 10) and the best AQ deciles (deciles 1 to 4). This procedure generates a series of daily AQ_{factor} returns.

Finally, Ecker et al. obtain a firm-year specific returns-based measure of earnings quality by adding *AQfactor* to the traditional one-factor and Fama-French three-factor asset-pricing models as shown below:

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + e_{j,T}AQfactor_t + \varepsilon_{j,t} \quad (2)$$

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + s_{j,T}SMB_t + h_{j,T}HML_t + e_{j,T}AQfactor_t + \varepsilon_{j,t} \quad (3)$$

where t = index for the trading day in year T; $R_{j,t}$ = firm j 's return on day t ; $R_{F,t}$ = the risk-free rate of return on day t ; $R_{M,t}$ = the market return on day t ; SMB_t = return of the small-minus-big size factor portfolio on day t ; HML_t = return of the high-minus-low book-to-market factor portfolio on day t . The slope coefficient of *AQfactor*, $e_{j,T}$, is the measure of firm j 's exposure/sensitivity to information risk related to poor earnings quality in year T. In other words, $e_{j,T}$ captures the market perception of a firm's earnings quality in year T. Ecker et al. term $e_{j,T}$ e-loading. I use this e-loading measure to analyze investor perceived earnings quality over several quarters surrounding an internal control disclosure.

My study is not intended to test whether earnings quality or accruals quality is a market priced risk factor. Core, Guay, & Verdi (2008) argue that Francis, LaFond, Olsson, & Schipper's (2005) regressions examining a contemporaneous relation between firms' excess stock returns and factor returns do not test the hypothesis that accruals quality is a priced risk factor. Ecker et al. (2006) use the similar regressions to derive e-loading. It is debatable whether accruals quality is a priced risk factor; however, e-loading is still a valid measure for the purpose of my study – to examine firms' exposure or sensitivity to information risk related to poor earnings quality, which can be interpreted as investor perceived earnings quality. Ecker et al. (2006) document that e-loading increased in three situations, including restatement, lawsuit, and bankruptcy, where one would

expect investors to perceive lower earnings quality. The event of internal control disclosure is similar to those three situations in terms of the potential impact on investor perceived earnings quality and hence e-loading is an appropriate empirical measure for the purposes of my study.

3.2.2. H1 and H2 univariate tests

H1 is first tested univariately by comparing the e-loading of ICMW firms and that of non-ICD firms. Non-ICD firms are companies that do not report any type of internal control problems, including material weaknesses, significant deficiencies, and control deficiencies. Consistent with prior research, the purpose of comparing ICMW firms with non-ICD firms is to enhance statistical power by comparing the earnings quality of firms with evident internal control problems (material weaknesses) with the earnings quality of those without apparent internal control problems (Doyle, Ge, & McVay, 2007b, p. 1147).

I construct a year-industry-size matched sample to control for common confounding factors that are likely to affect investor perceived earnings quality. As the ICMW disclosure dates for the 709 sample firms range from year 2002 to 2005, I match ICMW firms with problem-free firms that have the required data in the corresponding year. Specifically, I collect from Audit Analytics a list of companies that report any type of internal control problems during 2002 to 2006¹⁷. Then I obtain the qualified candidates for matching by deleting the Audit Analytics ICD firms and the 1,210 Doyle et al.'s ICMW firms from all the companies in each year of 2002 to 2005 that have the required

¹⁷ Firms disclosing ICD during 2006 are collected here in order to avoid matching an event firm disclosing ICMW in late 2005 with a firm that disclosed ICD in early or mid 2006 but did not have any such disclosure in previous years. As investor perceived earnings quality after disclosure of ICMW is measured using daily stock return data of three quarters right after the disclosure, a firm with ICD disclosure in early or mid 2006 is not a qualified clean firm that can be matched with a firm disclosing ICMW in late 2005.

Compustat and CRSP data¹⁸. Specifically, matching firms are required to have industry code and data of total assets in Compustat and have 250 or more daily stock return data in one year in CRSP¹⁹. Of the 709 sample firms, 11 disclosed ICMW in 2002, 61 in 2003, 194 in 2004, and 443 in 2005. Consequently, 11, 61, 194, and 443 matched sample firms are to be selected from the candidate pool of the corresponding year. After fixing the year, I identify problem-free firms in the same industry as a sample firm by matching firms first using four-digit Standard Industrial Classification (SIC) codes, then three-digit SIC codes, and finally two-digit SIC codes if the prior more stringent criterion fails to identify a match²⁰. Among firms in the same year-industry group, I select the matching firm as the one that is the closest to the event firm in firm size as measured by the natural logarithm of total assets (Compustat data item #6).

After identifying the matched firms, I collect market return data for the event sample and the matched sample. I then estimate the firm- and year-specific one-factor and three-factor asset-pricing models (2) and (3) for each of the ICMW firms and matched non-ICD firms. In models (2) and (3), the index t indicates the trading day in the testing period.

The testing period is a three-quarter period after a firm's first disclosure of material weaknesses, i.e., an event window of $(0, +270)$, where day 0 is the date when a

¹⁸ Not surprisingly, many observations in the Audit Analytic ICD-firm list and the Doyle et al. ICMW-firm list are duplicated.

¹⁹ The number of 250 is chosen because I require at least 100 daily return data in three quarters to calculate e-loadings for matched firms and statistics show that in each year of 2002 to 2005, approximately 95% of all the non-ICD firms which meet the Compustat data requirement and are covered by the CRSP Daily Stock File have 252 daily stock return data. I subjectively choose 250 to allow firms that miss only one or two days of return data in one year to be still qualified as a matching candidate.

²⁰ Of the 709 sample firms, 693 firms are matched with four-digit SIC code, 7 firms with three-digit SIC code, and 8 firms with two-digit SIC code. One company with a SIC code of 4100 (the industry of transit and passenger transportation) does not find a match on the basis of two-digit SIC code. I match it to firms with a two-digit SIC code of 40 (the industry of railway service), which is in the same Fama-French-48-industry group as 41.

firm discloses weaknesses for the first time. Appendix 3, Research Design, illustrates the testing structure of four hypotheses in chart format. As shown in the chart regarding H1 and H2, the three-quarter period after the first disclosure of weaknesses can be regarded as “Bad Period”. The three-quarter period is selected because one year of daily market return data is desirable to estimate a firm’s e-loading reliably. However, SOX 404 requires auditors to perform an annual audit of companies’ internal control and ICMW firms are likely to receive an unqualified SOX 404 audit report approximately one year after their initial disclosure of weaknesses. Such a favorable audit report is likely to generate confounding effects on a firm’s perceived earnings quality. I therefore choose three quarters instead of one year to avoid such confounding effects. Due to the same concern, the 61 companies that receive their first unqualified SOX 404 audit report during the three-quarter testing period (0, +270) are not candidates for H1 testing and hence are removed from the sample.

The testing period for the matched non-ICD firm is the same calendar time period as the testing period of the ICMW firm. For example, if firm *j* discloses material weaknesses on February 1, 2005 and the testing period of (0, +270) corresponds to the calendar period of February 1, 2005 to October 29, 2005, the same calendar period is used for firm *j*’s matched counterpart. This research design controls for events and conditions affecting all firms in a given period. Ecker et al. (2006, p. 757) require a firm to have at least 100 daily returns in year *T* to estimate its annual e-loading. Following that practice, I require each firm to have at least 100 daily returns in the three-quarter testing period.

Regressions of the one-factor model (2) generate 709 estimated coefficients of *AQfactor*, i.e., *eload-If*, for individual firms in the ICMW sample and the matched non-ICD sample, respectively. Similarly, regressions of the three-factor model (3) generate

709 e-loadings, i.e., $e_{load-3f}$, for each of the two samples. Comparing the mean and median of individual e-loadings between the weakness sample and the matched sample provides the first form of evidence regarding whether investors perceive the earnings quality of ICMW firms to be lower than that of non-ICD firms.

For H1, the testable hypothesis is that for e-loadings from both the one-factor model and the three-factor model, $e_{ICMW} - e_{non-ICD} > 0$. That is because the *AQfactor* portfolio mimics the risk factor of poor earnings quality and firms disclosing ICMW are predicted to be more sensitive to such a risk factor; hence they are expected to exhibit larger estimated *AQfactor* coefficients than firms not disclosing ICD.

Doyle et al. classify the sample of ICMW firms as having either a company-level or account-specific material weakness. Examples of company-level material weaknesses include override by senior management and ineffective control environment. Examples of account-specific material weaknesses include inadequate internal controls for accounting for loss contingencies, deficiencies in the documentation of a receivables securitization program, and inadequate internal controls over the application of new accounting principles (Doyle, Ge, & McVay, 2007b, p. 1167). According to the codes provided by Doyle et al., I divide the testing sample used in H1 into two subsamples: one with severe company-level material weaknesses (CLMW) and the other with more auditable, account-specific material weaknesses (ASMW)²¹.

I test H2 A (B) univariately by comparing e-loadings of CLMW (ASMW) firms with those of the matched firms. The testable hypothesis for H2 A is that for e-loadings

²¹ One sample firm used in H1 is excluded from H2 testing due to lack of the weakness severity code.

from both the one-factor model and the three-factor model, $e_{CLMW} - e_{non-ICD} > 0$. The testable hypothesis for H2B is that $e_{ASMW} - e_{non-ICD} = 0$.

3.2.3. H1 and H2 multivariate regression tests

Prior literature finds that some firm characteristics are associated with firms' internal control weaknesses. Companies disclosing internal control deficiencies tend to be smaller, younger, financially weaker, more complex, growing rapidly, and undergoing restructuring. As those firm characteristics could be related to investor perceived earnings quality and the prior matching process based on year, industry, and firm size is unlikely to provide a complete control for all the relevant firm characteristics, in the second step of testing H1 and H2, I conduct multivariate regression analysis to control for the confounding factors. In the regression model, the dependant variable is investor perceived earnings quality measured by $eload-1f$ or $eload-3f$; the testing variable is an indicator variable of material weakness disclosure equal to one if a firm is an ICMW (CLMW, or ASMW) firm and zero if it is a matched non-ICD firm. The control variables include a measure for each of the firm characteristics associated with internal control weaknesses: *firm size, firm age, loss proportion, firm segments, sales growth, and restructuring*.

Dechow and Dichev (2002) identify some innate firm characteristics that determine accruals quality, including firm size, financial health, sales volatility, cash flow volatility, and operating cycle. As accruals quality is the basis of e-loading and those innate firm characteristics are likely to be related to perceived earnings quality, I include a measure for each of the additional innate firm characteristics that do not overlap with the firm characteristics discussed above. The additional control variables are *sales volatility, cash flow volatility, and operating cycle*.

The regression model is shown below and the detailed description of the variables is provided in Appendix 4.

$$\begin{aligned} \text{Investor Perceived Earnings Quality (Eload-1f or Eload-3f)} = & \\ & \beta_0 + \beta_1 \text{Material Weakness (ICMW, CLMW, or ASMW)} + \beta_2 \text{Firm Size} + \\ & \beta_3 \text{Firm Age} + \beta_4 \text{Loss Proportion} + \beta_5 \text{Firm Segments} + \beta_6 \text{Sales Growth} \\ & + \beta_7 \text{Restructuring} + \beta_8 \text{Sales Volatility} + \beta_9 \text{Cash Flow Volatility} + \\ & \beta_{10} \text{Operating Cycle} + \varepsilon \end{aligned}$$

Sixty-seven firms in the H1 and H2 univariate testing sample lack required data for control variables in the multivariate regression model and are hence deleted in the second step of testing. For H1, the testable hypothesis is $\beta_1 > 0$ as a higher value of *Eload-1f* or *Eload-3f* indicates poorer investor perceived earnings quality. For H2 A, the testable hypothesis is also $\beta_1 > 0$, and for H2 B, the testable hypothesis is $\beta_1 = 0$.

3.2.4. H3 and H4 tests

I test H3 by analyzing the change in e-loading over the testing period of three quarters before and after the initial disclosure of material weaknesses, i.e., (-270, 0, +270). As shown in Appendix 3 regarding H3, the three quarters before the negative disclosure can be regarded as “Base Period”. To ensure that during the Base Period there is no unfavorable internal control related disclosure that is likely to negatively affect investor perceived earnings quality, firms which disclose significant deficiencies and control deficiencies in this period are excluded from the H3 sample. Again, as discussed in H1 and H2 research design, the three quarters after the first disclosure of material weaknesses can be regarded as “Bad Period”. The change or lack of change in e-loading from the Base Period to the Bad Period is tested via the following regression models (4) and (5).

One-factor model:

$$R_{j,t} - R_{F,t} = \alpha_0 + \alpha_1 D_{j,t} + \beta_0 (R_{M,t} - R_{F,t}) + \beta_1 (R_{M,t} - R_{F,t}) \times D_{j,t} + e_0 AQfactor_t + e_1 AQfactor \times D_{j,t} + \varepsilon_{j,t} \quad (4)$$

Three-factor model:

$$R_{j,t} - R_{F,t} = \alpha_0 + \alpha_1 D_{j,t} + \beta_0 (R_{M,t} - R_{F,t}) + \beta_1 (R_{M,t} - R_{F,t}) \times D_{j,t} + s_0 SMB_t + s_1 SMB_t \times D_{j,t} + h_0 HML_t + h_1 HML_t \times D_{j,t} + e_0 AQfactor_t + e_1 AQfactor_t \times D_{j,t} + \varepsilon_{j,t} \quad (5)$$

where a dummy variable D is used to indicate whether a trading day is after (including equal to) the day of ICMW disclosure (D=1) or before the disclosure day (D=0). I require each sample firm to have at least 100 daily returns in both the pre-disclosure Base Period (-270, -1) and the post-disclosure Bad Period (0, +270). In the two regression models, the coefficient e_1 of $AQfactor \times D$ captures changes in perceived earnings quality after disclosure of material weaknesses. The testable null hypothesis of H3 is that for both models, $e_1 = 0$.

The research design of H4 is similar to that of H3. The dummy variable D is used to indicate whether a trading day is after (including equal to) the day of disclosing remediation of a material weaknesses (D=1) or before the remediation disclosure (D=0). As shown in Appendix 3 regarding H4 research design, the testing period is composed of two three-quarters. One is -3Qs (-270, -1), which is the “Bad Period” after a firm’s first disclosure of material weaknesses and before the firm’s subsequent receipt of the first unqualified SOX 404 audit report indicating remediation. The other is +3Qs (0, +270), which is the “Good Period” after the disclosure of remediation. To ensure that during the Good Period there is no disclosure of ICMW under SOX 302, a negative disclosure that is likely to contaminate the Good Period, firms with such disclosure are excluded from the H4 sample. Again, I require each sample firm to have at least 100 daily returns in both the

Bad Period ($-270, -1$) and the Good Period ($0, +270$). In the two regression models, the coefficient e_1 of $AQfactor \times D$ captures changes in perceived earnings quality after firms disclose remediation of material weaknesses. The testable hypothesis is that for both models, $e_1 < 0$ since the $AQfactor$ portfolio mimics the factor of information risk related to poor earnings quality. Firms reporting remediation of ICMW are predicted to have lower information risk (higher perceived earnings quality) and hence smaller estimated coefficients of $AQfactor$ than before.

CHAPTER 4. RESULTS

4.1. Descriptive statistics

[Insert Table 3 about here]

Table 3 presents descriptive statistics of the material weakness firms and the year-industry-size matched firms used in H1 and H2 multivariate regression tests. Panel A compares the firm characteristics for 642 material weakness sample firms and their matched counterparts; Panel B analyzes the subsample of 226 company-level material weakness firms and the corresponding matched firms; and Panel C deals with 415 account-specific material weakness firms and their matched firms. For each of the variables depicting firm characteristics, I report the results of a difference in means using a two-tailed t-test and a difference in medians using a two-tailed Wilcoxon test.

Panel A shows that as expected, the material weakness sample and the matched sample are similar in firm size measured by total assets. The average size of ICMW firms is 2,183.10 million dollars, and that of the matched firms is 2,174.60 million dollars. The t-test demonstrates that the average firm sizes of the two samples are not statistically different as shown by the high p-value 0.98. The Wilcoxon test indicates that the median firm sizes of the two samples are not statistically different either as shown by the p-value of 0.39. Besides firm size, evidence from both the t-test and Wilcoxon test indicates that the weakness sample and the matched sample are close to each other in firm age, volatility of cash from operations, and the length of operating cycle.

However, the weakness firms are in significantly poorer financial condition measured by loss proportion, which is the proportion of the number of years reporting financial losses over the recent three years. On average, weakness firms report a loss in

nearly half (0.46) of the recent three years while the matched firms report a loss in less than one third (0.32) of the recent three years. In terms of the median loss proportion, at least half of the weakness firms suffer a loss in one or more of the recent three years as shown by the median of 0.33, while at least half of the matched firms do not report a loss in recent years. The small p-values of less than 0.001 from the t-test and Wilcoxon test demonstrate that the differences are statistically significant. Also, compared to the matched sample, weakness firms incur significantly higher restructuring charges in the most recent two years, have higher sales volatility, and operate with a more complex organizational structure measured by the number of firm segments. Finally, data about sales growth show that the weakness firms have a lower median growth rate (0.09) over the past three years than the control sample (0.12). This finding differs from the findings in some prior literature. The difference likely stems from my using a matched control sample, in contrast to the universal control samples used in prior research.

As for Panel B, the descriptive statistics display a pattern very similar to those in Panel A: the CLMW firms are close to their matched counterparts in firm size, firm age, operating cash flow volatility, and the length of operating cycle; the two groups of firms differ in their financial health, organizational complexity (marginally different), restructuring, and sales volatility; and the weakness firms have a higher mean sales growth rate in the recent three years than the matched firms.

The descriptive statistics in Panel C also display a pattern similar to those in Panel A do. Moreover, the ASMW firms appear to share more similarities with their matched firms. Besides the similar firm characteristics described before relating to Panel A, the event firms and their matched counterparts in Panel C are also close to each other in organizational complexity and sales volatility.

Overall, the descriptive statistics show that the firm matching process manages to control for some firm characteristics that could be related to investor perceived earnings quality. However, the control is not complete and some relevant firm features differ between the two samples.

[Insert Table 4 about here]

Table 4 presents a correlation matrix of the dependent and independent variables used in the H1 and H2 multivariate regression models. The table shows that the testing variable *ICMW* is positively correlated with the dependent variables *Eload_1f* and *Eload_3f*, that is, material weakness firms exhibit higher values of e-loading, indicating lower investor perceived earnings quality. The table also displays that the dummy variable of material weakness disclosure is correlated with some firm characteristics that prior literature finds to be associated with internal control deficiencies and/or affect firms' accruals quality. Specifically, material weakness disclosure is positively correlated with more financial loss years, more firm segments, higher restructuring charges, and higher volatility in sales. As shown in the table, those firm characteristic variables mostly are correlated with *Eload_1f* and/or *Eload_3f*. These correlations suggest the possibility that firm characteristics, in addition of disclosures of internal control weaknesses per se, contribute to lower investor perceived earnings quality.

4.2. Hypothesis testing

4.2.1. H1 and H2 univariate tests

[Insert Table 5 Panel A about here]

Table 5 presents the univariate test results of H1 and H2. Panel A compares e-loadings of the whole sample of 709 material weakness firms with e-loadings of the matched firms. Panel A 1 presents the comparison of the mean e-loadings between the

two groups of firms using a t-test. It shows that for e-loadings from the one-factor model, the mean of ICMW firms is 0.401 and that of the matched firms is 0.283. The difference of 0.119 is statistically larger than zero as indicated by the t-statistic of 3.78 and the one-tailed p-value of <0.001. For e-loadings from the three-factor model, the mean is 0.323 for ICMW firms and 0.199 for the matched firms. The difference of 0.124 is also statistically larger than zero as demonstrated by the t-statistic of 3.58 and the one-tailed p-value of <0.001. Therefore, ICMW firms have statistically larger means of e-loadings from both the one-factor and three-factor models than the matched firms have.

Panel A 2 displays the comparison of the median e-loadings between the two groups of firms using the Wilcoxon test. The results are qualitatively the same as the t-test results, although the magnitude of median e-loadings appears to be smaller than that of mean e-loadings. The panel shows that for e-loadings from the one-factor model, the median of ICMW firms is 0.275 and that of the matched firms is 0.176. The difference of 0.099 is statistically larger than zero as indicated by the z-statistic of 3.52 and the one-tailed p-value of <0.001. For e-loadings from the three-factor model, the median is 0.190 for ICMW firms and 0.089 for the matched firms. The difference of 0.101 is also statistically larger than zero as demonstrated by the z-statistic of 3.64 and the one-tailed p-value of <0.001. Therefore, ICMW firms have statistically larger medians of e-loadings from both the one-factor and three-factor models than the matched firms have.

In all, the univariate test provides preliminary evidence supporting H1 that firms disclosing internal control material weaknesses have lower investor perceived earnings quality than firms not disclosing any internal control problems.

[Insert Table 5 Panel B about here]

Panel B of Table 5 compares e-loadings of 250 company-level material weaknesses (CLMW) firms with those of the matched firms. This panel presents similar results as Panel A. In Panel B 1, I compare the mean e-loadings between the two groups of firms. For e-loadings from the one-factor model, the mean of CLMW firms is 0.513 and that of the matched firms is 0.323. The difference of 0.190 is statistically larger than zero as indicated by the t-statistic of 3.41 and the one-tailed p-value of <0.001. For e-loadings from the three-factor model, the mean is 0.435 for CLMW firms and 0.243 for matched firms. The difference of 0.192 again is statistically larger than zero as demonstrated by the t-statistic of 3.18 and the one-tailed p-value of <0.001. Panel B 2 displaying the comparison of median e-loadings report similar results. The median one-factor e-loading of CLMW firms is larger than that of matched firms by 0.173, and the median three-factor e-loading of CLMW firms is larger than that of matched firms by 0.252. Both differences are significantly larger than zero as indicated by the related z-statistic and p-value. Therefore, the univariate test provides preliminary evidence supporting H2A that firms disclosing company-level material weaknesses have lower investor perceived earnings quality than firms not disclosing internal control problems.

Comparing Panel B with Panel A, it is evident that the e-loading differences between CLMW firms and matched firms are larger than those between the whole sample of material weakness firms and control firms. For example, the difference in the means of one-factor e-loadings is 0.119 in Panel A 1 but 0.190 in Panel B 1; the difference in the means of three-factor e-loadings is 0.124 in Panel A 1 while 0.192 in Panel B 1. This suggests that investors perceive earnings quality differentially between firms disclosing severe company-level material weaknesses and firms disclosing material weaknesses in

general. Companies disclosing egregious company-level weaknesses appear to have even lower perceived earnings quality than firms disclosing general weaknesses.

[Insert Table 5 Panel C about here]

Panel C compares e-loadings of 458 firms disclosing account-specific material weaknesses (ASMW) and those of the matched firms. As I hypothesize that there is no difference of perceived earnings quality between ASMW firms and control firms, two-tailed p-values are reported here. Panel C 1 shows that the mean one-factor e-loading and the mean three-factor e-loading of ASMW firms are higher than those of matched firms by 0.079 and 0.086, respectively. Expectedly, the differences are smaller than their counterparts in Panel A 1 and Panel B 1. However, the t-statistics and two-tailed p-values indicate that those differences are significantly different from zero, suggesting that investors are not completely indifferent about account-specific material weaknesses and are concerned about their potential negative impact on financial reporting quality. The testing of median e-loadings presented in Panel C 2 produces a similar result – there are smaller differences between ASMW firms and control firms compared to the corresponding data in Panel A 2 and Panel B 2; however, the differences are statistically different from zero. The univariate tests hence provide evidence to reject the null hypothesis H2 B.

4.2.2. H1 and H2 multivariate regression tests

[Insert Table 6 about here]

Table 6 presents the results of multivariate regression analysis to further explore the role of material weakness disclosure in investor perceived earnings quality. I run two regressions with each of the three samples of ICMW, CLMW, and ASMW firms along with their corresponding matched firms. In the two regressions of a sample group, either

Eload-1f (e-loadings estimated from the one-factor model) or *Eload-3f* (e-loadings estimated from the three-factor model) serves as the dependent variable and the independent variables remain the same.

In the first two regression models examining H1, *ICMW* is the testing variable indicating disclosure of internal control material weaknesses for the full sample of 642 weakness firms and 642 matched counterparts. As all the independent variables (except the intercept) have a predicted direction regarding their impact on investor perceived earnings quality, one-tailed p-values are reported for the estimated coefficients. The table shows that, consistent with prior literature, *Firm Size* and *Firm Age* are negatively associated with *Eload_1f* and *Eload_3f*, indicating higher value of e-loading for smaller and younger firms, that is, lower investor perceived earnings quality for smaller and younger firms. Also in line with prior studies, *Restructuring*, *Loss Proportion*, and *Operating Cycle* are positively associated with *Eload_1f* and *Eload_3f*, reflecting higher value of e-loading, i.e., lower perceived earnings quality, for firms incurring higher restructuring charges, having a higher proportion of financial loss years, and operating with a longer cycle. Regarding the variables of *Firm Segments*, *Sales Volatility*, and *CFO Volatility*, they do not have statistically significant coefficients in both models, but the significant ones all have the expected sign, indicating lower perceived earnings quality for firms with more complex organizational structure and higher volatility in sales and operating cash flows. In addition, the control variable of *Sales Growth* is not statistically significant in both models. This finding is not surprising given the somewhat unexpected data shown in the descriptive statistics as explained before.

Finally, examining *ICMW*, the variable of interest, I find in both models the estimated coefficient is 0.05, which has the expected positive sign and is statistically

significant although the result is marginal in the second model. Firms with material weakness disclosure are thus found to be associated with higher values of e-loading even after controlling for relevant firm characteristics. This provides evidence supporting H1 that firms disclosing material weaknesses in their internal controls have lower investor perceived earnings quality than firms not disclosing any internal control deficiencies. Therefore, H1 is supported by both univariate and multivariate tests.

The third and fourth regression models investigate H2 A regarding firms disclosing company-level material weaknesses. The dummy variable *CLMW* is the testing variable. The sample comprises 226 *CLMW* firms along with the matched firms. The two models report results similar to those of the prior two models, except that some control variables — including *Restructuring*, *Operating Cycle*, and *CFO Volatility* — lose their statistical significance. *Firm Size* and *Firm Age* are still found to be significantly negatively associated with e-loading, and *Loss Proportion* is still significantly positively associated with e-loading. Regarding the testing variable *CLMW*, it is found to have a statistically positive coefficient in both models, similar to *ICMW* in the first two models. Compared with the coefficients of *ICMW*, those of *CLMW* in the third and fourth models exhibit stronger significance level (smaller one-tailed p-values of 0.02 and 0.06 versus 0.04 and 0.09) and larger magnitude (0.11 and 0.09 versus 0.05 and 0.05). This suggests that severe company-level material weaknesses likely have a greater negative impact on investor perceived earnings quality than general weaknesses do. The evidence from multivariate regression tests echoes that from univariate analysis: both support H2 A: that firms disclosing company-level material weaknesses in internal control have lower investor perceived earnings quality than firms not disclosing any internal control deficiencies.

The last two regression models examine firms disclosing account-specific material weaknesses. The testing variable is *ASMW* and the sample is composed of 415 *ASMW* firms along with their matched counterparts. The testing results concerning the control variables are very similar to the results in the first two models. Examining the testing variable, I find the estimated coefficient of *ASMW* is 0.02 in both models. This coefficient is not significantly different from zero in either model as indicated by the two-tailed p-values 0.54 and 0.63. (Two-tailed p-values are reported here because the related hypothesis is a non-directional null.) Consistent with H2B, the null is not rejected in this more comprehensive multivariate test. That is, there is no difference in perceived earnings quality between firms disclosing account-specific material weaknesses and firms not disclosing any internal control deficiencies. This suggests that the difference in perceived earning quality between *ASMW* firms and non-ICD firms as shown in prior univariate analysis is mainly caused by differences in characteristics of the two types of companies as expected. Disclosure of *ASMW* does not have any measurable incremental impact on perceived earnings quality after controlling for firm characteristics. In addition, this indicates the statistically significant results regarding material weaknesses in general examined in the first two regressions are mostly driven by severe company-level weaknesses.

4.2.3. H3 and H4 tests

[Insert Table 7 about here]

Table 7 presents the results of testing within-firm changes in investor perceived earnings quality following disclosures about internal control weaknesses. Panel A reports the testing results of H3 regarding firms' first disclosure of internal control material weaknesses. The tests are conducted with stock return data of 616 sample firms. The table

shows that e_1 from the one-factor model is 0.01. This is not significantly different from zero as shown by the t-statistic of 0.54 and two-tailed p-value of 0.59. The statistics adjusted for firm-level clusters report qualitatively the same result. As for e_1 from the three-factor model, the estimate is 0.02, which is also not significantly different from zero as shown by the t-statistic of 0.56 and two-tailed p-value of 0.58. The statistics adjusted for firm-level clustering again present qualitatively the same results. Based on the testing results, the null hypothesis of H3 that firms disclosing internal control material weaknesses experience no change in investor perceived earnings quality cannot be rejected. Investors appear to have already anticipated firms' potential internal control problems before the formal disclosure required by the new regulations. Overall, disclosure of internal control weaknesses does not provide much, if any, new information to the market in terms of reevaluating a firm's earnings quality.

Panel B of Table 7 reports the results of testing H4 regarding firms' first unqualified SOX 404 audit report after the initial material weakness disclosure. Such an audit report is an unambiguous signal indicating remediation of previously disclosed internal control weaknesses. The empirical tests are conducted with stock return data of 301 qualified sample firms. The table shows that e_1 from the one-factor model is -0.07 , which is statistically significantly less than zero as shown by the t-statistic of -2.51 and one-tailed p-value of 0.01. (One-tailed p-values are reported for H4 testing because the hypothesis is predicted with a direction.) The statistics adjusted for firm-level clusters report a t-statistic of -1.94 and one-tailed p-value of 0.03, indicating qualitatively the same result although slightly weaker. As for e_1 from the three-factor model, the estimate is -0.06 . This is also statistically significantly less than zero as shown by the t-statistic of -1.87 and one-tailed p-value of 0.03. The statistics adjusted for firm-level clustering are

again qualitatively the same although slightly weaker. Overall, H4 is supported, suggesting that a firm's perceived earnings quality increases after the firm receives its first SOX 404 clean audit report demonstrating remediation of previously disclosed internal control problems.

CHAPTER 5. SUMMARY AND CONCLUSIONS

This study examines whether disclosures of material weaknesses in firms' internal control over financial reporting are associated with lower investor perceived earnings quality. Cross-sectional univariate analysis shows that firms disclosing internal control material weaknesses have lower investor perceived earnings quality, measured by e-loading, than year-industry-size matched firms that disclose no internal control problems. Further cross-sectional multivariate regression analysis reveals that after controlling for firm characteristics that prior literature finds to be associated with internal control deficiencies and/or affect actual accruals quality, disclosures of company-level material weaknesses drive the results and are positively associated with investor perceived earnings quality.

From intertemporal within-firm analysis, I find no evidence that firms experienced a change in their perceived earnings quality after their first disclosure of internal control material weaknesses as per SOX 302 or 404. This result suggests that investors had already anticipated firms' internal control deficiencies based on observable firm characteristics and were not surprised at the disclosure of internal control weaknesses.. In contrast, as expected, I find that firms experienced an increase in perceived earnings quality after they received their first unqualified SOX 404 audit report indicating remediation of previously disclosed material weaknesses. This suggests that, although investors did not find the initial SOX disclosures of internal control weaknesses to be incrementally informative, the legislation motivated companies to remediate weak internal controls; moreover, investors perceived an increase in the offending firms' earnings quality after the firms received their first clean internal control audit reports.

My study has implications for the on-going debate about costs and benefits of SOX internal control provisions. One of the primary objectives of SOX internal control regulations is to restore investor confidence in public companies' financial reporting quality. I find that company-level material weaknesses in internal control have a negative impact on investor perceived earnings quality, one of the bedrocks of investor confidence. This finding lends support to regulators' presumption that firms' sound internal control systems play an important role in fostering investor confidence. However, my study also suggests that SOX-mandated costly disclosure of internal control weaknesses in general does not provide investors with new information about firms' earning quality. Investors seem to have gleaned sufficient information, on average, from observable firm characteristics to evaluate companies' financial reporting quality. Despite the lack of new information, the mandated disclosure of internal control weaknesses appears to benefit financial markets in that such disclosure imposes pressure on the offending companies and motivates them to effect improvements. I find that remediations of internal control weaknesses, which were evidently motivated by SOX internal control provisions, are associated with higher investor perceived earnings quality. The audit requirement of SOX 404 helps to enhance investor confidence not only by pressing managers to remediate but also by providing a credible venue for companies to disclose the results of remediation, mitigating investors' skepticism about the truthfulness of such disclosures.

Overall, my study provides evidence consistent with the *existence* of benefits stemming from SOX internal control provisions aimed at restoring investor confidence. As is the case for virtually all public policy issues, the *amounts* of the benefits cannot be accurately quantified in dollar terms. Potential benefits include enhanced investor participation in equity markets and improvements in the allocation of capital across firms.

However, I do not find evidence consistent with the existence of such benefits for all SOX internal control provisions. Given the lack of results related to account-specific material weaknesses, policy revisions regarding the specific disclosure and audit requirements are needed so that resources are not wasted in generating non-cost-effective or non-value-relevant information.

My study has several limitations. First, I use the measure of e-loading to capture the concept of investor perceived earnings quality. The results of Ecker et al. suggest that e-loading is an appropriate measure; however, to the extent that e-loading does not capture the concept effectively, my findings should be interpreted with caution. Second, the material weakness firms are collected from a specific period, August 2002 to October 2005, and the remediation firms are constrained to relatively large firms (accelerated filers). Whether my findings can be generalized beyond the sample period and the sample firms is not clear. Future research could examine whether similar results hold for smaller firms when audit data become available for non-accelerated filers in 2010. Moreover, future research could investigate whether internal control remediations disclosed in non-accelerated filers' management assessment reports, without auditors' attestation, convey the same level of credibility to investors as the auditor-confirmed remediations of larger firms did. Another worthy project could examine whether and to what extent investors discount the good news of remediation lacking an auditor's attestation.

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APPENDICES

Appendix 1. Two examples of disclosures and certifications as per SOX 302

(A) An example of effective internal control

Microsoft Corporation

(Source: Form 10-Q, quarterly report for the period ended March 31, 2007)

Disclosure of internal control:²² (bold added to emphasize key summary information)

Under the supervision and with the participation of our management, including the Chief Executive Officer and Chief Financial Officer, we have evaluated the effectiveness of our disclosure controls and procedures as required by Exchange Act Rule 13a-15(b) as of the end of the period covered by this report. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer have **concluded that these disclosure controls and procedures are effective. There were no changes in our internal control over financial reporting during the quarter** ended March 31, 2007 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Certification of Chief Executive Officer: (items 4 & 5 relating to internal control)

I, Steven A. Ballmer, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Microsoft Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision,

²² This study does not differentiate between the term "disclosure controls and procedures" mainly used in SOX 302 and the term "internal control over financial reporting" mainly used in SOX 404, as there is "substantial overlap" between the two concepts (SEC, 2003).

to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

- b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):
- a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 26, 2007

/signature/ Steven A. Ballmer

Steven A. Ballmer (Chief Executive Officer)

Certification of Chief Financial Officer:

I, Christopher P. Liddell, certify that:

[the same content as the CEO certification]

Date: April 26, 2007

/signature/ Christopher P. Liddell

Christopher P. Liddell (Chief Financial Officer)

(B) An example of deficient internal control

General Motors Corporation

(Source: Form 10-Q, quarterly report for the period ended June 30, 2006)

Disclosure of internal control: (bold added to emphasize key summary information)

The Corporation maintains disclosure controls and procedures designed to ensure that information required to be disclosed in reports filed under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized, and reported within the specified time periods.

GM's management, with the participation of its chief executive officer and its chief financial officer, evaluated the effectiveness of GM's disclosure controls and procedures (as defined in the Securities Exchange Act of 1934 Rules 13a-15(e) or 15d-15(e)) as of June 30, 2006. Based on that evaluation, GM's chief executive officer and chief financial officer **concluded that, as of that date, GM's disclosure controls and procedures** required by paragraph (b) of Exchange Act Rules 13a-15 or 15d-15, **were not effective at the reasonable assurance level.**

As discussed in GM's Annual Report on Form 10-K for the year ended December 31, 2005, **management's assessment identified the following material weakness and significant deficiency:**

- A. A material weakness was identified related to our design and maintenance of adequate controls over the preparation, review, presentation and disclosure of amounts included in our previously-reported condensed consolidated statements of cash flows for certain prior periods, which resulted in misstatements therein and our previous restatements thereof. Cash outflows related to certain mortgage loan originations and purchases were not appropriately classified as either operating cash flows or investing cash flows consistent with our original description as loans held for sale or loans held for investment. In addition, proceeds from sales and repayments related to certain mortgage loans, which initially were classified as mortgage loans held for investment and subsequently transferred to mortgage loans held for sale, were reported as operating cash flows instead of investing cash flows in our condensed consolidated statements of cash flows, as required by Statement of Financial Accounting Standards No. 102 "Statement of Cash Flows — Exemption of Certain Enterprises and Classification of Cash Flows from Certain Securities Acquired for Resale." Finally, certain non-cash proceeds and transfers were not appropriately presented in the condensed consolidated statements of cash flows.
GM management is continuing in the process of remediating this material weakness through the design and implementation of enhanced controls to aid in the correct preparation, review, presentation and disclosures of our condensed consolidated statements of cash flows. Management will continue to monitor, evaluate and test the operating effectiveness of these controls.
- B. GM management also identified a significant deficiency in internal controls related to accounting for complex contracts. This deficiency was identified as a

result of certain contracts being accounted for incorrectly and without appropriate consideration of the economic substance of the contracts. GM management is in the process of remediating this significant deficiency and has implemented a delegation of authority for approval of the accounting for complex contracts that requires formal review and approval by experienced accounting personnel. While procedures have been updated to prevent recurrence, management will continue to monitor the effectiveness of the remediation.

In June 2006 **GM commenced the transition of some of its information technology support services** between existing suppliers for its systems, including a portion of its financial systems. Management is closely monitoring the transition to ensure there is no adverse effect to its financial reporting and related internal controls.

Other than indicated above, there were no changes in the Corporation's internal control over financial reporting that occurred during the quarter ended June 30, 2006, that have materially affected, or are reasonably likely to materially affect, the Corporation's internal control over financial reporting.

Certification of Chief Executive Officer:

[similar to the certification shown in Example A]

Certification of Chief Financial Officer:

[similar to the certification shown in Example A]

Appendix 2. Two examples of management and auditor reports as per SOX 404

(A) An example of effective internal control

Microsoft Corporation

(Source: Form 10-K, annual report for the fiscal year ended June 30, 2007)

Management report on ICOFR: (bold added to emphasize key summary information)

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for the company. Internal control over financial reporting is a process to provide reasonable assurance regarding the reliability of our financial reporting for external purposes in accordance with accounting principles generally accepted in the United States of America. Internal control over financial reporting includes maintaining records that in reasonable detail accurately and fairly reflect our transactions; providing reasonable assurance that transactions are recorded as necessary for preparation of our financial statements; providing reasonable assurance that receipts and expenditures of company assets are made in accordance with management authorization; and providing reasonable assurance that unauthorized acquisition, use or disposition of company assets that could have a material effect on our financial statements would be prevented or detected on a timely basis. Because of its inherent limitations, internal control over financial reporting is not intended to provide absolute assurance that a misstatement of our financial statements would be prevented or detected.

Management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control – Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, **management concluded that the company's internal control over financial reporting was effective as of June 30, 2007. There were no changes in our internal control over financial reporting during the quarter ended June 30, 2007** that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Deloitte & Touche LLP has audited this assessment of our internal control over financial reporting; their report is included in Item 9A.

Auditor report on ICOFR: (bold added to emphasize key summary information)

To the Board of Directors and Stockholders of Microsoft Corporation:

We have audited management's assessment, included in the accompanying Report of Management on Internal Control over Financial Reporting, that Microsoft Corporation and subsidiaries (the "Company") maintained effective internal control over financial reporting as of June 30, 2007, based on criteria established in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting. Our responsibility is to express an opinion on management's assessment and an opinion on the effectiveness of the Company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, evaluating management's assessment, testing and evaluating the design and operating effectiveness of internal control, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed by, or under the supervision of, the company's principal executive and principal financial officers, or persons performing similar functions, and effected by the company's board of directors, management, and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of the inherent limitations of internal control over financial reporting, including the possibility of collusion or improper management override of controls, material misstatements due to error or fraud may not be prevented or detected on a timely basis. Also, projections of any evaluation of the effectiveness of the internal control over financial reporting to future periods are subject to the risk that the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, management's assessment that the Company maintained effective internal control over financial reporting as of June 30, 2007, is fairly stated, in all material respects, based on the criteria established in *Internal Control—Integrated*

Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. **Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of June 30, 2007**, based on the criteria established in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated financial statements as of and for the year ended June 30, 2007 of the Company and our report dated August 3, 2007 expressed an unqualified opinion on those financial statements.

/signature/ DELOITTE & TOUCHE LLP
Seattle, Washington

August 3, 2007

(B) An example of deficient internal control

General Motors Corporation

(Source: Form 10-K, annual report for the fiscal year ended December 31, 2006)

Management report on ICFR: (bold added to emphasize key summary information)

Management is responsible for establishing and maintaining effective internal control over financial reporting of the Corporation. This system is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP.

The Corporation's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Corporation; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Corporation are being made only in accordance with authorizations of management and directors of the Corporation; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the Corporation's assets that could have a material effect on the financial statements.

A material weakness is a significant deficiency, or combination of significant deficiencies, that results in there being a more than remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected. In its assessment of the effectiveness of internal control over financial reporting as of December 31, 2006, **the Corporation determined that there were control deficiencies that constituted material weaknesses**, as described below.

1. The Corporation lacked the technical expertise and processes to ensure compliance with SFAS No. 109, *Accounting for Income Taxes*, and did not maintain adequate controls with respect to (a) timely tax account reconciliations and analyses, (b) coordination and communication between Corporate Accounting and Tax Staffs, and (c) timely review and analysis of corporate journals recorded in the consolidation process. This material weakness resulted in a restatement of prior financial statements, as described in Note 2 to the Consolidated Financial Statements, and, if not remediated, has the potential to cause a material misstatement in the future.
2. The Corporation in certain instances lacked the technical expertise and did not maintain adequate procedures to ensure that the accounting for derivative financial instruments under SFAS No. 133, *Accounting for Derivative Instruments and Hedging Activities*, was appropriate. Procedures relating to hedging transactions in certain instances did not operate effectively to (a) properly evaluate hedge accounting treatment (b) meet the documentation requirements of SFAS No. 133, (c) adequately assess and measure hedge effectiveness on a quarterly basis, and (d) establish the appropriate communication and coordination between relevant GM departments involved in complex financial transactions. This material weakness resulted in a restatement of prior financial statements, as described in

Note 2 to the Consolidated Financial Statements and, if not remediated, has the potential to cause a material misstatement in the future.

3. The Corporation did not maintain a sufficient complement of personnel with an appropriate level of technical accounting knowledge, experience, and training in the application of generally accepted accounting principles commensurate with the Corporation's complex financial accounting and reporting requirements and low materiality thresholds. This was evidenced by a significant number of out-of-period adjustments noted during the year-end closing process. This material weakness contributed to the restatement of prior financial statements, as described in Note 2 to the Consolidated Financial Statements and, if not remediated, has the potential to cause a material misstatement in the future.
4. Due to the previously reported material weaknesses, as evidenced by the significant number and magnitude of out-of-period adjustments identified during the year-end closing process and the resulting restatements related to deferred taxes and hedging activities, management has concluded that the controls over the period-end financial reporting process were not operating effectively. Specifically, controls were not effective to ensure that significant non-routine transactions, accounting estimates, and other adjustments were appropriately reviewed, analyzed, and monitored on a timely basis. A material weakness in the period-end financial reporting process could result in the Corporation not being able to meet its regulatory filing deadlines and, if not remediated, has the potential to cause a material misstatement or to miss a filing deadline in the future.

Management performed an assessment of the effectiveness of the Corporation's internal control over financial reporting as of December 31, 2006, utilizing the criteria described in the "Internal Control — Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). The objective of this assessment was to determine whether the Corporation's internal control over financial reporting was effective as of December 31, 2006.

Based on our assessment, and because of the material weaknesses described above, **management has concluded that our internal control over financial reporting was not effective as of December 31, 2006.**

Management's assessment of the effectiveness of the Corporation's internal control over financial reporting has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Auditor report on ICOFR: (bold added to emphasize key summary information)

General Motors Corporation, its Directors, and Stockholders:

We have audited management's assessment, included in the accompanying Management's Report on Internal Control over Financial Reporting in Item 9A, that General Motors Corporation and subsidiaries (the Corporation) did not maintain effective internal control over financial reporting as of December 31, 2006, because of the effect of the material weaknesses identified in management's assessment, based on criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. The Corporation's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting. Our responsibility is to express an opinion on management's assessment and an opinion on the effectiveness of the Corporation's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, evaluating management's assessment, testing and evaluating the design and operating effectiveness of internal control, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed by, or under the supervision of, the company's principal executive and principal financial officers, or persons performing similar functions, and effected by the company's board of directors, management, and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of the inherent limitations of internal control over financial reporting, including the possibility of collusion or improper management override of controls, material misstatements due to error or fraud may not be prevented or detected on a timely basis. Also, projections of any evaluation of the effectiveness of the internal control over financial reporting to future periods are subject to the risk that the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

A material weakness is a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected. **The following material weaknesses have been identified** and included in management's assessment resulting from deficiencies in the design or operation of the respective controls:

- 1) The Corporation lacked the technical expertise and processes to ensure compliance with Statement of Financial Accounting Standards (SFAS) No. 109, *Accounting for Income Taxes*, and did not maintain adequate controls with respect to (a) timely tax account reconciliations and analyses, (b) coordination and communication between Corporate Accounting and Tax Staffs, and (c) timely review and analysis of corporate journals recorded in the consolidation process. This material weakness resulted in a restatement of prior financial statements, as described in Note 2 to the consolidated financial statements and, if not remediated, could result in a material misstatement in the future.
- 2) The Corporation, in certain instances, lacked the technical expertise and did not maintain adequate procedures to ensure that the accounting for derivative financial instruments under SFAS No. 133, *Accounting for Derivative Instruments and Hedging Activities* (SFAS No. 133), was appropriate. Procedures relating to hedging transactions in certain instances did not operate effectively to (a) properly evaluate hedge accounting treatment, (b) meet the documentation requirements of SFAS No. 133, (c) adequately assess and measure hedge effectiveness on a quarterly basis, and (d) establish the appropriate communication and coordination between relevant GM departments involved in complex hedging transactions. This material weakness resulted in a restatement of prior financial statements, as described in Note 2 to the consolidated financial statements and, if not remediated, could result in a material misstatement in the future.
- 3) The Corporation did not maintain a sufficient complement of personnel with an appropriate level of accounting knowledge, experience, and training in the application of generally accepted accounting principles commensurate with the Corporation's complex financial accounting and reporting requirements. This material weakness contributed to the restatement of prior financial statements, as described in Note 2 to the consolidated financial statements and, if not remediated, has the potential to cause a material misstatement in the future.
- 4) Due to the previously reported material weaknesses, as evidenced by the significant number and magnitude of out-of-period adjustments identified during the year-end closing process and the resulting restatement related to deferred taxes, and derivatives and hedging activities, management has concluded that the controls over the period-end financial reporting process were not operating effectively. Specifically, controls were not effective to ensure that significant non-routine transactions, accounting estimates, and other adjustments were appropriately reviewed, analyzed, and monitored on a timely basis. This material weakness contributed to the restatement of prior financial statements, as described in Note 2 to the consolidated financial statements and, if not remediated, has the potential to cause a material misstatement in the future.

Management has restated previously reported 2005 and 2004 consolidated financial statements due to these matters. These material weaknesses were considered in determining the nature, timing, and extent of audit tests applied in our audit of the consolidated financial statements and the financial statement schedule listed at Item 15 as of and for the year ended December 31, 2006 (collectively, the financial statements and financial statement schedule). This report does not affect our report on such consolidated financial statements and financial statement schedule.

In our opinion, management’s assessment that the Corporation did not maintain effective internal control over financial reporting as of December 31, 2006, is fairly stated, in all material respects, based on the criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. **Also in our opinion,** because of the effect of the material weaknesses described above on the achievement of the objectives of the control criteria, **the Corporation has not maintained effective internal control over financial reporting as of December 31, 2006,** based on the criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

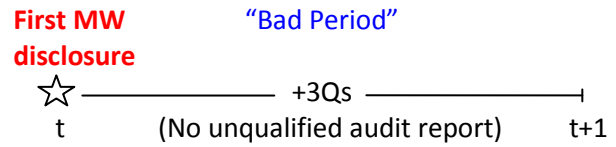
We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the Consolidated Balance Sheet and the related Consolidated Statements of Operations, Cash Flows, and Stockholders’ Equity (Deficit) of the Corporation as of and for the year ended December 31, 2006. Our audit also included the financial statement schedule listed at Item 15 as of and for the year ended December 31, 2006. Our report dated March 14, 2007 expressed an unqualified opinion on those financial statements and financial statement schedule and included explanatory paragraphs concerning (1) the adoption of the funded status recognition provisions of SFAS No. 158, *Employers’ Accounting for Defined Benefit Pension and Other Postretirement Plans — an amendment of FASB Statements No. 87, 88, 106, and 132(R)* and (2) the Corporation’s sale of a controlling interest in GMAC LLC.

/signature/ DELOITTE & TOUCHE LLP
DELOITTE & TOUCHE LLP
Detroit, Michigan

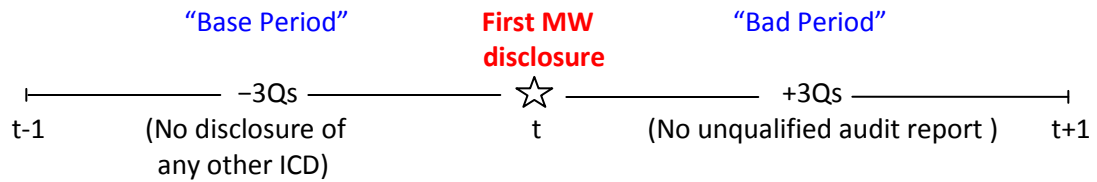
March 14, 2007

Appendix 3. Research design

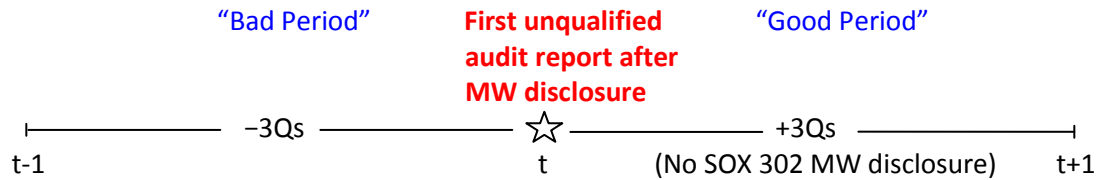
H1 & H2 (cross section)



H3 (time series)



H4 (time series)



Appendix 4. Variable definitions

Perceived earnings quality

Eload-1f (*Eload-3f*) The slope coefficient from a regression of a firm's daily excess returns in year T on a factor-mimicking portfolio capturing earnings quality, controlling for the factor of market risk premium (three factors of market risk premium, size, and book-to-market ratio).

Material weakness disclosure

- *ICMW* An indicator variable that is equal to one if the firm disclosed at least one internal control material weakness in the sample period (August 2002 to October 2005), and zero otherwise.
- *ASMW* (*CLMW*) An indicator variable that is equal to one if the firm disclosed an account-specific (company-level) material weakness in internal control in the sample period, and zero if no disclosure of any type of material weaknesses.

Material weakness determinants that could be related to perceived earnings quality

- *Firm Size* The natural log of total assets [Compustat #6] in year t.
- *Firm Age* The natural log of the number of years the firm has Compustat data as of year t.
- *Loss Proportion* The proportion of years during the past three years (t-2, t-1, and t) that a firm reports negative earnings [Compustat #18].
- *Firm Segments* The natural log of the sum of the number of operating and geographic segments reported by the Compustat Segments database for the firm in year t.
- *Sales Growth* The geometric average growth rate in sales [Compustat #12] from year t-2 to t.
- *Restructuring* The aggregate restructuring charges [Compustat #376 \times (-1)] in t-1 and t, scaled by the firm's year t market capitalization [Compustat #199 \times #25].

Additional innate firm characteristics that affect accruals quality and could be related to perceived earnings quality

- *Sales Volatility* The standard deviation of sales [Compustat #12], scaled by average assets [Compustat #6], from year t-6 to year t, requiring at least three years of data.
- *CFO Volatility* The standard deviation of cash from operations [Compustat #308], scaled by average assets, from year t-6 to year t, requiring at least three years of data.
- *Operating Cycle* The natural log of the average of [360/(sales/average accounts receivable) + 360/(cost of goods sold/average inventory)], calculated from year t-6 to year t, requiring at least three years of data. [accounts receivable: Compustat #2; cost of goods sold: Compustat #41; inventory: Compustat #3]

TABLES

Table 1. Verification of firms' first date of disclosing material weaknesses

Panel A. Comparison of dates from DGM versus from AA*

No. of DGM sample firms which disclosed material weaknesses for the first time under SOX during August 2002 to October 2005	1,210
Less firms without needed identification information	-242
Remaining firms	<u>968</u>
Compare the 968 DGM sample firms with the AA sample:	
Firms have different event dates	457
Firms not covered in the AA sample	129
Firms have the same event dates	382

Descriptive statistics of the date difference for the 457 firms that have a different event date from DGM versus from AA

Analysis variable: DATE_DIFF = AA date - DGM date

Min.	10% Pctl	25% Pctl	Mean	Median	75% Pctl	90% Pctl	Max.
-898	-160	-10	82	26	181	386	1315

Panel B. Date verification via 10K Wizard

No. of firms whose event dates are verified via 10K Wizard	968
Less firms with erroneous identification information	-10
Less firms that disclosed material weaknesses before August 1, 2002	-10
Less firms without disclosure of material weaknesses	-4
Total valid firms to form the basis for various hypothesis testing	<u>944</u>

* DGM stands for Doyle, Ge, & McVay (2007b) and AA refers to Audit Analytics.

Table 2. Sample selection

No. of sample firms to start with for various hypothesis testing	944
H1 and H2:	
Less firms that received an unqualified SOX 404 audit opinion during the three-quarter testing period (0, 270)	-61
Less firms not having adequate daily stock return data	-147
Less firms without needed Compustat data to construct the matched sample	-27
Total sample firms having required data for H1 and H2 univariate tests*	709
Less firms without needed Compustat data for control variables	-67
Total sample firms having required data for H1 and H2 multivariate tests*	642
H3:	
Less firms that received an unqualified SOX 404 audit opinion during the three-quarter testing period (0, 270)	-61
Less firms that disclosed any other non-material weakness deficiencies during the three-quarter testing period (-270, 0)	-120
Less firms not having adequate daily stock return data	-147
Total sample firms having required data to test H3	616
H4:	
Less firms that did not receive their first unqualified SOX 404 audit report during year 2004 to 2006 after filing material weaknesses	-483
Less firms that have a time lag of less than three quarters between the date of receiving the unqualified audit report and the date of first filing weaknesses	-57
Less firms that disclosed material weaknesses again under SOX 302 during the three quarters after receiving the unqualified audit report	-11
Less firms that received the unqualified audit report after March 31, 2006	-77
Less firms not having adequate daily stock return data	-15
Total sample firms having required data to test H4	301

* As one sample firm of H1 lacks the DGM code of material weakness type, the number of total sample firms for H2 univariate tests is 708 (250 with company-level weaknesses and 458 with account-specific weaknesses) and for H2 multivariate tests is 641 (226 with company-level weaknesses and 415 with account-specific weaknesses).

Table 3. Descriptive statistics**Panel A. Internal control material weakness firms versus matched firms**

Variables	ICMW Firms (642 firms)		Matched Firms (642 firms)		T-test of Mean Diff.	Wilcoxon Test of Med. Diff.
	Mean	Median	Mean	Median	P-value	P-value
Firm Size	2,183.100	273.040	2,174.600	293.586	0.984	0.389
Firm Age	17.673	13.000	16.682	12.000	0.153	0.356
Loss Proportion	0.456	0.333	0.320	0.000	<0.001	<0.001
Firm Segments	4.670	4.000	4.363	4.000	0.049	0.072
Sales Growth	0.186	0.093	0.171	0.119	0.509	0.023
Restructuring	0.015	0.000	0.006	0.000	<0.001	<0.001
Sales Volatility	0.350	0.247	0.301	0.219	0.007	0.067
CFO Volatility	0.087	0.064	0.085	0.065	0.524	0.807
Operating Cycle	197.350	113.297	202.140	108.001	0.835	0.122

Panel B. Company-level material weakness firms versus matched sample

Variables	CLMW Firms (226 firms)		Matched Firms (226 firms)		T-test of Mean Diff.	Wilcoxon Test of Med. Diff.
	Mean	Median	Mean	Median	P-value	P-value
Firm Size	1,881.100	191.602	1,763.100	206.804	0.853	0.730
Firm Age	16.451	13.000	15.518	12.000	0.385	0.493
Loss Proportion	0.532	0.667	0.364	0.333	<0.001	<0.001
Firm Segments	4.575	4.000	4.195	4.000	0.100	0.139
Sales Growth	0.238	0.100	0.158	0.119	0.071	0.889
Restructuring	0.017	0.000	0.006	0.000	0.005	0.047
Sales Volatility	0.377	0.274	0.299	0.227	0.012	0.090
CFO Volatility	0.096	0.069	0.090	0.069	0.370	0.546
Operating Cycle	192.090	126.829	248.380	121.778	0.157	0.612

Table 3. (Continued)**Panel C. Account-specific material weakness firms versus matched sample**

Variables	ASMW Firms (415 firms)		Matched Firms (415 firms)		T-test of Mean Diff.	Wilcoxon Test of Med. Diff.
	Mean	Median	Mean	Median	P-value	P-value
Firm Size	2,352.800	334.421	2,403.900	366.921	0.924	0.409
Firm Age	18.366	13.000	17.342	13.000	0.254	0.519
Loss Proportion	0.413	0.333	0.294	0.000	<0.001	<0.001
Firm Segments	4.730	4.000	4.463	4.000	0.193	0.246
Sales Growth	0.158	0.090	0.172	0.121	0.564	0.010
Restructuring	0.014	0.000	0.006	0.000	0.002	0.011
Sales Volatility	0.336	0.246	0.303	0.215	0.141	0.295
CFO Volatility	0.081	0.061	0.082	0.063	0.937	0.858
Operating Cycle	200.400	105.433	175.740	100.971	0.382	0.119

All variables are defined in Appendix 4. For ease of interpretation, I present in this table the untransformed values (instead of the natural log) of *Firm Size*, *Firm Age*, *Firm Segments*, and *Operating Cycle*. The t-test results for the logged values are similar. In this table, the unit of total assets used to measure *Firm Size* is millions of dollars. The t-test of means uses the pooled method when the underlying variances are equal and the Satterthwaite method when the variances are unequal. All p-values are two-tailed. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers.

Table 4. Pearson Spearman correlation matrix

	ICMW	Eload_1f	Eload_3f	Firm Size	Firm Age	Loss Prop.	Firm Segments	Sales Growth	Restructu.	Sales Volatility	CFO Volatility	Operating Cycle
ICMW		0.106 (<.001)	0.097 (<.001)	-0.021 (0.461)	0.029 (0.302)	0.167 (<.001)	0.047 (0.092)	0.018 (0.509)	0.118 (<.001)	0.075 (0.007)	0.018 (0.524)	0.034 (0.221)
Eload_1f	0.100 (<.001)		0.865 (<.001)	-0.252 (<.001)	-0.222 (<.001)	0.389 (<.001)	-0.029 (0.297)	0.031 (0.265)	0.162 (<.001)	0.069 (0.013)	0.204 (<.001)	0.070 (0.012)
Eload_3f	0.102 (<.001)	0.852 (<.001)		-0.296 (<.001)	-0.207 (<.001)	0.411 (<.001)	-0.015 (0.599)	0.039 (0.165)	0.159 (<.001)	0.020 (0.476)	0.181 (<.001)	0.081 (0.004)
Firm Size	-0.024 (0.389)	-0.278 (<.001)	-0.329 (<.001)		0.208 (<.001)	-0.347 (<.001)	0.243 (<.001)	-0.037 (0.180)	0.039 (0.165)	-0.154 (<.001)	-0.386 (<.001)	0.031 (0.275)
Firm Age	0.026 (0.357)	-0.254 (<.001)	-0.248 (<.001)	0.190 (<.001)		-0.249 (<.001)	0.192 (<.001)	-0.262 (<.001)	-0.006 (0.818)	-0.102 (<.001)	-0.262 (<.001)	0.000 (0.996)
Loss Prop.	0.174 (<.001)	0.385 (<.001)	0.418 (<.001)	-0.364 (<.001)	-0.265 (<.001)		-0.012 (0.667)	0.026 (0.350)	0.248 (<.001)	-0.050 (0.074)	0.218 (<.001)	0.105 (<.001)
Firm Segments	0.050 (0.072)	-0.033 (0.231)	-0.023 (0.416)	0.230 (<.001)	0.158 (<.001)	0.007 (0.810)		-0.084 (0.003)	0.126 (<.001)	-0.080 (0.004)	-0.120 (<.001)	0.141 (<.001)
Sales Growth	-0.063 (0.023)	-0.034 (0.217)	-0.032 (0.252)	0.039 (0.161)	-0.231 (<.001)	-0.182 (<.001)	-0.065 (0.020)		-0.126 (<.001)	0.160 (<.001)	0.221 (<.001)	0.114 (<.001)
Restructuring	0.090 (0.001)	0.068 (0.015)	0.048 (0.088)	0.178 (<.001)	-0.007 (0.813)	0.182 (<.001)	0.207 (<.001)	-0.196 (<.001)		0.037 (0.183)	0.006 (0.816)	0.032 (0.251)
Sales Volatility	0.051 (0.067)	0.120 (<.001)	0.075 (0.007)	-0.214 (<.001)	-0.087 (0.002)	-0.046 (0.098)	-0.047 (0.096)	0.206 (<.001)	-0.006 (0.839)		0.267 (<.001)	-0.169 (<.001)
CFO Volatility	0.007 (0.808)	0.271 (<.001)	0.247 (<.001)	-0.443 (<.001)	-0.287 (<.001)	0.215 (<.001)	-0.129 (<.001)	0.177 (<.001)	-0.083 (0.003)	0.434 (<.001)		0.115 (<.001)
Oper. Cycle	0.043 (0.122)	0.096 (0.001)	0.111 (<.001)	-0.092 (0.001)	0.013 (0.642)	0.132 (<.001)	0.178 (<.001)	0.020 (0.485)	0.042 (0.129)	-0.158 (<.001)	0.113 (<.001)	

All variables are defined in Appendix 4. Pearson correlations are reported above the diagonal, and Spearman correlations are reported below. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. Significant correlation coefficients (two-tailed p-value <= 10%) are in bold.

Table 5. Panel A. Comparison of e-loadings between internal control material weakness (ICMW) firms and matched firms

Panel A. 1. Compare the means of e-loadings using the t-test

Model	No. of Firm Pairs	ICMW Firms	Matched Firms	Difference	T-statistic	One-tailed P-value
One-factor	709	0.401	0.283	0.119	3.78	<0.001
Three-factor		0.323	0.199	0.124	3.58	<0.001

Panel A. 2. Compare the medians of e-loadings using the Wilcoxon test

Model	No. of Firm Pairs	ICMW Firms	Matched Firms	Difference	Z-statistic	One-tailed P-value
One-factor	709	0.275	0.176	0.099	3.52	<0.001
Three-factor		0.190	0.089	0.101	3.64	<0.001

E-loading is the estimated coefficient of $AQfactor$, i.e., $e_{j,T}$, for each weakness firm (or each matched non-internal control deficiency firm) during the testing period of three quarters after disclosure of material weaknesses, i.e., (0, +270), from the following one-factor and three-factor regression models:

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + s_{j,T}SMB_t + h_{j,T}HML_t + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

where t = index for the trading day in the testing period; j = index for firm j ; $R_{j,t}$ = firm j 's return on day t ; $R_{F,t}$ = the risk-free rate of return on day t ; $R_{M,t}$ = the market return on day t ; SMB_t = return of the small-minus-big factor portfolio on day t ; HML_t = return of the high-minus-low book-to-market factor portfolio on day t ; $AQfactor_t$ = return of the poor-minus-good accruals quality factor-mimicking portfolio on day t .

Table 5. Panel B. Comparison of e-loadings between company-level material weakness (CLMW) firms and matched firms

Panel B. 1. Compare the means of e-loadings using the t-test

Model	No. of Firm Pairs	CLMW Firms	Matched Firms	Difference	T-statistic	One-tailed P-value
One-factor	250	0.513	0.323	0.190	3.41	<0.001
Three-factor		0.435	0.243	0.192	3.18	<0.001

Panel B. 2. Compare the medians of e-loadings using the Wilcoxon test

Model	No. of Firm Pairs	CLMW Firms	Matched Firms	Difference	Z-statistic	One-tailed P-value
One-factor	250	0.413	0.240	0.173	3.32	<0.001
Three-factor		0.367	0.114	0.252	3.19	0.001

E-loading is the estimated coefficient of $AQfactor$, i.e., $e_{j,T}$, for each weakness firm (or each matched non-internal control deficiency firm) during the testing period of three quarters after disclosure of material weaknesses, i.e., (0, +270), from the following one-factor and three-factor regression models:

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + s_{j,T}SMB_t + h_{j,T}HML_t + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

where t = index for the trading day in the testing period; j = index for firm j ; $R_{j,t}$ = firm j 's return on day t ; $R_{F,t}$ = the risk-free rate of return on day t ; $R_{M,t}$ = the market return on day t ; SMB_t = return of the small-minus-big factor portfolio on day t ; HML_t = return of the high-minus-low book-to-market factor portfolio on day t ; $AQfactor_t$ = return of the poor-minus-good accruals quality factor-mimicking portfolio on day t .

Table 5. Panel C. Comparison of e-loadings between account-specific material weakness (ASMW) firms and matched firms

Panel C. 1. Compare the means of e-loadings using the t-test

Model	No. of Firm Pairs	ASMW Firms	Matched Firms	Difference	T-statistic	Two-tailed P-value
One-factor	458	0.339	0.260	0.079	2.10	0.04
Three-factor		0.262	0.175	0.086	2.06	0.04

Panel C. 2. Compare the medians of e-loadings using the Wilcoxon test

Model	No. of Firm Pairs	ASMW Firms	Matched Firms	Difference	Z-statistic	Two-tailed P-value
One-factor	458	0.222	0.157	0.065	1.92	0.06
Three-factor		0.129	0.074	0.054	2.16	0.03

E-loading is the estimated coefficient of $AQfactor$, i.e., $e_{j,T}$, for each weakness firm (or each matched non-internal control deficiency firm) during the testing period of three quarters after disclosure of material weaknesses, i.e., (0, +270), from the following one-factor and three-factor regression models:

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

$$R_{j,t} - R_{F,t} = \alpha_{j,T} + \beta_{j,T}(R_{M,t} - R_{F,t}) + s_{j,T}SMB_t + h_{j,T}HML_t + e_{j,T}AQfactor_t + \varepsilon_{j,t}$$

where t = index for the trading day in the testing period; j = index for firm j ; $R_{j,t}$ = firm j 's return on day t ; $R_{F,t}$ = the risk-free rate of return on day t ; $R_{M,t}$ = the market return on day t ; SMB_t = return of the small-minus-big factor portfolio on day t ; HML_t = return of the high-minus-low book-to-market factor portfolio on day t ; $AQfactor_t$ = return of the poor-minus-good accruals quality factor-mimicking portfolio on day t .

Table 6. Multivariate regression analysis

Independent Variables	Predicted Sign	Dependent Variable					
		Eload-1f	Eload-3f	Eload-1f	Eload-3f	Eload-1f	Eload-3f
		Coefficient Estimate (One-tailed P-value*)					
Intercept		0.46 (<0.001)	0.50 (<0.001)	0.66 (0.004)	0.71 (0.003)	0.40 (0.005)	0.45 (0.004)
ICMW	+	0.05 (0.04)	0.05 (0.09)				
CLMW	+			0.11 (0.02)	0.09 (0.06)		
ASMW	?					0.02 (0.54)	0.02 (0.63)
Firm Size	-	-0.04 (<0.001)	-0.07 (<0.001)	-0.05 (0.004)	-0.08 (0.002)	-0.03 (0.005)	-0.06 (0.002)
Firm Age	-	-0.11 (<0.001)	-0.10 (<0.001)	-0.16 (0.001)	-0.14 (0.002)	-0.09 (0.001)	-0.09 (0.005)
Firm Segments	+	0.01 (0.30)	0.04 (0.09)	0.02 (0.32)	0.02 (0.31)	0.00 (0.48)	0.03 (0.14)
Restructuring	+	1.33 (0.001)	1.48 (0.001)	0.54 (0.22)	0.78 (0.15)	1.90 (<0.001)	1.99 (0.001)
Loss Proportion	+	0.41 (<0.001)	0.47 (<0.001)	0.40 (0.002)	0.52 (0.002)	0.41 (0.001)	0.43 (0.002)
Sales Growth	+	-0.04 (0.17)	0.00 (0.46)	-0.05 (0.20)	0.02 (0.38)	-0.03 (0.28)	-0.01 (0.43)
Sales Volatility	+	0.08 (0.05)	-0.01 (0.42)	0.22 (0.01)	0.04 (0.35)	0.00 (0.48)	-0.04 (0.26)
CFO Volatility	+	0.49 (0.02)	0.19 (0.23)	0.32 (0.22)	0.00 (0.50)	0.52 (0.04)	0.24 (0.24)
Operating Cycle	+	0.03 (0.06)	0.03 (0.05)	0.02 (0.27)	0.02 (0.25)	0.03 (0.06)	0.03 (0.06)
No. of Weakness Firm Obs.		642	642	226	226	415	415
No. of Total Obs.		1284	1284	452	452	830	830
Adjusted R ²		19.13%	20.99%	18.78%	23.08%	18.45%	18.67%

* One-tailed p-values are reported for all the estimated coefficients which have a predicted sign. Two-tailed p-values are reported for the intercept and the variable *ASMW*.

All variables are defined in Appendix 4. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers.

Table 7. Within-firm changes in e-loading**Panel A. After disclosure of internal control material weaknesses**

Model	No. of Firms	e_1	T-statistic	Two-tailed P-value	Adjusted for Firm Clusters	
					T-statistic	Two-tailed P-value
One-factor	616	0.01	0.54	0.59	0.39	0.70
Three-factor		0.02	0.56	0.58	0.38	0.70

Panel B. After disclosure of remediation of internal control material weaknesses

Model	No. of Firms	e_1	T-statistic	One-tailed P-value	Adjusted for Firm Clusters	
					T-statistic	One-tailed P-value
One-factor	301	-0.07	-2.51	0.01	-1.94	0.03
Three-factor		-0.06	-1.87	0.03	-1.70	0.05

The coefficient e_1 is estimated during the three quarters prior to and after the internal control disclosure, i.e., (-270, 0, +270), from the following one-factor and three-factor regression models:

One-factor model:

$$R_{j,t} - R_{F,t} = \alpha_0 + \alpha_1 D_{j,t} + \beta_0 (R_{M,t} - R_{F,t}) + \beta_1 (R_{M,t} - R_{F,t}) \times D_{j,t} + e_0 AQfactor_t + e_1 AQfactor_t \times D_{j,t} + \varepsilon_{j,t}$$

Three-factor model:

$$R_{j,t} - R_{F,t} = \alpha_0 + \alpha_1 D_{j,t} + \beta_0 (R_{M,t} - R_{F,t}) + \beta_1 (R_{M,t} - R_{F,t}) \times D_{j,t} + s_0 SMB_t + s_1 SMB_t \times D_{j,t} + h_0 HML_t + h_1 HML_t \times D_{j,t} + e_0 AQfactor_t + e_1 AQfactor_t \times D_{j,t} + \varepsilon_{j,t}$$

where t = index for the trading day in the testing period; j = index for firm j ; $D_{j,t}$ = a dummy variable indicating whether a trading day is after (including equal to) the day of disclosure ($D=1$) or before the day of disclosure ($D=0$); $R_{j,t}$ = firm j 's return on day t ; $R_{F,t}$ = the risk-free rate of return on day t ; $R_{M,t}$ = the market return on day t ; SMB_t = return of the small-minus-big factor portfolio on day t ; HML_t = return of the high-minus-low book-to-market factor portfolio on day t ; $AQfactor_t$ = return of the poor-minus-good accruals quality factor-mimicking portfolio on day t .