INTERNAL CONTROL WEAKNESSES, CORPORATE GOVERNANCE AND THE INFORMATIVENESS OF EARNINGS

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CERTIFICATE OF ORIGINALITY

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ABSTRACT

In this study I examine whether market discounts the information content of accounting earnings for firms reporting material weaknesses under Section 404 of SOX. To explore the influence of managerial ownership, I examine whether managerial ownership moderates the negative consequences of material weakness disclosures and whether its impact depends on the magnitude of information asymmetry. To explore the influence of female executives, I examine whether the presence of female executives moderates the negative consequences of material weakness disclosures and whether its impact depends on the magnitude of information asymmetry.

Because the macroeconomic environment changes after the financial crisis, I focus on the sample period from 2004 to 2007, and a sample of 2,349 firm-year observations yields the following results. First, regardless of the moderating effects of managerial ownership or female exeutives, the results do not indicate a significantly negative impact of material weakness disclosures under Section 404 of SOX on the informativeness of earnings. Second, consistent with the argument that managerial ownership reduces agency costs, I find that managerial ownership moderates the negative impact of material weaknesses on the informativeness of earnings. Third, because the magnitude of information asymmetry decreases with firm age, I find that the moderating effect of managerial ownership diminishes with firm age. Fourth, consistent with the argument that female executives are more risk-averse and therefore ensure the quality of accounting earnings, I find that the presence of female executives moderates the negative impact of material weaknesses on the informativeness of earnings. Fifth, I

find that the moderating effect of female executives also diminishes with firm age. These results are robust to a number of additional tests.

Keywords: the Informativeness of Earnings, Internal Control, Material Weaknesses, Managerial Ownership, Female Executives, Information Asymmetry.

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Chapter One

Introduction

1.1 The Importance of Internal Control over Financial Reporting (ICFR)[1]

SEC Commissioner Cynthia A. Glassman (2006) states that

> "Effective internal controls over financial reporting are necessary to help ensure that companies provide investors with accurate financial statements. This is essential for the vitality of our financial markets and our economy. This country has created the deepest and most robust financial markets in the world, and this success is first and foremost predicated on our free-market economy. Our regulatory scheme, which is based on full and accurate disclosure, provides transparency, which fosters the success of the financial markets. If investors lose faith in the accuracy and completeness of companies' financial statements and other disclosures, they will be less willing to invest, and our financial markets will suffer."

[1] See Section 2.2 for a definition of internal control over financial reporting (ICFR).

The exposure of corporate fraud at Enron, WorldCom and other companies in late 2001 and in 2002 necessitated an immediate solution to the resultant loss of investor confidence in the financial reporting system. As a result, effective internal controls have proven a primary regulatory tool for ensuring the credibility of financial statements and restoring investor confidence. According to the Institute of Internal Auditors (IIA),[2] an effective internal control system not only benefits organizational processes and the quality of accounting information, but also benefits regulatory compliance.

To protect businesses from corporate fraud, public companies strive to enhance their Internal Control over Financial Reporting (ICFR). The PCAOB[3] (2007) defines ICFR as "a process designed by, or under the supervision of, the company's principal executive and principal financial officer, or persons performing similar functions, and affected 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

[2] The Institute of Internal Auditors (IIA) is an international association that specializes in the certification, education, research and technical guidance of internal audit profession (www.theiia.org).

[3] The Public Company Accounting Oversight Board (PCAOB) is a non-profit organization established by U.S. Congress to oversee the audits of public companies (www.pcaobus.org).

accordance with generally accepted accounting principles (GAAP)". Because ICFR aims to prevent errors and financial misstatements, good ICFR is supposed to generate higher earnings quality.

1.2 Objectives and Motivation

I investigate the association between the informativeness of earnings (measured by the coefficient on earnings in the regression of stock returns on earnings) and material weakness disclosures. Jensen and Meckling (1976) argue that agency problems between managers and shareholders arise from the separation of ownership and control. Lafond and Roychowdhury (2008) believe that this separation can be captured using the percentage of the firm owned by managers. Because the market perceives managerial ownership as a force that affects agency costs and hence the quality of accounting numbers, the informativeness of earnings should be affected by managerial ownership Therefore, I examine whether the relation between the informativeness of earnings and material weaknesses is strengthened or weakened by the inclusion of an additional ownership variable.[4]With women playing increasingly vital role within corporate management

[4] See Section 2.4 for the empirical studies regarding the impact of managerial ownership.

and in relation to decisions about the quality of accounting earnings,[5] I investigate whether female executives influence the relation between the informativeness of earnings and material weakness disclosures. Extant studies provide evidence that women are more risk-averse and more concerned about ethical issues than men, which makes them less tolerant of opportunistic earnings management. It is possible that the presence of female executives affects the quality of earnings and the link between the informativeness of earnings and material weakness disclosures. In addition, I test whether the impact of managerial ownership and female executives varies with firm age. In literature, firm age is used to capture the magnitude of information asymmetry, such that, uncertainty in the capital markets regarding firms' earnings is found to decrease with their age (Lang, 1991). Considering the different levels of information asymmetry over time, the influence of managerial ownership and female executives could be different for young and old firms.

This study is motivated by the following factors. First, sustainable development of financial markets is based on reliable financial disclosures and regulators emphasize that they consider ICFR to be an important determinant for producing reliable financial information. Although good internal controls cannot ensure the prevention

[5] See Krishnan and Parsons (2008), Francis et al. (2009) and Barua et al. (2010) in Section 2.5.

or detection of fraud, they can help reduce instances of fraud and enhance investor protection (PCAOB, 2007). Effective internal controls benefit investors by preventing both intentional and unintentional financial misstatement during the process of financial report preparations. The demand for better internal control systems arises in response to the developing mistrust of financial reporting. The financial scandals revealed in the past decade have caused investors to lose faith in the credibility of financial reports. Given that a well-functioning economy depends on the accuracy and reliability of its financial reporting systems, the U.S. Congress passed the Sarbanes-Oxley Act (SOX) on July 30, 2002 to restore investors' confidence in corporate accounting. The new provisions outlined in SOX, particularly Sections 302 and 404, aim to improve ICFR and ensure the integrity of financial reporting. Section 302 of SOX requires that managers evaluate the effectiveness of their internal controls and report any material weaknesses or material changes. Under Section 404 of SOX, managers must issue an assessment of the overall effectiveness of their ICFR, and the resultant report should be further attested by an external auditor. I focus on material weakness disclosures under Section 404 of SOX in this thesis.

Second, researchers try to specify the usefulness of accounting earnings to investors through examining returns-earnings association since Ball and Brown (1968). How material weakness disclosures under Section 404 of SOX affect the usefulness of earnings remains an open question. Although there are a number of studies examining the association between internal control disclosures under SOX and earnings quality (Hogan and Wilkins, 2005; Doyle et al., 2007a; Ashbaugh-Skaife et al., 2008), research on the relation between internal controls and the informativeness of earnings is scarce. The majority of previous research has tested the direct relation between internal control weaknesses and earnings quality, which requires a specific measure of earnings quality. Rather than having the researcher specify a measure of earnings quality, I allow the stock market to infer the usefulness of earnings and focus on the value-relevance of accounting earnings (e.g., Warfield et al., 1995; Gul et al., 2002). Under the efficient market hypothesis, the market adjusts for all available public information in a timely manner. Hence, if the market expects less reliable accounting information to be disclosed by firms with an internal control weakness, then this will impair the informativeness of earnings. Gong et al. (2009) find that firms reporting internal control weaknesses under Section 302 of SOX tend to have lower accruals quality and less informative earnings. However, there is no evidence of the relation between the informativeness of earnings and internal control

disclosures under Section 404 of SOX. This study aims to fill this gap by examining the impact of material weaknesses on the informativeness of earnings under Section 404 of SOX.

Third, the literature documents that agency costs do play a crucial role in how the market assesses the information content of firms' earnings. One key variable that previous research has used to measure agency costs is managerial ownership (e.g. Warfield et al., 1995; Fan and Wong, 2002; Gul and Lai, 2002). The separation of equity ownership from the control of corporate decisions suggests that managers have an incentive to act in their own interests rather than maximizing shareholders' interests. Some researchers suggest that managerial ownership helps align the interests of shareholders and managers and therefore enhances earnings' explanatory power for returns (Warfield et al., 1995; Gul et al., 2002). Others argue that when managerial ownership reaches a certain level, managers become entrenched and act in their own self-interests rather than focusing on the best interests of shareholders (Morck et al., 1988; Gul and Lai, 2002; Yeo et al., 2002). Thus, the impact of managerial ownership can depend on the level of shareholding. Hence, how managerial ownership affects the association between internal control weakness

disclosures under Section 404 of SOX and the informativeness of earnings remains an unsolved empirical question.

Fourth, the contributions of female executives to their corporations have become well recognized, as has the knowledge that the presence of female executives leads to higher earnings quality, to the extent that the number of female top executives has increased dramatically in recent years. Huang and Kisgen (2008) report that 8 percent of CFOs and 2 percent of CEOs in 2005 were female, while only 2.8 percent of CFOs and 0.5 percent of CEOs in 1994 were female. However, research exploring the gender effects within the accounting literature is limited. Consistent with the notion that women are expected to be more risk averse and more concerned about ethical issues, previous studies show that the participation of female managers in corporate leadership enhances earnings quality (Krishnan and Parsons, 2008; Francis et al., 2009; Barua et al., 2010). Francis et al. (2009) and Barua et al. (2010) focus on the relation between female CFOs and earnings quality because they believe that CFOs are the only top executives who should be responsible for the quality of financial reporting. Because the quality of accounting earnings is influenced by a group of top managers in real-world situations (Flatt, 1996; Beasley et al., 1999; Dunn, 2004), I explore the impact that female executives have on the

association between the informativeness of earnings and material weakness disclosures.

Finally, previous literature documents that the magnitude of information uncertainty regarding firms' earnings declines over time as firms accumulate a history in the capital markets (Lang, 1991). Therefore, it is necessary to find out how information environment influences the impact of managerial ownership and female executives on the relation between the informativeness of earnings and internal control weakness disclosures under Section 404 of SOX. Studies document that asymmetric information problems between insiders and outsiders decrease with firm age (Diamond, 1989; Lang, 1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004). When a large amount of firm-specific information is revealed over time, there is less information asymmetry associated with the involved firms. This study examines whether the effect of managerial ownership and female executives on the association between the informativeness of earnings and material weakness reports will differ young and old firms.[6]

1.3 Overview of Research Methods and Major Findings

[6] The sample is split into young and old firms based on the median firm age.

Five hypotheses are tested in this paper. The first tests whether material weaknesses affect the informativeness of earnings. I propose that earnings are less informative for material weakness firms under Section 404 of SOX. Following Warfield et al. (1995), the informativeness of earnings is measured by the coefficient on earnings in the regression of stock returns on earnings. Among the three types of internal control deficiencies, namely control deficiency, significant deficiency and material weakness (PCAOB, 2004), I focus exclusively on the material weaknesses for two reasons (e.g., Doyle et al, 2007a; Doyle et al., 2007b; Ge and McVay, 2005; Beneish et al., 2008). First, material weakness is the most severe type of internal control deficiency. Second, the disclosure of material weakness is mandatory under Section 404. Regardless of the moderating impacts of managerial ownership or female exeutives, I did not find that accounting earnings are less informative for firms with material weaknesses compared to those of firms with no material weaknesses under Section 404 of SOX. My results are inconsistent with the conjecture that poorer internal controls undermine the credibility of accounting earnings by allowing both intentional and unintentional errors in financial reports.

The second hypothesis tests whether managerial ownership moderates the association between the informativeness of earnings and material weakness

disclosures under Section 404 of SOX. Managerial ownership is measured as the ownership of the five managers who receive the highest compensation (excluding compensation from option grants) from the firm.[7] If investors perceive that firms with higher managerial ownership tend to have more reliable financial reporting, then the earnings of such firms will be more informative than those of firms with lower managerial ownership. Given that the market discounts the information content of earnings for firms who disclose internal control weakness, I posit that the negative relation between the informativeness of earnings and material weakness disclosures under Section 404 is weakened in firms with higher levels of managerial ownership. The regression results show that a higher level of managerial ownership moderates the negative association between material weakness disclosures under SOX Section 404 and the informativeness of earnings, which suggests that managerial ownership works as a disciplining mechanism to reduce agency conflicts within the firms, and therefore helps improve earnings quality.

The third hypothesis tests whether the moderating effect of managerial ownership is stronger for young firms. Because a larger amount of firm-specific information is revealed over time, the information asymmetry decreases with a firm's age. When

[7] The top five highest compensated managers are identified by ExecuComp.

there is greater information uncertainty regarding accounting earnings, investors tend to weigh the influence of managerial ownership more heavily. I predict that the moderating effect of managerial ownership on the link between the informativeness of earnings and material weakness reports is stronger when there is a limited amount of firm-specific information available, whereas the moderating effect of managerial ownership is weaker when there is an adequate amount of private information available. Firm age is measured by the number of years since the firm's initial public offering. Based on the median score of age, I split the sample into young and old firms, and test the impact of managerial ownership on the association between the informativeness of earnings and internal control disclosures under SOX Section 404 for young and old firms, separately. Consistent with the argument that firms in their early age suffer from more severe information problems, the empirical results indicate that the moderating effect of managerial ownership on material weakness disclosures under SOX Section 404 is stronger for young firms.

The fourth hypothesis tests whether the association between the informativeness of earnings and internal control reports is affected by the participation of female top executives in the corporate top management team. Female executives are defined as the top five highest paid female managers within the firm in terms of salary and

bonuses. Prior literature documents that women are more risk averse and more concerned about ethical issues than men, and are therefore less tolerant of opportunistic earnings management. As a result, studies indicate that firms hiring female top managers have higher earnings quality (Krishnan and Parsons, 2008; Francis et al., 2009; Barua et al., 2010). If investors assume that firms with female executives are more likely to report reliable accounting numbers, the earnings will be more informative compared to those of firms without female executives. Thus, I predict that the negative association between the informativeness of earnings and internal control weakness reports under SOX Section 404 will be moderated by the presence of female executives. The empirical evidence provides supporting evidence that the presence of female top managers helps moderate the negative relation between the informativeness of earnings and internal control weakness disclosures under Section 404 of SOX. This is consistent with the argument that investors consider the presence of female executives to be an assurance of earning quality.

The fifth hypothesis tests whether the impact of female executives on the link between the informativeness of earnings and internal control reports under Section 404 of SOX subsides with firm age. Because the information uncertainty regarding

earnings decreases over time (Diamond, 1989; Lang, 1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004), I posit that the impact of the presence of female executives on management teams varies with firm age. When there is little firm-specific information available to investors, they weigh the impact of female executives more heavily. Using the median score of age to define young and old firms, I compare the impact of female executives on the relation between the informativeness of earnings and internal control weakness disclosures under Section 404 of SOX for the two samples. The empirical findings exhibit that the influence of female top managers on the relation between the informativeness of earnings and internal control disclosures under Section 404 of SOX is much stronger for young firms, which further supports the argument that information problems diminish with firm age as more firm-specific information becomes available over time.

1.4 Contributions

This paper contributes to the literature in the following ways. First, it supplements the studies that examine the relation between internal control weakness disclosures under Section 404 of SOX and the informativeness of earnings. In contrast to Section 302 disclosures, the disclosure of material weaknesses is mandatory under Section 404 of SOX, focusing on which helps avoid self-selection biases. Although

there are a number of studies on the effects of internal control weaknesses on accounting-based earnings quality (Hogan and Wilkins, 2005; Bedard, 2006; Doyle et al., 2007; Ashbaugh-Skaife et al., 2008; Cohen et al., 2008), empirical evidence on the value relevance of earnings for internal control weakness firms is scarce. Gong et al. (2009) examine the impact of internal control weakness disclosures on the informativeness of earnings under Section 302 of SOX. However, they focus on the comparison of cross-listed firms and U.S. firms under Section 302 of SOX. Adopting the approach of Warfield et al. (1995), I extend the literature by showing that the effectiveness of internal controls has an adverse influence on the informativeness of earnings under Section 404 of SOX.

Second, it enriches the corporate governance literature by investigating the impact of managerial ownership on the relationship between earnings explanatory power for returns and internal control weakness disclosures under Section 404 of SOX. This is the first study to examine the impact of managerial ownership on the association between the informativeness of earnings and internal control weakness. Specifically, it shows that the negative relation between material weakness and the informativeness of earnings is attenuated by a higher level of managerial ownership.

This finding further supports the significant role of management ownership as an effective internal monitoring mechanism.

Third, it contributes to the gender literature by providing a new insight into the moderating impact of female top managers on the negative association between the informativeness of earnings and internal control weakness disclosures under Section 404 of SOX. Although the importance of women in corporate leadership has already been recognized by regulators and researchers, empirical evidence of the impact of female executives in the accounting literature is very limited. This thesis is the first study to test whether the presence of female executives affects informativeness of earnings and, consequently, the link between the informativeness of earnings and internal control reports. My findings further validate the conjectures of previous studies regarding the positive influence of female executives.

Finally, it extends the information asymmetry literature by showing that asymmetric information problems influence the moderating effect of managerial ownership and female executives on the association between the informativeness of earnings and material weakness reports under Section 404 of SOX. Consistent with previous evidence that information uncertainty subsides over time (Diamond, 1989; Lang,

1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004), this thesis contributes to the understanding of information problems associated with firms by showing that the moderating effects that managerial ownership and female executives have on the relation between the informativeness of earnings and internal control reports under Section 404 of SOX decrease with firm age.

1.5 Thesis Structure

The rest of this study is organized as follows. Chapter Two provides the literature review on ICFR, the informativeness of earnings, managerial ownership, female executives and information asymmetry. Chapter Three develops hypotheses. Chapter Four describes the data collection, sample selection and research methodology. Chapter Five provides the empirical results, followed by additional tests, and Chapter Six presents the conclusion.

Chapter Two

Literature Review

2.1 Introduction

This chapter reviews the literature on ICFR, the informativeness of earnings, managerial ownership, female executives and information asymmetry. Section 2.2 offers the conceptual background information for ICFR, internal control weakness (ICW) and the Sarbanes-Oxley Act (SOX) in addition to the relevant empirical evidence in these areas. Section 2.3 reviews the theories and empirical work on the informativeness of earnings. Section 2.4 presents evidence regarding the impact of managerial ownership on agency conflicts in existing empirical research. Section 2.5 reviews the literature on the role of female executives in corporate firms. Section 2.6 explores previous studies on the relation between information problems and firm age and Section 2.7 provides a brief summary of this chapter.

2.2 Internal Control over Financial Reporting (ICFR)

2.2.1 Definition of ICFR

The PCAOB defines ICFR as:

A process designed by, or under the supervision of, the company's principal executive and principal financial officer, or persons performing similar functions, and affected 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 GAAP and 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. (PCAOB, 2007)

According to this definition, when managers and other relevant employees fail to perform their functions to prevent or detect financial misstatements in a timely

manner, ICFR becomes inefficient and hence the quality of financial reporting becomes questionable. In other words, internal control policies and procedures, implemented by managers and other personnel, ensure the credibility of financial reporting.

2.2.2 Classification of Internal Control Weakness (ICW)

Based on the likelihood that a material misstatement of annual or interim financial statements might result, internal control deficiency is categorized into three types: control deficiency, significant deficiency and material weakness (PCAOB, 2007).

A control deficiency is a deficiency or a combination of deficiencies in ICFR, such that there is a reasonable possibility that a significant misstatement of the company's annual or interim financial statements will not be prevented or detected. (PCAOB, 2007)

A significant deficiency is a deficiency or a combination of deficiencies in ICFR, that is less severe than a material weakness yet important enough to merit attention by those responsible for oversight of the company's financial reporting. (PCAOB, 2007)

A material weakness is a deficiency or a combination of deficiencies in ICFR, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. (PCAOB, 2007)

Although material weakness is the most severe type of ICW, it can be classified as "account-specific" or "company-level" weakness (e.g., Doyle et al., 2007a; Doyle et al., 2007b; Raghunandan and Rama, 2006). Account-specific material weaknesses are less severe because they relate to specific accounts or transaction-level processes and they are usually auditable. Examples include "inadequate internal controls for accounting for loss contingencies, including bad debts", "deficiencies in the documentation of a receivables securitization program" (Doyle et al., 2007b). Company-level material weaknesses are more severe because they relate to more fundamental problems and they may not be effectively auditable. Examples include "override by senior management" and "ineffective control environment" (Doyle et al., 2007b).

2.2.3 The Sarbanes-Oxley Act (SOX)

Internal control has long been recognized as a crucial element for achieving high quality financial reporting (Kinney et al., 1990; Kinney, 2000). However, sufficient ICFR regulations did not exist until the implementation of SOX in 2002. Before SOX, the Foreign Corrupt Practices Act of 1977 (FCPA) was the only statutory regulation addressing internal control over all SEC registrants. Managers and auditors were not required to evaluate or certify the effectiveness of internal control at the time, therefore information on the effectiveness of internal controls for that period is not publicly available. Significant internal control deficiencies only had to be disclosed in SEC Form 8-K when disclosing a change in auditor (Geiger and Taylor, 2003; Krishnan, 2005).

The recent financial fraud perpetrated by Enron, WorldCom, HealthSouth and AIG raises questions about the limited scope of regulation over internal controls. These cases of fraud not only cost investors billions of dollars, but also undermined investors' confidence in the credibility of financial reports. Because investors rely on financial information for their decision-making, a complete and accurate financial reporting system plays an important role in maintaining the efficient operation of capital markets. To restore investors' confidence in the reliability of financial reporting, the U.S. Congress passed SOX in 2002. Consequently, the improvement

of internal controls has become a major focus of the new provisions under SOX.

Section 302 of SOX, effective on August 29, 2002, requires managers to certify the effectiveness of their firms' internal controls in periodic SEC filings and to report any significant changes. Section 302 does not require attestation of the report by an independent auditor. Instead, it expects the CEO and the CFO to disclose any material weaknesses. Thus, Beneish et al. (2008) argue that ICW disclosures under Section 302 of SOX depend on managers' diligence in identifying ICWs and their discretion over disclosure. Section 404 of SOX, effective on November 15, 2004 for accelerated filers,[8] not only requires that managers assesses the internal control quality of their firms annually over financial reporting, but also mandates that such reports be attested by external auditors. Both managers and independent auditors are responsible for reporting material weaknesses in internal controls under Section 404. Since the implementation of this process, the unaudited internal control disclosure system has transformed into a full attestation regime (Doyle et al., 2007b).

[8] Public firms with a market capitalization of at least $75 million are considered as accelerated filers. For non-accelerated filers, Section 404 will be effective for years ending on or after December 15, 2007 for management assessment of the effectiveness of internal control and December 15, 2008 for the auditor's attestation report (Doyle et al., 2007b).

2.2.4 Previous Research on ICW Disclosures under SOX

The passage of SOX has structurally changed the information environments of public companies by requiring the disclosure of firms' internal controls under Sections 302 and 404. However, the impact of ICW disclosures under Section 302 might be different from that of those under Section 404. The disclosure of material weaknesses is voluntary under Section 302, which can result in self-selection biases and although the disclosure of material weaknesses is effectively mandatory under Section 404, there could be noise in the results without a consistent model of the materiality threshold of material weaknesses (Doyle et al., 2007a). This section reviews the empirical evidence of ICW disclosures under Sections 302 and 404 of SOX.

2.2.4.1 The Determinants of ICW

Ge and McVay (2005) investigate firm characteristics associated with ICWs under Section 302 of SOX. They document that poor ICFR is associated with insufficient resources for accounting controls. Specifically, material weaknesses tend to be attributed to a lack of training, deficiencies in the period-end reporting process and accounting policies, deficient revenue-recognition policies and a lack of duty segregation and inappropriate account reconciliation (Ge and McVay, 2005). In

addition, material weaknesses are often identified in complex accounts, such as derivative and income tax accounts. Statistical results show that material weakness disclosures are positively related to business complexity, and negatively related to firm size and profitability. After business complexity, firm size and profitability are controlled, the incidence of material weakness disclosure is higher when the firm is audited by a large auditor.

Using a sample of 779 firms disclosing material weaknesses from 2002 to 2005, Doyle et al. (2007a) explore the determinants of internal control weaknesses under Sections 302 and 404 of SOX. They find that firms disclosing material weaknesses tend to be smaller, less profitable, more complex, experiencing rapid growth, or under restructuring. When the materials weaknesses are classified into two different types based on internal control weakness severity, Doyle et al. (2007a) find that (1) firms with account-specific weaknesses tend to have more diversified, complex and rapidly changing operations; and (2) firms with company-level problems tend to be younger and financially weaker. When the materials weaknesses are classified based on the underlying reason for the weaknesses, the results suggest that (1) firms with staffing-related problems tend to be small and financially weak; and (2) firms with

complexity-related problems tend to have diversified and complex operations and are often sustaining rapid changes.

Ashbaugh-Skaife et al. (2007) examine the determinants of ICW after Section 302 of SOX became effective and before the implementation of Section 404. Focusing on pre-Section 404 disclosures that sustained less managerial and auditor scrutiny and less demanding disclosure rules, they investigate managers' incentives to discover and report internal control weaknesses. The results show that firms with internal control problems tend to have more complex operations, more structural changes, higher accounting risk, fewer resources for internal controls, and a higher incidence of auditor resignations. Regarding managers' incentives to disclose and report problems, firms are more likely to report ICWs when they are audited by dominant auditors, have previous restatements or sanctions, and have a higher level of institutional ownership.

2.2.4.2 ICW and Earnings Quality

There are a number of studies that focus on the impact of ICW on earnings quality after SOX, but the empirical evidence is mixed. Bedard (2006) investigates whether the implementation of Sections 302 and 404 of SOX is associated with enhanced

earnings quality. Using unexpected accruals as a proxy for earnings quality, he tests whether the disclosure of internal control weaknesses under both sections influence the level of unexpected accruals in the disclosure year and finds that the absolute level of unexpected accruals increases in the year that ICWs are disclosed. Because it is documented that firms with ICWs have a higher level of unexpected accruals in the year preceding disclosure, the results indicate that managers reverse these extremely large accruals in the disclosure year. Further, there is a decrease in the level of unexpected accruals for firms without ICWs under Section 404 in the year following the disclosure, which suggests that firms enhance their internal controls and/or auditors increase audit efforts. As a result, managers use fewer accruals for events and transactions.

Based on a sample of 705 firms reporting at least one material weakness from August 2002 to November 2005, Doyle et al. (2007b) examine the association between internal control weaknesses and accruals quality under Sections 302 and 404 of SOX. Following the approach outlined in Dechow and Dichev (2002), accruals quality is measured as the extent to which accruals are realized as cash flows. After controlling for the documented determinants of accruals quality and internal control deficiencies, they find that firms with material weaknesses tend to

have poorly estimated accruals compared to those without weaknesses under Section 302. When material weaknesses are classified into account-specific and company-level weaknesses based on severity, there is strong evidence that the positive association between internal control quality and accruals quality is driven by company-level weaknesses rather than by more auditable, account-specific weaknesses. This suggests that ICWs are negatively related to accruals quality under Section 302 and only company-level material weaknesses are related to accruals quality under Section 404.

Compared to firms without internal control deficiencies, Chan et al. (2008) examine whether firms with disclosed internal control deficiencies under Section 404 of SOX tend to have more earnings management, which is measured as the average discretionary accruals and the magnitude of absolute discretionary accruals. The Jones (1991) model is estimated cross-sectionally using annual data for firms sharing the same two-digit SIC code in each year from 2003 to 2004. Using a sample of 149 ICD firms and 908 non-ICD firms, they find that firms with internal control weakness tend to have more positive average discretionary accruals and absolute discretionary accruals compared to firms without ICWs after controlling for other firm characteristics related to accounting accruals. This is consistent with

the hypothesis that firms reporting material weaknesses under Section 404 of SOX tend to have a higher level of earnings management than those that report no material weaknesses.

Ashbaugh-Skaife et al. (2008) focus on the impact of ICWs and their remediation on accruals quality under Sections 302 and 404. Specifically, they test whether internal control weakness disclosures are related to poor accruals quality, measured by the extent to which accruals map into past, present and future operating cash flows and by the magnitude of abnormal total and working capital accruals. In addition, they test whether the remediation of previous problems results in higher accruals quality, whereas the accruals quality remains unchanged without remediation. As predicted, the results show that firms with material weakness tend to have much noisier accruals and larger abnormal accruals, which suggests that weak internal controls make unintentional misstatements with offsetting effects on earnings more likely. Further, they find that firms who remediate their previously reported weaknesses tend to have improved accruals quality compared to those that fail to remediate their internal control problems.

Gong et al. (2009) compare the impact that internal control weakness disclosures under Section 302 of SOX have on the earnings quality of cross-listed firms and U.S. firms. Rather than focusing exclusively on accounting-based earnings quality, Gong et al. (2009) examine the impact of internal controls on both accruals quality and the informativeness of earnings. However, there is no existing evidence regarding the impact of ICWs reported under Section 404 of SOX on the informativeness of earnings. They suggest that internal control weakness disclosures under Section 302 of SOX convey useful information on the earnings quality of U.S. firms. Specifically, internal control weakness disclosures are associated with poor accruals quality and less informative accounting earnings. However, Gong et al. (2009) fail to find the association between internal controls and earnings quality for cross-listed firms. Their results suggest that internal control weakness disclosures under Section 302 of SOX only relate to earnings quality for U.S. firms and not for cross-listed firms. It is argued that a weak investor protection environment is the reason for these different results regarding cross-listed firms.

2.2.4.3 Stock Market Reaction to ICW Disclosures

Previous research on the market response to internal control weakness disclosures provides mixed evidence. Gupta and Nayar (2007) investigate the value-relevance

of internal control weakness disclosures under Sections 302 and 404 of SOX. The results exhibit that internal control weakness disclosures have a negative impact on stock prices on average, which suggests that these disclosures under Sections 302 and 404 do convey value-relevant information to the stock market. Moreover, this impact is attenuated by the presence of the following remediation plan, which is intended to correct the internal control weaknesses, and the use of "Big-4" auditors. Further, Gupta and Nayar (2007) find that the stock market reaction is more negative for firms with larger current liabilities relative to total assets, which suggests that the disclosure of ICWs is believed to imply short-term default risk.

Hammersley et al. (2008) examine the stock price reaction to the disclosure of ICWs under Section 302 of SOX. They also investigate the characteristics of these weaknesses and whether such characteristics convey relevant information to investors. Consistent with previous evidence, Hammersley et al. (2008) discover that the size-adjusted returns are significantly negatively related to internal control weaknesses when the observations with disclosures of other material news in the event window are excluded. The magnitude of the market reaction to the internal control weakness disclosures depends on the severity of the weaknesses, with stock prices responding most negatively to firms reporting material weaknesses. Further,

the results exhibit that returns react less negatively when managers conclude that the overall internal controls are effective or when the firm is audited by a Big-4 auditor. However, it is also shown that stock prices react more negatively when the disclosed weaknesses are less auditable or when the disclosures of the ICWs are vague.

Beneish et al. (2008) analyze the effects of internal control weakness disclosures on the capital market under Sections 302 and 404 of SOX. Their sample consists of 330 firms with unaudited material weakness disclosures under Section 302 and 383 firms with audited material weakness disclosures under Section 404 of SOX. The results illustrate that material weakness disclosures under Section 302 of SOX have a negative impact on stock prices. This is consistent with the notion that investors would require compensation for holding firms with poor financial reporting quality. However, no market reaction to the material weakness disclosures is detected under Section 404 of SOX. Beneish et al. (2008) offer some possible explanations for the uninformative disclosures under Section 404. First, accelerated filers usually operate in richer information environments in which the market response to internal control weakness disclosures is weakened. Second, consistent with Doyle et al. (2007b), a lower materiality threshold can be applied under Section 404. Third, the data constraints might reduce the power of tests.

2.2.4.4 ICW and Cost of Capital

The empirical evidence for the association between internal control quality and cost of capital is still unclear. Using a sample of 346 ICD firms and 2169 non-ICD firms from November 2004 to January 2006, Ogneva et al. (2007) test whether firms disclosing first-time internal control problems tend to have higher cost of equity than firms with no such problems under Section 404 of SOX. Ogneva et al. (2007) argue that ICWs are generally associated with higher cost of equity due to higher information risk or problematic management controls. As predicted, they find that firms that report ICWs have a relatively higher cost of equity compared to other firms. However, this increase in cost of capital for firms with ICWs can be attributed to some of the antecedents of internal control weaknesses. After controlling for analyst forecast bias and the firm characteristics associated with internal control weaknesses, they conclude that there is no significant relation between ICWs and cost of equity. These results suggest that ICWs are not directly related to a higher cost of equity under Section 404 of SOX.

In addition to the market reaction to internal control weakness disclosures, Beneish et al. (2008) also investigate the impact of ICWs on cost of capital under Sections

302 and 404 of SOX. Their sample consists of 330 firms with unaudited material weakness disclosures under Section 302 and 383 firms with audited material weakness disclosures under Section 404 of SOX. Their results exhibit that firms' cost of capital is positively related to Section 302 disclosures, whereas they find no evidence supporting the relation between cost of capital and Section 404 disclosures. There are two possible explanations for these weak results for Section 404 disclosures. First, given the mandatory disclosure of material weakness under Section 404 of SOX, Beneish et al. (2008) note that Section 404 disclosure may not identify firms with weaknesses that market participants consider material. Second, considering only accelerated filers' firm risk under Section 404 might bias the results.

Based on the unique setting of Sections 302 and 404 of SOX, Ashbaugh-Skaife et al. (2009) conduct both cross-sectional and inter-temporal tests to explore the impact of reported internal control problems on investors' risk assessment and firms' cost of equity. The results of these cross-sectional tests show that firms with internal control problems have significantly higher idiosyncratic risk, systematic risk and cost of equity compared to those without internal control problems. Ashbaugh-Skaife et al. (2009) conduct further inter-temporal change analyses and they find a significant

increase in the market-adjusted cost of equity when the firm discloses an internal control weakness, whereas a significant decrease in the market-adjusted cost of equity is observed when firms with ICWs receive an unqualified Section 404 audit opinion. These findings are consistent with the fact that firms with internal control problems signal higher information risk to investors, while firms with remediation of previously reported weaknesses signal reduced information risk and, hence, a lower cost of equity.

2.3 The Informativeness of Earnings

The central tenet of the traditional earnings response coefficient (ERC) literature is rational expectations and the efficient market paradigm, which postulates that accounting information is efficiently impounded into stock prices by rational agents in well-functioning capital markets (Holthausen and Watts, 2001; Kothari, 2001). This paradigm asserts that investors use all available information and do so perfectly to set prices and that there is no need to disentangle how the market uses information because there is an immediate link between prices and information (Daniel, 2004). The implication for the future cash flows conveyed by a particular event is, thus, inferred from the change in stock prices surrounding the event. Under the assumption of an efficient market and rational expectations, the market correctly

values the earnings of firms with and without ICWs. This creates an ideal setting in which to test whether ICWs impact the valuation of a firm's earnings. The informativeness of earnings, measured by the earnings–return relation, is commonly estimated as the coefficient of earnings in the regression of stock returns on earnings ERC. This measure captures the extent to which accounting information is capitalized into stock prices and it is considered an effective measure of the value-relevance of accounting information. Because the market is supposed to adjust for all public information in a timely manner, I examine the contemporaneous association between ICWs and the informativeness of earnings. A number of capital market studies have examined cross sectional differences in ERC.

Ball and Brown (1968) provide early evidence that accounting numbers are useful in setting stock prices and conclude that accounting numbers contain value relevant information. To evaluate both the content and the timeliness of annual net income numbers, Ball and Brown (1968) construct two alternative models of what the market expects income to be and then investigate the market's reactions when its expectations are not met. They report that at least one-half of the available information about an individual firm in a particular year is captured in that year's income number, which suggests that the information contained in the income

number is considerable. The accounting reports, however, tend to be less timely because about 85 to 90 percent of their content is captured by other media (Ball and Brown, 1968).

To reveal how accounting earnings are related to stock returns, a number of studies focus on the cross-sectional variations in ERCs. Given that accounting earnings contain useful information, Kormendi and Lipe (1987) investigate whether the time-series properties of earnings have any impact on the magnitude of the earnings-returns relation. Assuming that accounting numbers can be represented by a time-series process, they model stock equity returns as a function of the revisions in expected future earnings. They document that the earnings-returns association is positively related across firms to the persistence of earnings, which suggests that the time-series properties of earnings are crucial to the earnings-returns association.

Based on a simple discounted dividends valuation model, Collins and Kothari (1989) further examine the determinants of the earnings-returns association. In contrast to previous research, they focus on both cross-sectional and temporal variations in the earnings-returns association. Consistent with their predictions, the empirical results show that ERC is positively related to a firm's growth opportunities and earnings

persistence, but negatively related to the risk-free interest rate and systematic risk. However, it cannot be concluded that growth opportunities and earnings persistence affect the earnings-returns association separately, because the proxies used for growth opportunities and earnings persistence can capture the effects of both variables.

Easton and Zmijewski (1989) use the Swamy (1970) random coefficients model for their empirical test, and assume that the parameters are stationary over time but vary across firms. They argue that the random coefficient model is suitable for the following reasons. First, the random coefficient model makes the predictions of individual firm parameters more efficient compared to OLS regression, which is good for examining cross-sectional variation in ERC. Second, cross-sectional variation in ERC is inferred from the correlations among the time-series parameters, whereas the random coefficient regressions generate cross-sectional correlations among the time-series coefficients with well-defined properties. Their results indicate that ERC is positively related to the revision coefficient and firm size, but negatively related to systematic risk.

Using the sample firms of Kormendi and Lipe (1987), Lipe (1990) provides further insights into the factors that contribute to the earnings-returns relation under the assumption that the market has access to current-period non-earnings information. Lipe (1990) argues that by explicitly including alternative information when formulating the hypotheses, the results cannot be attributed to errors in measuring market expectations. Taking a nonlinear weighted least squares approach, Lipe (1990) includes data for 145 firms from 1947 to 1980 to estimate the ERC, variance of price changes, predictability and persistence of earnings. The empirical evidence indicates that the earnings-returns relation relies on the relative ability of earnings versus alternative information to predict both future earnings and the time-series persistence of earnings series. Specifically, ERC is found to be positively related to the predictability of earnings series and the persistence of earnings.

Rather than simply focusing on the informativeness of aggregate accounting numbers, Wild (1992) examines the informativeness of earnings, book values and their components. He examines the usefulness of disaggregate accounting data in financial statements and tests whether the disaggregate accounting numbers convey value-relevant information to investors. His results suggest that the components of earnings do convey value-relevant information, which indicates that investors rely

on this disaggregate accounting information to make investment decisions. Specifically, the components of both earnings and book value convey incremental information to the capital market along with that conveyed by their aggregate data. In addition, the informativeness of earnings and book value components varies across industries and firm size.

Teoh and Wong (1993) provide empirical evidence of the association between auditor size and ERC. Using the modified Holthausen-Verrecchia (1988) model, they test whether the investors' response to earnings, proxied by the ERC, differs between the "Big 8" and non-Big 8 clients. Their results show that Big 8 audited firms have significantly larger ERCs compared to non-Big 8 audited firms, which indicates that larger auditors tend to generate more credible earnings and further supports the Holthausen-Verrecchia prediction relating ERC to the precision of earnings. Teoh and Wong (1993) also show that their results are obtained in both a matched-pair sample of firms paired according to industry membership and a switch sample of firms grouped according to auditor size.

Subramanyam and Wild (1996) investigate the relation between the informativeness of earnings and a firm's going-concern status. Traditional valuation theory suggests

that the relation between earnings innovations and changes in security valuation is positively related to the persistence of the earnings innovations. Subramanyam and Wild (1996) argue that earnings persistence predictably increases over the length of a firm's expected life or, alternatively, decreases the probability of termination. Hence, earnings persistence depends on a firm's going-concern status. The related empirical tests are based on an earnings persistence model (Miller and Rock, 1985; Kormendi and Lipe, 1987) and their sample consists of 25,000 firm-quarter observations, including more than 1,500 firms, for the period from 1981 to 1990. Subsequently, they find that the possibility of termination is inversely related to earnings informativeness, which is consistent with the fundamental role of a firm's going-concern status in determining the usefulness of earnings.

Francis et al. (2005) compare the earnings and dividend informativeness of firms with dual-class and single-class ownership structures.[9] Compared to single-class firms, dual-class firms have relatively concentrated managerial ownership and cash flow rights are separated from voting rights. Based on a sample of 205 U.S. dual-

[9] Informativeness is estimated as the slope coefficient relating returns to earnings or dividends and is obtained from the regressions of annual returns on annual earnings or dividends, and from the regressions of three-day abnormal returns on news conveyed by earnings or dividend announcements (Francis et al., 2005).

class firms matched by year and industry with 5,764 single-class firms in the period from 1990 to 1999, Francis et al. (2005) find that the earnings of dual-class firms are less informative than the earnings of single-class firms. These results extend Fan and Wong's (2002) findings by showing that the separation of cash flow rights from voting rights has negative impact on earnings quality not only in East Asian countries, but also in countries with better investor protection and more sophisticated financial reporting systems, such as the U.S., and that this effect is incremental to the effects associated with concentrated ownership.

Wang (2006) explores the relation between founding family ownership and the informativeness of earnings. It is believed that founding family ownership creates incentives and opportunities for managers to behave opportunistically (e.g. Fama and Jensen, 1983; Fan and Wong, 2002). If this entrenchment effect is dominant, the founding family ownership is predicted to be negatively related to earnings quality. However, the alignment effect of concentrated ownership tend to lead to better monitoring by controlling owners (Demsetz and Lehn, 1985; Shleifer and Vishny, 1997) and the founding families are less likely to manipulate earnings because they have a long horizon. These empirical results support the alignment effect of founding family ownership and confirm that it is positively related to earnings

quality. Specifically, it is related to lower abnormal accruals, greater earnings informativeness, and less persistence of transitory loss components in earnings (Wang, 2006).

2.4 Managerial Ownership

2.4.1 Managerial Ownership and Agency Problem

The separation of equity ownership from control over corporate decisions is fundamental to contemporary firm theory (Berle and Means, 1932; Williamson, 1964; Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983; Warfield et al., 1995). Since Berle and Means (1932), agency conflicts between managers and shareholders have become an important issue. Because individuals typically choose actions that maximize their own utility, managers do not always act in the best interests of their shareholders (Jensen and Meckling, 1976). As a result, managers engage in self-maximizing activities such as shirking, perquisite-taking and empire building at the cost of shareholders' wealth.

One stream of studies shows that managerial ownership aligns the interests of shareholders and managers (e.g., Warfield et al., 1995; Gul et al., 2002), which is known as the alignment effect of managerial ownership. Jensen and Meckling (1976)

claim that managers with small ownership levels fail to maximize shareholder wealth because they have an incentive to consume perquisites, whereas the costs of deviation from value-maximization decline as managerial ownership rises. This suggests that a higher level of managerial ownership helps align the interests of shareholders and managers, and consequently attenuates the agency conflicts within firms. Lafond and Roychowdhury (2008) note that managers with high ownership stakes are more likely to have longer horizons, to the extent, that when the level of management ownership is high, any increase in personal wealth resulting from earnings manipulations or wealth transference from shareholders will eventually be offset by the decrease in firm value.

In support of this alignment effect, Lafond and Roychowdhury (2008) identify two sources of management shareholdings. A primary source of a high level of management ownership is a particular situation, in which the manager happens to be the founder or a member of the firm's founding family. In such cases, founding families are more likely to forgo the short-term benefits of managing earnings due to the incentive to pass their business on to future generations and protect their family's reputation (Wang, 2006). The other possible source is equity-based compensation, including grants of restricted stocks and stock options, which allow

managers to increase their holding of shares by vesting restricted stock or exercising vested stock options. As long as the tenure is sufficiently long, managers can get a large number of equity shares even when they do not belong to the founding family. When their stakes rise, managers suffer from the significant costs if they maximize their own utilities instead of those of their shareholders' and these costs are likely to outweigh the benefits to managers.

Another stream of studies shows that a higher level of managerial ownership encourages managerial entrenchment behavior (e.g., Morck et al., 1988; Gul and Lai, 2002), which is known as the entrenchment effect of managerial ownership. If the manager owns a low level of the equity, market discipline will make him or her pursue actions that maximize the value of the firm. However, with a higher level of the equity stock holding, the manager will obtain greater control over the firm, which would make it difficult to discipline his or her misbehavior. It is very probable that with effective control, a manager might indulge his or her preference for non-value-maximizing behavior, although perhaps to a more limited extent than if he or she had effective control with no claim on the firm's cash flows (Morck et al., 1988).

2.4.2 Previous Literature on the Role of Managerial Ownership

2.4.2.1 Managerial Ownership as an Interests-aligning Mechanism

The majority of relevant accounting literature and some finance literature suggest that managerial ownership works as a disciplining mechanism. Warfield et al. (1995) conduct pooled cross-sectional regressions to investigate whether managerial ownership influences the informativeness of earnings and the magnitude of discretionary accounting accrual adjustments. Theory proposes that a low level of managerial ownership creates a demand for accounting-based constraints to reduce managers' opportunistic behavior. Managers are very likely to maximize their own interests in a contractual environment, which consequently impairs the credibility of accounting earnings. The sample that Warfield et al. (1995) use consists of 4,778 and 3,871 firm-year observations, respectively, for the two sets of tests in the period from 1988 to 1990. Consistent with their predictions, the findings indicate a positive relation between managerial ownership and the informativeness of earnings and this correlation increases significantly for firms with a higher level of managerial ownership. In addition, it is shown that the magnitude of discretionary accounting accrual adjustments is negatively related to the level of managerial ownership.

Based on Warfield et al. (1995), Gul et al. (2002) use Australian data in their cross-sectional regressions from 1992 to 1993 to test the effects of audit quality on both the relation between the informativeness of earnings and management ownership and on the relation between the informativeness of earnings and discretionary accruals. According to the availability of director ownership data, they use director share ownership as a proxy for managerial ownership and following previous studies, a "Big 6" auditor is used as a proxy for audit quality. Their results show that both the positive association between the informativeness of earnings and managerial ownership and the negative association between management ownership and discretionary accruals are attenuated by the choice of Big 6 auditor. This empirical evidence is consistent with the theory that high-quality audits mitigate the agency conflicts that arise from the separation of ownership and control.

Core and Larcker (2002) examine the link between managerial ownership and firm performance using a sample of unique firms. Because the boards of directors mandate the increased equity ownership of managers under "target ownership plans", any changes in firm performance following the adoption of such plans should be attributed to the increasing amount of managerial equity ownership. Core and Larcker's (2002) results suggest that increases in managerial ownership levels

lead to significant improvements in firm performance, which indicates that managerial equity ownership plays a role in the alignment of interests between managers and shareholders. The results also document a significant increase in ownership level in the two years following plan adoption. Regarding firm performance, excess accounting returns are statistically higher in the two years after the plan adoption with higher excess stock returns reported in the first six months of the fiscal year in which the plan is adopted.

Gul et al. (2003) investigate the relation between discretionary accruals, managerial ownership, management compensation and audit fees and predict that firm managers with high managerial ownership tend to use discretionary accruals to communicate value-relevant information to investors, whereas the managers of firms with high accounting-based compensation tend to use discretionary accruals to manipulate earnings in ways that improve their compensation. Audit fees will be higher for those firms using discretionary accruals for managerial opportunism because auditors will perceive a higher inherent risk. The empirical test used by Gul et al. (2003) is based on the OLS regression of 648 Australian firms in 1993. Consistent with their predictions, the results show that discretionary accruals and audit fees are positively correlated and that this association is attenuated by managerial ownership.

In addition, accounting-based management compensation further mitigates the impact of managerial ownership because a high level of accounting-based management compensation generates managerial incentives to manipulate earnings.

Lafond and Roychowdhury (2008) provide evidence of the relation between managerial ownership and accounting conservatism. They measure separation of ownership and control using the percentage of the firm owned by managers, and measure conservatism using the asymmetric timeliness of earnings (Basu, 1997). Their empirical tests are based on a sample of 14,786 firm-year observations for the period from 1994 to 2004 and their results indicate an inverse association between managerial ownership and the conservatism of financial reporting. They also document that good news timeliness is positively related to managerial ownership. Specifically, when managerial ownership is low, earnings become less timely in recognizing good news and more asymmetrically timely in recognizing bad news. The overall results imply that managers have a greater demand in accounting conservatism to mitigate the agency conflicts that arise from the separation of ownership and control when managerial ownership is low.

2.4.2.2 The Non-monotonic Influence of Managerial Ownership

A number of studies document both the non-linear relation between managerial ownership and firm value and the non-linear relation between managerial ownership and accounting earnings. Morck et al. (1988) investigate the relation between managerial ownership and a firm's market valuation, which is measured using Tobin's Q. Based on a sample of 371 Fortune 500 firms in 1980, their results indicate a significant non-monotonic association between managerial ownership and the market valuation of the firm. Whether the convergence-of-interests effect or the entrenchment effect is dominant depends on the level of managerial ownership. Specifically, board ownership and Tobin's Q are positively correlated when the ownership level is below 5 percent, and the association becomes negative when the ownership level falls between a range of 5 to 25 percent. When the level of managerial ownership rises above 25 percent, ownership and Tobin's Q are positively related.

Gul and Lai (2002) investigate the market reaction to accounting earnings conditional on two corporate governance variables: insider shareholding and CEO duality. Based on the OLS regression of 1,770 firms listed in 1997 on the New York Stock Exchange, the American Stock Exchange and the National Association of Securities Dealers Automated Quotation, Gul and Lai (2002) find that the

association between earnings informativeness and insider shareholding depends on the level of shareholding. Specifically, at a medium level of insider shareholding, the informativeness of earnings is positive because the interest-alignment effect is dominant. At a high level of insider shareholding, the informativeness of earnings is negatively related because the entrenchment effect is dominant. In addition, their results show that the association between insider shareholding and the informativeness of earnings is weaker for firms that separate the roles of CEO and chairman, which suggests that non-CEO duality works as a device to reduce the agency costs of entrenchment effects.

Yeo et al. (2002) examine the influences of managerial ownership and external unrelated block holdings on the informativeness of earnings for companies listed on the Stock Exchange of Singapore. Consistent with Gul and Lai (2002), the empirical results of Yeo et al. (2002) indicate a non-linear correlation between managerial ownership and the informativeness of earnings. At a lower level of management shareholding, the informativeness of earnings is positively associated with managerial ownership, which suggests better alignment of interests between managers and shareholders. In contrast, at a higher level of managerial ownership, the informativeness of earnings is negatively associated with managerial ownership,

which suggests that entrenched managers are motivated to engage in non-value-maximizing activities at the cost of shareholders. Using a modified Jones (1991) model, Yeo et al. (2002) further find a non-linear relation between managerial ownership and income-increasing discretionary accruals that is consistent with their evidence regarding the informativeness of earnings.

2.5 Female Participation in Corporate Leadership

Previous studies show that the characteristics of individual executives affect corporate outcomes, such as the quality of financial reporting. Hambrick and Mason's (1984) upper echelons theory indicates that in complex ambiguous situations plagued by multiple and often incompatible goals, managers operate within the bounds of rationality, and that within these bounds their choices can be influenced by their idiosyncratic experiences and values (Hambrick and Mason, 1984; Finkelstein and Hambrick, 1996; Hambrick, 2007; Bamber et al., 2010). Consistent with the notion that women and men behave differently towards risk, extant evidence shows that the gender of top managers plays an important role in accounting decision-making. In response to recent instances of accounting fraud, male corporate domination has been seriously questioned. Kristof (2009) states that the male-dominated situation in financial firms may contribute to the poor

performance of banks. Morris (2009) argues that much of the recent financial crisis resulted from the male domination of banks. To cope with the complex business environments, a management team with genuine gender diversity is essential to a firm's success. Catalyst (2004) notes that gender constitutes an important measure of top management team diversity that includes all of the benefits that a diverse team has to offer. The following studies suggest that women are more cautious in a variety of settings, and that the gender differences towards risk taking lead to specific corporate outcomes.

2.5.1 Gender Differences in Risk Attitudes

The following studies show that women in general are more risk-averse in a variety of contexts. To eliminate the sexual stereotyping of women business owners, Sexton and Bowman-Upton (1990) compare the psychological traits of female and male entrepreneurs. Their sample consists of 105 female members of the Houston Entrepreneurial Resource Service and 69 male entrepreneurs from the Columbus and Ohio areas (Sexton and Bowman-Upton, 1990). Their multivariate results disclose that female entrepreneurs have significantly lower scores than their male counterparts concerning the scales of energy level and risk taking, which indicates that female business owners tend to avoid uncertainties that may lead to potential

financial risk and avoid intense work that requires a lot of energy. In contrast, females receive significantly higher scores on scales of autonomy and change, which suggests that women have a stronger desire for independence and new experiences.

Based on a meta-analysis of 150 studies, Byrnes et al. (1999) examine the differences in risk taking behaviors of male and female participants. Because more than one comparison was made in each of these 150 studies, there are 322 effects in total used to compute the average effect in the same context. Byrnes et al. (1999) find that men are generally more likely to take risks compared to women with the average effects for most types of risk taking reported as significantly greater than 0 and about half of these effects reaching levels greater than 0.20 (Byrnes et al., 1999). Their study also reveals that gender differences in risk taking depend on both contexts and age. Considerable gender differences exist and increase with age in some contexts, such as driving, while relatively small gender differences remain unchanged with age in other contexts, such as smoking, and in contexts such as sexual activities, such differences decrease with age.

Powell and Ansic (1997) investigate gender differences in risk preference regarding financial decision-making. To exclude the impact of the context factors, they conduct two experiments and the degree of risk preference is measured by the frequency of actual choices in each experiment (Powell and Ansic, 1997). Their first experiment is an insurance study and the second is a currency market study. The results indicate that women are more risk-averse than men and that the gender differences are not driven by context factors such as familiarity, framing, costs or ambiguity. In addition, Powell and Ansic (1997) find that the different financial decision strategies that result from gender differences in risk preference do not affect firm performance because the strategy differences are more observable in the short run.

Sunden and Surette (1998) explore gender differences in investment decisions by examining whether males and females make different decisions regarding the allocation of assets in defined contribution (DC) plans. Their sample consists of 3,906 households in 1992 and 4,299 households in 1995. There are three investment choices reported in the Surveys of Consumer Finances (SCF) for DC plans: (1) invest mostly in stocks; (2) invest mostly in interest earning assets; and (3) investments split between stocks and interest earning assets (Sunden and Surette,

1998).[10] After controlling for demographic, financial and attitudinal characteristics, Sunden and Surette's (1998) results reveal that the combination of gender and marital status plays an important role in deciding the allocation of assets in DC plans. Specifically, the possibility of single women and married men investing mostly in stocks is lower than that for single men, but there is no significant difference between married women and other groups in relation to investing mostly in stocks. In addition, the probability of married women investing mostly in bonds is lower than it is for single women.

Using gender as a proxy for overconfidence, Barber and Odean (2001) test whether male investors tend to trade more excessively compared to their female counterparts. As the psychology literature documents, males tend to be more overconfident than females in the certain areas, including finance. Therefore, Barber and Odean (2001) predict that men trade more excessively than women and such excessive trading will do more damage to the performance of men than that of women. Based on the gender of the account opener, they split the sample into two sub-samples and compare the common stock investments of households during the period from 1991

[10] The data are collected from the Surveys of Consumer Finances (SCF), which is a triennial survey sponsored by the Federal Reserve Board and Statistics of Income (Sunden and Surette, 1998).

to 1997 to reveal that men trade 45 percent more than women and excessive trading reduces men's net returns by 2.65 percentage points a year compared to 1.72 percentage points for women. These results are consistent with the notion that male participants are overconfident and, thus, more likely to engage in irrational excessive trading.

Olsen and Cox (2001) investigate whether gender differences in risk-taking attitudes exist within groups of professional investors. Their survey focuses on two groups of professionals. The first consists of 209 anonymous Chartered Financial Analysts (CFAs), of whom 42 (20 percent) were women, and the second consists of 274 Certified Financial Planners (CFPs), of whom 99 (36 percent) were women (Olsen and Cox, 2001). Their findings indicate that female professional investors are more likely to emphasize the possibility of loss and ambiguity than their male counterparts. This is consistent with Lopes's (1987) argument that women are classified as security-prone decision-makers because they pay more attention to potential risks when making investment decisions. Furthermore, their results also show that a gender difference does exist in portfolio construction and that it is most significant for extremely low- or extremely high-risk financial assets.

Watson and McNaughton (2007) provide evidence of the impact of gender differences on retirement investment choices in an Australian context. Their data come from the superannuation fund provider for an Australian university staff, from which the retirement fund information is available for the period from 1997 to 2003. There are two Unisuper fund member categories: members whose retirement funds are predetermined based on their years of service and salary and members whose retirement funds are determined by the performance of Unisuper's investment. Watson and McNaughton (2007) focus on the second group to test the gender effects on superannuation investments and show that after controlling for age, income and education, women prefer more conservative investment plans with low risks compared to men. Watson and McNaughton (2007) further report that women are more likely to receive lower retirement benefits compared to men, and that lower income is the main cause of these lower benefits.

2.5.2 Female Executives and Corporate Outcomes

Since the mid-1990s, fierce global competition and complex business environments have called for greater diversity in management teams. Catalyst (2004) notes that gender diversity is crucial to a diverse management team. The increasing number of female top managers over the past decade is continuously expanding, women play

ever more vital roles in corporate leadership. There are a considerable number of studies that focus on the influences of women executives on corporate firms and the empirical findings suggest that the presence of women in top management teams signals benefits to the firm.

2.5.2.1 Female Executives and Firm Performance

Welbourne (1999) explores the impact that female presence within a top management team has on the short-term and long-term performance of IPO firms. Welbourne (1999) notes that the effect of female presence within a top management team on short-term performance is an indicator of how investors evaluate such presence, whereas the effect it has on long-term performance is an indicator of whether investors are making informed decisions. The short-term performance is measured by Tobin's Q while the long-term performance is measured by stock price growth and earnings per share (EPS). He selects 585 firms that went public in 1993 and then investigates the impact of the gender diversity of their top management team on firm performance based on a time-series study. He mainly collects data from the prospectus documents, which provide firm information to the Securities and Exchange Commission (SEC) before the public offering and finds that female

participation in top management has a positive impact on short-term performance, three-year stock price growth and growth in earnings per share.

Catalyst (2004) examines the impact of gender diversity in top management teams on the financial performance of 353 Fortune 500 companies from 1996 to 2000.[11] Return on equity (ROE) and total return to shareholders (TRS) are used as proxies for the financial performance of the sample firms and the empirical results show that firms with the highest percentage of females in their top management teams have a 35.1 percent higher ROE and a 34 percent higher TRS compared to firms with the lowest percentage of female managers (Catalyst, 2004). When examining the impact of female representation by industry, they find that firms with the highest percentage of females have a relatively higher ROE than firms with the lowest percentage of female managers in all five industries studies. Similarly, the TRS is higher for firms with the largest proportion of female managers in four out of the five industries studies. In general, these results disclose that gender diversity has a positive impact on business outcome, particularly corporate financial performance.

[11] Catalyst (2004) states that the second half of the 1990s represents a time of considerable economic growth, and gender diversity information from the Catalyst-compiled database is consistent and reliable during this period.

Using a sample of 679 Fortune 1000 listed firms for 1998, Krishnan and Park (2005) extend the gender diversity literature by examining the link between the percentage of women in top management teams and Fortune 1000 firm performance. They argue that the proportion of women in top management teams should have a positive impact on the performance of Fortune 1000 listed firms because of the extraordinary leadership styles and interpersonal skills of female managers. In addition, Krishnan and Park (2005) test the possible moderating effect of environmental characteristics on the relation between the presence of female managers and organizational performance. As predicted, their findings suggest that the presence of female top managers benefits the Fortune 1000 listed firms in terms of the ROA averaged over a 3-year period. However, they fail to prove that the environmental characteristics, including munificence, dynamism and complexity, affect the association between female presence and firm performance.

Based on the data from the 2,500 largest Danish firms from 1993 to 2001, Smith et al. (2006) attempt to link management diversity to firm performance. Management diversity is proxied by the percentage of female CEOs within firms and the percentage of female directors on boards. They report that the presence of females in top management teams and on boards of directors has a positive impact on firm

performance. Further, their empirical evidence shows that the positive relation between female CEOs and firm performance is mainly driven by female CEOs with university degrees. In addition, the female directors elected by staff tend to have a stronger impact on firm performance. However, these results disappear after controlling for other firm-specific factors. Smith et al. (2006) argue that due to the relatively small number of female CEOs in Danish firms, the panel estimates might be determined under statistical uncertainty. They also note that there could be very few firms with female managers in their top management teams that perform well in other aspects (Smith et al., 2006).

2.5.2.2 Female Executives and Accounting Earnings

Krishnan and Parsons (2008) analyze the link between earnings quality and gender diversity in senior management teams. Using the gender diversity data of the Fortune 500 firms from Catalyst et al. (2004) for the period from 1996 to 2000, Krishnan and Parsons (2008) compare the accounting conservatism, earnings smoothness, loss avoidance tendencies and earnings persistence of firms with high and low gender diversity. According to the first and fourth quartiles of gender diversity rankings, they categorize their sample into high and low gender diversity groups. Although there is no evidence indicating that a higher proportion of female

managers in the senior management team leads to higher earnings quality, it is found that earnings quality tends to be higher for the high gender diversity sample group compared to that of the low gender diversity sample group. These results suggest that increased gender diversity in senior management teams is positively associated with earnings quality.

Francis et al. (2009) examine the impact of gender differences on accounting conservatism. They focus on a group of firms who experience a male-to-female CFO transition, and compare the degree of reporting conservatism between pre- and post-transition periods. Because females are believed to be more risk-averse than males, female CFOs are expected to be more cautious about recognizing good news to reduce the risks of overstatement. Hence, the female CFOs should conduct their financial reporting in a more conservative manner compared to their male counterparts. As expected, the results disclose a significant increase in accounting conservatism in the post-transition period compared to the pre-transition period. However, firms also display a significant decrease in accounting conservatism when they experience a female-to male CFO transition. Consistent with the gender effects on financial reporting practices, these results remain unchanged after controlling for

the effects of corporate governance, CFO ownership and concurrent CEO turnover (Francis et al., 2009).

Barua et al. (2010) investigate the relation between Chief Financial Officer (CFO) gender and the quality of accounting accruals. Based on Kothari et al. (2005) and Dechow and Dichev (2002), both the performance matched abnormal accruals and the accrual estimation errors are used to measure accruals quality. Using a sample of 2,781 firm-year observations for the performance-matched accrual analysis and a sample of 2,622 firm-year observations for the Dechow and Dichev (2002) accruals quality analysis, Barua et al. (2010) reveal a positive association between the presence of female CFOs and the quality of accruals. Their results show that firms with female CFOs are more likely to have a lower level of absolute abnormal accruals and accrual estimation errors. This is consistent with the literature, which documents that women tend to be less aggressive and more risk-averse in business and financial decision making contexts, which consequently ensures a higher accounting accruals quality.

2.5.2.3 Female Executives and Investment Decision Making

Using gender as a proxy for overconfidence, Peng and Wei (2006) examine the influence of gender differences on corporate investment decisions. Malmendier and Tate (2005) find that the overconfident CEOs tend to make corporate investments that are more sensitive to cash flow, particularly for equity-dependent firms. Given that men are considered to be more overconfident than women, Peng and Wei (2006) aim to show that the investment-cash flow sensitivity is lower for firms with female executives. They define female top executives as female CEOs, female CFOs and Chairwomen, because such titles represent the most powerful individuals within a firm who are the most responsible for investment decisions (Peng and Wei, 2006). As expected, they report a significant negative association between female executives and investment-cash flow sensitivity, which suggests that the investment decisions made by females are less sensitive to cash flow compared to those made by males. In addition, this gender effect is even more significant in equity-dependent firms.

Huang and Kisgen (2009) explore the difference between male CFOs and female CFOs making financing or acquisition decisions. Taking a difference-in-differences approach around executive transitions, their final sample consists of 3,812 firm-year observations with 584 cases of male-to-male transitions and 73 cases of male-to-

female transitions (Huang and Kisgen, 2009). Consistent with previous evidence that men tend to be more overconfident while women tend to be more risk-averse, their results show that female CFO-led firms are less likely to make acquisitions and issue debts than male CFO-led firms. In terms of the market reactions to these financial decisions, Huang and Kisgen (2009) find that the acquisitions, debt offerings and equity offerings made by female CFO-led firms usually have higher announcement returns, which suggests that investors perceive the presence of a female CFO as an asset within a firm.

2.6 Information Asymmetry and Firm Age

It is assumed that both the managers of firms and the market are well informed of non-firm-specific information, such that there will be no difference in the market-wide uncertainty of insiders and the market. However, managers have private access to firm-specific information that is not acquired by the market and there is high information asymmetry between managers and the market when insiders obtain a large amount of value-relevant, firm-specific information. In contrast, there is low information asymmetry between managers and the market when insiders obtain a small amount of value-relevant, firm-specific information. Dierkens (1991) argue that the firm-specific information known by managers is eventually transferred to

the market, either through the passage of time or an information-releasing event. Until then, the market has to face a certain level of firm-specific uncertainty. A number of studies show that there are greater information asymmetries for younger firms and fewer information problems for older firms.

Diamond (1989) develops a model to analyze the incentive effects of reputation in an effort to reduce conflicts of interest in debt markets. Specifically, he examines the joint effects of adverse selection and moral hazard on reputation to mitigate the incentive problems between borrowers and lenders engaged in making investment decisions. Diamond (1989) notes that incentive problems can be more severe for young firms with short credit records and less severe for old firms with good reputations. These results indicate that young firms tend to engage in risky, low-value projects without the incentive effects of reputation while old firms pursue safe projects with high expected returns rather than taking on risky projects with high maximum returns. For new borrowers, when there is widespread adverse selection in the debt market the interest rates are high and the present value of rents from an established reputation are low for firms with short credit records. Once a good reputation has been established, the interest rates decline and the present value of rents from an established reputation increases.

Using firm age as a proxy for earnings uncertainty, Lang (1991) tests whether the informativeness of earnings depends on the level of uncertainty about the time series of earnings. Because the informativeness of earnings, proxied by the stock price response to earnings announcements, is affected by the extent to which the investors value the earnings information, earnings tend to be more informative when there is less firm-specific information available to investors. However, earnings also tend to be less informative when more firm-specific information on previous earnings is available for time-series parameter estimation. Consistent with the notion that information uncertainty about earnings decreases with firm age, Lang (1991) shows that the magnitude of the stock price reaction to unexpected earnings decreases over time. Overall, these empirical findings support the assumption that the informativeness of earnings is positively related to the information asymmetry between insiders and the market.

Focusing on small enterprises, Berger and Udell (1995) examine the impact of the bank-borrower relationship on bank loan contract terms. Although they find that information problems are more severe for small firms compared to their larger counterparts, they also determine that good relationships with banks might help

alleviate such problems and facilitate in the acquisition of more favorable loan contract terms. The data are from NSSBF, which provides extensive survey data covering about 3,400 small businesses. The bank-borrower relationship is measured by firm age, which captures the firm-specific information made available to the entire market. Berger and Udell (1995) find that older firms with longer bank-borrower relationships enjoy lower interest rates and are less likely to pledge collateral. Their results suggest that information asymmetry diminishes gradually after the firm has built a relationship with the bank, as more private information about the borrower is revealed during that period.

Based on a sample of 98 initial public offers of straight debts from 1971 to 1994, Datta et al. (1999) examine whether the bank-firm relationship, which is proxied by firm age, affects the cost of public debt. Considering that bank creditors offer effective monitoring to borrowers, Datta et al. (1999) discover that the existence of bank debt, which is considered a proof of creditworthiness, reduces the monitoring and bonding costs of public debt capital. Hence, they compare the at-issue yield spreads for the initial public straight bond offers issued by firms with and without banking relationships. Their OLS results reveal that bank debt reduces the at-issue spread by 68 basis points on average, which indicates that bank-firm relationships

are greatly valued in public debt pricing. In addition, taking firm age as a proxy for reputation, Datta et al. (1999) find that firm reputation is reversely associated with the at-issue yield spread for initial public debt offers, which is consistent with Diamond's (1989) assertion that firms with good reputations enjoy lower interest rates compared to those with a short track record. In addition, Datta et al. (1999) show that the length of a banking relationship significantly lowers the cost of external debt capital.

Pittman and Fortin (2004) investigate the association between auditor choice and cost of debt for newly public firms. Young public firms tend to rely heavily on external financing, despite suffering from severe information problems that can have a negative impact on their debt issuance. Therefore, it is assumed that choosing a Big 6 auditor, which ensures the quality of financial reporting, could reduce young firms' cost of debt capital to some extent. Based on a time-series analysis of the influence of auditor choice on the interest rates in young firms' first 9 public years, Pittman and Fortin (2004) find that choosing a Big 6 auditor benefits young public firms in terms of debt pricing. Although the influence of auditor choice decreases significantly with the age of public firms, those with short private histories benefit even more from hiring a Big 6 auditor in their early public years. Pittman and

Fortin (2004) conclude that the economic value of auditor reputation declines with age as borrowers shift toward exploiting their own reputations to reduce information asymmetry.

2.7 Summary

This chapter reviews the relevant literature on ICFR, the informativeness of earnings, managerial ownership, female executives and information asymmetry. ICFR received significant attention after the passage of the Sarbanes-Oxley Act (SOX) in 2002, such that the existing studies mainly focus on the impact of ICWs on earnings quality, stock prices and cost of capital. However, the empirical evidence is mixed. The informativeness of earnings, measured by the earnings–return relation, captures the extent to which accounting information is capitalized into stock prices. This measure has been widely documented to truly reflect the credibility of accounting earnings. Reviews of the literature on managerial ownership show that the role of management shareholdings remains mixed in different contexts. Female top managers are seen as valuable assets because they have a positive impact on firm performance, accounting earnings and financial decision-making. In addition, previous studies show that the information problems between insiders and outsiders diminish with firm age.

Chapter Three

Hypotheses Development

3.1 Introduction

This chapter develops the five hypotheses central to my thesis. Section 3.2 presents the theoretical and empirical evidence and develops Hypothesis One, which addresses the impact of material weakness on the informativeness of earnings. Section 3.3 develops Hypothesis Two, which addresses how managerial ownership affects the association between material weakness and the informativeness of earnings. Section 3.4 presents Hypothesis Three, which addresses whether the influence of managerial ownership on the relation between material weakness and the informativeness of earnings varies with the magnitude of information asymmetry between insiders and outsiders. Section 3.5 develops Hypothesis Four, which addresses the impact of female executives on the relation between material weakness and the informativeness of earnings. Section 3.6 develops Hypothesis Five, which addresses whether the impact of female executives varies with different levels of information asymmetry. Section 3.7 summarizes the chapter.

3.2 **Material Weakness Disclosures and the Informativeness of Earnings**

Accounting earnings have generally been evaluated using different analytic models. To evaluate the usefulness of accounting numbers, they are compared to the standard implied by the model. However, Ball and Brown (1968) claim that an analytical model does not itself assess the significance of departures from its implied measurements, and hence a lack of substantive meanings could imply a lack of utility without any empirical evidence. Canning (1929) states

> "What is set out as a measure of net income can never be supposed to be a fact in any sense at all except that it is the figure that results when the accountant has finished applying the procedures which he adopts."[12]

As a result, the empirical evaluation of accounting numbers proves more meaningful because it allows the market to reflect the usefulness of those numbers. Given that accounting numbers are of particular interests to investors, their investment decisions, which are reflected in the stock prices, can be used to capture the credibility of earnings. Under the efficient market hypothesis, capital markets are both efficient and unbiased in that if information is useful in forming capital asset prices, then the market will quickly adjust asset prices to that information without leaving any

[12] See Ball and Brown (1968) for a detailed discussion.

opportunity for further abnormal gain (Ball and Brown, 1968). Considering that stock prices adjust for all available public information in a timely manner, the changes in stock prices should reflect the flow of information to the market. Hence, the perceived revision in stock prices related to the release of accounting earnings suggests that the information reflected in earnings is useful.

A number of studies have used ERC as a measure of market-based earnings quality, with a higher ERC indicating a higher quality of earnings. Teoh and Wong (1993) find that the ERCs are higher for Big 8 clients than they are for non-Big 8 clients, which suggests that Big 8 auditors generate higher quality earnings that signal higher credibility for investors. Warfield et al. (1995) focus on the influence that managerial ownership has on both earnings' explanatory power for return and discretionary accruals. They show that managerial ownership is positively related to the informativeness of earnings and negatively related to the magnitude of discretionary accruals. Subramanyam and Wild (1996) examine the role that a firm's going-concern status plays in determining earnings' usefulness and report that the informativeness of earnings is inversely related to a firm's probability of termination. Fan and Wong (2002) investigate the association between corporate ownership structure and financial reporting quality in seven East Asian economies and find that

both highly concentrated ownership and separated ownership and control impair the informativeness of earnings to investors in East Asia. In contrast to Warfield et al. (1995), Gul and Lai (2002) show that the impact of insider shareholding on the informativeness of earnings relies on the level of shareholding. Specifically, at a medium level of shareholding, insider shareholding is positively related to the informativeness of earnings, whereas at a high level of shareholding, it is negatively related. Similarly, Yeo et al. (2002) examine the relation between managerial ownership and the informativeness of earnings for firms listed on the Stock Exchange of Singapore and find that the level of managerial ownership does, indeed, matter. Based on Warfield et al. (1995), Gul et al. (2002) find that higher audit quality moderates both the positive association between the informativeness of earnings and managerial ownership and the negative association between the discretionary accruals and managerial ownership. In their exploration of the differences in the credibility of earnings for firms with dual-class and single-class ownership structures, Francis et al. (2005) find that dual class firms have more informative earnings, with dividends that are at least as informative as those of single class firms. Wang (2006) focuses on the relation between founding family ownership and earnings quality and the results show that founding family ownership enhances

earnings quality, which produces higher earnings informativeness, lower abnormal accruals and less persistence of transitory loss components in accounting earnings.

According to PCAOB (2007), a material weakness in internal control implies that a material misstatement of a firm's financial statements will not be prevented or detected in a timely manner. Therefore, internal control weakness disclosures under either Section 302 or Section 404 could provide useful information on earnings quality. This suggests that ICWs can affect earnings quality in two different ways. One way is through unintentional misstatement due to insufficient internal control resources such as policies, training or employee diligence. Examples include "inventory counting and pricing errors that misreport inventory on hand and related cost of sales, omission of items such as failure to record credit purchases, variation in revenue recording due to lack of specific policies (or employee discretion) for revenue recognition, expensing amounts that should be capitalized and vice versa, inadequate basis for accounting estimates such as the allowance of inventory obsolescence, and unreliable procedures or rolling up amounts from segments and subsidiaries" (Ashbaugh-Skaife et al., 2008). The other way is through the intentional misstatements of employees or managers. Ashbaugh-Skaife et al. (2008) argue that this type of non-random misstatement typically overstates earnings for the

current period, but “big bath” write-offs or cookie jar reserves can also result in the opportunistic understatement of current earnings.

The literature has linked the effectiveness of internal controls with earnings quality under Sections 302 and 404 of SOX, such that the majority of related studies show that internal control weakness disclosures convey negative information on earnings quality. Bedard (2006) shows that the new provisions of Sections 302 and 404 of SOX improve the earning quality measured by unexpected accruals. More specifically, the level of unexpected accruals increases in the weakness disclosure year under both Sections, which suggests that managers voluntarily or mandatorily reverse previous accruals in the disclosure year. Firms which achieve effective internal control under 404 also experience a decrease in the magnitude of unexpected accruals in their first reporting year, which indicates that enhanced internal control reduces the magnitude of unexpected accruals.

Doyle et al. (2007) explore the relation between internal control weakness reports under Sections 302 and 404 and accruals quality. They demonstrate that material weaknesses are associated with poorly estimated accruals that are not realized as

cash flows under Section 302, whereas there is no difference in the accruals quality between material weakness firms and non-weakness firms under Section 404.

Chan et al. (2008) investigate whether firms with ICWs under Section 404 of SOX are more likely to engage in earnings management compared to firms with no such weaknesses. Consistent with their hypothesis, internal control weakness firms tend to have more positive discretionary accruals and absolute discretionary accruals than non-internal control weakness firms.

Ashbaugh-Skaife et al. (2008) note that firms that report ICWs under Sections 302 and 404 have greater accrual noise and larger abnormal accruals, which suggests that ICWs inversely affect accruals quality through unintentional errors rather than through intentional earnings management. Compared to firms that fail to remediate previously reported weaknesses, firms that successfully manage to remediate such weaknesses tend to have improved accruals quality.

Evidence of market reactions to the earnings of firms with ICWs is scarce. Gong et al. (2009) compare cross-listed firms with U.S. firms to provide evidence of the association between internal control weakness disclosures under Section 302 of SOX

and earnings quality as proxied by the informativeness of earnings. They document that the Section 302 disclosures of U.S. firms convey value relevant information on earnings quality, whereas the disclosures of cross-listed firms are barely related to the informativeness of earnings. They also argue that the weaker results of cross-listed firms are driven by managers' incentive to conceal existing ICWs from outside investors.

Based on the existing evidence, I conclude that strong internal controls ensure the credibility of financial reporting, whereas weak internal controls allow both intentional and unintentional misstatements. Hence, firms with internal control problems tend to have lower earnings quality while firms with no such problems tend to have more reliable accounting earnings. Because investors cannot directly observe earnings quality, they rely on reported accounting numbers for their valuations. As a result, the market expects less reliable accounting information from material weakness firms compared to those provided by non-material weakness firms and this decrease in the credibility of accounting earnings reduces the informativeness of earnings. In other words, internal control weakness disclosures are supposed to provide investors with negative information on earnings quality. Thus, the informativeness of earnings will be attenuated by material weakness

disclosures. Because the disclosure of material weaknesses is voluntary under Section 302 but mandatory under Section 404 of SOX, focusing on Section 404 disclosures helps avoid self-selection biases.

For the above mentioned reasons, I posit the following hypothesis (in its alternative form):

H1: Ceteris paribus, earnings are less informative for material weakness firms under Section 404 of SOX when compared to those for non- material weakness firms.

3.3 Managerial Ownership, Material Weakness Disclosures and the Informativeness of Earnings

The separation of ownership and control gives rise to agency problems between managers and shareholders in modern diffuse ownership firms (Lafond and Roychowdhury, 2008). An agency relationship is a contract under which the principal engages the agent to perform some service on their behalf that involves delegating some decision making authority to the agent (Jensen and Meckling, 1976). When the interests of managers and shareholders are not perfectly aligned, agency conflicts arise between the two parties. If both parties are interested in maximizing their own utilities, it is very likely that managers will choose to transfer wealth from

shareholders to themselves. However, there are ways for shareholders to limit such divergences from their interests by establishing certain incentive mechanisms. Managerial shareholding is believed to be a key example of such a mechanism that facilitates efficient contracting between managers and shareholders.

Consistent with Jensen and Meckling (1976), managerial ownership is known to act as a monitoring mechanism that better aligns the interests of managers and shareholders, which consequently reduces agency problems between the two parties. Lafond and Roychowdhury (2008) argue that when managerial ownership is high, any increase in personal wealth that manager expects to gain from overstating current earnings and transferring wealth from external shareholders is offset by an eventual decline in firm value when these overstatements reverse in the future. Hence, when the level of managerial ownership is high, managers are disciplined to maximize shareholders wealth. In contrast, when the level of managerial ownership is low, managers are more likely to engage in self-maximizing activities. Empirical evidence suggests that managerial ownership helps address the agency problems between managers and shareholders (Warfield et al., 1995; Gul et al., 2002; Core and Larcker, 2002; Gul et al., 2003; Lafond and Roychowdhury, 2008).

The association between managerial ownership and the informativeness of earnings is documented. Consistent with the agency theory argument, a number of previous studies report that managerial shareholdings have a positive impact on the informativeness of earnings. Warfield et al. (1995) investigate how the separation of corporate ownership and control affects both the informativeness of accounting earnings and the accounting choices of managers. Consistent with the role of managerial ownership in alleviating agency conflicts, their results indicate that managerial ownership is positively related to the informativeness of earnings and negatively related to the magnitude of discretionary accruals. These findings suggest that as the contracting role of accounting earnings becomes increasingly important for firms with low managerial ownership, the compensation-driven discretionary accruals tend to be larger and, therefore, the informativeness of earnings tends to be smaller for these firms.

Using Australian data, Gul et al. (2002) reexamine the association between managerial shareholding and the informativeness of earnings and additionally explore whether audit quality moderates this relation. They find that managerial ownership is positively related to the informativeness of accounting earnings, but that the association relies on auditor quality, specifically Big 6 versus non-Big 6

auditors. These results suggest that audit quality mitigates the agency conflicts that arise from the separation of ownership and control (Gul et al., 2002).

In addition, the following studies provide some supporting evidence that managerial ownership reduces managerial opportunism and, hence, improves earnings quality. Gul et al. (2003) find that the magnitude of discretionary accruals is positively related to audit fees and that this relation grows weaker in firms with a high level of managerial ownership. Lafond and Roychowdhury (2008) discover that firms with a lower level of managerial ownership display more conservative accounting earnings.

Another stream of studies shows that the level of managerial ownership matters. It is plausible that when the level of managerial ownership gets high, it becomes difficult to discipline managers who pursue self-maximizing activities at the cost of shareholders' interests. Rather than aligning the interests of managers and shareholders, managerial ownership can deteriorate agency conflicts within firms. Gul and Lai (2002) show that when the alignment effect remains dominant at a medium level of insider shareholding, the informativeness of earnings is positively related to insider shareholding, such that when the entrenchment effect remains dominant at a high level of insider shareholding, the informativeness of earnings is

negatively related to insider shareholding. Using Singaporean data, Yeo et al. (2002) show that at a low level of ownership, managerial ownership increases the informativeness of earnings, whereas at a higher level of ownership, it decreases the informativeness of earnings.

Although some evidence indicates that management shareholding provides opportunities for managers to pursue self-interested, non-value-maximizing activities when the level of shareholding gets high, I consider this effect to be less important than the reduction in agency costs that results from managerial shareholding for the following reasons. First, the level of managerial ownership is relatively low for ExecuComp sample, because it only covers firms in the S&P 1500 index. Second, I assume that such opportunistic activities will be regulated to some extent in countries with strong legal systems and institutional environments, such as in the U.S.

Consistent with the traditional agency theory, I believe that managers with stakes in their firms are less likely to engage in managerial opportunism, because the misbehavior is also costly for them. An increase in shares in their firms aligns the interests of managers and shareholders such that the agency costs are greatly

reduced. In addition, if managerial ownership addresses the agency conflicts between managers and shareholders, I expect that the larger the percentage of managerial shareholding, the better the alignment of interests between managers and shareholders. Because managers have both the means and incentives to oversee the quality of financial reporting, the market expects firms with a high level of managerial ownership to provide more reliable accounting numbers than others. This perception ensures the quality of financial reporting and subsequently increases the informativeness of earnings.

A firm's internal control weakness disclosures under Sections 302 and 404 of SOX signal that it cannot ensure the credibility of its financial reports due to the incidence of unintentional misrepresentation or intentional manipulation. Consequently, ICW reports are also likely to reduce the informativeness of earnings. However, a higher level of managerial ownership can improve the informativeness of earnings and moderate the negative impact of internal controls on the credibility of earnings. Therefore, the negative association between ICWs and the informativeness of earnings is attenuated for firms with a high level of managerial ownership.

Based on this discussion, I propose the following hypothesis (in its alternative form):

H2: Ceteris paribus, managerial ownership moderates the negative association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX.

3.4 Firm Age, Managerial Ownership and the Effect of Material Weakness Disclosures on the Informativeness of Earnings

The literature shows that the level of information asymmetry decreases with a firm's age. Diamond (1989) examines the impact that a firm's reputation has on incentive problems in the debt market. Debt contracts create incentives for borrowers to pursue risky, less profitable projects. Diamond (1989) notes that young firms suffer from more severe adverse selection and moral hazard problems. Consistent with the prediction, the conflicts of interests between borrowers and lenders are most severe in the early years of firms with short track records and, less severe for firms with a good credit history.

Lang (1991) investigates whether the informativeness of earnings depends on the level of earnings uncertainty. It is assumed that information asymmetry diminishes with firm age and, therefore, that the informativeness of earnings decreases correspondingly as more firm-specific information is revealed over time. The results

show that the magnitude of the stock price reaction to unexpected earnings decreases with firm age, which is consistent with the prediction that investors heavily value the level of unexpected earnings when limited information on previous earnings is available.

Berger and Udell (1995) explore the impact of the bank-borrower relationship on the price and non-price terms of loan contracts. They predict that information problems will decrease with firm age as more private information is released over time once a bank-borrower relationship is established. Berger and Udell (1995) find that firms with a longer bank-borrower relationship enjoy lower interest rates and are less likely to pledge collateral, which suggests that long-term relationships with banks mitigate asymmetric information problems through the release of more private information, such that these firms are able to earn more favorable contract terms.

Datta et al. (1999) test whether a relationship with the bank helps reduce public debt borrowing costs. Firm age is used as a proxy for reputation, which also captures the magnitude of information asymmetry related to the firm. Consistent with Diamond's (1989) reputation building argument, Datta et al. (1999) find that firm age is

negatively related to the at-issue yield spread for initial public debt offers, which suggests that banking relationships help borrowing firms reduce the monitoring and bonding costs associated with public debt capital.

Pittman and Fortin (2004) establish a link between the auditor choice and cost of debt for firms with short private histories. Consistent with the argument that high-quality audits ensure the credibility of financial reporting and, consequently, reduce the monitoring costs of debtholders, their results indicate that young firms audited by Big-6 auditors tend to have lower interest rates. In addition, the impact of Big-6 auditors on firms' borrowing costs diminishes over time because firms largely suffer the more severe information problems in their early age.

Many believe that firms reporting ICWs under Sections 302 and 404 of SOX are very likely to have intentional and unintentional errors in their ICFR. Compared to firms without internal control weaknesses, the informativeness of earnings is lower for firms with ICWs (Bedard, 2006; Doyle et al., 2007; Chan et al., 2008; Ashbaugh-Skaife et al., 2008; Gong et al., 2009). Because managerial ownership helps reduce agency costs within firms, firms with a higher level of managerial ownership tend to have higher earnings quality (Warfield et al., 1995; Gul et al., 2002; Gul et al., 2003;

Lafond and Roychowdhury, 2008). Thus, managerial ownership attenuates the negative association between ICW disclosure and the informativeness of earnings. Pittman and Fortin (2004) suggest that information problems steadily subside with age as firms' accumulate histories in the capital markets. Previous studies provide empirical evidence that there are more severe information problems for young firms with short track records and less severe information problems for old firms with long track records. Considering the greater uncertainty regarding the earnings of young firms, I believe that the moderating effect of managerial ownership will be stronger for young firms.

Following this reasoning, I posit the third hypothesis (in its alternative form):

H3: Ceteris paribus, the moderating effect of managerial ownership on the association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX will be stronger for young firms.

3.5 Female Executives, Material Weakness Disclosures and the Informativeness of Earnings

A surge in the number of women participating in corporate management in the last decade has brought much attention of the politicians and researchers to the influence

of female top managers. In the psychology and economic literature, women are documented to be more risk-averse than men in a variety of contexts. In general, Byrnes et al. (1999) find that men are more likely to take risks compared to women, but that the gender differences vary according to context and age. Similarly, female entrepreneurs are more risk-averse, on average, than their male counterparts (Sexton and Bowman-Upton, 1990). Some studies show that women are more conservative when making financial investment decisions (Powell and Ansic, 1997; Barber and Odean, 2001; Olsen and Cox, 2001). Other research discloses that women prefer less risky retirement options compared to men (Sunden and Surette, 1998; Watson and McNaughton, 2007).

The psychology literature illustrates that women are more conservative in terms of risk taking for two reasons. First, the gender differences in risk preference are determined by biological factors. Zuckerman (1994) finds that women produce higher levels of the enzyme monoamine oxidase, which inhibits sensation seeking and limits risk taking behavior. LaBorde Witt (1994) notes that women are more risk-averse due to their responsibility for reproduction. In contrast, male fitness is believed to have been derived from success in risky competitions (Wilson and Daly 1985). In addition, men appear to attract a mate and support their offspring through

engaging in risk taking behavior. Second, these gender differences are also driven by socio-cultural factors. Slovic (1966) suggests that peer pressure and social expectations shape the cultural gender roles of young minds in childhood. As a result, males grow to love risk, while females develop more of an aversion to it. Moreover, Byrnes (1998) argues that the conservative risk preferences of women are related to more restrictive parental monitoring in their early years.

Moreover, anecdotal evidence suggests that women put greater emphasis on ethical issues than men. Betz et al. (1989) show that men are two times as likely as women to engage in unethical actions. Bernardi and Arnold (1997) discover that female managers have a significantly higher level of moral development, on average, compared to their male counterparts. Bernardi and Arnold (1997) state that men are more concerned about money, whereas women are more concerned about self-fulfillment and independence. Cohen et al. (1998) find that women consider questionable actions to be less ethical and are less likely to perform these actions compared to men. These gender differences in ethical evaluation are even more significant in deontological and justice reasoning, which suggests that women are more sensitive to deontological and justice issues. Overall, women are believed to be

more interested in helping people and building relationships and men are believed to be more interested in making money and achieving other tangible goals.

Consistently, accounting and finance studies provide supporting evidence that firms with female top managers tend to have better firm performance (Welbourne, 1999; Alder, 2001; Catalyst, 2004; Krishnan and Park, 2005; Smith et al., 2005), more reliable accounting earnings (Krishnan and Parsons, 2008; Francis et al., 2009; Barua et al., 2010) and less aggressive investment decisions (Peng and Wei, 2006; Huang and Kisgen, 2009). The following studies link female participation in the top management team with earnings quality. Krishnan and Parsons (2008) examine the impact that the gender diversity of the senior management has on the quality of reported accounting earnings. Using multiple proxies of earnings quality to reduce measurement error, they compare the earnings quality of firms with high gender diversity to the earnings quality of firms with low gender diversity from 1996 to 2000 and find that earnings quality is positively related to the gender diversity of top management teams.

Francis et al. (2009) explore the relation between the gender of a firm's CFO and the degree of conservatism in its financial reporting and find that the presence of a

female CFO is positively related to accounting conservatism. Compared to firms with male CFOs, firms with female CFOs tend to be more cautious in recognizing gains than losses and recognize bad news in a timelier manner (Francis et al., 2009).

Barua et al. (2010) focus on the association between the gender of a firm's CFO and the quality of its accruals. Based on a sample of 2,781 for the performance-matched accrual analyses and 2,622 for the accrual estimation error analyses, their results suggest that firms with female CFOs tend to have lower levels of absolute abnormal accruals and lower accrual estimation errors.

The literature shows that females display lower risk preference and have a greater concern for ethical issues in a variety of areas. It follows that if women are less likely to engage in risky and unethical behavior, then firms led by female top managers should be less tolerant of opportunistic earnings management. As a result, the presence of women in firms' top management teams should ensure the credibility of accounting earnings. Meanwhile, the market should signal the participation of female executives in corporate management as an assurance of earnings quality which should, in turn, enhance the informativeness of earnings. Rather than focusing on female CFOs, I investigate the impact of top female executives on the association

between the informativeness of earnings and internal control weakness disclosures. Although CFOs do play an important role in financial reporting, financial decision making is the result of the decisions of a group of corporate managers. Studies note that a number of insiders are responsible for financial reporting, including Chairs, Vice-Chairs, Presidents, CEOs, CFOs, COOs and Vice-Presidents of Finance (Flatt, 1996; Beasley et al., 1999; Dunn, 2004). Therefore, accounting earnings can be influenced by any combination of these top executives.

When firms report ICWs under Sections 302 and 404 of SOX, the market expects that their ICFR has become problematic (Bedard, 2006; Doyle et al., 2007; Chan et al., 2008; Ashbaugh-Skaife et al., 2008; Gong et al., 2009). Hence, the informativeness of earnings is also greatly reduced. Given that female executives are less likely to engage in risky and/or unethical behavior, investors expect firms with female top managers to have higher earnings quality. It is also assumed that the presence of female executives increases the informativeness of earnings and therefore moderates the negative association between material weaknesses and the informativeness of earnings.

Based on the abovementioned rationale, I state the following hypothesis (in its alternative form):

H4: Ceteris paribus, the presence of female executives moderates the negative association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX.

3.6 Firm Age, Female Executives and the Effect of Material Weakness Disclosures on the Informativeness of Earnings

Researchers agree that internal control weakness disclosures convey valuable information regarding the quality of firms' financial reporting (Bedard, 2006; Doyle et al., 2007; Chan et al., 2008; Ashbaugh-Skaife et al., 2008; Gong et al., 2009). The market signals the reported ICWs under Sections 302 and 404 of SOX as unreliable accounting numbers. As a result, the earnings are believed to be less informative for firms reporting ICWs under Sections 302 and 404 of SOX. Previous studies provide empirical evidence of the unique corporate leadership roles that women play. Given that women tend to be more risk-averse and more concerned about ethical issues than men (Sexton and Bowman-Upton, 1990; Byrnes et al., 1999; Powell and Ansic, 1997; Sunden and Surette, 1998; Barber and Odean, 2001; Olsen and Cox, 2001; Watson and McNaughton, 2007; Betz et al., 1989; Bernardi and Arnold, 1997;

Cohen et al., 1998), the presence of female executives prevents earnings management and ensures the quality of accounting earnings (Krishnan and Parsons, 2008; Francis et al., 2009; Barua et al., 2010). Hence, investors might perceive the participation of female executives as a positive influence on a firm's earnings quality, which consequently attenuates the negative association between the informativeness of earnings and ICW disclosures. However, the moderating effect of female executives depends on the level of information asymmetry associated with firms. The age of firms has been widely used to measure the degree of information asymmetry and studies document that information problems decrease with age (Diamond, 1989; Lang, 1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004), such that the greater the age of the firm, the lower the degree of information asymmetry. Therefore, I assume that the impact of female executives on the association between the informativeness of earnings and material weakness disclosures decreases over time because information uncertainty is strongest in a firm's early years. In other words, the moderating effect of female executives is stronger in young firms compared to their older counterparts.

For the abovementioned reasons, I posit my last hypothesis (in its alternative form):

H5: Ceteris paribus, the moderating effect of female executives on the association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX will be stronger for young firms.

3.7 Summary

In this chapter, I discuss the relevant theory framework and develop the following five hypotheses for this thesis based on previous research.

H1: Ceteris paribus, earnings are less informative for material weakness firms under Section 404 of SOX when compared to those for non- material weakness firms.

H2: Ceteris paribus, managerial ownership moderates the negative association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX.

H3: Ceteris paribus, the moderating effect of managerial ownership on the association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX will be stronger for young firms.

H4: Ceteris paribus, the presence of female executives moderates the negative association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX.

H5: Ceteris paribus, the moderating effect of female executives on the association between the informativeness of earnings and material weakness disclosures under Section 404 of SOX will be stronger for young firms.

Chapter Four

Research Methodology

4.1 Introduction

This chapter discusses the research methodology I use in my thesis to examine the five hypotheses developed in Chapter Three. Sections 4.2 to 4.6 present the empirical model, sample selection, data sources and descriptive statistics for Hypotheses 1 through 5, respectively. Section 4.7 summarizes this chapter.

4.2 Test of Hypothesis One

4.2.1 The Empirical Model

Based on Warfield et al. (1995), I adopt an OLS regression model test H1. As a proxy for the market-based earnings quality, the informativeness of earnings is measured using the earnings coefficient from the regression of stock returns on earnings (Warfield et al., 1995; Fan and Wong, 2002; Gul and Wah, 2002; Gul et al., 2002; Yeo et al., 2002; Francis et al., 2005). Previous studies suggest that there are a number of variables that relate to the informativeness of earnings, including regulatory environment, firm size, systematic risk, leverage, growth opportunities, earnings variability and earnings persistence (Warfield et al., 1995; Gul and Wah,

2002; Gul et al., 2002; Yeo et al., 2002). In addition, I control for the impact of managerial ownership on the informativeness of earnings because managerial shareholding reduces agency problems and consequently enhances the informativeness of earnings.[13] I also control for the impact of female executives because it is documented that women are more risk-averse and are more concerned with ethical issues.[14] Thus, I assume that firms led by female executives will have more informative earnings. The following model examines H1, which addresses the relation between material weakness disclosures under Section 404 of SOX and the informativeness of earnings.

$$
\begin{aligned}
RETURN_{i,t} &= \alpha_0 + \alpha_1 E_{i,t} / P_{i,t-1} + \alpha_2 MW_{i,t} + \alpha_3 E_{i,t} / P_{i,t-1} * MW_{i,t} + \alpha_4 E_{i,t} / P_{i,t-1} * REG_{i,t} \\
&+ \alpha_5 E_{i,t} / P_{i,t-1} * SIZE_{i,t} + \alpha_6 E_{i,t} / P_{i,t-1} * BETA_{i,t} + \alpha_7 E_{i,t} / P_{i,t-1} * DEBT_{i,t} \\
&+ \alpha_8 E_{i,t} / P_{i,t-1} * MTB_{i,t} + \alpha_9 E_{i,t} / P_{i,t-1} * VAR_{i,t} + \alpha_{10} E_{i,t} / P_{i,t-1} * PERS_{i,t} \\
&+ \alpha_{11} E_{i,t} / P_{i,t-1} * MO_{i,t} + \alpha_{12} E_{i,t} / P_{i,t-1} * FEMAEL_{i,t} + \varepsilon_{i,t} \qquad (1)
\end{aligned}
$$

Where

[13]Assuming that managerial ownership affects the informativeness of earnings, I examine the impact of managerial ownership on the association between ICWs and the informativeness of earnings in H2. Therefore, I control for the effect of managerial ownership in model (1).

[14] Similarly, assuming that female executives affect the informativeness of earnings, I examine the impact of female executives on the association between ICWs and the informativeness of earnings in H4. Therefore, I control also for the effect of female executives in model (1).

$RETURN_{i,t}$: Holding returns for firm i for a window from 9 months before fiscal year-end in year t through 3 months after fiscal year-end.

$E_{i,t} / P_{i,t-1}$: Earnings-per-share in year t scaled by price-per-share at the end of year t - 1.

$MW_{i,t}$: Equals 1 if material weakness is identified under Section 404 of SOX in year t, 0 otherwise.

$REG_{i,t}$: Equals 1 when the firm operates in a regulated industry and 0 otherwise. Regulated industries include: depository institutions (SIC code 60), non-depository credit institutions (SIC code 61), security and commodity brokers (SIC code 62), insurance carriers (SIC code 63), and transportation firms and public utilities (SIC codes 40-49).

$SIZE_{i,t}$: The log of the market value of equity.

$BETA_{i,t}$: Systematic risk as measured by the market model beta. Estimates for each firm are obtained using stock returns from the most recent 60 months before the test period.

$DEBT_{i,t}$: The ratio of total debt to total assets.

$MTB_{i,t}$: The ratio of market value of equity over the book value of equity.

$VAR_{i,t}$: Variability of earnings as measured by the standard deviation of reported earnings for the 20 quarters before the test period.

$PERS_{i,t}$: Persistence of earnings as measured by the first-order autocorrelation in earnings for the 20 quarters before the test period.

$MO_{i,t}$: Percentage of total shares outstanding held by the top five highest paid executives (excluding options) in year t.

$FEMALE_{i,t}$: Equals 1 if there is at least one female executive in the top management team, 0 otherwise.

YEAR: Dummies variables equaling 1 for the year t (t=2004,…,2006), 0 otherwise.

INDUSTRY: Industries dummies based on 2-digit SIC code.

The dependent variable $RETURN_{i,t}$ is the annual return of firm i for year t; $E_{i,t}$ is earnings per share for year t; and $P_{i,t-1}$ is price per share at the end of year t-1. Therefore, α_1 captures the market's response to earnings and is expected to be significantly positive. Consistent with the argument that the market tends to discount the information content of accounting earnings for internal control weakness firms, I expect to discover a negative association between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t}$. If α_3 is significantly negative, H1 will be supported.

To investigate the relation between material weaknesses and the informativeness of earnings, I control for other factors that influence the share price response to earnings. $REG_{i,t}$ is a dummy variable that indicates regulated industries. Warfield et al. (1995) note that regulation constrains opportunistic behavior within firms, which increases the informativeness of earnings. Because larger firms are more likely to suffer from political costs (Watts and Zimmerman, 1978), firm size ($SIZE_{i,t}$) is

controlled using the log of the market value of equity. $BETA_{i,t}$ is used to control for systematic risk because research documents that firm risk can lead to volatile stock returns (Lipe, 1990). $DEBT_{i,t}$ is the ratio of total debt to total assets, and it is found that the earnings-return association decrease with financial leverage (Dhaliwal et al.,1991). The market to book ratio ($MTB_{i,t}$) is controlled as a proxy for growth opportunity because research suggests that growth opportunity is positively related to the informativeness of earnings (Collins and Kothari, 1989). Given the relation between firm risk and earnings variability (Zmijewski and Hagerman, 1981), I predict that $VAR_{i,t}$ will be negatively related to the informativeness of earnings. Following Warfield et al. (1995), I also control for earnings persistence ($PERS_{i,t}$) because more persistent earnings tend to be heavily valued by investors. Research documents that managerial ownership reduces agency costs and enhances earnings quality (Warfield et al., 1995; Gul et al., 2002). Hence, I control for the percentage of shares outstanding held by the top five managers ($MO_{i,t}$). I also include $FEMALE_{i,t}$ to control for the presence of female executives, because the unique leadership styles of female executives are believed to positively affect the informativeness of earnings. YEAR is an indicator variable that controls for year effects from 2004 to 2007 and industry effects (INDUSTRY) are controlled by including industry dummies based on 2-digit SIC codes.

4.2.2 Data and Descriptive Statistics

I only identify material weaknesses among the three types of internal control deficiencies under SOX Section 404 from Audit Analytics because material weakness is the most severe type of internal control deficiency and its disclosure is mandatory. Doyle et al. (2007a) argue that this focus offers the greatest power to the test and helps avoid self-selection biases. The ownership and female executive data are collected from Compustat Executive Compensation (ExecuComp) while the stock returns are from CRSP and the financial statement data are from Compustat. The initial sample consists of all of the U.S. listed firms with available internal control disclosure data under Section 404 of SOX from 2004 to 2007. To conduct empirical tests on my hypotheses, I delete firms with (1) missing data on financial statement items; (2) missing data on stock returns; (3) missing data on managerial ownership; and (4) missing data on female executives. The final sample consists of 2,349 firm-year observations for the period from 2004 to 2007. Panel A of Table1 illustrates the sample selection procedures.

(Insert Table 1 here)

Panel A of Table 2 presents the descriptive statistics for my sample in the analysis of the association between internal control weakness disclosures and the informativeness of earnings under Section 404 of SOX. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers. The means and medians are comparable with the scores reported in previous studies. Panel B of Table 2 provides the Pearson correlation matrix. As expected, $RETURN_{i,t}$ is positively related to accounting earnings ($E_{i,t}/P_{i,t-1}$), and negatively related to material weaknesses disclosures under Section 404 of SOX ($MW_{i,t}$). However, the variable of interest $E_{i,t}/P_{i,t-1} * MW_{i,t}$ is positively related to $RETURN_{i,t}$, which does not seem to support my prediction that investors discount the accounting earnings of internal control weakness firms.

(Insert Table 2 here)

4.3 Test of Hypothesis Two

4.3.1 The Empirical Model

Model 2 analyzes H2 in my thesis. Consistent with previous work, managerial ownership is measured using the top five manager ownerships, excluding shares granted in options (Lafond and Roychowdhury, 2008). Similar to model 1, I include

control variables for regulation environment, firm size, firm risk, leverage ratio, market to book ratio, earnings variability, earnings persistence and the presence of female executives. Consistent with H1, I predict that there will be a negative relation between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t}$, which indicates that firms with material weaknesses tend to have less informative earnings compared to firms with no such weaknesses. If a higher level of managerial ownership provides better monitoring, I assume that there will be a positive association between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$, which suggests that managerial ownership moderates the negative relation between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t}$. Therefore, H2 will be supported if α_7 is significantly positive. I use the following OLS model to test H2, which addresses the impact of managerial ownership on the link between the informativeness of earnings and internal control reports under Section 404 of SOX.

$$RETURN_{i,t} = \alpha_0 + \alpha_1 E_{i,t}/P_{i,t-1} + \alpha_2 MW_{i,t} + \alpha_3 E_{i,t}/P_{i,t-1} * MW_{i,t} + \alpha_4 MO_{i,t} + \alpha_5 E_{i,t}/P_{i,t-1} * MO_{i,t}$$
$$+ \alpha_6 MW_{i,t} * MO_{i,t} + \alpha_7 E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t} + \alpha_8 E_{i,t}/P_{i,t-1} * REG_{i,t} + + \alpha_9 E_{i,t}/P_{i,t-1} * SIZE_{i,t}$$
$$+ \alpha_{10} E_{i,t}/P_{i,t-1} * BETA_{i,t} + \alpha_{11} E_{i,t}/P_{i,t-1} * DEBT_{i,t} + \alpha_{12} E_{i,t}/P_{i,t-1} * MTB_{i,t} + \alpha_{13} E_{i,t}/P_{i,t-1} * VAR_{i,t}$$
$$+ \alpha_{14} E_{i,t}/P_{i,t-1} * PERS_{i,t} + \alpha_{15} E_{i,t}/P_{i,t-1} * FEMALE_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where

$RETURN_{i,t}$: Holding returns for firm i for a window from 9 months before fiscal year-end in year t through 3 months after fiscal year-end.

$E_{i,t}/P_{i,t-1}$: Earnings-per-share in year t scaled by price-per-share at the end of

year t – 1.

$MW_{i,t}$: Equals 1 if material weakness is identified under Section 404 of SOX in year t, 0 otherwise.

$MO_{i,t}$: Percentage of total shares outstanding held by the top five highest paid executives (excluding options) in year t.

$REG_{i,t}$: Equals 1 when the firm operates in a regulated industry and 0 otherwise. Regulated industries include: depository institutions (SIC code 60), non-depository credit institutions (SIC code 61), security and commodity brokers (SIC code 62), insurance carriers (SIC code 63), and transportation firms and public utilities (SIC codes 40-49).

$SIZE_{i,t}$: The log of the market value of equity.

$BETA_{i,t}$: Systematic risk as measured by the market model beta. Estimates for each firm are obtained using stock returns for the most recent 60 months before the test period.

$DEBT_{i,t}$: The ratio of total debt to total assets.

$MTB_{i,t}$: The ratio of market value of equity over the book value of equity.

$VAR_{i,t}$: Variability of earnings as measured by the standard deviation of reported earnings for the 20 quarters before the test period.

$PERS_{i,t}$: Persistence of earnings as measured by the first-order autocorrelation in earnings for the 20 quarters before the test period.

$FEMALE_{i,t}$: Equals 1 if there is at least one female executive in the top management team, 0 otherwise.

YEAR: Dummies variables equaling 1 for the year t (t=2004,…,2006), 0

otherwise.

INDUSTRY: Industries dummies based on 2-digit SIC codes.

4.3.2 Data and Descriptive Statistics

I start with a sample of firms that filed Section 404 reports during the period from 2004 to 2007 on Audit Analytics. Following previous studies (e.g. Ge and McVay, 2005; Raghunandan and Rama, 2006; Doyle et al., 2007a; Doyle et al., 2007b; Beneish et al., 2008), I only focus on material weakness among three types of internal control deficiencies under Section 404 of SOX. The stock returns are collected from CRSP, the financial data are obtained from Compustat and the corporate governance data on managerial ownership and female executives come from Compustat Executive Compensation (ExecuComp). The final sample consists of 2,349 firm-year observations from 2004 to 2007.

The descriptive statistics for this sample are reported in Panel A of Table 3, which shows that 9.6 percent of the sample firms report at least one material weakness under Section 404 of SOX, comparable to 9 percent in Raghunandan and Rama (2006). The mean and median top five manager ownership of the sample firms are 4.566 percent and 1.29 percent, comparable to 4.5 percent and 0.9 percent in Lafond

and Roychowdhury (2008).[15] The means and medians of all of the other variables are also comparable to those stated in previous studies. Panel B of Table 3 shows the Pearson correlation matrix of the sample with $RETURN_{i,t}$ positively related to $E_{i,t}/P_{i,t-1}$* $MW_{i,t}$* $MO_{i,t}$, which indicates that managerial ownership reduces agency conflicts within firms and consequently increases their earnings quality. In addition, I find that all of the correlation coefficients are very small, which suggests that multicollinearity will not be a problem.

(Insert Table 3 here)

4.4 Test of Hypothesis Three

4.4.1 The Empirical Model

To test whether the effect that managerial ownership has on the association between material weakness disclosures and the informativeness of earnings depends on the information problems associated with the firms, I estimate model 2 for young and old firms separately. Following Pittman and Fortin (2004), I differentiate between

[15]The descriptive statistics of managerial ownership are very similar to those in previous studies. For example, Lafond and Roychowdhury (2008) report a mean (median) managerial ownership of 4.5 percent (0.9 percent) for their ExecuComp sample. Lafond and Roychowdhury (2008) argue that the relatively low values of managerial ownership in their sample are most likely due to the fact the ExecuComp's coverage is primarily limited to the S&P 1500 index, which biases the sample toward larger firms in which wealth constraints most likely restrict the level of managerial ownership.

young and old firms using the median firm age. Firm age is proxied by the number of years since a firm's initial public offering. If a firm's age is larger than the median of the sample, the firm is classified as an old firm; if a firm's age is smaller than the median of the sample, the firm is classified as a young firm. Previous research shows that there are more severe information problems associated with young firms compared to their older counterparts (Diamond, 1989; Lang, 1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004). If investors choose to rely more on established firm reputation when assessing the credibility of accounting earnings, the influence of management ownership is expected to diminish with firm age. The control variables used in this test are the same as those used to test H2. Thus, H3 will be supported if the coefficient of $E_{i,t} / P_{i,t-1} * MW_{i,t} * MO_{i,t}$ is different for the two samples, such that α_7 is more significantly positive for young firms than old firms.

4.4.2 Data and Descriptive Statistics

Based on the median firm age, I split the full sample into young and old firms to test H3.[16] The sample of old firms consists of 1,159 firm-year observations from 2004 to

[16] I split the sample into young and old firms based on a median firm age of 20 years, which is comparable to previous evidence. For example, the median for the ExecuComp sample in Coles et al. (2008) is 25 years. I also find that ExecuComp firms are much older than non-ExecuComp firms.

2007, while the sample of young firms consists of 1,179 firm-year observations from 2004 to 2007. The internal control weakness disclosure data are from Audit Analytics. The governance data are collected from Compustat Executive Compensation (ExecuComp). The stock returns are from CRSP and all of the financial data come from Compustat.

Descriptive data for the two samples are reported in Panel A of Table 4. The average $RETURN_{i,t}$ is 0.105 for young firms and 0.097 for old firms. The average $E_{i,t}/P_{i,t-1}$ is 0.036 for young firms and 0.043 for old firms. Panel A shows that 10.8 percent of young firms and 7.9 percent of old firms have internal control weaknesses, but that relative to old firms, young firms are more likely to report material weakness under Section 404 of SOX. In addition, the average managerial ownership is 4.672 percent for young firms, which is slightly higher than 4.475 percent for old firms. Panel B of Table 4 presents the correlation matrix for the two samples. The results indicate a significantly positive association between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$ for young and old firms, with a stronger correlation of 0.266 for young firms and a weaker correlation of 0.063 for old firms. This is consistent with H3, which posits that the impact of managerial ownership on the

link between internal control weakness disclosures and the informativeness of earnings decreases with age.

(Inset Table 4 here)

4.5 Test of Hypothesis Four

4.5.1 The Empirical Model

I use the following OLS model to test H4, which addresses the impact of female executives on the relation between material weakness disclosures under Section 404 of SOX and the informativeness of earnings. Consistent with the definition of managerial ownership, I define top management as the top five highest paid managers within a firm in terms of salary and bonuses. $FEMALE_{i,t}$ is an indicator variable that equals 1 if there is at least one female executive in the top management team and 0 otherwise. Rather than focusing on the impact of female CFOs, I am interested in the influence of female executives because previous literature shows that a number of executives are typically responsible for the quality of accounting numbers, including Chairs, Vice-Chairs, Presidents, CEOs, CFOs, COOs and Vice-Presidents of Finance (Flatt, 1996; Beasley et al., 1999; Dunn, 2004). Previous evidence also documents that women are both more risk-averse in a variety of fields

(Sexton and Bowman-Upton, 1990; Byrnes et al., 1999; Powell and Ansic, 1997; Barber and Odean, 2001; Olsen and Cox, 2001; Sunden and Surette, 1998; Watson and McNaughton, 2007) and more concerned with ethical issues than men (Betz et al., 1989; Bernardi and Arnold, 1997; Cohen et al., 1998). Therefore, female executives might be less tolerant of opportunistic earnings management, which would consequently ensure the quality of accounting earnings (Krishnan and Parsons, 2008; Francis et al., 2009; Barua et al., 2010). If the market perceives that firms led by female top managers are more likely to have higher earnings quality, it tends to react more positively to the earnings of such firms. Thus, H4 will be supported if α_7 is significantly positive.

$$RETURN_{i,t} = \alpha_0 + \alpha_1 E_{i,t}/P_{i,t-1} + \alpha_2 MW_{i,t} + \alpha_3 E_{i,t}/P_{i,t-1} * MW_{i,t} + \alpha_4 FEMALE_{i,t} + \alpha_5 E_{i,t}/P_{i,t-1} * FEMALE_{i,t} + \alpha_6 MW_{i,t} * FEMALE_{i,t} + \alpha_7 E_{i,t}/P_{i,t-1} * MW_{i,t} * FEMALE_{i,t} + \alpha_8 E_{i,t}/P_{i,t-1} * REG_{i,t} + +\alpha_9 E_{i,t}/P_{i,t-1} * SIZE_{i,t} + \alpha_{10} E_{i,t}/P_{i,t-1} * BETA_{i,t} + \alpha_{11} E_{i,t}/P_{i,t-1} * DEBT_{i,t} + \alpha_{12} E_{i,t}/P_{i,t-1} * MTB_{i,t} + \alpha_{13} E_{i,t}/P_{i,t-1} * VAR_{i,t} + \alpha_{14} E_{i,t}/P_{i,t-1} * PERS_{i,t} + \alpha_{15} E_{i,t}/P_{i,t-1} * MO_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where

$RETURN_{i,t}$: Holding returns for firm i for a window from 9 months before fiscal year-end in year t through 3 months after fiscal year-end.

$E_{i,t}/P_{i,t-1}$: Earnings-per-share in year t scaled by price-per-share at the end of year t – 1.

$MW_{i,t}$: Equals 1 if material weaknesses are identified under Section 404

of SOX in year t, 0 otherwise.

$FEMALE_{i,t}$: Equals 1 if there is at least one female executive in the top management team, 0 otherwise.

$REG_{i,t}$: Equals 1 when the firm operates in a regulated industry, 0 otherwise. Regulated industries include: depository institutions (SIC code 60), non-depository credit institutions (SIC code 61), security and commodity brokers (SIC code 62), insurance carriers (SIC code 63), and transportation firms and public utilities (SIC codes 40-49).

$SIZE_{i,t}$: The log of the market value of equity.

$BETA_{i,t}$: Systematic risk as measured by the market model beta. Estimates for each firm are obtained using stock returns from the most recent 60 months before the test period.

$DEBT_{i,t}$: The ratio of total debt to total assets.

$MTB_{i,t}$: The ratio of market value of equity over the book value of equity.

$VAR_{i,t}$: Variability of earnings as measured by the standard deviation of reported earnings for the 20 quarters before the test period.

$PERS_{i,t}$: Persistence of earnings as measured by the first-order autocorrelation in earnings for the 20 quarters before the test period.

YEAR: Dummies variables equaling 1 for the year t (t=2004,…,2006), 0 otherwise.

INDUSTRY: Industries dummies based on 2-digit SIC codes.

$MO_{i,t}$: Percentage of total shares outstanding held by the top five highest paid executives (excluding options) in year t.

4.5.2 Data and Descriptive Statistics

The sample is the same as that used for models 1 and 2. After deleting the missing data values, I obtained a final sample of 2,349 firm-year observations from 2004 to 2007. Table 5 provides the descriptive statistics and the correlation matrix. The results show that 24.7 percent of the sample firms hire at least one female executive, which is comparable to the 22.3 percent in Francis et al. (2011).[17] The univariate results show that $RETURN_{i,t}$ is positively related to $E_{i,t}$ /$P_{i,t-1}$* $MW_{i,t}$* $FEMALE_{i,t}$, which indicates that the presence of female executives attenuates the negative association between material weakness disclosures under Section 404 of SOX and the informativeness of earnings.

(Insert Table 5 here)

4.6 Test of Hypothesis Five

4.6.1 The Empirical Model

[17] It is interesting that the percentage of firms hiring female directors is 66.6 percent (Bin et al., 2011), which is significantly higher than the percentage of firms hiring female executives.

I use the same OLS model used to test H4 to test whether the influence of female executives varies with the level of information asymmetry between managers and investors. Based on Pittman and Fortin (2004), I divide the full sample into young and old firms based on median firm age. Previous research shows that the information asymmetry associated with firms diminishes with age (Diamond, 1989; Lang, 1991; Berger and Udell, 1995; Datta et al., 1999; Pittman and Fortin, 2004). A firm's age is measured as the number of years since its initial public offering. Greater uncertainty in the accounting earnings of firms with short private histories is expected to create a situation in which the influence of female executives will be weighed more heavily by investors. H5 will be supported if α_7 is more significantly positive for young firms.

4.6.2 Data and Descriptive Statistics

The sample is the same as that used to test H3. After splitting the full sample into two sub-samples, I obtain an old firm sample of 1,159 observations and a young firm sample of 1,179 firm-year observations from 2004 to 2007. The material weakness disclosure data are from Audit Analytics. The stock returns are from CRSP. All of the financial data come from Compustat and the governance data are collected from Compustat Executive Compensation (ExecuComp).

Panel A of Table 6 reports the descriptive statistics of the two samples. A total of 25.8 percent of young firms are hiring female executives, which is slightly higher than 23.7 percent of old firms. The descriptive statistics for all of the variables are comparable with those reported in previous studies. Panel B of Table 6 illustrates the correlation matrix of young and old firms, separately. Consistent with my prediction that the moderating effect of female executives would be much stronger for young firms, the correlation coefficients are 0.205 for young firms and 0.069 for old firms.

(Insert Table 6 here)

4.7 Summary

This chapter illustrates the methodology applied in this study to test the five hypotheses central to this thesis. The informativeness of earnings is measured using the coefficient relating returns to earnings. I conduct these tests based on three OLS models. Following previous studies, I control for regulatory environment, firm size, systematic risk, leverage, growth opportunities, earnings variability and earnings persistence in the OLS regressions. In addition, I also consider the influence of

managerial ownership and female executives. My descriptive statistics are very comparable to those established in previous studies. The Pearson correlation results are also consistent with my predictions, with the exception of H1.

Chapter Five

Empirical Results

5.1 Introduction

This chapter reports the results of the empirical tests discussed in Chapter Four. Section 5.2 summarizes the main results of the previously discussed hypotheses. These results show that: (1) managerial ownership moderates the negative association between material weaknesses and the informativeness of earnings; (2) the moderating effects of managerial ownership are stronger for young firms; (3) the presence of female executives moderates the negative association between material weaknesses and the informativeness of earnings; and (4) the moderating effects of female executives are stronger for young firms. Section 5.3 presents a number of additional tests to validate the robustness of the empirical results and Section 5.4 concludes this chapter.

5.2 Empirical Results

5.2.1 Results on H1Tests

The OLS results regarding the impact of material weakness disclosures on the informativeness of earnings are reported in Table 7 (N=2349). Model 1 includes only the experimental variables, while model 2 includes both experimental and the

control variables. Comparable to previous evidence (Warfield et al., 1995; Gul and Lai, 2002; Gul et al., 2002), the adjusted R^2 of models 1 and 2 are 8.1 percent and 16.7 percent, respectively. Consistent with existing studies (e.g., Warfield et al., 1995; Gul and Lai, 2002; Gul et al., 2002; Yeo et al., 2002), $RETURN_{i,t}$ is significantly and positively related to $E_{i,t}/P_{i,t-1}$ in both models 1 and 2 (at 1 percent level). In contrast to my prediction, there is an insignificant positive relation between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MW_{i,t}$ in both models 1 and 2. This result is in contrast to H1, which posits that firms reporting material weaknesses under Section 404 of SOX have less informative earnings, because the market perceives these firms as more likely to have poor earnings quality and consequently discounts their accounting earnings. Therefore, H1 is not supported. Model 2 shows that the influences of some controls are significant. $RETURN_{i,t}$ is significantly and negatively associated with $E_{i,t}/P_{i,t-1} * BETA_{i,t}$ (at the 5 percent level), which suggests that risky firms are likely to have less informative earnings. Consistent with the argument that highly levered firms have greater incentives to manipulate earnings, I find that $RETURN_{i,t}$ is significantly and negatively related to $E_{i,t}/P_{i,t-1} * DEBT_{i,t}$ (at the 10 percent level). In addition, the results reveal a significantly positive association between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1} * MO_{i,t}$, which supports the notion that investors signal management shareholdings as interest-aligning

mechanisms that can effectively reduce agency costs and improve firms' earnings quality.

(Insert Table 7 here)

5.2.2 Results on H2 Tests

Table 8 reports the empirical results for H2, which addresses the impact that managerial ownership has on the association between material weakness disclosures under Section 404 of SOX and the informativeness of earnings (N=2349). Comparable to previous evidence (Warfield et al., 1995; Gul and Lai, 2002; Gul et al., 2002), the adjusted R^2 of models 1 and 2 are 10.7 percent and 17.9 percent, respectively. The results show positive coefficients relating stock returns ($RETURN_{i,t}$) to accounting earnings ($E_{i,t}/P_{i,t-1}$) in both models 1 and 2 (at the 1 percent level). The coefficients relating $RETURN_{i,t}$ to $E_{i,t}/P_{i,t-1} * MW_{i,t}$ are significantly negative in the two models (at the 5 and 1 percent levels, respectively), which suggests that disclosing material weaknesses under Section 404 of SOX attenuates the informativeness of earnings. Consistent with Warfield et al. (1995), $RETURN_{i,t}$ is significantly and positively related to $E_{i,t}/P_{i,t-1} * MO_{i,t}$ (at the 1 percent level), which implies that managerial shareholding strengthens the informativeness of

earnings. As expected, the coefficient estimates for interactions between material weakness disclosures and managerial ownership are significantly negative (at the 10 and 5 percent levels, respectively). Consistent with my assumption, I find that RETURN $_{i,t}$ is significantly and positively associated with E $_{i,t}$ /$P_{i,t-1}$* MW $_{i,t}$* MO $_{i,t}$ (at the 1 percent level). This finding provides supporting evidence for H2 by showing that managerial ownership, as an effective incentive mechanism, moderates the negative effect of material weakness disclosures on the informativeness of earnings. Finally, I find that RETURN $_{i,t}$ is significantly and negatively related to E $_{i,t}$ /$P_{i,t-1}$* BETA $_{i,t}$ (at the 5 percent level), which suggests that risky firms tend to have less informative earnings.

(Insert Table 8 here)

5.2.3 Results on H3 Tests

Table 9 reports the results for the testing of H3, which addresses whether the influence that managerial ownership has on the link between internal controls and the informativeness of earnings decreases with firm age. I split the full sample into young (N=1187) and old (N=1162) firms based on the median age of the sample. All four models produce reasonable adjusted R^2 values, specifically 11.9 and 21.4

percent for models 1 and 2 of the young firms and 10.5 and 19 percent for models 3 and 4 of the old firms. The results for the young firms remain very similar to the results reported in Table 8 of the full sample. I find that $RETURN_{i,t}$ is significantly and positively related to $E_{i,t}/P_{i,t-1}$ in model 1 of the young firms (at the 1 percent level), whereas the coefficient becomes insignificantly negative after including all of the control variables. Consistently, $RETURN_{i,t}$ is significantly and negatively related to $E_{i,t}/P_{i,t-1} * MW_{i,t}$ in both models (at the 5 and the 10 percent levels, respectively) and significantly and positively related to $E_{i,t}/P_{i,t-1} * MO_{i,t}$ in both models (at the 1 percent level). More importantly, the coefficient for the three way interaction ($E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$) remains significantly positive in models 1 and 2 (at the 1 percent level). These results indicate that managerial ownership moderates the negative impact of material weaknesses on the informativeness of earnings for young firms. The signs of the coefficients for the control variables are generally consistent with previous studies, but only a few of them are significant. The coefficient relating $RETURN_{i,t}$ to $E_{i,t}/P_{i,t-1} * REG_{i,t}$ is significantly negative in model 2 for young firms (at the 10 percent level), which seems to oppose the argument made by Warfield et al.'s (1995), which states that regulations restrict the earnings manipulations of managers and improve earnings quality. In addition, I find that the coefficient estimate for the interaction between earnings and market to

book ratio is significantly positive (at the 1 percent level), which suggests that high growth firms are likely to have more reliable accounting numbers and, therefore, more informative earnings.

(Insert Table 9 here)

In contrast, the coefficient estimate for the three way interaction term ($E_{i,t}/P_{i,t-1}$* $MW_{i,t}$* $MO_{i,t}$) becomes insignificantly negative in models 3 and 4 of the old firms, which is the opposite of the results for the young firms. In addition, I find that the coefficients for $E_{i,t}/P_{i,t-1}$ are significantly positive (at the 1 percent level) and the coefficients for $E_{i,t}/P_{i,t-1}$* $MO_{i,t}$ are significantly positive (at the 1 and the 10 percent levels, respectively) in the two models. $RETURN_{i,t}$ is significantly and negatively related to $E_{i,t}/P_{i,t-1}$* $DEBT_{i,t}$ (at the 5 percent level) while $E_{i,t}/P_{i,t-1}$* $FEMALE_{i,t}$ (at the 5 percent level). Overall, the results show that the moderating effect of managerial ownership on the relation between material weaknesses and the informativeness of earnings is stronger for young firms. This is consistent with the notion that information uncertainty about earnings diminishes with firm age, which makes the impact of managerial ownership less important to the association between

material weaknesses and the informativeness of earnings for the old firms. Based on these findings, H3 is empirically supported.

5.2.4 Results on H4 Tests

Table 10 reports the results regarding the impact that female executives have on the proposed relation between internal controls and the informativeness of earnings (N=2349). Consistent with previous research, the adjusted R^2 of the two models are 9 and 17.2 percent, respectively. As expected, there is a significant relation between $RETURN_{i,t}$ and $E_{i,t}/P_{i,t-1}$ in both models 1 and 2 (at the 1 percent level). With respect to the main variable of interest, the coefficient estimate for the three way interaction $E_{i,t}/P_{i,t-1} * MW_{i,t} * FEMALE_{i,t}$ is significantly positive (at the 1 percent level) in both models 1 and 2, which suggests that the presence of female executives mitigates the negative association between material weakness reports under Section 404 of SOX and the informativeness of earnings. This finding further supports the argument that because women are more risk-averse and have a greater concern for ethical issues, firms led by female executives should be less tolerant of earnings management and, therefore, implement higher earnings quality. In addition, I find that the coefficient estimate for the interaction between $E_{i,t}/P_{i,t-1}$ and $BETA_{i,t}$ is significantly negative (at the 10 percent level), which supports my prediction that a

high level of firm risk undermines the informativeness of earnings. Consistent with the argument that managers are more likely to manipulate the earnings of highly levered firms (Sweeney, 1994), I find that the coefficient for $E_{i,t} / P_{i,t-1}$* $DEBT_{i,t}$ is significantly negative (at the 10 percent level). Finally, the coefficient for $E_{i,t} / P_{i,t-1}$* $MO_{i,t}$ is significantly positive (at the 1 percent level), which suggests that managerial ownership reduces agency costs within firms and enhances the informativeness of earnings. The results also show that even after controlling for the effects of other factors on the informativeness of earnings, the coefficient estimates for $E_{i,t} / P_{i,t-1}$* $MW_{i,t}$* $FEMALE_{i,t}$ remain significantly positive (at the 1 percent level). Thus, H4 is supported.

(Insert Table 10 here)

5.2.5 Results on H5 Tests

Table 11 provides the results regarding the impact of female executives on young and old firms, separately. The adjusted R^2 values for the young firms are 9.6 and 21.2 percent, respectively, whereas the values for old firms are 10.4 and 19 percent, respectively. I find that the coefficients for $E_{i,t} / P_{i,t-1}$ are significantly positive in model 1 (at the 1 percent level), but that they lose their significance in model 2.

Consistent with the results of the full sample, the coefficients for $E_{i,t}/P_{i,t-1}$* $MW_{i,t}$* $FEMALE_{i,t}$ are still significantly positive for the young firms (at the 1 percent level) while the coefficient relating $RETURN_{i,t}$ to $E_{i,t}/P_{i,t-1}$* $REG_{i,t}$ is significantly negative (at the 5 percent level), which supports my prediction that the regulation setting affects the informativeness of earnings. Consistent with the argument that high growth firms have more informative earnings, $RETURN_{i,t}$ is significantly and positively related to $E_{i,t}/P_{i,t-1}$* $MTB_{i,t}$ in model 2 (at the 1 percent level) and consistent with the assumption that managerial ownership improves earnings quality, $RETURN_{i,t}$ is significantly and positively related to $E_{i,t}/P_{i,t-1}$* $MO_{i,t}$ (at the 1 percent level).

(Insert Table 11 here)

In contrast, models 3 and 4 do not provide evidence that the presence of female managers affects the negative link between material weaknesses under Section 404 of SOX and the informativeness of earnings. I find that the coefficient estimates for $E_{i,t}/P_{i,t-1}$* $MW_{i,t}$* $FEMALE_{i,t}$ are insignificant in both of the two models for the old firms. In addition, the coefficients for $E_{i,t}/P_{i,t-1}$ are consistently positive (at the 1 percent level) and the coefficient for $E_{i,t}/P_{i,t-1}$* $DEBT_{i,t}$ is found to be

significantly negative (at the 5 percent level). These findings imply that the moderating effect of female executives is more significant for young firms because the information asymmetries are more severe in a firm's early years.

5.3 Additional Tests

Following Warfield et al. (1995), I use earnings' explanatory power for returns as a proxy for the informativeness of earnings. However, previous evidence from ERC studies suggests that both the level of earnings and the changes in earnings have explanatory power for returns (e.g., Beaver, Lambert, and Morse, 1980; Easton and Harris, 1991). Ali and Zarowin (1991) note that changes in earnings are used as a proxy for unexpected earnings in a number of accounting studies, such that if the changes in earnings do convey a certain amount of value relevant information on the informativeness of earnings, then excluding them in the empirical tests can result in biased results. As a robustness test, I follow Ghosh and Moon (2005) and include: (1) not only the level of earnings, but also the change in earnings; and (2) not only the main effects of the control variables, but also the interaction between earnings and control variables in the model. My results remain consistent with the findings of the Warfield et al. (1995) model.

Based on their severity, ICWs are categorized into account-specific and firm-level weaknesses (e.g., Doyle et al., 2007a; Doyle et al., 2007b; Raghunandan and Rama, 2006). Account-specific weaknesses are the relatively more auditable problems that relate to specific account balances or transaction processes. Firm-level weaknesses are the less auditable problems that relate to macro-level controls, which can ultimately lead to more serious consequences, such as unreliable accounting numbers (Doyle et al., 2007b; Raghunandan and Rama, 2006). Following Raghunandan and Rama (2006), the material weaknesses reported under Section 404 of SOX are identified as firm-level for any of the following reasons: (1) Quality and training of accounting personnel; (2) Segregation of duties; (3) Reconciliation of accounts statement preparation; (4) Information Systems related problems; or (5) Quality of internal audit and/or audit committee. To test whether the type of internal control weakness matters, I replace the overall material weakness variable ($MW_{i,t}$) with two separate variables ($ACCOUNT\text{-}SPECIFIC_{i,t}$ and $COMPANY\text{-}LEVEL_{i,t}$) and re-run the regressions.[18] As Tables 12 and 13 report, the coefficients for the three way interaction $E_{i,t}/P_{i,t-1} * MO_{i,t} * COMPANY\text{-}LEVEL_{i,t}$ and $E_{i,t}/P_{i,t-1} * FEMALE_{i,t} * COMPANY\text{-}LEVEL_{i,t}$ are significantly positive (at the 1 percent

[18] There are 81 firms reporting account-specific weaknesses and 144 firms reporting company-level weaknesses in my sample.

level). However, the coefficients for $E_{i,t}/P_{i,t-1}$ * $MO_{i,t}$ * ACCOUNT-SPECIFIC$_{i,t}$ and $E_{i,t}/P_{i,t-1}$ * $FEMALE_{i,t}$ * ACCOUNT-SPECIFIC$_{i,t}$ are not significant. These results suggest that both managerial ownership and female executives improve the informativeness of earnings by enhancing the control environment or the overall financial reporting process rather than by affecting individual accounts. In addition, when I split the sample into young and old firms, the results are consistent with the results of the full sample, which suggests that managerial ownership and female executives effectively reduce the firm-level material weaknesses of young firms with higher information asymmetry, but not those of old firms.

I use the material disclosures under Section 302 of SOX to repeat the tests of my hypotheses. Under Section 302 of SOX, managers are required to certify the effectiveness of their internal controls in periodic SEC filings and report any material weaknesses and material changes in internal control. Without any requirements regarding the attestation of management reports, Beneish et al. (2008) state that disclosure under Section 302 is a function of managers' diligence in identifying weaknesses and their discretion over disclosure. The disclosure of material weaknesses under Section 302 of SOX considered is voluntary, whereas the disclosure of material weaknesses under Section 404 of SOX is mandatory. Under

Section 404 of SOX, managers must report the effectiveness of their ICFR in their annual internal control report, with the expectation that it will be attested by an independent auditor. Although the level of scrutiny for the two reporting regimes is different, I still anticipate consistent results using either Section 302 or Section 404 discourses. Consistent with previous evidence, my untabulated results for all of the hypotheses are comparable to the main findings for Section 404 of SOX disclosures.

The literature documents that different corporate governance mechanisms work as substitutes to alleviate agency problems within firms (Feltham et al., 1991; Mehran 1995; Anderson et al., 2000, Gul and Lai, 2002; Gul et al., 2002). Recent ERC studies document that the informativeness of earnings is affected by CEO duality and audit quality (Gul and Lai, 2002; Gul et al., 2002). To control for the impact of CEO duality and audit quality, I re-run the regressions for H1 through H5 with two additional controls.[19] The coefficient estimates for the key variables are comparable with those reported in Tables 7 through 11 and even the significance levels are not changed by the inclusion of CEO duality and Big-4 auditors. In addition, I use a three-way interaction term $E_{i,t}$ /$P_{i,t-1}$ *$MW_{i,t}$ *$BIG4_{i,t}$ to explore whether hiring a

[19] Big-4 auditors are used as a proxy for audit quality, as they are widely characterized as ‘‘brand-name’’ and ‘‘high-quality’’ providers, and as the providers of ‘‘differentiated’’ audits (Krishnan 2005). Big-4 accounting firms include PricewaterhouseCoopers, Deloitte Touche Tohmatsu, Ernst & Young and KPMG.

Big 4 auditor improves the informativeness of earnings and therefore moderates the negative association between MW disclosures and the informativeness of earnings. The untabulated results show a significantly positive coefficient on $E_{i,t}/P_{i,t-1}$ *$MW_{i,t}$ *$BIG4_{i,t}$ and support the effect of hiring a Big 4 auditor. Furthermore, I control for auditor change and going-concern audit opinion and re-run the regressions. The results are consistent with previous findings.

Since Morck et al. (1988), there has been supporting evidence of the non-monotonic effect of managerial ownership. Research shows that both the alignment and entrenchment effects of managerial shareholding exist, but whether the alignment or the entrenchment effects dominate depends on the level of managerial shareholding. I find that the interests of managers and shareholders are better aligned at a lower level of managerial ownership, whereas the entrenchment of managers are more likely to exceeds the incentive benefits of managerial ownership at a higher level of managerial ownership (e.g. Gul and Wah, 2002; Yeo et al., 2002). Following Morck et al. (1988), I create three variables based on two ownership level cut-off points: 5 and 25 percent of shareholding. To test whether managerial ownership has a nonlinear influence, I replace $MO_{i,t}$ with the following variables in the empirical tests.

$MOL_{i,t}$ = managerial ownership if managerial ownership <5 percent

= 5 percent if managerial ownership > = 5 percent.

$MOM_{i,t}$ = 0 if managerial ownership < 5 percent.

= managerial ownership minus 5 percent if 5 percent < = managerial ownership < 25 percent.

= 20 percent if managerial ownership > = 25 percent..

$MOU_{i,t}$ = 0 if managerial ownership < 25 percent.

= managerial ownership minus 25 percent if managerial ownership > = 25 percent.

As a result, I do not find supporting evidence of the entrenchment effect. In contrast, I find that the moderating effect of managerial ownership grows stronger at higher levels of managerial ownership, which is only consistent with the alignment argument.

Because it is very likely that female managers are not randomly assigned to firms, endogeneity has always been an issue in gender studies. Therefore, I econometrically control for self-selection bias using the Heckman (1976) two-stage approach. The first-stage probit regression shows the likelihood of a firm hiring a female executive, from which I calculate the Inverse Mills Ratio (IMR). Consistent with Francis et al. (2010), Huang and Kisgen (2010) and Francis et al. (2011), I include firm size, leverage ratio, ROA, tangibility, market to book ratio, board

independence, board size, CEO duality and female directors in the probit regression. In addition, I also control for year and industry effects. In the second stage, I re-run the regressions for H4 and H5 with the additional control variable, IMR. The results are consistent with my main findings and indicate that the negative association between material weaknesses and the informativeness of earnings is less pronounced in firms with female executives. When I use the sub-samples instead of the full sample, I find that the influence of female executives is stronger for young firms compared to old firms.

Similarly, I use Heckman (1976) two-stage approach to control for the possibility of self-selecting as material weaknesss firms. Ashbaugh-Skaife et al. (2007) note that firms can choose both the quality of their internal controls and their efforts to discover and disclose any known weaknesses. I obtain IMR based on the first stage probit regression estimating the determinants of internal control weaknesses. Following Doyle et al. (2007) and Ashbaugh-Skaife et al. (2007), I include firm size, foreign transactions, aggregate loss, sales growth, firm age, segments, restructuring charge and Z score in the probit regression. To control for the self-selection bias, I include IMR in the second stage OLS models, the results remain consistent with previous findings.

Given that firm age might prove a noisy measure of information asymmetry, I use the the number of analysts following, bid-ask spread and quartile cutoff of firm age as alternative measures and re-run the regressions for H3 and H5. The number of analysts following is measured by the number of analysts issuing earnings forecasts during that year and the analysts following data are collected from I/B/E/S tape. Following Elgers et al. (2001) and Gleason and Lee (2003), I split the entire sample into high and low analyst coverage firms based on the median of the number of analysts following.[20] Consistently, I find that the moderating effects of managerial ownership and female executives are stronger for low analyst coverage firms, which supports the main results of H3 and H5. Bid-ask spread has been widely used as a proxy for information asymmetry since Copeland and Galai (1983), Glosten and Milgrom (1985) and Kyle (1985). Following prior studies, I calculate bid-ask spread as the quarterly average of the difference between the closing ask and the closing bid quotes scaled by the average of the ask and the bid (Ball et al., 2012). Based on the median cutoff point, I partition the whole sample into high bid-ask spread firms and low bid-ask spread firms. The results provide supporting evidence of H3 and H5.

[20] The median number of analysts following is 30 in my sample. It is slightly higher because the ExecuComp sample only includes large firms.

Instead of the median cutoff, I also classify young and old firms based on a the 75th percentile of firm age as a cutoff point. The OLS results show that the moderating effects of managerial ownership and female executives are stronger for young firms with more severe information problems.

5.4 Summary

This chapter provides empirical results for the hypotheses in this thesis. Consistent with my prediction, the results suggest that: (1) managerial ownership moderates the negative association between internal control weakness discourses and the informativeness of earnings; (2) the moderating effect of managerial ownership is stronger for young firms; (3) the presence of female executives mitigates the negative relation between internal control reports and the informativeness of earnings; and (4) the mitigating impact of female executives is stronger for young firms. I do not, however, find supporting evidence for H1. These results are robust to several robustness checks.

Chapter Six

Conclusions and Discussions

6.1 Summary

Given the series of accounting scandals at Enron, Andersen and WorldCom, the role that internal controls play in enhancing the reliability of financial reporting has been the focus of the new provisions under SOX. Researchers agree that the implementation of SOX has brought significant changes to the U.S. corporate financial reporting system and these new regulations offer great opportunities for academic research in this area. In this study, I posit that the material weakness discourse under Section 404 is negatively related to the informativeness of earnings. Because previous research documents that managerial ownership and female executives improve earnings quality, I predict that the negative relation between material weaknesses and the informativeness of earnings will be affected by the level of managerial ownership and the presence of female executives. In addition, I anticipate that the abovementioned impact of managerial ownership and female executives depends on firm age because information uncertainty regarding earnings diminishes with firm age.

Based on a full sample of 2,349 U.S. firms and two subsamples of 1,187 young firms and 1,162 old firms from 2004 to 2007, my results suggest that: (1) regardless of the moderating impacts of managerial owernship or female executives, I find no results that support H1; (2) managerial ownership moderates the negative relation between material weaknesses and the informativeness of earnings; (3) the moderating effect of managerial ownership is stronger for young firms than it is for old firms; (4) the presence of female executives moderates the negative relation between material weaknesses and the informativeness of earnings; and (5) the moderating effect of managerial ownership is stronger for young firms than it is for old firms. The results are robust to several additional tests.

6.2 Limitations

Although this study contributes to the literature in a variety of ways, it is also subject to some limitations. First, the exclusion of non-accelerated filers could underestimate the effects of smaller firms. I conduct all of the empirical tests based on a sample from 2004 to 2007, which is after the implementation of Section 404 of SOX and before the global financial tsunami in 2008. PCAOB (2004) highlights that accelerated filers are required to comply with the internal control reporting and disclosure requirements of Section 404 of SOX for fiscal years ending on or after

November 15, 2004. However, the date for non-accelerated filers to comply with Section 404 was postponed to December 15, 2008 for full attestation (Doyle et al., 2007). Because my sample mostly includes accelerated filers, which are larger and financially stronger firms, the results might be biased. It is very likely that the results of my tests do not truly reflect the impact that internal control weakness disclosures under Section 404 of SOX have on the informativeness of earnings, or the impact of the two governance mechanisms and that of firm age, because the information problems might be different for larger firms compared to smaller firms.

Second, focusing on ExecuComp firms could lead to biased results. Following Lafond and Roychowdhury (2008), I define managerial ownership as the percentage of shares held by a firm's five highest paid managers, and ownership data are collected from ExecuComp. In addition, the presence of female executives is measured by a dummy variable that indicates the existence of female managers in firms' top management teams, which consist of the top five highest paid managers in the firm. However, ExecuComp only provides the executive compensation data of firms in the S&P 1500 index and these firms are mainly larger firms. Consistent with Lafond and Roychowdhury (2008), focusing on this particular sample tends to bias against finding the influence of managerial ownership and female executives on

the relation between internal control weakness disclosures under Section 404 of SOX and the informativeness of earnings.

Third, I do not consider the possible impact of other corporate governance mechanisms on my results. Research shows that different governance mechanisms work as substitutes in terms of reducing the agency conflicts of firms (Feltham et al., 1991; Mehran, 1995; Anderson et al., 2000, Gul and Lai, 2002; Gul et al., 2002). However, some argue that there is also a complementary effect between internal and external governance mechanisms (Hadlock and Lumer, 1997; Mikkelson and Partch, 1997; Cremers and Nair, 2005). A number of studies identify the alternative corporate governance mechanisms that affect the quality of financial reporting, including board independence, shares held by outside directors, the presence of outside block-holders, CEO as firm founder, CEO family ties, board size and the presence of female directors (Beasley, 1996; Vafeas, 2000; Anderson et al., 2003; Labelle, 2007; Jaggi and Leung, 2007; Agrawal and Chadha, 2005; Srinidhi et al., 2011). Therefore, it is likely that the results of this study would be affected by the inclusion of alternative corporate governance mechanisms.

6.3 Future Research Opportunities

This study offers excellent opportunities for future research in this area. First, as more internal control disclosure data under Section 404 of SOX become available, both accelerated and non-accelerated filers can be included in the sample, which would ensure that the impact of both larger and smaller firms is considered and the results would be less biased toward certain types of firms. Hence, future research could provide more reliable evidence of the link between internal control weakness disclosures under Section 404 of SOX and the informativeness of earnings, in addition to confirming the effects of different corporate governance mechanisms on the abovementioned association.

Second, I explore the impact of managerial ownership and the presence of female top managers in this study, but future research can focus on the impact of female CFOs. As Francis et al. (2009) argue, CFOs are ultimately responsible for the quality of financial reporting and for the management of a firm's entire financial reporting system. It would be interesting to investigate the impact of female CFOs on the informativeness of earnings and explore the effect of female CFOs on the link between ICWs and the informativeness of earnings.

Third, changes in the informativeness of earnings after the implementation of SOX could prove an important topic. Because the implementation of SOX has always been very controversial, it would be interesting to examine whether the new regulations definitely improve earnings quality. Therefore, future research could compare the informativeness of earnings before the passage of SOX to that after its implementation. If the new SOX regulations do, in fact, enhance the quality of financial reporting, then accounting earnings would tend to be more informative after SOX.

Last, this study offers an opportunity to further test the impact of alternative corporate governance mechanisms. For example, research shows that the presence of female directors is related to higher earnings quality (Srinidhi et al., 2011), so it follows that future work could focus on the impact that female directors have on both the informativeness of earnings, and the proposed relation between ICWs and the informativeness of earnings. A number of governance mechanisms could be examined, including board independence, the presence of outside block-holders and board size. In addition, further tests might show whether the substitution or complementary effect exists between such governance mechanisms.

APPENDIX

Descriptive statistics of the main effects for all variables

	Mean	Median	S.D.	Q1	Q3
$RETURN_{i,t}$	0.101	0.060	0.377	-0.116	0.260
$E_{i,t}/P_{i,t-1}$	0.039	0.049	0.070	0.027	0.068
$MW_{i,t}$	0.096	0.000	0.294	0.000	0.000
$MO_{i,t}$	4.566	1.290	7.585	0.441	4.846
$FEMALE_{i,t}$	0.247	0.000	0.431	0.000	0.000
$AGE_{i,t}$	25.414	20.000	14.284	14.000	37.000
$REG_{i,t}$	0.190	0.000	0.392	0.000	0.000
$SIZE_{i,t}$	7.275	7.240	1.258	6.440	8.075
$BETA_{i,t}$	1.171	1.008	0.817	0.584	1.560
$DEBT_{i,t}$	0.201	0.181	0.190	0.031	0.312
$MTB_{i,t}$	2.938	2.346	15.322	1.621	3.517
$VAR_{i,t}$	0.386	0.224	0.466	0.133	0.421
$PERS_{i,t}$	0.310	0.284	0.345	0.051	0.556

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Table 1

Sample Selection

	2004	**2005**	**2006**	**2007**	**Total**
Firms with available financial data (Compustat)	1309	1254	1289	1228	5080
Less firms with missing return data (CRSP)	(0)	(0)	(0)	(0)	(0)
Less firms with missing material weakness disclosure data (Audit Analytics)	(446)	(31)	(30)	(28)	(535)
Less firms with missing ownership and gender data (Execomp)	(421)	(567)	(678)	(530)	(2196)
Total used in OLS regressions	442	656	581	670	2349

Table 2 Test on H1: the association between material weakness disclosures under Section 404 of SOX and the informativeness of earning.

Panel A Descriptive Statistics (N=2349)

	Mean	Median	S.D.	Q1	Q3
$RETURN_{i,t}$	0.101	0.060	0.377	-0.116	0.260
$E_{i,t}/P_{i,t-1}$	0.039	0.049	0.070	0.027	0.068
$MW_{i,t}$	0.096	0.000	0.294	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.001	0.000	0.034	0.000	0.000
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.011	0.000	0.035	0.000	0.000
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.314	0.362	0.449	0.194	0.517
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.034	0.039	0.125	0.015	0.074
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.006	0.006	0.026	0.000	0.015
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.248	0.122	4.714	0.060	0.193
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.010	0.008	0.085	0.004	0.020
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.012	0.010	0.044	-0.001	0.027
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.212	0.052	0.641	0.011	0.210
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.010	0.000	0.036	0.000	0.000
$AGE_{i,t}$	25.414	20.000	14.284	14.000	37.000

Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 2 Panel B
Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
$RETURN_{i,t}$	1.000												
$E_{i,t}/P_{i,t-1}$	0.286	1.000											
	(0.0001)												
$MW_{i,t}$	-0.037	-0.174	1.000										
	0.0712	(0.0001)											
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.145	0.483	0.014	1.000									
	(0.0001)	(0.0001)	(0.5114)										
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.049	0.372	-0.045	0.110	1.000								
	(0.0173)	(0.0001)	(0.0294)	(0.0001)									
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.286	0.969	-0.174	0.417	0.380	1.000							
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)								
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.221	0.835	-0.128	0.401	0.230	0.774	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)							
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.189	0.754	-0.135	0.373	0.249	0.727	0.631	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)						
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	-0.018	-0.081	0.054	-0.196	0.001	-0.044	-0.003	-0.164	1.000				
	(0.3928)	(0.0001)	(0.0083)	(0.0001)	(0.9531)	(0.0314)	(0.8796)	(0.0001)					
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.235	0.743	-0.089	0.372	0.270	0.745	0.602	0.637	-0.022	1.000			
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2923)				
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.223	0.674	-0.128	0.288	0.286	0.661	0.553	0.497	-0.070	0.588	1.000		
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0007)	(0.0001)			
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.244	0.4526	-0.0657	0.2058	0.2138	0.4459	0.3675	0.2865	-0.013	0.4257	0.361	1.000	
	(0.0001)	(0.0001)	0.0014	(0.001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.5279)	(0.0001)	(0.0001)		
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.090	0.400	-0.019	0.146	0.215	0.385	0.296	0.240	0.007	0.262	0.200	0.123	1.000
	(0.0001)	(0.0001)	(0.3471)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.7332)	(0.0001)	(0.0001)	(0.0001)	

Table 3 Test on H2: the impact of managerial ownership on the association between material weakness disclosures under Section 404 of SOX and the informativeness of earning.

Panel A Descriptive Statistics (N=2349)

	Mean	Median	S.D.	Q1	Q3
$RETURN_{i,t}$	0.101	0.060	0.377	-0.116	0.260
$E_{i,t}/P_{i,t-1}$	0.039	0.049	0.070	0.027	0.068
$MW_{i,t}$	0.096	0.000	0.294	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.001	0.000	0.034	0.000	0.000
$MO_{i,t}$	4.566	1.290	7.585	0.441	4.846
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.212	0.052	0.641	0.011	0.210
$MW_{i,t} * MO_{i,t}$	0.409	0.000	2.648	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$	0.008	0.000	0.241	0.000	0.000
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.011	0.000	0.035	0.000	0.000
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.314	0.362	0.449	0.194	0.517
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.034	0.039	0.125	0.015	0.074
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.006	0.006	0.026	0.000	0.015
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.248	0.122	4.714	0.060	0.193
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.010	0.008	0.085	0.004	0.020
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.0123	0.010	0.044	-0.001	0.027
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.010	0.000	0.036	0.000	0.000
$AGE_{i,t}$	25.414	20.000	14.284	14.000	37.000

Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 3 Panel B
Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i.t}$	1.000															
$E_{i.t}/P_{i.t-1}$	0.286	1.000														
	(0.0001)															
$MW_{i.t}$	-0.037	-0.174	1.000													
	(0.0712)	(0.0001)														
$E_{i.t}/P_{i.t-1} * MW_{i.t}$	0.145	0.483	0.014	1.000												
	(0.0001)	(0.0001)	(0.5114)													
$MO_{i.t}$	0.073	0.064	-0.013	0.028	1.000											
	(0.0004)	(0.0020)	(0.5410)	(0.1744)												
$E_{i.t}/P_{i.t-1} * MO_{i.t}$	0.244	0.453	-0.066	0.206	0.629	1.000										
	(0.0001)	(0.0001)	0.0014	(0.0001)	(0.0001)											
$MW_{i.t} * MO_{i.t}$	0.028	-0.043	0.475	0.087	0.264	0.141	1.000									
	(0.1732)	(0.0364)	(0.0001)	(0.0001)	(0.0001)	(0.0001)										
$E_{i.t}/P_{i.t-1} * MW_{i.t} * MO_{i.t}$	0.188	0.249	0.101	0.551	0.158	0.366	0.505	1.000								
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)									
$E_{i.t}/P_{i.t-1} * REG_{i.t}$	0.049	0.372	-0.045	0.110	0.075	0.214	0.011	0.074	1.000							
	(0.0173)	(0.0001)	(0.0294)	(0.0001)	(0.0003)	(0.0001)	(0.6074)	(0.0004)								
$E_{i.t}/P_{i.t-1} * SIZE_{i.t}$	0.286	0.969	-0.174	0.417	0.055	0.446	-0.052	0.216	0.380	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0075)	(0.0001)	(0.0124)	(0.0001)	(0.0001)							
$E_{i.t}/P_{i.t-1} * BETA_{i.t}$	0.221	0.835	-0.128	0.401	0.044	0.368	-0.036	0.205	0.230	0.774	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0346)	(0.0001)	(0.0797)	(0.0001)	(0.0001)	(0.0001)						
$E_{i.t}/P_{i.t-1} * DEBT_{i.t}$	0.189	0.754	-0.135	0.373	-0.003	0.287	-0.053	0.152	0.249	0.727	0.631	1.000				
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8932)	(0.0001)	(0.0106)	(0.0001)	(0.0001)	(0.0001)	(0.0001)					
$E_{i.t}/P_{i.t-1} * MTB_{i.t}$	-0.018	-0.081	0.054	-0.196	-0.008	-0.013	0.007	-0.042	0.001	-0.044	-0.003	-0.164	1.000			
	(0.3928)	(0.0001)	(0.0083)	(0.0001)	(0.6975)	(0.5279)	(0.7437)	(0.0412)	(0.9531)	(0.0314)	(0.8796)	(0.0001)				
$E_{i.t}/P_{i.t-1} * VAR_{i.t}$	0.2351	0.7434	-0.089	0.3723	0.054	0.4257	-0.0142	0.2334	0.2703	0.7446	0.602	0.637	-0.0217	1.000		
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	0.0089	(0.0001)	0.4923	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2923)			
$E_{i.t}/P_{i.t-1} * PERS_{i.t}$	0.223	0.674	-0.128	0.288	0.002	0.361	-0.042	0.163	0.286	0.661	0.553	0.497	-0.070	0.588	1.000	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.9358)	(0.0001)	(0.0422)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0007)	(0.0001)		
$E_{i.t}/P_{i.t-1} * FEMALE_{i.t}$	0.090	0.400	-0.019	0.146	0.018	0.123	0.038	0.128	0.215	0.385	0.296	0.240	0.007	0.262	0.200	1.000
	(0.0001)	(0.0001)	(0.3471)	(0.0001)	(0.3822)	(0.0001)	(0.0632)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.7332)	(0.0001)	(0.0001)	

Table 4 Test on H3: the impact of managerial ownership on the association between material weakness disclosures under Section 404 of SOX and the informativeness of earning for young firms and old firms.

Panel A Descriptive Statistics

	Young firms (N=1187)					Old firms (N=1162)				
	Mean	**Median**	**S.D.**	**Q1**	**Q3**	**Mean**	**Median**	**S.D.**	**Q1**	**Q3**
$RETURN_{i,t}$	0.101	0.056	0.408	0.101	0.056	0.101	0.056	0.408	0.101	0.056
$E_{i,t}/P_{i,t-1}$	0.036	0.044	0.068	0.036	0.044	0.036	0.044	0.068	0.036	0.044
$MW_{i,t}$	0.110	0.000	0.312	0.110	0.000	0.110	0.000	0.312	0.110	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.000	0.000	0.031	0.000	0.000	0.000	0.000	0.031	0.000	0.000
$MO_{i,t}$	4.842	1.486	7.784	4.842	1.486	4.842	1.486	7.784	4.842	1.486
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.221	0.050	0.643	0.221	0.050	0.221	0.050	0.643	0.221	0.050
$MW_{i,t} * MO_{i,t}$	0.464	0.000	2.866	0.464	0.000	0.464	0.000	2.866	0.464	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$	0.010	0.000	0.287	0.010	0.000	0.010	0.000	0.287	0.010	0.000
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.010	0.000	0.037	0.010	0.000	0.010	0.000	0.037	0.010	0.000
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.283	0.321	0.423	0.283	0.321	0.283	0.321	0.423	0.283	0.321
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.033	0.037	0.134	0.033	0.037	0.033	0.037	0.134	0.033	0.037
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.006	0.004	0.024	0.006	0.004	0.006	0.004	0.024	0.006	0.004
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.132	0.118	0.317	0.132	0.118	0.132	0.118	0.317	0.132	0.118
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.009	0.007	0.073	0.009	0.007	0.009	0.007	0.073	0.009	0.007
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.013	0.009	0.039	0.013	0.009	0.013	0.009	0.039	0.013	0.009
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.009	0.000	0.034	0.009	0.000	0.009	0.000	0.034	0.009	0.000
$AGE_{i,t}$	13.90	14.000	3.326	11.000	16.000	37.177	37.000	11.281	26.000	46.000

Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 4 Panel B
Pearson correlation matrix (Young firms N=1187)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i,t}$	1.000															
$E_{i,t}/P_{i,t-1}$	0.286	1.000														
	(0.0001)															
$MW_{i,t}$	-0.029	-0.144	1.000													
	(0.3187)	(0.0001)														
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.156	0.428	0.077	1.000												
	(0.0001)	(0.0001)	(0.0079)													
$MO_{i,t}$	0.153	0.092	-0.034	0.027	1.000											
	(0.0001)	(0.0017)	(0.2414)	(0.3577)												
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.311	0.452	-0.068	0.227	0.649	1.000										
	(0.0001)	(0.0001)	0.019	(0.0001)	(0.0001)											
$MW_{i,t} * MO_{i,t}$	0.079	-0.029	0.458	0.119	0.263	0.137	1.000									
	(0.0066)	(0.3174)	(0.0001)	(0.0001)	(0.0001)	(0.0001)										
$E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$	0.266	0.218	0.104	0.536	0.131	0.428	0.429	1.000								
	(0.0001)	(0.0001)	0.0004	(0.0001)	(0.0001)	(0.0001)	(0.0001)									
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.047	0.434	-0.013	0.082	0.086	0.257	0.024	0.073	1.000							
	(0.1092)	(0.0001)	(0.6514)	(0.0049)	(0.0032)	(0.0001)	(0.4197)	(0.0124)								
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.297	0.969	-0.147	0.376	0.096	0.442	-0.028	0.191	0.427	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0010)	(0.0001)	(0.3349)	(0.0001)	(0.0001)							
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.199	0.817	-0.111	0.426	0.064	0.356	-0.023	0.192	0.283	0.751	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0277)	(0.0001)	(0.4341)	(0.0001)	(0.0001)	(0.0001)						
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.163	0.658	-0.109	0.299	0.024	0.231	-0.043	0.117	0.297	0.651	0.513	1.000				
	(0.0001)	(0.0001)	0.0002	(0.0001)	(0.4033)	(0.0001)	(0.1417)	(0.0001)	(0.0001)	(0.0001)	(0.0001)					
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.211	0.390	-0.071	0.122	0.041	0.202	-0.017	0.090	0.110	0.383	0.370	0.207	1.000			
	(0.0001)	(0.0001)	(0.0147)	(0.0001)	(0.1592)	(0.0001)	(0.5549)	(0.0020)	(0.0002)	(0.0001)	(0.0001)	(0.0001)				
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.233	0.745	-0.075	0.349	0.078	0.353	0.018	0.230	0.350	0.743	0.552	0.555	0.242	1.000		
	(0.0001)	(0.0001)	(0.0105)	(0.0001)	(0.0073)	(0.0001)	(0.5457)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)			
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.222	0.639	-0.110	0.201	0.062	0.350	-0.019	0.154	0.346	0.627	0.519	0.376	0.267	0.525	1.000	
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0340)	(0.0001)	(0.5062)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)		
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.108	0.421	0.015	0.103	0.015	0.134	0.033	0.111	0.286	0.377	0.339	0.190	0.165	0.242	0.165	1.000
	(0.0002)	(0.0001)	(0.6073)	(0.0004)	(0.6004)	(0.0001)	(0.2639)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	

Pearson correlation matrix (Old firms N=1162)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i,t}$	1.000															
$E_{i,t}/P_{i,t-1}$	0.296	1.000														
	(0.0001)															
$MW_{i,t}$	-0.044	-0.179	1.000													
	(0.1305)	(0.0001)														
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.150	0.513	-0.003	1.000												
	(0.0001)	(0.0001)	(0.9110)													
$MO_{i,t}$	-0.016	0.041	0.012	0.030	1.000											
	(0.5799)	(0.1593)	(0.6849)	(0.3136)												
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.170	0.448	-0.050	0.180	0.614	1.000										
	(0.0001)	(0.0001)	(0.0861)	(0.0001)	(0.0001)											
$MW_{i,t} * MO_{i,t}$	-0.026	-0.044	0.492	0.085	0.266	0.153	1.000									
	(0.3698)	(0.1354)	(0.0001)	(0.0039)	(0.0001)	(0.0001)										
$E_{i,t}/P_{i,t-1} * MW_{i,t} * MO_{i,t}$	0.063	0.278	0.138	0.591	0.202	0.292	0.653	1.000								
	(0.0334)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)									
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.054	0.310	-0.073	0.139	0.066	0.171	-0.001	0.075	1.000							
	(0.0642)	(0.0001)	(0.0131)	(0.0001)	(0.0239)	(0.0001)	(0.9934)	(0.0106)								
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.289	0.968	-0.174	0.429	0.023	0.445	-0.060	0.235	0.336	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.4301)	(0.0001)	(0.0426)	(0.0001)	(0.0001)							
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.253	0.861	-0.120	0.359	0.021	0.376	-0.037	0.196	0.164	0.809	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.4706)	(0.0001)	(0.2049)	(0.0001)	(0.0001)	(0.0001)						
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.230	0.837	-0.150	0.420	-0.026	0.332	-0.056	0.193	0.202	0.789	0.767	1.000				
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.3839)	(0.0001)	(0.0584)	(0.0001)	(0.0001)	(0.0001)	(0.0001)					
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	-0.041	-0.136	0.091	-0.265	-0.013	-0.029	0.011	-0.079	-0.007	-0.082	-0.029	-0.234	1.000			
	(0.1686)	(0.0001)	(0.0019)	(0.0001)	(0.6623)	(0.3279)	(0.7044)	(0.0072)	(0.8168)	(0.0054)	(0.3290)	(0.0001)				
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.248	0.750	-0.090	0.380	0.037	0.479	-0.032	0.244	0.210	0.750	0.669	0.697	-0.038	1.000		
	(0.0001)	(0.0001)	(0.0022)	(0.0001)	(0.2039)	(0.0001)	(0.2814)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.1974)			
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.234	0.706	-0.138	0.336	-0.047	0.368	-0.055	0.172	0.238	0.689	0.600	0.585	-0.103	0.625	1.000	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.1083)	(0.0001)	(0.0611)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0005)	(0.0001)		
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.067	0.378	-0.053	0.185	0.023	0.107	0.046	0.155	0.139	0.391	0.248	0.284	-0.001	0.279	0.228	1.000
	(0.0217)	(0.0001)	(0.0710)	(0.0001)	(0.4424)	(0.0003)	(0.1169)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.9898)	(0.0001)	(0.0001)	

Table 5 Test on H4: the impact of female executives on the association between material weakness disclosures under Section 404 of SOX and the informativeness of earning.

Panel A Descriptive Statistics (N=2349)

	Mean	Median	S.D.	Q1	Q3
$RETURN_{i,t}$	0.101	0.060	0.377	-0.116	0.260
$E_{i,t}/P_{i,t-1}$	0.039	0.049	0.070	0.027	0.068
$MW_{i,t}$	0.096	0.000	0.294	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.001	0.000	0.034	0.000	0.000
$FEMALE_{i,t}$	0.247	0.000	0.431	0.000	0.000
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.010	0.000	0.036	0.000	0.000
$MW_{i,t} * FEMALE_{i,t}$	0.029	0.000	0.169	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t} * FEMALE_{i,t}$	0.001	0.000	0.013	0.000	0.000
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.011	0.000	0.035	0.000	0.000
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.314	0.362	0.449	0.194	0.517
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.034	0.039	0.125	0.015	0.074
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.006	0.006	0.026	0.000	0.015
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.248	0.122	4.714	0.060	0.193
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.010	0.008	0.085	0.004	0.020
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.012	0.010	0.044	-0.001	0.027
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.212	0.052	0.641	0.011	0.210
$AGE_{i,t}$	25.414	20.000	14.284	14.000	37.000

Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 5 Panel B
Pearson correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i.t}$	1.000															
$E_{i.t}/P_{i.t-1}$	0.286	1.000														
	(0.0001)															
$MW_{i.t}$	-0.037	-0.174	1.000													
	(0.0712)	(0.0001)														
$E_{i.t}/P_{i.t-1} * MW_{i.t}$	0.145	0.483	0.014	1.000												
	(0.0001)	(0.0001)	(0.5114)													
$FEMALE_{i.t}$	-0.032	0.002	0.045	0.047	1.000											
	(0.1168)	(0.9306)	(0.0288)	(0.0238)												
$E_{i.t}/P_{i.t-1} * FEMALE_{i.t}$	0.090	0.400	-0.019	0.146	0.470	1.000										
	(0.0001)	(0.0001)	(0.3471)	(0.0001)	(0.0001)											
$MW_{i.t} * FEMALE_{i.t}$	0.024	-0.036	0.535	0.125	0.304	0.072	1.000									
	(0.2451)	(0.0836)	(0.0001)	(0.0001)	(0.0001)	(0.0005)										
$E_{i.t}/P_{i.t-1} * MW_{i.t} * FEMALE_{i.t}$	0.125	0.162	0.166	0.394	0.094	0.359	0.310	1.000								
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)									
$E_{i.t}/P_{i.t-1} * REG_{i.t}$	0.049	0.372	-0.045	0.110	-0.019	0.215	-0.009	0.027	1.000							
	(0.0173)	(0.0001)	(0.0294)	(0.0001)	(0.3543)	(0.0001)	(0.6805)	(0.1944)								
$E_{i.t}/P_{i.t-1} * SIZE_{i.t}$	0.286	0.969	-0.174	0.417	-0.004	0.385	-0.042	0.144	0.380	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8501)	(0.0001)	(0.0414)	(0.0001)	(0.0001)							
$E_{i.t}/P_{i.t-1} * BETA_{i.t}$	0.221	0.835	-0.128	0.401	0.004	0.296	-0.008	0.097	0.230	0.774	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8371)	(0.0001)	(0.7016)	(0.0001)	(0.0001)	(0.0001)						
$E_{i.t}/P_{i.t-1} * DEBT_{i.t}$	0.189	0.754	-0.135	0.373	0.010	0.240	-0.029	0.091	0.249	0.727	0.631	1.000				
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.6393)	(0.0001)	(0.1645)	(0.0001)	(0.0001)	(0.0001)	(0.0001)					
$E_{i.t}/P_{i.t-1} * MTB_{i.t}$	-0.018	-0.081	0.054	-0.196	-0.014	0.007	-0.006	0.005	0.001	-0.044	-0.003	-0.164	1.000			
	(0.3928)	(0.0001)	(0.0083)	(0.0001)	(0.5045)	(0.7332)	(0.7848)	(0.8249)	(0.9531)	(0.0314)	(0.8796)	(0.0001)				
$E_{i.t}/P_{i.t-1} * VAR_{i.t}$	0.235	0.743	-0.089	0.372	0.020	0.262	0.019	0.091	0.270	0.745	0.602	0.637	-0.022	1.000		
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.3449)	(0.0001)	(0.3611)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2923)			
$E_{i.t}/P_{i.t-1} * PERS_{i.t}$	0.223	0.674	-0.128	0.288	-0.054	0.200	-0.054	0.099	0.286	0.661	0.553	0.497	-0.070	0.588	1.000	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0090)	(0.0001)	(0.0088)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0007)	(0.0001)		
$E_{i.t}/P_{i.t-1} * MO_{i.t}$	0.244	0.453	-0.066	0.206	-0.012	0.123	0.013	0.120	0.214	0.446	0.368	0.287	-0.013	0.426	0.361	1.000
	(0.0001)	(0.0001)	(0.0014)	(0.0001)	(0.5723)	(0.0001)	(0.5352)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.5279)	(0.0001)	(0.0001)	

Table 6 Test on H5: the impact of female executives on the association between material weakness disclosures under Section 404 of SOX and the informativeness of earning for young firms and old firms.

Panel A Descriptive Statistics

	Young firms (N=1187)					Old firms (N=1162)				
	Mean	**Median**	**S.D.**	**Q1**	**Q3**	**Mean**	**Median**	**S.D.**	**Q1**	**Q3**
$RETURN_{i,t}$	0.101	0.055	0.408	-0.128	0.257	0.100	0.065	0.343	-0.109	0.266
$E_{i,t}/P_{i,t-1}$	0.036	0.044	0.068	0.024	0.064	0.042	0.054	0.072	0.034	0.070
$MW_{i,t}$	0.110	0.000	0.312	0.000	0.000	0.082	0.000	0.274	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	0.000	0.000	0.031	0.000	0.000	-0.000	0.000	0.037	0.000	0.000
$FEMALE_{i,t}$	0.254	0.000	0.435	0.000	1.000	0.240	0.000	0.427	0.000	0.000
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	0.009	0.000	0.034	0.000	0.000	0.010	0.000	0.038	0.000	0.000
$MW_{i,t} * FEMALE_{i,t}$	0.035	0.000	0.183	0.000	0.000	0.024	0.000	0.153	0.000	0.000
$E_{i,t}/P_{i,t-1} * MW_{i,t} * FEMALE_{i,t}$	0.001	0.000	0.011	0.000	0.000	0.000	0.000	0.016	0.000	0.000
$E_{i,t}/P_{i,t-1} * REG_{i,t}$	0.010	0.000	0.037081	0.000	0.000	0.011	0.000	0.032	0.000	0.000
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$	0.283	0.321	0.423	0.166	0.476	0.344	0.405	0.473	0.240	0.550
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$	0.033	0.037	0.134	0.013	0.072	0.036	0.042	0.115	0.016	0.075
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$	0.006	0.004	0.024	0.000	0.014	0.007	0.008	0.027	0.001	0.017
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$	0.132	0.118	0.317	0.053	0.186	0.367	0.127	6.695	0.066	0.198
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$	0.009	0.007	0.073	0.003	0.017	0.012	0.010	0.096	0.004	0.022
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$	0.013	0.009	0.039	0.000	0.025	0.012	0.010	0.049	-0.000	0.029
$E_{i,t}/P_{i,t-1} * MO_{i,t}$	0.221	0.050	0.643	0.009	0.197	0.203	0.055	0.638	0.012	0.219
$AGE_{i,t}$	13.90	14.000	3.326	11.000	16.000	37.177	37.000	11.281	26.000	46.000

Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 6 Panel B
Pearson Correlation Matrix (Young firms N=1187)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i.t}$	1.000															
$E_{i.t}/P_{i.t-1}$	0.258	1.000														
	(0.0001)															
$MW_{i.t}$	-0.029	-0.169	1.000													
	(0.3215)	(0.0001)														
$E_{i.t}/P_{i.t-1} * MW_{i.t}$	0.142	0.458	0.028	1.000												
	(0.0001)	(0.0001)	(0.3291)													
$FEMALE_{i.t}$	-0.017	-0.003	0.050	0.078	1.000											
	(0.570)	(0.933)	(0.086)	(0.007)												
$E_{i.t}/P_{i.t-1} * FEMALE_{i.t}$	0.106	0.402	0.016	0.110	0.449	1.000										
	(0.0003)	(0.0001)	(0.5901)	(0.0001)	(0.0001)											
$MW_{i.t} * FEMALE_{i.t}$	0.053	-0.007	0.539	0.1982	0.325	0.134	1.000									
	(0.0661)	(0.8206)	(0.0001)	(0.0001)	(0.0001)	(0.0001)										
$E_{i.t}/P_{i.t-1} * MW_{i.t} * FEMALE_{i.t}$	0.195	0.108	0.299	0.352	0.180	0.296	0.554	1.000								
	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)									
$E_{i.t}/P_{i.t-1} * REG_{i.t}$	0.027	0.442	-0.023	0.087	-0.082	0.286	-0.018	0.016	1.000							
	(0.3451)	(0.0001)	(0.4312)	(0.0028)	(0.0045)	(0.0001)	(0.5375)	(0.5838)								
$E_{i.t}/P_{i.t-1} * SIZE_{i.t}$	0.266	0.969	-0.172	0.411	-0.006	0.361	-0.012	0.120	0.439	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8416)	(0.0001)	(0.6930)	(0.0001)	(0.0001)							
$E_{i.t}/P_{i.t-1} * BETA_{i.t}$	0.187	0.821	-0.137	0.453	0.004	0.337	0.005	0.107	0.277	0.753	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8813)	(0.0001)	(0.8567)	(0.0002)	(0.0001)	(0.0001)						
$E_{i.t}/P_{i.t-1} * DEBT_{i.t}$	0.149	0.654	-0.122	0.318	-0.015	0.178	-0.012	0.026	0.285	0.645	0.513	1.000				
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.6014)	(0.0001)	(0.6924)	(0.3741)	(0.0001)	(0.0001)	(0.0001)					
$E_{i.t}/P_{i.t-1} * MTB_{i.t}$	0.211	0.427	-0.074	0.141	-0.020	0.199	-0.016	0.075	0.113	0.417	0.400	0.216	1.000			
	(0.0001)	(0.0001)	(0.0107)	(0.0001)	(0.4845)	(0.0001)	(0.5787)	(0.0095)	(0.0001)	(0.0001)	(0.0001)	(0.0001)				
$E_{i.t}/P_{i.t-1} * VAR_{i.t}$	0.224	0.745	-0.094	0.364	0.027	0.220	0.026	0.101	0.350	0.743	0.558	0.555	0.261	1.000		
	(0.0001)	(0.0001)	(0.0013)	(0.0001)	(0.3541)	(0.0001)	(0.3767)	(0.0005)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)			
$E_{i.t}/P_{i.t-1} * PERS_{i.t}$	0.210	0.661	-0.123	0.222	-0.058	0.181	-0.032	0.022	0.362	0.645	0.530	0.385	0.299	0.541	1.000	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0460)	(0.0001)	(0.2749)	(0.4464)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)		
$E_{i.t}/P_{i.t-1} * MO_{i.t}$	0.287	0.465	-0.071	0.239	-0.033	0.143	0.014	0.155	0.295	0.455	0.360	0.227	0.228	0.358	0.361	1.000
	(0.0001)	(0.0001)	(0.0149)	(0.0001)	(0.2558)	(0.0001)	(0.6239)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	

Pearson Correlation Matrix (Old firms N=1162)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
$RETURN_{i.t}$	1.000															
$E_{i.t}/P_{i.t-1}$	0.323	1.000														
	(0.0001)															
$MW_{i.t}$	-0.049	-0.176	1.000													
	(0.0932)	(0.0001)														
$E_{i.t}/P_{i.t-1} * MW_{i.t}$	0.152	0.505	-0.001	1.000												
	(0.0001)	(0.0001)	(0.9615)													
$FEMALE_{i.t}$	-0.052	0.007	0.038	0.019	1.000											
	(0.0747)	(0.7998)	(0.1936)	(0.5276)												
$E_{i.t}/P_{i.t-1} * FEMALE_{i.t}$	0.075	0.397	-0.055	0.175	0.493	1.000										
	(0.0103)	(0.0001)0	(0.0614)	(0.0001)	(0.0001)											
$MW_{i.t} * FEMALE_{i.t}$	-0.019	-0.066	0.527	0.051	0.280	0.006	1.000									
	(0.5250)	(0.0237)	(0.0001)	(0.0818)	(0.0001)	(0.8366)										
$E_{i.t}/P_{i.t-1} * MW_{i.t} * FEMALE_{i.t}$	0.072	0.203	0.062	0.424	0.033	0.407	0.118	1.000								
	(0.0142)	(0.0001)	(0.0350)	(0.0001)	(0.2633)	(0.0001)	(0.0001)									
$E_{i.t}/P_{i.t-1} * REG_{i.t}$	0.079	0.300	-0.074	0.136	0.056	0.143	0.005	0.038	1.000							
	(0.0068)	(0.0001)	(0.0121)	(0.0001)	(0.0544)	(0.0001)	(0.8600)	(0.1992)								
$E_{i.t}/P_{i.t-1} * SIZE_{i.t}$	0.314	0.969	-0.174	0.425	-0.000	0.403	-0.072	0.165	0.325	1.000						
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.9973)	(0.0001)	(0.0139)	(0.0001)	(0.0001)							
$E_{i.t}/P_{i.t-1} * BETA_{i.t}$	0.269	0.863	-0.115	0.358	0.005	0.257	-0.026	0.095	0.164	0.812	1.000					
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.8763)	(0.0001)	(0.3809)	(0.0012)	(0.0001)	(0.0001)						
$E_{i.t}/P_{i.t-1} * DEBT_{i.t}$	0.237	0.839	-0.148	0.417	0.034	0.290	-0.046	0.136	0.216	0.794	0.769	1.000				
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2482)	(0.0001)	(0.1193)	(0.0001)	(0.0001)	(0.0001)	(0.0001)					
$E_{i.t}/P_{i.t-1} * MTB_{i.t}$	-0.040	-0.133	0.089	-0.265	-0.018	0.000	-0.007	0.004	-0.005	-0.081	-0.028	-0.232	1.000			
	(0.1765)	(0.0001)	(0.0024)	(0.0001)	(0.5344)	(0.9968)	(0.8195)	(0.8906)	(0.8726)	(0.0060)	(0.3413)	(0.0001)				
$E_{i.t}/P_{i.t-1} * VAR_{i.t}$	0.257	0.749	-0.087	0.379	0.015	0.292	0.015	0.087	0.210	0.751	0.668	0.697	-0.038	1.000		
	(0.0001)	(0.0001)	(0.0029)	(0.0001)	(0.6216)	(0.0001)	(0.6209)	(0.0029)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2008)			
$E_{i.t}/P_{i.t-1} * PERS_{i.t}$	0.244	0.690	-0.138	0.335	-0.051	0.215	-0.079	0.145	0.222	0.677	0.594	0.582	-0.102	0.618	1.000	
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0800)	(0.0001)	(0.0074)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0005)	(0.0001)		
$E_{i.t}/P_{i.t-1} * MO_{i.t}$	0.193	0.444	-0.062	0.178	0.010	0.106	0.010	0.097	0.120	0.443	0.380	0.343	-0.029	0.487	0.365	1.000
	(0.0001)	(0.0001)	(0.0352)	(0.0001)	(0.7264)	(0.0003)	(0.7282)	(0.0010)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.3197)	(0.0001)	(0.0001)	

Table 7
Material Weaknesses and the Informativeness of Earnings (H1)

	Model 1	**Model 2**
INTERCEPT	0.040***	-0.096
	(4.20)	(-0.77)
$E_{i,t}/P_{i,t-1}$	1.523***	1.543***
	(12.30)	(2.69)
$MW_{i,t}$	0.015	-0.017
	(0.59)	(-0.67)
$E_{i,t}/P_{i,t-1}$ * $MW_{i,t}$	0.083	0.137
	(0.33)	(0.53)
$E_{i,t}/P_{i,t-1}$ * $REG_{i,t}$		-0.352
		(-1.14)
$E_{i,t}/P_{i,t-1}$ * $SIZE_{i,t}$		0.049
		(0.68)
$E_{i,t}/P_{i,t-1}$ * $BETA_{i,t}$		-0.233**
		(-2.02)
$E_{i,t}/P_{i,t-1}$ * $DEBT_{i,t}$		-0.769*
		(-1.68)
$E_{i,t}/P_{i,t-1}$ * $MTB_{i,t}$		-0.000
		(-0.05)
$E_{i,t}/P_{i,t-1}$ * $VAR_{i,t}$		-0.048
		(-0.34)
$E_{i,t}/P_{i,t-1}$ * $PERS_{i,t}$		0.055
		(0.23)
$E_{i,t}/P_{i,t-1}$* $MO_{i,t}$		0.083***
		(6.25)
$E_{i,t}/P_{i,t-1}$* $FEMALE_{i,t}$		-0.246
		(-1.07)
Year	No	Yes
Industry	No	Yes
N	2349	2349
F value	69.58	7.29
Adj. R^2	0.081	0.167

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 8
Managerial Ownership, Material Weaknesses, and the Informativeness of Earnings (H2)

	Model 1	**Model 2**
INTERCEPT	0.043***	-0.074
	(3.93)	(-0.60)
$E_{i,t}/P_{i,t-1}$	1.219***	1.687***
	(8.56)	(2.96)
$MW_{i,t}$	0.027	0.003
	(0.90)	(0.09)
$E_{i,t}/P_{i,t-1}$* $MW_{i,t}$	-0.779**	-0.888***
	(-2.56)	(-2.85)
$MO_{i,t}$	-0.001	-0.001
	(-1.01)	(-0.33)
$E_{i,t}/P_{i,t-1}$* $MO_{i,t}$	0.074***	0.061***
	(3.92)	(3.20)
$MW_{i,t}$* $MO_{i,t}$	-0.008*	-0.009**
	(-1.87)	(-2.18)
$E_{i,t}/P_{i,t-1}$* $MW_{i,t}$ * $MO_{i,t}$	0.240***	0.265***
	(4.96)	(5.56)
$E_{i,t}/P_{i,t-1}$ * $REG_{i,t}$		-0.314
		(-1.02)
$E_{i,t}/P_{i,t-1}$ * $SIZE_{i,t}$		0.049
		(0.68)
$E_{i,t}/P_{i,t-1}$ * $BETA_{i,t}$		-0.233**
		(-2.03)
$E_{i,t}/P_{i,t-1}$ * $DEBT_{i,t}$		-0.678
		(-1.49)
$E_{i,t}/P_{i,t-1}$ * $MTB_{i,t}$		-0.001
		(-0.49)
$E_{i,t}/P_{i,t-1}$ * $VAR_{i,t}$		-0.100
		(-0.71)
$E_{i,t}/P_{i,t-1}$ * $PERS_{i,t}$		0.057
		(0.24)
$E_{i,t}/P_{i,t-1}$* $FEMALE_{i,t}$		-0.367
		(-1.60)
Year	No	Yes
Industry	No	Yes
N	2349	2349
F value	41.37	7.56
Adj. R^2	0.107	0.179

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 9
Information Asymmetry, Managerial Ownership
Material Weaknesses, and the Informativeness of Earnings (H3)

	Young firms		Old firms	
	Model 1	**Model 2**	**Model 1**	**Model 2**
INTERCEPT	0.041**	0.009	0.044***	-0.033
	(2.54)	(0.12)	(3.10)	(-0.29)
$E_{i,t}/P_{i,t-1}$	1.106***	-0.008	1.316***	2.778***
	(4.99)	(-0.01)	(7.29)	(3.59)
$MW_{i,t}$	0.022	-0.016	0.001	-0.016
	(0.53)	(-0.39)	(0.03)	(-0.37)
$E_{i,t}/P_{i,t-1}$* $MW_{i,t}$	-1.135**	-0.919*	0.229	-0.082
	(-2.35)	(-1.82)	(0.54)	(-0.18)
$MO_{i,t}$	-0.001	0.001	-0.003*	-0.002
	(-0.04)	(0.26)	(-1.75)	(-1.01)
$E_{i,t}/P_{i,t-1}$* $MO_{i,t}$	0.088***	0.089***	0.064***	0.044*
	(2.84)	(2.88)	(2.79)	(1.83)
$MW_{i,t}$* $MO_{i,t}$	-0.007	-0.006	0.003	-0.001
	(-1.33)	(-1.19)	(0.51)	(-0.06)
$E_{i,t}/P_{i,t-1}$* $MW_{i,t}$ * $MO_{i,t}$	0.307***	0.287***	-0.104	-0.066
	(4.96)	(4.70)	(-1.04)	(-0.66)
$E_{i,t}/P_{i,t-1}$ * $REG_{i,t}$		-0.881*		0.069
		(-1.96)		(0.15)
$E_{i,t}/P_{i,t-1}$ * $SIZE_{i,t}$		0.180		-0.057
		(1.56)		(-0.62)
$E_{i,t}/P_{i,t-1}$ * $BETA_{i,t}$		-0.192		-0.195
		(-1.19)		(-1.04)
$E_{i,t}/P_{i,t-1}$ * $DEBT_{i,t}$		-0.172		-1.756**
		(-0.28)		(-2.38)
$E_{i,t}/P_{i,t-1}$ * $MTB_{i,t}$		0.114***		-0.001
		(2.97)		(-0.61)
$E_{i,t}/P_{i,t-1}$ * $VAR_{i,t}$		0.231		-0.050
		(0.93)		(-0.29)
$E_{i,t}/P_{i,t-1}$ * $PERS_{i,t}$		0.313		-0.172
		(0.78)		(-0.59)
$E_{i,t}/P_{i,t-1}$* $FEMALE_{i,t}$		0.272		-0.727**
		(0.72)		(-2.50)
Year	No	Yes	No	Yes
Industry	No	Yes	No	Yes
N	1187	1187	1162	1162
F value	23.97	5.61	20.54	4.73
Adj. R^2	0.119	0.214	0.105	0.190

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 10
Female Executives, Material Weaknesses, and the Informativeness of Earnings (H4)

	Model 1	Model 2
INTERCEPT	0.044***	-0.080
	(4.08)	(-0.65)
$E_{i,t}/P_{i,t-1}$	1.662***	1.577***
	(11.82)	(2.73)
$MW_{i,t}$	-0.018	-0.043
	(-0.59)	(-1.42)
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	-0.452	-0.263
	(-1.64)	(-0.93)
$FEMALE_{i,t}$	-0.018	-0.022
	(-0.81)	(-1.00)
$E_{i,t}/P_{i,t-1} * FEMALE_{i,t}$	-0.617**	-0.443
	(-2.11)	(-1.50)
$MW_{i,t} * FEMALE_{i,t}$	0.055	0.039
	(0.94)	(0.68)
$E_{i,t}/P_{i,t-1} * MW_{i,t} * FEMALE_{i,t}$	3.046***	2.300***
	(4.40)	(3.36)
$E_{i,t}/P_{i,t-1} * REG_{i,t}$		-0.277
		(-0.89)
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$		0.041
		(0.58)
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$		-0.202*
		(-1.75)
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$		-0.787*
		(-1.72)
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$		-0.001
		(-0.37)
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$		-0.012
		(-0.08)
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$		0.027
		(0.11)
$E_{i,t}/P_{i,t-1} * MO_{i,t}$		0.078***
		(5.86)
Year	No	Yes
Industry	No	Yes
N	2349	2349
F value	34.09	7.25
Adj. R^2	0.09	0.172

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 11
Information Asymmetry, Female Executives,
Material Weaknesses and the Informativeness of Earnings (H5)

	Young firms		Old firms	
	Model 1	**Model 2**	**Model 1**	**Model 2**
INTERCEPT	0.051***	0.057	0.038***	-0.039
	(3.09)	(0.70)	(2.70)	(-0.35)
$E_{i,t}/P_{i,t-1}$	1.624***	0.280	1.702	2.687***
	(7.39)	(0.31)	(9.70)	(3.47)
$MW_{i,t}$	-0.040	-0.057	0.006	-0.021
	(-0.90)	(-1.32)	(0.15)	(-0.51)
$E_{i,t}/P_{i,t-1} * MW_{i,t}$	-0.621	-0.063	-0.333	-0.494
	(-1.40)	(-0.14)	(-0.99)	(-1.33)
$FEMALE_{i,t}$	-0.016	-0.054	-0.021	-0.010
	(-0.51)	(-1.63)	(-0.71)	(-0.34)
$E_{i,t}/P_{i,t-1}* FEMALE_{i,t}$	-0.624	0.373	-0.588	-0.905**
	(-1.41)	(0.78)	(-1.56)	(-2.26)
$MW_{i,t}* FEMALE_{i,t}$	-0.073	-0.074	0.016	-0.010
	(-0.81)	(-0.85)	(0.21)	(-0.13)
$E_{i,t}/P_{i,t-1}* MW_{i,t}* FEMALE_{i,t}$	8.481***	5.573***	0.879	1.045
	(6.21)	(4.07)	(1.13)	(1.31)
$E_{i,t}/P_{i,t-1} * REG_{i,t}$		-0.966**		0.121
		(-2.11)		(0.26)
$E_{i,t}/P_{i,t-1} * SIZE_{i,t}$		0.095		-0.040
		(0.81)		(-0.44)
$E_{i,t}/P_{i,t-1} * BETA_{i,t}$		-0.265		-0.179
		(-1.65)		(-0.94)
$E_{i,t}/P_{i,t-1} * DEBT_{i,t}$		-0.087		-1.714**
		(-0.14)		(-2.32)
$E_{i,t}/P_{i,t-1} * MTB_{i,t}$		0.111***		-0.001
		(2.90)		(-0.87)
$E_{i,t}/P_{i,t-1} * VAR_{i,t}$		0.370		0.001
		(1.48)		(0.01)
$E_{i,t}/P_{i,t-1} * PERS_{i,t}$		0.427		-0.142
		(1.07)		(-0.49)
$E_{i,t}/P_{i,t-1} * MO_{i,t}$		0.128***		0.021
		(6.23)		(1.18)
Year	No	Yes	No	Yes
Industry	No	Yes	No	Yes
N	1187	1187	1162	1162
F value	18.95	5.56	20.34	4.73
Adj. R^2	0.096	0.212	0.104	0.190

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 12
Managerial Ownership, Classified Material Weaknesses,, and the Informativeness of Earnings

	Model 1	Model 2
INTERCEPT	0.043***	-0.080
	(3.94)	(-0.65)
$E_{i.t}/P_{i.t-1}$	1.219***	1.642***
	(8.58)	(2.88)
COMPANY-LEVEL$_{i.t}$	0.003	-0.016
	(0.07)	(-0.45)
$E_{i.t}/P_{i.t-1}$* COMPANY-LEVEL$_{i.t}$	-0.775**	-0.731**
	(-2.27)	(-2.10)
$MO_{i.t}$	-0.001	-0.000
	(-1.01)	(-0.31)
$E_{i.t}/P_{i.t-1}$* $MO_{i.t}$	0.074***	0.061***
	(3.93)	(3.18)
COMPANY-LEVEL$_{i.t}$* $MO_{i.t}$	-0.002	-0.005
	(-0.52)	(-0.98)
$E_{i.t}/P_{i.t-1}$* $MO_{i.t}$* COMPANY-LEVEL$_{i.t}$	0.300***	0.320***
	(5.77)	(6.29)
ACCOUNT-SPECIFIC$_{i.t}$	0.048	0.022
	(0.92)	(0.42)
$E_{i.t}/P_{i.t-1}$*ACCOUNT-SPECIFIC$_{i.t}$	-0.529	-0.927
	(-0.88)	(-1.55)
ACCOUNT-SPECIFIC$_{i.t}$ * $MO_{i.t}$	-0.005	-0.004
	(-0.53)	(-0.54)
$E_{i.t}/P_{i.t-1}$* $MO_{i.t}$* ACCOUNT-SPECIFIC$_{i.t}$	-0.013	0.010
	(-0.11)	(0.09)
$E_{i.t}/P_{i.t-1}$ * REG $_{i.t}$		-0.38
		(-1.24)
$E_{i.t}/P_{i.t-1}$ * SIZE $_{i.t}$		0.064
		(0.89)
$E_{i.t}/P_{i.t-1}$ * BETA $_{i.t}$		-0.277**
		(-2.41)
$E_{i.t}/P_{i.t-1}$ * DEBT$_{i.t}$		-0.72
		(-1.59)
$E_{i.t}/P_{i.t-1}$ * MTB $_{i.t}$		-0.001
		(-0.25)
$E_{i.t}/P_{i.t-1}$ * VAR $_{i.t}$		-0.061
		(-0.43)
$E_{i.t}/P_{i.t-1}$ * PERS $_{i.t}$		0.065
		(0.27)
$E_{i.t}/P_{i.t-1}$* FEMALE $_{i.t}$		-0.321
		(-1.41)
Year	No	Yes
Industry	No	Yes
N	2349	2349
F value	28.23	7.51
Adj. R^2	0.113	0.185

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.

Table 13
Female Executives, Classified Material Weaknesses, and the Informativeness of Earnings

	Model 1	Model 2
INTERCEPT	0.044***	-0.086
	(4.08)	(-0.70)
$E_{i.t}/P_{i.t-1}$	1.662***	1.493***
	(11.83)	(2.59)
COMPANY-LEVEL$_{i.t}$	-0.023	-0.052
	(-0.61)	(-1.45)
$E_{i.t}/P_{i.t-1}$* COMPANY-LEVEL$_{i.t}$	-0.272	0.022
	(-0.87)	(0.07)
FEMALE$_{i.t}$	-0.018	-0.024
	(-0.81)	(-1.07)
$E_{i.t}/P_{i.t-1}$* FEMALE$_{i.t}$	-0.617**	-0.438
	(-2.11)	(-1.49)
COMPANY-LEVEL$_{i.t}$* FEMALE$_{i.t}$	0.065	0.070
	(0.89)	(0.99)
$E_{i.t}/P_{i.t-1}$* FEMALE$_{i.t}$ * COMPANY-LEVEL$_{i.t}$	3.843***	3.199***
	(4.65)	(3.93)
ACCOUNT-SPECIFIC$_{i.t}$	0.007	0.002
	(0.13)	(0.04)
$E_{i.t}/P_{i.t-1}$* ACCOUNT-SPECIFIC$_{i.t}$	-1.009**	-1.071**
	(-2.07)	(-2.22)
ACCOUNT-SPECIFIC$_{i.t}$ * FEMALE$_{i.t}$	0.043	-0.012
	(0.48)	(-0.13)
$E_{i.t}/P_{i.t-1}$* FEMALE$_{i.t}$ * ACCOUNT-SPECIFIC$_{i.t}$	1.830	0.928
	(1.62)	(0.84)
$E_{i.t}/P_{i.t-1}$ * REG $_{i.t}$		-0.297
		(-0.96)
$E_{i.t}/P_{i.t-1}$ * SIZE $_{i.t}$		0.063
		(0.87)
$E_{i.t}/P_{i.t-1}$ * BETA $_{i.t}$		-0.225*
		(-1.94)
$E_{i.t}/P_{i.t-1}$ * DEBT$_{i.t}$		-0.868*
		(-1.90)
$E_{i.t}/P_{i.t-1}$ * MTB $_{i.t}$		-0.001
		(-0.15)
$E_{i.t}/P_{i.t-1}$ * VAR $_{i.t}$		0.020
		(0.14)
$E_{i.t}/P_{i.t-1}$ * PERS $_{i.t}$		-0.003
		(-0.01)
$E_{i.t}/P_{i.t-1}$* MO$_{i.t}$		0.078***
		(5.86)
Year	No	Yes
Industry	No	Yes
N	2349	2349
F value	22.41	7.11
Adj. R^2	0.091	0.176

*, **, *** Significant at a two-tailed p-value $\leq$ 0.10, 0.05, or 0.01, respectively. Each of the continuous variables is winsorized at 1 percent and 99 percent to mitigate outliers.