Manager's Personal Legal Liability and External Audits of Internal Controls: Are These Regulatory Mechanisms Complements or Substitutes?

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ABSTRACT

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Policymakers advocate that effective internal controls are paramount to generating reliable financial statements and to improving investor confidence. To motivate managers to improve internal controls, the Sarbanes-Oxley Act of 2002 (SOX) extends managers' personal legal liability to include internal control disclosures. Additionally, SOX and related PCAOB standards require that external auditors issue an opinion on the effectiveness of a firm's internal controls over financial reporting. This study investigates the effects of manager liability and internal control audits on (1) managers' internal control spending and disclosure behaviors, and (2) investor confidence and stock prices. Results of a laboratory experiment suggest that both regulatory mechanisms motivate managers to improve internal controls. Also, results indicate that these regulatory mechanisms are additive with respect to the amount managers spent on improving internal controls. However, with respect to investor confidence and stock prices, results suggest that investors' perceive these two regulatory mechanisms to be substitutes.

Key Words: Internal control audit, Manager's legal liability, Internal control spending, Investor confidence

1. Introduction

A common assertion is that the string of corporate scandals, beginning with Enron, severely eroded investors' confidence in the reliability of financial statements (SEC 2003a; SEC 2003b; PCAOB 2005). Investor confidence is essential to the vitality of the stock market because as the SEC Commissioner Cynthia A. Glassman points out, "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" (SEC 2006a).[1] Consequently, in order to restore investor confidence, policymakers have focused much of their efforts on improving internal controls over financial reporting (ICFR). This focus on ICFR is based on the belief that companies with effective ICFR systems generate more reliable financial statements (SEC 2003a; PCAOB 2005; SEC 2006b).

In order to motivate managers to improve ICFR, policymakers implemented the Sarbanes-Oxley Act of 2002 (SOX). Section 302 of SOX extends managers' personal legal liability (hereafter referred to as manager liability) to include reporting on the effectiveness of ICFR. Furthermore, Section 404 of SOX requires the external auditor to issue an opinion on the effectiveness of a firm's ICFR (SEC 2002; PCAOB 2004; PCAOB 2007). Given that the combination of manager liability and an external audit of internal controls (IC audit) constitutes a new financial reporting environment, direct empirical evidence is scant regarding their individual and joint effectiveness in accomplishing at least two policy objectives: (1) motivating managers to improve ICFR, and (2) ultimately improving investor confidence in the financial statements (SEC 2006a; SEC 2006b). The primary purpose of this study is to investigate the effects of

[1] Investor confidence sometimes refers to confidence in the economy or beliefs about market risk (State Street 2006). This study uses investor confidence in the sense that policymakers and regulators have used the term as a justification for corporate reporting reform (i.e., confidence in reported earnings) (SEC 2003a; SEC 2003b; SEC 2006b).

managers' personal legal liability and an IC audit on (1) managers' ICFR spending and disclosures, and (2) on investor confidence as measured directly and as reflected in stock prices.

Given the costs associated with conducting IC audits and imposing liability on managers, the debate is ongoing regarding the incremental effectiveness of these mechanisms (PCAOB 2006; SEC 2006a). As Cynthia A. Glassman, SEC Commissioner, advocates, in order to begin evaluating the effectiveness of the IC audit in improving ICFR, it is necessary to examine this regulation "as part of the larger whole of new law and regulation" (SEC 2006a). This study contributes to this debate by examining the effectiveness of an IC audit in the presence of manager liability, another key regulatory mechanism also intended to improve ICFR.

A laboratory experiment is used to examine the individual and combined effectiveness of manager liability and an IC audit on (1) managers' ICFR spending and disclosure behaviors, and (2) investor confidence and stock prices. A laboratory experiment allows for the existence of manager liability and IC audits to vary independent of each other which otherwise would not be feasible given that both mechanisms function simultaneously in the marketplace. Second, an experiment enables a controlled examination of not only the first order effects of manager liability and an IC audit on managers' ICFR spending and disclosure decisions, but also the second order effects of these two regulatory mechanisms on investors' perceptions and behaviors.

Results suggest that managers will spend more to improve ICFR when either manager liability or an IC audit is present and that the effects are independent such that the combination of manager liability and an IC audit leads to the greatest amount of ICFR spending. However, after controlling for the amount of ICFR spending, results suggest that only manager liability has a significant effect on managers' willingness to disclose that ICFR is not effective.

As for investor reactions, results suggest that the presence of either manager liability or an IC audit improves investor confidence. Results also suggest that manager liability and an IC audit interact as substitutes with respect to investor confidence. Specifically, investor confidence is no greater when both manager liability and an IC audit are present than when only one is present. Results for stock prices reveal similar findings as those for investor confidence.

This study makes three primary contributions. First, it extends the auditing literature by focusing on managerial spending to improve ICFR. Prior studies in this area focus on managers' efforts to increase profits (i.e., asset value) (DeJong et al. 1985; Dopuch et al. 1989; King and Wallin 1990; Wallin 1992; Dopuch et al. 1994). Unlike managers' spending to increase profits, spending on ICFR reduces company resources that otherwise could be used to generate higher asset values (PCAOB 2005). This is an important distinction because decisions to direct resources to ICFR require managers to consider the trade-off between improving the reliability of financial statements versus generating profits.

Second, this study contributes to the limited research regarding the interactive effects of manager liability and audits on managerial actions as well as investors' behaviors (c.f., Wallin 1992). This study extends prior research by demonstrating that an IC audit has incremental benefits in terms of motivating managers to improve ICFR even in the presence of increased manager liability. Moreover, this study provides insight regarding whether investors perceive increased manager liability and IC audits as additive, complements, or substitutes. Results suggest that investors' perceive these two regulatory mechanisms as substitutes. These results have implications for policymakers by providing insight into how these regulatory mechanisms taken together motivate managers to improve ICFR and improve investor confidence.

Third, this study tests policymakers' claim that increased manager liability and IC audits will improve investor confidence in the reliability of the financial statements (SEC 2002; SEC 2006a; SEC 2006b). A common assumption is that the observed association between manager liability or IC audits and stock price is necessarily explained by changes in investor confidence (e.g., Chang, Chen, Liao, and Mishra 2006; Wilkinson and Clements 2006; Singer and You 2008). By directly measuring investor confidence in financial reporting, our study tests this assumption and extends prior literature by establishing a causal link between these regulatory mechanisms and investor confidence.

The remainder of this paper is organized into four sections. The next section provides background and hypotheses development. Section 3 describes the experiment and Section 4 presents the results. Finally, Section 5 provides a discussion of the conclusions, implications and limitations of this study.

2. Background and Hypotheses Development

Policymakers argue that firms with effective ICFR produce more reliable financial statements (i.e., higher earnings quality) than those with lower quality ICFR (SEC 2006b).[2] Investors could benefit from investments in ICFR because they receive more reliable information about firm performance, and thus, reduce their investment risk. Recent empirical evidence supports this argument by finding that firms disclosing ineffective ICFR have higher, more varied abnormal accruals than firms that make no such disclosures. (Doyle, Ge and McVay 2007; Ashbaugh, Collins, Kinney, and LaFond 2008; Chan, Farrell, and Lee 2008).

Both investors and managers could benefit from better internal control systems because they generate more reliable signals of firm performance. More reliable financial information

[2] Earnings quality can be defined as the amount to which net income reported on the financial statements differs from an unbiased and accurate net income (Hodge 2003).

reduces investors' perceived uncertainty about managers' reported earnings. This is turn benefits managers because reduced uncertainty should increase investors' willingness to pay more for the firm's stock. From the manager's perspective, however, spending on ICFR diverts limited firm resources that otherwise could be used to generate higher profits (PCAOB 2005). Thus, managers must choose between investing in income producing assets and investing in ICFR. Calls for increased regulation are based, in part, on the market's inability to achieve a socially optimum balance between these two choices. Yet, prior studies have not examined this important trade-off with respect to ICFR. Hence, this study focuses on whether two mechanisms recently implemented as a result of SOX, personal liability for managers and an IC audit, motivate managers to improve ICFR over financial reporting.

2.1 Effects of Manager Liability

SOX Section 302 extends managers' legal liability from financial reporting to include ICFR disclosures. Specifically, Section 302 requires that CEOs and CFOs personally attest that among other things, (1) effective ICFR have been established, maintained and evaluated on a timely basis, and (2) the financial statements are accurate and reliable (SEC 2002; SEC 2003b; PCAOB 2004 p. 211). The required certification is expected to reinforce management's responsibility for the process that creates the information contained in the quarterly and annual reports (SEC 2002; SEC 2003b). [3] CEOs and CFOs are subject to SEC enforcement actions if they provide incorrect certifications.

Existing analytical models predict that the presence of legal liability motivates managers to reduce self-interested behaviors, and in turn, to spend more on increasing asset value (e.g., DeJong et al. 1985; King and Wallin 1990; Wallin 1992; Dopuch et al. 1994). Existing analytical

[3] With the certification requirement policymakers have created new legal obligations for management (SEC 2002). By certifying under oath, managers can be prosecuted for perjury.

models also predict that in the presence of legal liability, managers are more likely to provide truthful reports of asset values (e.g., King and Wallin 1990; Wallin 1992; Dopuch et al. 1994). These predictions suggest that legal liability motivates managers to act in the interest of investors because they are penalized when they engage in behaviors that are unfavorable to investors.

Results from prior studies generally support existing analytical model predictions. For instance, King and Wallin (1990) find that legal liability deters managers from engaging in fraudulent reporting. Furthermore, DeJong et al. (1985) find evidence that managers' legal liability decreases the frequency that managers delivered substandard service (i.e., product). Likewise, Wallin (1992) finds that managers are more likely to provide truthful reports of asset value when legal recourse is available to investors. Similarly, Dopuch et al. (1994) find that when both the auditor and client are liable and both parties have sufficient funds to pay damages, clients engaged in less fraudulent reporting. This stream of literature provides a theoretical basis for predicting the effect of manager liability on managers' behaviors related to ICFR. While we rely on past results to predict behavior with respect to ICFR spending, the extension is uncertain because prior results lack the trade-off between asset value and improving ICFR.

With increased manager liability imposed by SOX Section 302, managers have incentives to spend firm resources on internal controls in order to gain assurance that effective internal controls have been established and maintained (SEC 2002). This in turn reduces managers' liability exposure because they have greater assurance that the financial statements and internal control reports they certify are correct. Furthermore, in order to avoid personal legal penalties, manager liability increases managers' incentives to disclose negative internal control information if they believe effective internal controls have not been established and/or maintained. Hypotheses H1a and H1b, stated in the alternative form, express the idea that managers will spend more on ICFR and be more likely to disclose negative information regarding the effectiveness of ICFR in the presence of manager liability:

> H1a: Managers will increase their spending on ICFR when faced with legal liability with respect to ICFR.
>
> H1b: Managers are more likely to disclose that ICFR is not effective when faced with legal liability with respect to ICFR.

It is important to note that in order to isolate and test the incremental effect of manager liability on managers' willingness to disclose ineffective ICFR, as predicted in H1b, it is necessary to control for the effect of increased spending, as predicted in H1a.

2.2 Effects of External Audit of ICFR

SOX Section 404 and the Public Company Accounting Oversight Board (PCAOB), Auditing Standard No. 5 require that the auditors of U.S. publicly-traded companies provide assurance on the effectiveness of ICFR (PCAOB 2004, 2007). Auditing serves as a monitoring and verification mechanism to prevent managers from taking advantage of the information asymmetry in the manager-investor relationship (Blazenko and Scott 1986; Smith, Schatzberg, and Waller 1987; McConomy 1998). In doing so, prior theoretical audit studies predict that the audit function should motivate managers to choose costly investments that increase asset value, and to engage in truthful reporting (Ng 1978; Blazenko and Scott 1986).[4]

Prior studies support the notion that auditing motivates managers to spend on asset value and to engage in truthful reporting. DeJong et al. (1985) and Wallin (1992) find that audits increase managers' propensity to spend on asset value. More importantly, Dopuch et al. (1989) find that audits not only increase the frequency of investments on asset value but also the frequency of truthful reporting. Finally, using archival data, McConomy (1998) finds that the

[4] The purpose of this study is not to examine managers' or investors' decisions to purchase internal control audit services. Therefore, in this study the internal control audit function is mandated and therefore exogenous since neither managers nor investors decide whether to purchase auditing services.

extent of positively biased earnings forecasts by managers decreased when audits of these forecasts became mandatory in Canada. In summary, prior studies demonstrate that the presence of auditing increases managers' incentives to (1) increase asset value, (2) increase truthful reporting, and (3) provide more reliable earnings forecasts.

Likewise, the presence of an IC audit should motivate managers to spend on ICFR in order to reduce the likelihood that auditors will issue an adverse internal control opinion (i.e., ICFR is not effective). Furthermore, the presence of an IC audit should increase managers' willingness to disclose that ICFR is not effective. This leads to Hypotheses H2a and H2b, stated in the alternative form.[5]

H2a: Managers will increase their spending on ICFR in the presence of an IC audit.

H2b: Managers are more likely to disclose that ICFR is not effective in the presence of an IC audit.

2.3 Interactive Effects of Manager Liability and IC Audits

Wallin (1992) develops an analytical model that predicts when both manager liability and auditing are available, managers' spending on improving asset value will not be greater than when either manager liability or auditing is available. Provided that the manager's legal liability is sufficient (Boatsman, Grasso, Ormiston, and Reneau 1992; Wallin 1992), the model thus suggests that manager liability and auditing interact as substitutes with respect to spending to increase asset values.[6] This is an interesting proposition in an audit context, albeit a context that did not contemplate the trade-offs between asset values and reporting reliability inherent with ICFR. For this reason, the current study tests the hypothesis of an interaction in a setting where

[5] Consistent with H1b, in order to isolate the effect of an IC audit on managers' internal control disclosures, it is necessary to control for the effect of internal control spending on managers' internal control disclosures.
[6] Alternatively, if manager liability and an IC audit interact as complements (i.e., positive interaction), then the marginal effectiveness of each regulatory mechanism will increase in the presence of the other (Siggelkow 2002).

managers must consider this trade-off as depicted in Panel A of Figure 1 and as formally stated by Hypotheses H3a and H3b, in the alternative form.

> H3a: The effect of an IC audit on managers' ICFR spending is weaker in the presence of manager liability than in the absence of manager liability.
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> H3b: The effect of an IC audit on managers' propensity to disclose that ICFR is not effective is weaker in the presence of manager liability than in the absence of manager liability.

[INSERT FIGURE 1 HERE]

2.4 Investors' Confidence and Risk Premium

In response to a perceived confidence crisis caused by recent accounting scandals, policymakers advocate that effective ICFR is paramount to restoring investor confidence in the financial statements (SEC 2002; SEC 2006a; SEC 2006b). Theoretically, stock prices decline when investors lack confidence in the reliability of financial statements because they require a higher risk premium to compensate for the uncertainty. Supposedly, effective ICFR improve the reliability of financial statements by constraining reported earnings within a reasonable range of true earnings (Boritz and Zhang 2006). Accordingly, spending on ICFR should reduce investors' required risk premium because better ICFR reduce the risk associated with the inherent imprecision of earnings.

Investor reactions to managers' disclosures depend in part on the perceived credibility of the disclosures (Mercer 2004). Persuasion models in psychology suggest that a message receiver's perception regarding the incentives faced by the message sender affect message credibility (Eagly, Wood, and Chaiken 1978; Pornpitakpan 2004). Therefore, when managers have greater incentives to mislead investors, investors should perceive managers' disclosures to be less credible (Mercer 2004). The presence of manager liability should decrease managers' incentives to engage in behaviors that are unfavorable to investors because managers are potentially penalized for doing so. If investors recognize that managers are concerned with the legal liability, then increased manager liability should increase the perceived credibility of managers' disclosures by reducing managers' incentives to mislead investors. This in turn should improve investor confidence and reduced required risk premium.

Indirect evidence suggests that increased manager liability has the potential to improve investor confidence. Using archival data, Chang et al. (2006) demonstrate a positive relation between CEO/CFO certifications and stock price such that companies with CEO/CFO certifications prior to the first SOX certification deadline experienced positive abnormal returns. Conversely, Bhattacharya, Groznik, and Haslem (2002) and Wilkinson and Clements (2006) do not find a significant association between companies that file early CEO/CFO certifications and stock price. The potential for extraneous variables when using correlational data for self-selected early filers may explain the mixed results. Therefore, it is not entirely clear whether increased manager liability leads to higher investor confidences and lower required risk premium. This study uses an experiment to control for extraneous variables and to isolate and directly examine the effect of increased manager liability on investor confidence and required risk premium. The above discussion leads to Hypotheses H4a and H4b, stated in the alternative form.

> H4a: Investor confidence will be greater in the presence of manager liability than in the absence of manager liability.

> H4b: Investors' required risk premium will be less in the presence of manager liability than in the absence of manager liability.

The audit function serves as a monitoring and verification mechanism. Thus, the presence of an IC audit should increase the perceived credibility of managers' disclosures by decreasing managers' incentives to engage in behaviors that are unfavorable to investors (Mercer 2004). This in turn should improve investor confidence and reduced required risk premium.

Existing evidence suggests that IC audits may improve investor confidence in the reliability of financial statements. Prior studies show that users of financial information (i.e., bankers) rate the credibility/reliability of audited disclosures higher than unaudited disclosures (e.g., Libby 1979; Pany and Smith 1982). In addition, Blackwell, Noland, and Winters (1998) find that small private firms with audited financial statements experienced reduced interest rates on bank loans compared to those without audited financial statements. Also, numerous prior studies provide evidence that audit opinions, both financial statements and internal controls, are value-relevant (e.g., Firth 1978; Dopuch, Holthausen, and Leftwich 1986; Fleak and Wilson 1994; Schneider and Church 2007; Lopez, Vandervelde and Wu 2008). Taken together, the existing auditing literature suggests that audits affect users' behavior and that the typical assumption is that confidence in the reliability of the audited information increases. The above discussion leads to H5a and H5b, stated in the alternative form.

> H5a: Investor confidence will be greater in the presence of an IC audit than in the absence of an IC audit.

> H5b: Investors' required risk premium will be less in the presence of an IC audit than in the absence of an IC audit.

No research regarding the interactive effect of manager liability and an IC audit on investor confidence and risk premium exists. However, if manager liability and an IC audit interact as substitutes with respect to managers' behaviors, it is reasonable to assume that an interaction exists with respect to investor confidence and required risk premium. This leads to Hypotheses H6a and H6b, stated in the alternative form (See graphs of the predicted interactions in Panel B and Panel C of Figure 1).

> H6a: The effect of an IC audit on investor confidence is weaker in the presence of manager liability than in the absence of manager liability.

H6b: The effect of an IC audit on investors' risk premium is weaker in the presence of manager liability than in the absence of manager liability.

3. Method

3.1 Experimental Tasks

The hypotheses are tested using a laboratory experiment. The experiment was programmed and conducted with the z-Tree software (Fischbacher 2007). Participants are randomly assigned one of two roles: managers or investors. Participants who assume the role of the manager must decide how much to spend on ICFR. Then, the manager decides and reports the following to investors: (1) whether the manager believes the financial reporting system is effective or not effective, based on an ICFR effectiveness probability distribution, and (2) an earnings amount, based on a predetermined earnings multiplier distribution. The ICFR effectiveness probability and earnings multiplier distributions are discussed in detail in the Appendix.

Once the manager discloses whether he/she believes ICFR is effective and an earnings amount, participants who assume the role of investors assess their confidence in the reliability of the manager's reported earnings. Then, each investor submits one bid to purchase true earnings by participating in a Vickery (i.e., second-price, sealed-bid) auction. The investor with the highest bid wins the auction and purchases true earnings at a price equal to the second highest bid price.[7] (Details regarding laboratory procedures are discussed below.) Within this setting the absence and presence of manager liability and an IC audit are manipulated as discussed in detail below.

[7] The second-price, sealed-bid auction is used because it theoretically reveals the true demand curve and mitigates the overbidding problem (Vickrey 1961). The overbidding problem occurs when the winner of the auction ends up losing money (Gardner 1995; Dopuch et al. 1989).

3.2 Experimental Design

This study uses a 2 (absence or presence of manager liability) x 2 (absence or presence of an IC audit) x 20 (rounds) mixed design (presented in Figure 2). Round is a within-subjects factor.

[INSERT FIGURE 2 HERE]

3.3 Independent Variables

In conditions where manager liability is present, if the manager discloses that ICFR is effective but the true state of ICFR is not effective, the manager surrenders the amount investors paid above the true earnings amount (i.e., disgorgement), and pays a penalty. This dual penalty structure is consistent with defendants who settle SEC enforcement actions (Carton 2004).[8] On the other hand, in conditions where manager liability is absent, no regulatory mechanism exists to penalize managers regarding their ICFR disclosures.

In conditions where an IC audit is absent, investors only receive information regarding the ICFR effectiveness from the manager prior to bidding on earnings. Conversely, in the treatment conditions where an IC audit is present, investors not only receive information regarding ICFR effectiveness from the manager prior to bidding on earnings, but also from an automated auditor, who reveals the true state of ICFR effectiveness with 95 percent accuracy.[9]

[8] Prior to the implementation of SOX, of the total penalty paid by the defendant, the SEC only distributed the disgorgement portion to investors. The civil penalty portion of the total settlement has in the past gone to the Treasury. However, with the implementation of SOX, Section 308, if the civil penalty settlement contains disgorgement, then the civil penalty is included in the disgorgement portion that is paid to investors (Carton 2004).
[9] Setting audit quality at a 95 percent accuracy level is consistent with the notion that the "real-world" audit mechanism is not perfect while still providing a strong manipulation.

3.4 Dependent Variables

Two dependent variables are used to measure managers' behaviors. First, managers' ICFR spending is measured as dollars spent on ICFR. Second, manager's willingness to disclose ineffective ICFR is measured as the frequency that managers disclose that ICFR is not effective.

Two dependent variables are used to measure investors' responses to the information they receive. First, consistent with prior marketing research (e.g., Settle and Golden 1974) and with accounting research in which confidence has been measured using a one question scale (e.g., Pincus 1991), investor confidence is measured by asking investors to indicate on a 1 to 7 scale how confident they are in the earnings reported by the manager ("1" indicates very LOW confidence and "7" indicates very HIGH confidence). Second, investors' required risk premium is measured as the ratio of the winning investor's purchase price to the manager's reported earnings. As an investor's purchase price decreases, so does this ratio indicating that the investor requires a higher return for his/her investment and vice versa.

3.5 Experimental Procedures

Four markets are conducted, one for each of the four between-subjects treatment conditions. In each session within a market, one participant assumes the role of a manager (i.e., seller) and three participants assume the role of investors (i.e., buyers). A total of nineteen sessions are conducted. Each session took approximately ninety minutes and is made up of three practice rounds and twenty-one rounds for the actual experiment. The sequence of each round is presented in Figure 3. Each round consists of two phases: Phase I, in which the manager decides how much to spend on ICFR and what earnings and ICFR disclosures to report, and Phase II in which investors rate their confidence and provide bids to purchase the managers' earnings. Each phase is discussed in detail below.

[INSERT FIGURE 3 HERE]

PHASE I – Manager Decisions

The manager starts each round with $1,000 experimental dollars. The manager must decide how much of the $1,000, up to $100, to spend on ICFR. All rounds are independent and the decisions a manager makes in one round do not affect subsequent rounds. Each dollar spent on ICFR increases the probability that ICFR is effective. Any portion of the $1,000 NOT spent on ICFR is automatically invested to generate earnings. In summary, every dollar the manager decides to spend on ICFR (1) increases the probability that the true state of ICFR is effective, but (2) decreases the amount available to generate earnings.

Once the manager decides how much to spend on ICFR, the manager is told the probability that the true state of ICFR is effective. The relation between the amount spent on ICFR and probability that the true state of ICFR is effective is based on a predetermined formula in which each dollar spent on ICFR increases the probability that the true state of ICFR is effective (for details regarding the formula see Appendix).

Before the manager makes any other decisions or is provided with any other information, the computer performs the following calculations. First, the computer generates an earnings multiplier which represents the return on investment based on a pre-determined probability distribution (for details see Appendix). Second, the computer determines the true earnings amount which is calculated as the amount of the $1,000 not spent on ICFR *times* the earnings multiplier. Third, the computer determines the true state of ICFR effectiveness. This is based on the predetermined relation between dollars spent on ICFR and a probability distribution that the true state of ICFR is effective.

Once the manager learns of the probability that the true state of ICFR is effective, the manager will disclose to investors whether he/she believes ICFR is effective or not effective. The experiment is set up so that the manager does not know the true state of ICFR with certainty.[10] In markets where an IC audit is absent (i.e., treatment conditions A and C from Figure 2), the true state of ICFR effectiveness is revealed only *after* investors bid for current round earnings. However, in markets where an IC audit is present (i.e., treatment conditions B and D from Figure 2), the true state of ICFR is revealed by the automated auditor with 95 percent accuracy *prior* to investors' bidding on the current round earnings.

After the manager makes his/her ICFR disclosure decision, the manager will decide the current round earnings amount to report to investors. Consistent with the inherent imprecision of an accounting system, the manager does not know the true earnings amount until the end of each round. Instead, the manager is told the reportable upper and lower bounds, which represent a range of possible true earnings amounts. Investors, however, are not given any information about earnings other than the number the manager reports and that the range or dollar distance between the upper and lower bounds the manager receives is always $100 (for details regarding the determination of the upper and lower bounds see Appendix). The manager must decide within this range of plausible values what amount to report as earnings.[11]

Whether the true earnings amount is within the reportable upper and lower bounds the manager receives depends on the true state of ICFR effectiveness. If the true state of ICFR is *effective*, then the true earnings amount will be a number *within* the upper and lower bounds the manager receives. However, if the true state of ICFR is *not effective*, then the true earnings

[10] This feature allows the examination of the effects of each regulatory mechanism on managers' risk-assuming reporting behaviors rather than truthful versus deceitful reporting behaviors.
[11] This reporting restriction is consistent with the concept of an audited financial statement in which to receive an unqualified financial statement opinion, the manager must report within a range that is acceptable to the auditor. Thus, the constant range of $100 also controls for the type of financial statement audit opinion and audit quality.

amount will be a number less than the lower bound, and thus is *outside* the upper and lower bounds that the manager receives. Hence, by spending on ICFR, the manager reduces the probability that the true state of ICFR is not effective and reduces his/her risk of reporting unreliable earnings information.

In markets where an IC audit is present, an automated auditor issues a report to both managers and investors regarding the effectiveness of ICFR. The auditor randomly determines the true state of ICFR according to a predetermined probability function (see Appendix). In cases where the manager discloses that ICFR is effective, the auditor's internal control report reveals with 95 percent accuracy the true state of ICFR effectiveness. When the manager discloses that ICFR is not effective, the auditor is precluded from issuing an unqualified internal control opinion (i.e., cannot opine that ICFR is effective) to be consistent with Auditing Standard No. 5.

PHASE II: Investor Confidence Rating and Bidding

After the manager discloses whether he/she believes ICFR is effective and reports earnings, investors rate their confidence in the reported earnings. Then, investors submit a sealed-bid to purchase the current round true earnings. In all markets, once investors' bids are submitted, the investor with the highest bid purchases the current round earnings at the second highest bid price. Subsequent to the announcement of the winning bid, true earnings for the current round is revealed both to managers and investors.

After the announcement of the winning bid, the true state of ICFR is revealed to managers and investors simultaneously with the true earnings amount in markets where an IC audit is absent (i.e., treatment conditions A and C in Figure 2). In markets where an IC audit is present (i.e., treatment conditions B and D in Figure 2), investors have already learned the true state of ICFR effectiveness prior to bidding. In markets where manager liability is present (i.e., treatment conditions C and D), managers who incorrectly disclose effective ICFR is penalized (for details regarding the penalty structure see Appendix). At this point, the round ends and current round payoffs are calculated.

Following the experiment, participants complete a post-experiment questionnaire that includes questions about their work experience, gender, undergraduate major, investment experience and future investment plans. Once participants complete the questionnaire they are paid as described below.

3.6 Cash Payout

Participants are guaranteed to earn at least 5 U.S. dollars in the form of a participation bonus and they had an opportunity to earn more money based on their decisions. During the experiment, cash earnings accumulate in experimental dollars, which convert to U.S. dollars at the end of the experiment according to separate conversion rates for managers and investors as discussed below. Using different conversion rates is necessary to equalize U.S. dollar payouts between subject roles. The average payout per participant is $16.01 U.S. dollars.

Managers accumulate experimental cash in each round by collecting the second highest bid price from the winning investor. In the presence of manager liability, the manager's experimental cash balance is reduced by penalties when the manager's ICFR disclosure is incorrect. At the conclusion of the study, participants are paid 1 U.S. dollar for each 1000 experimental dollars they have accumulated.

At the beginning of the experiment, each investor received a one-time $500 endowment, and a $500 loan, which must be repaid at the end of the experiment. The loan provides the participants with working capital without diluting their earnings. The investor with the winning bid accumulates experimental cash in each round by collecting the current round true earnings reduced by the price paid for the earnings. At the conclusion of the study, investors convert the experimental dollars they have accumulated (less the loan repayment) at the rate of 0.02 U.S. dollars for each experimental dollar.

3.7 Participants

A total of 76 MBA students from a major public university served as participants for this study. When asked whether they have ever owned stock, bonds and/or other market investments (PSTOCK) 67.6 percent responded yes. When asked how likely they are to invest in stocks, bonds and/or other market investments in the future on a scale with "1" being very unlikely and "9" being very likely, the mean is 8.18. The average years of work experience is 3.6 years (standard deviation = 3.11). The participant pool is 61.1 percent male and 38.7 percent female. Approximately 43 percent of the participants majored in business as undergraduate students.[12]

4. Results

4.1 Analyses of Experimental Results

Analyses of results do not include data from the three practice rounds or the last round. Hence, analyses include all managers' decisions over 20 rounds.[13] Analyses for investor confidence include all investors' confidence ratings over the 20 rounds, but analyses for investors' required risk premium include only the winning investors' bids in each round.[14]

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[12] Participants were randomly assigned to treatment conditions; and, tests reveal no difference in any demographic variable across treatment conditions. Moreover, analyses reveal that none of the demographic variables are significantly correlated with the dependent variables used to test the hypotheses, except for PSTOCK which correlates with investor confidence. PSTOCK, however, is not included as a covariate in the model since it does not alter results or conclusions.

[13] Learning the experimental procedures may potentially affect participants' decisions and behaviors in early rounds. Also, the possibility of end-of-game behaviors may affect the last round (Burton, Leitch, and Tuttle 2001). Therefore, to control for these potential effects, the practice rounds and last round are not included in our analyses. Furthermore, analyses including the last round reveal conclusions consistent with those including only 20 rounds.

[14] Sixteen observations (out of a total of 380 observations) are removed where the winning investor's purchase price exceeds the manager's reported earnings by more than $100. Thirteen such bids occurred in the first 10 rounds and only three occurred in the last 10 rounds.

Table 1 presents means and frequency for each of the four dependent variables by round. IC_SPENDING represents the manager's ICFR spending in dollars. IC_DISCLOSURE represents the frequency that managers disclose ineffective ICFR. CONFIDENCE represents investor confidence in earnings reported by the manager. Finally, PREMIUM represents investors' required risk premium. The calculation of PREMIUM is discussed in more detail below.

[INSERT TABLE 1 ABOUT HERE]

To control for the variability of managers' reported earnings from one round to another, each winning investor's purchase price is divided by the manager's reported earnings. If the scaled purchase price is less than one, this means that the investor required a risk premium. Therefore, PREMIUM is calculated as one minus the scaled purchase price. For example, if the purchase price divided by the reported earnings amount is 0.95, PREMIUM is 0.05 (1 – 0.95) to reflect that the price the winning investor paid discounted the manager's reported earnings amount by 5 percent.

4.2 Testing Hypotheses 1, 2, and 3 (Managers' Behaviors)

Hypotheses 1 through 3 relate to how managers respond to manager liability and an IC audit. We conduct individual tests for each dependent measure. Hypotheses 1a, 2a, and 3a test the effects of ML and an IC audit on managers' ICFR spending behavior. A 2 x 2 x 20 mixed model is used to test H1a, H2a and H3a with ML, and IC audit as the between-subjects factors and round as the within-subjects (repeated measures) factor.[15]

[15] Ordinary least squares estimation (OLS) assumes that each observation is statistically independent and that the variance-covariance matrix is the same for each subject. However, given the time-series nature of the data collected, observations on the same subject are likely correlated and can exhibit non-constant variability. Therefore, SAS PROC MIXED, which allows for a variety of covariance structures, including autoregressive structures, is used to statically test hypotheses using a repeated measures model where the repeated variable is rounds.

Panel A of Table 2 presents managers' mean IC_SPENDING by treatment over the 20 experimental rounds. H1a predicts that IC_SPENDING will be greater in the presence of ML. As predicted, Table 2 Panel A shows that in the presence of ML the mean IC_SPENDING is $63.20 compared to $53.14 in the absence of ML. Formal statistical test results in Panel B of Table 2 show a marginally significant main effect of ML on IC_SPENDING ($F = 2.01$; $p < 0.09$, one-tailed), thus weakly supporting H1a.

[INSERT TABLE 2 ABOUT HERE]

H2a predicts that managers' ICFR spending will be greater in the presence of an IC audit. As predicted, Panel A of Table 2 shows that in the presence of IC audit the mean IC_SPENDING is $66.26 compared to $51.39 in the absence of IC audit. Formal statistical test results in Panel B of Table 2 show a significant main effect of IC audit on IC_SPENDING ($F = 5.15$; $p < 0.02$, one-tailed), thus supporting H2a.

H3a predicts that ML and IC audit will interact as substitutes with respect to managers' IC_SPENDING. As presented in Panel A of Figure 4, it appears that the marginal effect of IC audit on IC_SPENDING is slightly reduced in the presence of ML. However, formal statistical test results in Panel B of Table 2 do not show a significant ML x IC audit effect on IC_SPENDING ($F = 0.23$, $p = 0.32$, one-tailed); thus, H3a is not supported. [16]

[INSERT FIGURE 4 ABOUT HERE]

Hypotheses 1b, 2b, and 3b test the effects of ML and an IC audit on managers' willingness to disclose that ICFR is not effective. In order to isolate this effect it is important to recognize that ML and IC audit are hypothesized to affect both spending on ICFR and

[16] The statistically significant Round – by – IC audit interaction presented in Panel B of Table 2 ($F = 1.74$, $p = 0.03$, two-tailed) reflects trends in IC_SPENDING over time. In analysis not presented, the average amount of IC_SPENDING in the earlier rounds is greater than the middle rounds. However, in the later rounds IC_SPENDING increases again particularly in the presence of IC audit.

subsequently, the propensity to disclose negative ICFR information. However, because spending reduces the risk that ICFR is not effective (IC_RISK), spending effects must be controlled for in order to isolate the incremental effects of ML and IC audits on managers' ICFR disclosures. Therefore, IC_RISK is included as a covariate in the 2 x 2 model with ML and IC audit as the between-subjects factors. This model is used to test H1b, H2b, and H3b.

H1b predicts that after controlling for the effect of ICFR spending, managers are more likely to disclose that ICFR is not effective when ML is present than when ML is absent. Panel A of Table 3 indicates that in the absence of ML, the frequency that managers disclose ineffective ICFR is 36, while in the presence of ML the frequency that managers disclose ineffective ICFR is 45. The statistical test results are presented in Panel B of Table 3. Results indicate that IC_RISK is a significant covariate ($\chi^2 = 3.68$, $p = 0.06$, two-tailed). Also results show a significant main effect of ML on scaled IC_DISCLOSURE ($\chi^2 = 2.73$, $p = 0.05$, one-tailed); therefore, supporting H1b.

[INSERT TABLE 3 ABOUT HERE]

H2b predicts that after controlling for the effect of ICFR spending managers are more likely to disclose that ICFR is not effective when an IC audit is present than when an IC audit is absent. Contrary to predictions, Panel A of Table 3 indicates that in the absence of IC audit, the frequency that managers disclose ineffective is 61, while in the presence of IC Audit the frequency that managers disclose ineffective is 20. The statistical test results are presented in Panel B of Table 3. Given that results are not in the predicted direction ($\chi^2 = 2.80$, $p = 0.95$, two-tailed), H2b is not supported.

H3b predicts that ML and IC audit will interact as substitutes with respect to managers' willingness to disclose that ICFR is not effective. Panel B of Figure 4 suggests a negative interaction between ML and IC audit on IC_DISCLOSURE. Formal statistical test results in Panel B of Table 3 show a marginally significant ML x IC audit effect on IC_DISCLOSURE ($F = 2.05$, $p = 0.08$, one-tailed); therefore, H3b is weakly supported.

4.3 Testing Hypotheses 4, 5, and 6 (Investors' Behaviors)

Hypotheses 4, 5, and 6 test the effects of ML and an IC audit on two dependent variables: (1) CONFIDENCE, and (2) PREMIUM. A 2 x 2 x 20 mixed model is used to test H4, H5, and H6 with ML and IC audit as the between-subjects factors and round as the within-subjects (repeated measures) factor.

Panel A of Table 4 presents mean CONFIDENCE by ML and IC Audit. H4a predicts that CONFIDENCE will be greater when ML is present than when ML is absent. Panel A of Table 4 shows that in the presence of ML the mean CONFIDENCE is 4.52 compared to 3.65 in the absence of ML. Formal statistical test results in Panel B of Table 4 show a significant main ML effect on CONFIDENCE ($F = 21.63$, $p<0.01$, one-tailed), therefore, H4a is supported.

[INSERT TABLE 4 ABOUT HERE]

H4b predicts that PREMIUM will be greater when ML is absent than when ML is present. Panel A of Table 5 presents mean PREMIUM, standard deviation, and sample size by ML and IC Audit over 20 rounds. Panel A of Table 5 shows that in the absence of ML the mean PREMIUM is 6.9% compared to 5.6% in the presence of ML. Formal statistical test results in Panel B of Table 5 do not show a significant main effect of ML effect on PREMIUM ($F = 0.54$, $p = 0.24$, one-tailed), therefore, H4b is not supported.

[INSERT TABLE 6 ABOUT HERE]

H5a predicts that CONFIDENCE will be greater in the presence of an IC audit than in the absence of an IC audit. Panel A of Table 4 shows that in the presence of IC audit the mean

CONFIDENCE is 4.32 compared to 3.93 in the absence of IC audit. Formal statistical test results in Panel B of Table 4 show a significant main effect of IC audit on CONFIDENCE ($F = 4.68$, $p = 0.02$, one-tailed), therefore, H5a is supported.

H5b predicts that PREMIUM is greater in the absence of an IC audit than in the presence of an IC audit. Panel A of Table 5 shows that in the absence of IC audit the mean PREMIUM is 8.0% compared to 4.2% in the in the presence of IC audit. Formal statistical test results in Panel B of Table 5 show a significant main effect of IC audit on PREMIUM ($F = 7.10$, $p = 0.01$, one-tailed); therefore, H5b is supported.

H6a predicts that ML and an IC audit will interact as substitutes with respect to CONFIDENCE. As predicted, Panel A of Figure 5 indicates that the marginal effect of an IC audit on CONFIDENCE is less in the presence of ML. Panel B of Table 4 shows a significant negative interaction between ML and IC audit on CONFIDENCE ($F = 9.94$, $p < 0.01$, one-tailed). Therefore, H6a is supported.

[INSERT FIGURE 5 ABOUT HERE]

H6b predicts a negative interaction between ML and IC audit on PREMIUM. As predicted, Panel B of Figure 5 suggests that the marginal effect of an IC audit on PREMIUM is reduced in the presence of ML. Formal statistical test results in Panel B of Table 5 show a marginally significant negative interaction between ML and IC audit on PREMIUM ($F = 1.85$, $p = 0.10$, one-tailed); therefore, H6b is weakly supported. [17]

Additional contrast analyses are performed to further investigate the interactive effect of ML and IC audit on PREMIUM. The first contrast tests the effect of IC Audit when ML is

[17] The statistically significant Round and Round-by-IC audit presented in Panel B of Table 4 and 5 reflect trends in CONFIDENCE and PREMIUM over the 20 rounds. In analysis not presented, there appears to be more variability in CONFIDENCE and PREMIUM in earlier rounds; however, in later rounds there appears to be less variability. The round-by-IC audit interaction can be explained by the reduction in variability and the effect of IC audit on CONFIDENCE and PREMIUM over time.

absent. This contrast, presented in Panel C of Table 5, Column 1, is significant ($F = 7.72$, $p < 0.01$, one-tailed), which suggests that in the absence of ML, an IC audit further decreases PREMIUM. The second contrast tests the effect of IC Audit when ML is present. This contrast, presented in Panel C of Table 5, Column 2, is not significant ($F = 0.89$, $p = 0.18$, one-tailed), which suggests that in the presence of ML, PREMIUM is not further reduced by the presence of an IC audit. The third contrast tests the effect of ML when IC Audit is absent. This contrast, presented in Panel C of Table 5, Column 3, is marginally significant ($F = 2.34$, $p = 0.07$, one-tailed), which suggests that in the absence of an IC audit, the presence of ML reduces PREMIUM. The fourth contrast tests the effect of ML when IC Audit is present. This contrast, presented in Panel C of Table 5, Column 4, is not significant ($F = 0.19$, $p = 0.34$, one-tailed), which suggests that in the presence of an IC audit, PREMIUM is not further reduce by the presence of ML. Taken together, the above contrasts suggest that the marginal effectiveness of each regulatory mechanism on PREMIUM decreases in the presence of the other; therefore, providing strong support for H6b.

Supplemental analysis reveals a significant negative correlation between CONFIDENCE and PREMIUM ($r = -0.45$, $p < 0.01$, one-tailed). That is, as CONFIDENCE increases, the risk PREMIUM decreases. However, it is worth noting that while the negative correlation between CONFIDENCE and PREMIUM is significant, this correlation is not perfect. The presence of ML significantly improves CONFIDENCE, yet, while in the predicted direction, the presence of ML does not significantly reduce PREMIUM. A potential explanation for this finding may be that CONFIDENCE is a first order effect that more directly captures each investor's reaction to either the absence or presence of ML. On the other, PREMIUM is a second order effect that requires investors first to internalize their beliefs about CONFIDENCE and then translate those beliefs into their bidding behaviors. Therefore, it is reasonable to expect that results for PREMIUM may be weaker than those for CONFIDENCE.

5. Conclusions, Implications, and Limitations

This study investigates the effects of manager liability and IC audits on (1) managers' ICFR spending and disclosures, and (2) investor confidence and required risk premium. Findings show that managers spend more to improve ICFR when either manager liability or an IC audit is present. In terms of the amount spent on ICFR, results suggest that the effects of manager liability and an IC audit are additive (i.e., independent) and not substitutes. The combination of manager liability and an IC audit leads to the greatest amount of ICFR spending. After controlling for the effect of ICFR spending, results suggest that the presence of manager liability has a significant effect on managers' willingness to disclose that ICFR is not effective, yet an IC audit does not increase managers' willingness to disclose that ICFR is not effective.

In terms of investors' behaviors, results show that increased manager liability or the presence of an IC audit leads to higher investor confidence. Also, results show that an IC audit reduces investors' required risk premium, and increased manager liability reduces investors' required risk premium only in the absence of an IC audit. Finally, results suggest that manager liability and an IC audit interact as substitutes with respect to investor confidence and investors' required risk premium.

Results from this study have several implications. First, results provide evidence supporting policymakers' rationales for increasing manager liability and implementing mandatory IC audits. Results demonstrate that each regulatory mechanism motivates managers to improve the reliability of financial statements. These findings also have implications for researchers by showing that the individual effect of either legal liability or audits on managers' behaviors extends to spending on ICFR. This extension is important because unlike managers' decision to spend on increasing asset value, managers' decision to spend on ICFR carries with it a trade-off between spending on improving the reliability of financial statements versus increasing profits.

Second, results from this study extend prior accounting research into managerial legal liability (e.g., DeJong et al. 1985; Wallin 1992; Dopuch et al. 1994; Baginski et al. 2002 by demonstrating that the effect of managers' liability on their propensity to engage in truthful earnings reporting extends to managers' mandatory disclosures of ICFR effectiveness.

Third, results provide direct evidence that increasing manager liability and mandating IC audits affect investor confidence as purported by policymakers (SEC 2006b). Moreover, results also have implications for researchers by showing that prior theory regarding the substitution effect of manager liability and audits on managers' behaviors extends to investor confidence and required risk premium (Wallin 1992). This extension is important because it furthers our understanding of investors' demand for IC audits when other regulatory mechanisms are also present.

Fourth, results provide insight into the ongoing debate regarding the benefits of IC audits in the presence of other regulatory mechanisms. Results demonstrate that while either manager liability or an IC audit increases managers' spending on ICFR, the combination of manager liability and IC audits leads to the greatest amount spent on improving ICFR. Thus, results suggest that an IC audit has incremental benefits even in the presence of increased manager liability to improve ICFR. These results support policymakers' decision to increase manager liability and also to require an IC audit with respect to motivating managers to improve ICFR. Alternatively, results differ with respect to investors' behaviors. The combination of both regulatory mechanisms does not lead to greater improvement of investor confidence than either regulatory mechanism alone. Taken together, results suggest that while investors' demand for the IC audit diminishes in the presence of manager liability, the IC audit has incremental benefits in motivating managers to achieve higher levels of ICFR quality.

This study has at least three limitations. First, the auditor is not a strategic player in the experiment. While this feature is different than in the field, it holds constant audit quality and allows for a controlled examination of the objectives of this study. To address this study's objectives, the focus is on managers' ICFR effort and disclosure strategies and not those of auditors.

Second, this study uses standard experimental methods in a laboratory setting, and therefore, care should be used when extrapolating to other settings, tasks, and individuals. However, given that both regulatory mechanisms are functioning simultaneously in the marketplace, an experiment is the most suitable method to examine both the incremental and joint effects of manager liability and IC audits. Moreover, the experimental method used in this study allows for incentives and information to be controlled in a manner consistent with the theory. It, therefore, provides a strong test of the hypothesized relations.

Third, this study assumes that managers do not act in a fraudulent manner. Thus, in this study managers cannot attempt to maximize stock price by overriding ICFR and engage in fraudulent financial reporting. Instead, managers can only attempt to maximize stock price with ICFR disclosures and reported earnings that are within a reasonable range. Future studies can examine managers' attempts to maximize stock prices in a setting where managers can decide whether to engage in fraudulent earnings reporting.

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Appendix: Parameter Definitions and Values

<u>IC_SPENDING</u>

IC_SPENDING is a response variable that represents the manager's spending on ICFR. IC_SPENDING is bounded by $0 and $100 so that in each round the MANAGER can spend anywhere from $0 to $100 on improving ICFR. Each dollar spent on ICFR increases the probability that ICFR is effective. Any amount of the $1,000 NOT spent on ICFR is automatically invested to generate earnings. For example, if the manager decides to spend $10 on ICFR, then the remaining $990 ($1,000 – $10) is automatically invested to generate earnings. If instead the manager decides to spend $80 on ICFR, then the remaining $920 ($1,000 - $80) is automatically invested to generate earnings. In summary, every dollar spent on ICFR (1) increases the probability that the true state of ICFR is effective, but (2) decreases the amount available to generate earnings.

<u>Pr(IC EFFECTIVE) and the True State of ICFR</u>

For any given round, the true state of ICFR is either effective or not effective. Pr(IC EFFECTIVE) represents the probability that the true state of ICFR is effective. Pr(IC EFFECTIVE) is a function of the amount managers spend on ICFR. This is implemented in the experiment using a linear relation between Pr(IC EFFECTIVE) and IC_SPENDING in which each dollar spent on ICFR increases Pr(IC EFFECTIVE) at a constant rate. Pr(IC EFFECTIVE) is constrained between 50 percent ($0 spent on ICFR) and 95 percent ($100 spent on ICFR). The function to describe the relation between Pr(IC EFFECTIVE) and IC_SPENDING is

$$\Pr(\text{IC EFFECTIVE}) = 1 - (0.50 - (0.0045 * \text{IC\_SPENDING})). \qquad (1)$$

The graph of this function is presented in Figure 1 of the Appendix. For example, suppose the manager decides to spend $40 on ICFR, then Pr(IC EFFECTIVE) equals 1 – (0.50 –

(0.0045*40)) or 0.68. In other words, there is a 68 percent chance that the true state of ICFR is effective in this case.

[INSERT APPENDIX FIGURE 1 HERE]

<u>Earnings Multiplier and True Earnings</u>

The earnings multiplier represents the return on investment which is used to calculate a true earnings amount. The earnings multiplier can be any number, in increments of 0.03, between 0.70 and 1.27. The earnings multiplier is always a positive number in order to prevent true earnings amounts that are less than zero. The probability distribution of the earnings multiplier is shown in Table 1 of the Appendix.

[INSERT APPENDIX TABLE 1 HERE]

Any amount of the initial $1,000 given to managers at the beginning of each round that is not spent on ICFR will automatically be invested to earn profits. The current round true earnings amount is calculated as the amount of the $1,000 not spent on ICFR *times* the earnings multiplier. For example, suppose the manager spends $50 on ICFR and the earnings multiplier randomly generated is 1.06. Then, the true earnings amount is ((1,000 – 50)*1.06) or $1,007.

<u>Upper and Lower Earnings Bounds</u>

The upper and lower bounds represent a range of reportable earnings amounts. The earnings range or dollar distance between the upper and lower bounds is always $100. If the true state of ICFR is effective, then the true earnings amount will be a number *within* the upper and lower bounds the manager receives. However, if the true state of ICFR is not effective, then the true earnings amount will be a number *less* than the lower bound, which is *outside* the upper and lower bounds the manager receives. This feature is consistent with the assumption that more effective ICFR generate more reliable financial information.

If the true state of ICFR is *effective,* the upper and lower bounds are calculated as follows. First, the computer randomly selects a number from 0 to 100. Each number from 0 to 100 has an equal probability of being selected. Second, the computer subtracts the randomly selected number from the true earnings amount to arrive at the lower bound. Third, the computer adds 100 to the lower bound to arrive at the upper bound.

Below is an example of how the upper and lower bounds are determined when the true state of ICFR is *effective*. Suppose in this round the true earnings amount is $1,030. The computer randomly selects 29 (a random number from 0 to 100). Then, the lower bound is $1,030 – 29 = $1,001 and the upper bound is equal to $1,001 + 100 = $1,101. Hence, the earnings range is $1,101 - $1,001 = 100. If the true state of ICFR is effective, then the reportable upper and lower bounds the manager receives are $1,101 and $1,001, respectively. The true earnings amount of $1,030, which is unknown to the manager, falls within the upper and lower bounds.

If the true state of ICFR is *not effective,* the upper and lower bounds are calculated as follows. First, the computer divides the true earnings amount by 85 percent to arrive at the lower bound. In other words, the above calculation makes the true earnings amount a number that is 15 percent below the lower bound when the true state of ICFR is not effective. Second, the computer adds 100 to the lower bound to arrive at the upper bound. The above calculations (when the true state of ICFR is not effective) result in true earnings that fall outside the earnings range the manager receives. Essentially, by setting the true earnings amount to be a number 15 percent below the lower bound results in financial statement errors that overstate earnings.

Below is an example of how the upper and lower bounds are determined when the true state of ICFR is *not effective*. Suppose the true earnings amount is $1,030, as in the previous example. The lower bound is \$1,030/0.85 = \$1,212 (rounded to the nearest dollar) and the upper bound is equal to \$1,212 + 100 = \$1,312. If the true state of ICFR is not effective, then the reportable upper and lower bounds the manager receives are \$1,312 and \$1,212, respectively. The true earnings amount of \$1,030, which is unknown to the manager, falls outside the upper and lower bounds.

It is important to note that the earnings range is always \$100 and the true earnings amount calculated each round remains the same regardless of the true state of ICFR. Instead, the true state of ICFR determines how reliable the earnings information the manager receives each round as operationalized by whether the earnings range the manager receives contains the true earnings amount.

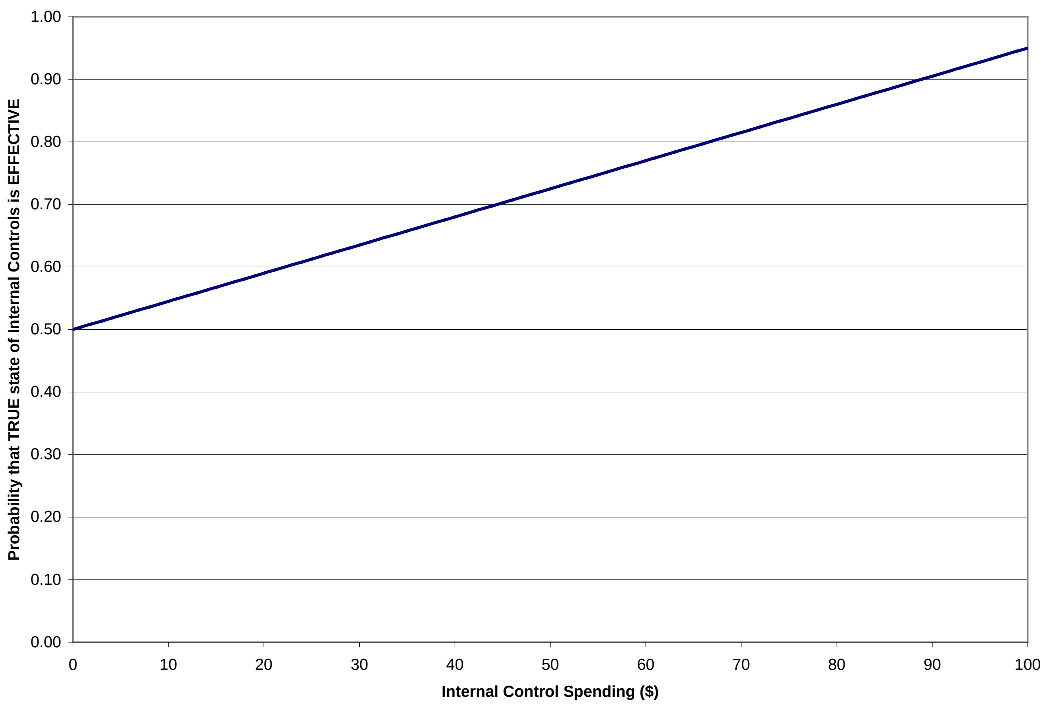
Type of Internal Control Opinion

In markets where an IC audit is present, the automated auditor releases an audit report to investors regarding the effectiveness of ICFR. Whether the automated auditor issues an unqualified internal control opinion (i.e., ICFR is effective) or an adverse internal control opinion (i.e., ICFR is not effective) depends on how much the manager spends on ICFR. The automated auditor determines the type of internal control opinion to issue each round based on a predetermined relation between the probability that the auditor will issue an unqualified opinion and IC_SPENDING. This relation can be expressed by using the same function as the one for Pr(IC EFFECTIVE) presented above (Equation 1). This relation is consistent with the notion that the more managers spend on improving ICFR the less likely auditors will issue an adverse internal control opinion.

Manager Penalty

In markets where manager liability is present, managers surrender the amount investors paid above true earnings plus a penalty of $150, if managers incorrectly report the true state of ICFR to be effective. This monetary penalty structure is consistent with settlements of SEC enforcement actions where managers are found guilty for violating the securities laws (Carton 2004, SEC 2006a).

Appendix Figure 1: Relation between ICFR spending and probability that ICFR is EFFECTIVE

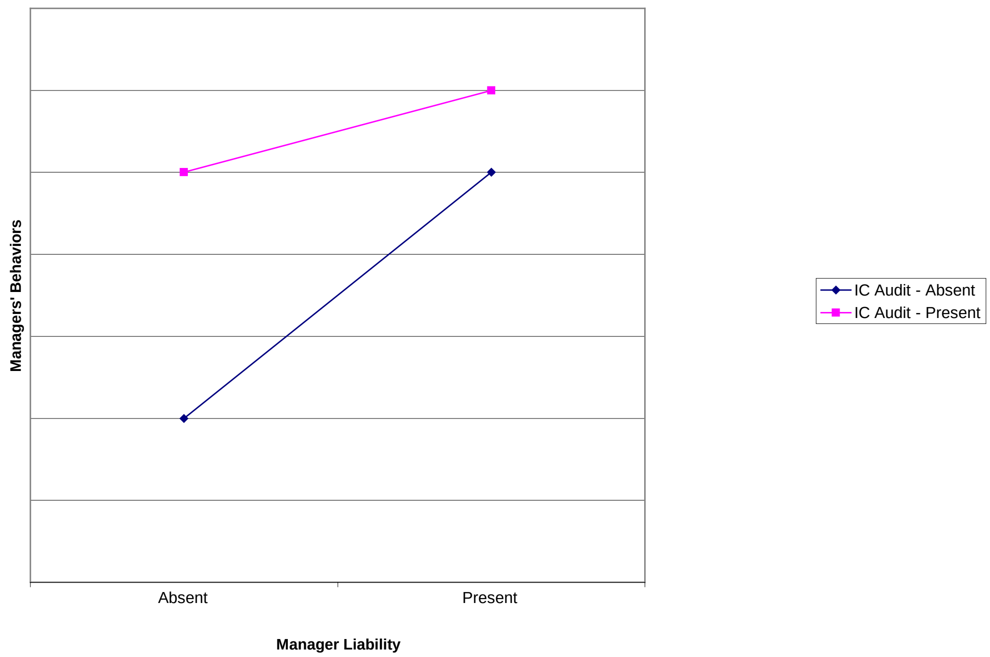


Appendix Table 1: Earnings Multiplier Probability Distribution

Earnings Multiplier	Probability
0.70	0.05
0.73	0.05
0.76	0.05
0.79	0.05
0.82	0.05
0.85	0.05
0.88	0.05
0.91	0.05
0.94	0.05
0.97	0.05
1.00	0.05
1.03	0.05
1.06	0.05
1.09	0.05
1.12	0.05
1.15	0.05
1.18	0.05
1.21	0.05
1.24	0.05
1.27	0.05
Sum	1.000

Figure 1: Predicted Manager Liability and an IC Audit Interactions

Panel A: Managers' Behaviors, Dependent Variable = ICFR Spending or Disclosure



PANEL B: Investors' Behavior, Dependent Variable = Investor Confidence

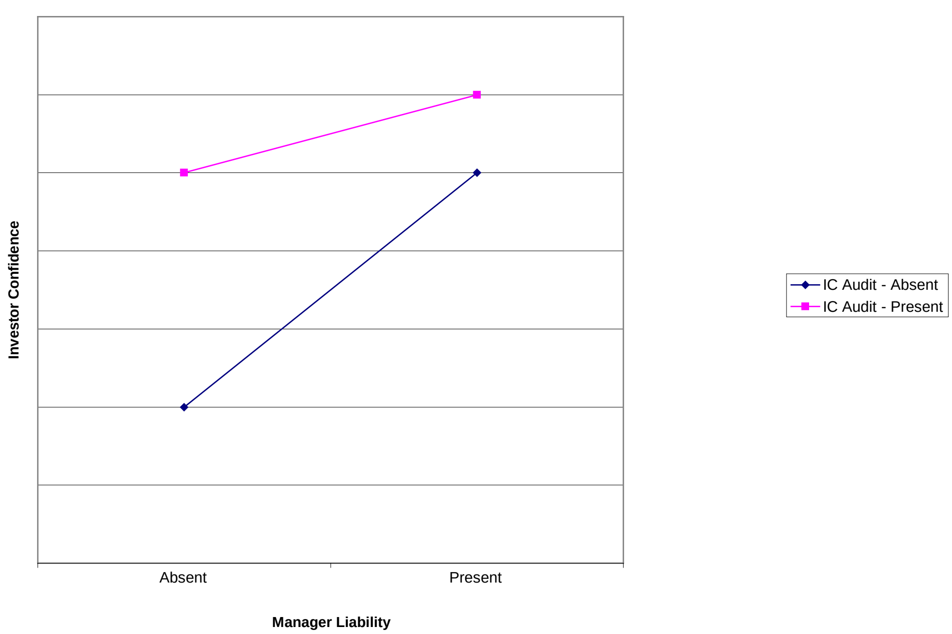


Figure 1: Predicted Manager Liability and an IC Audit Interactions (Continue)

PANEL C: Investors' Behaviors, Dependent Variable: Required Risk Premium

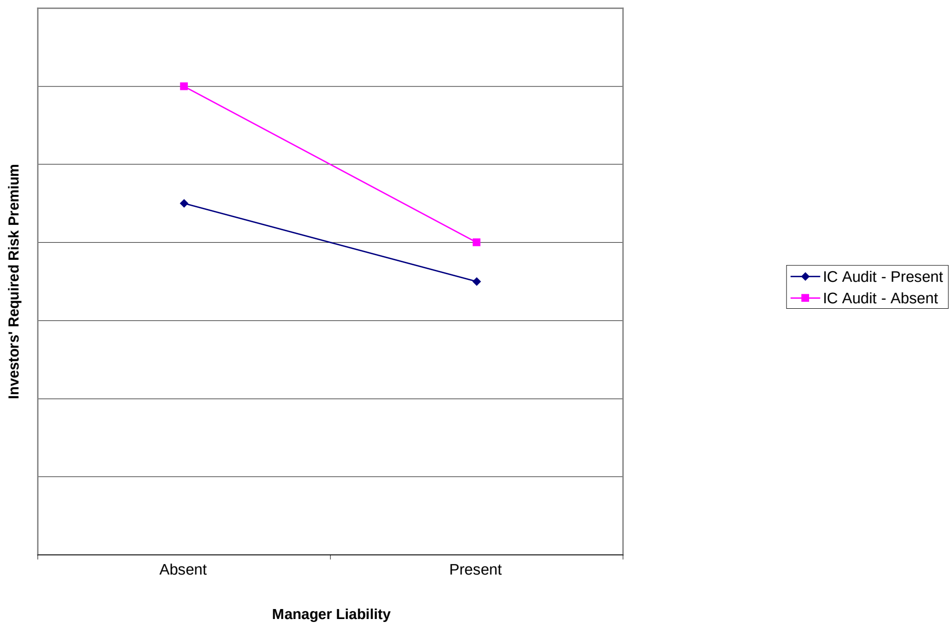


Figure 2: 2 x 2 Experimental Design
(For the Manipulated Between-Subjects Factors)

Cell A IC audit = Absent Manager liability = Absent	**Cell B** IC audit = Present Manager liability = Absent
Cell C IC audit = Absent Manager liability = Present	**Cell D** IC audit = Present Manager liability = Present

IC audit – Internal control audit
Manager liability – Manager's legal liability for ICFR disclosures

Figure 3: Experimental Procedures for each Round

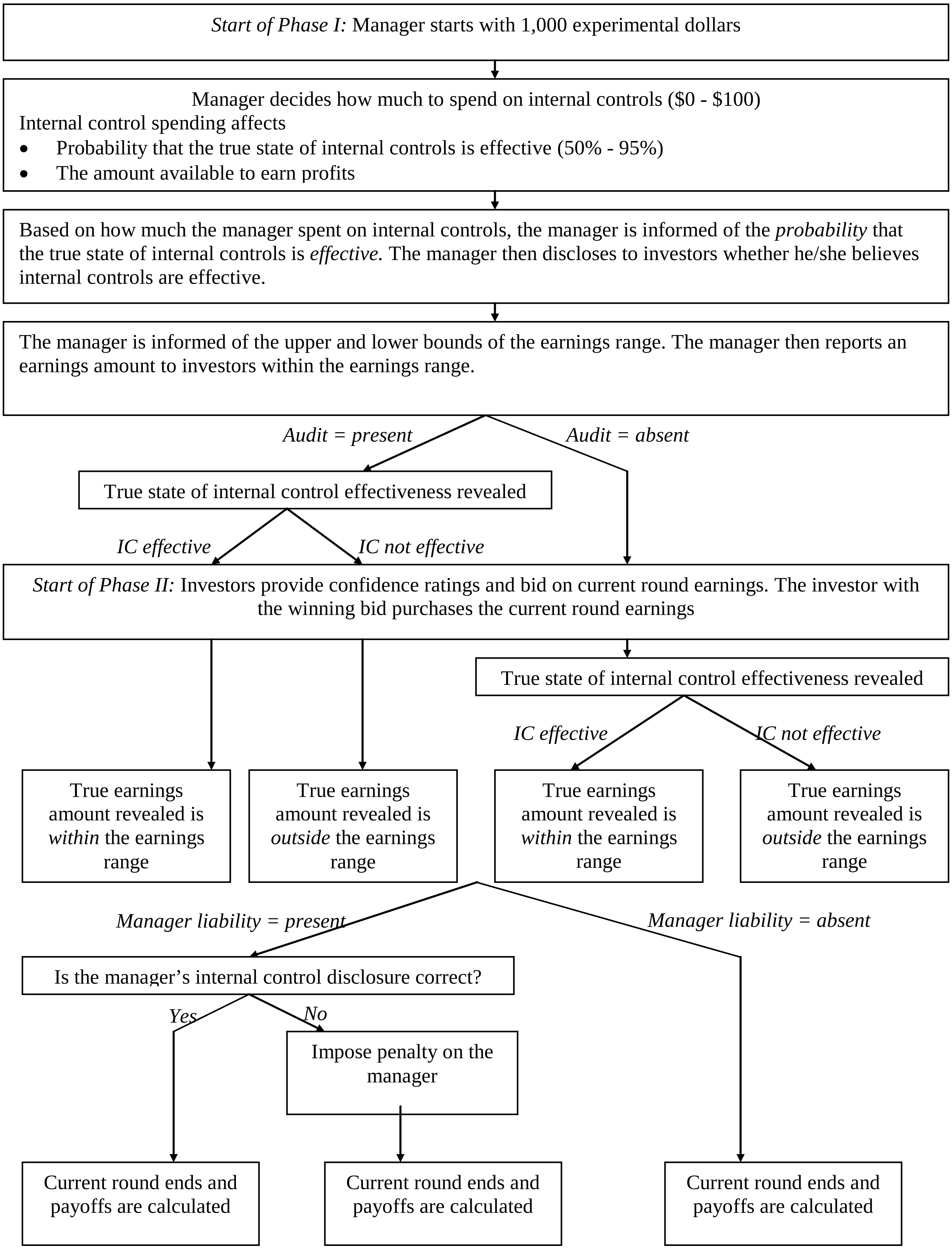
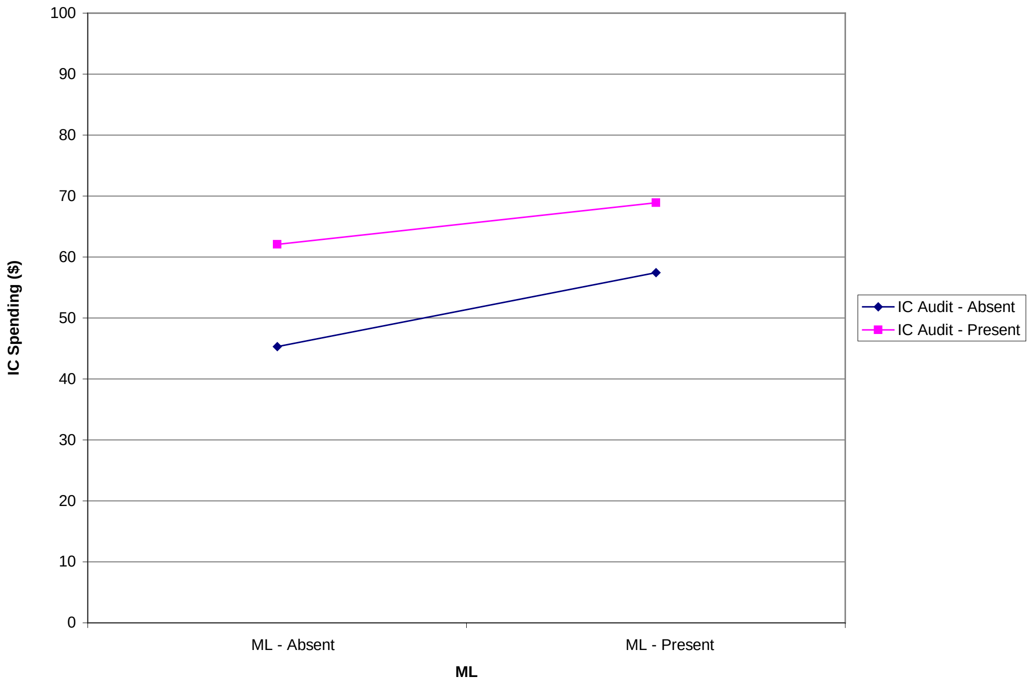
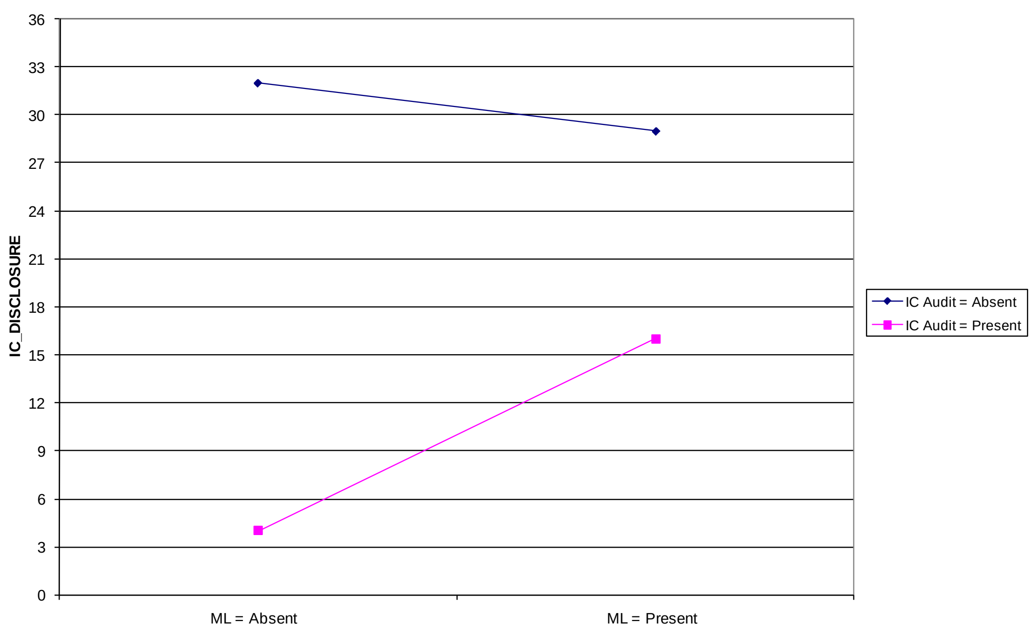


Figure 4: Observed ML and IC Audit Interaction on Managers' Behaviors

Panel A: Dependent Variable = ICFR Spending



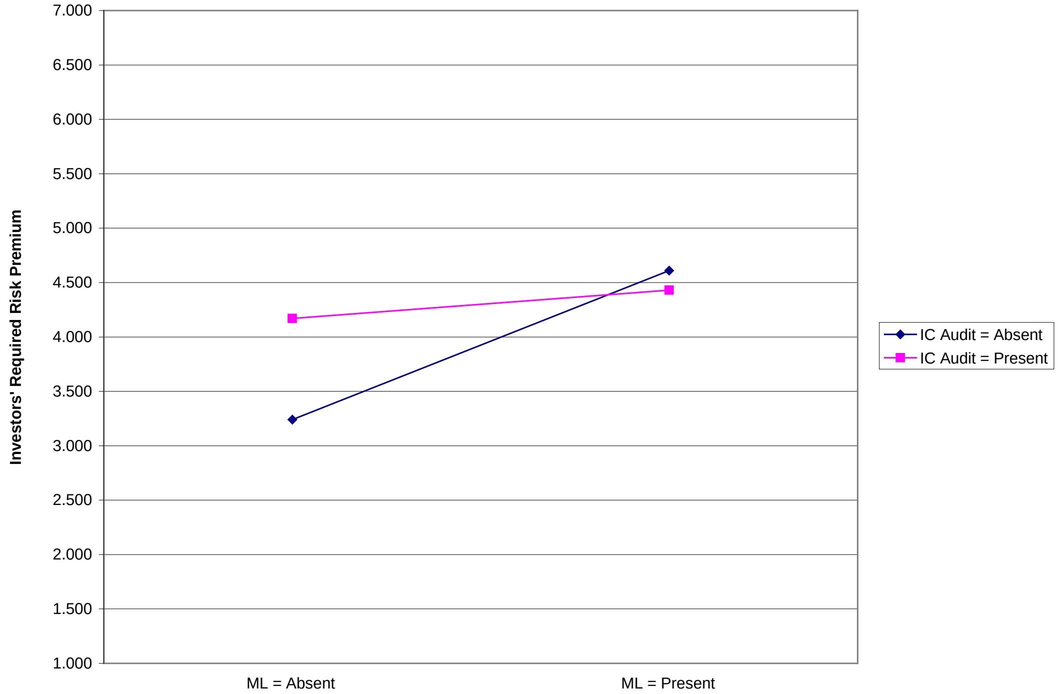
Panel B: Dependent Variable = Frequency that Managers Disclose Ineffective ICFR



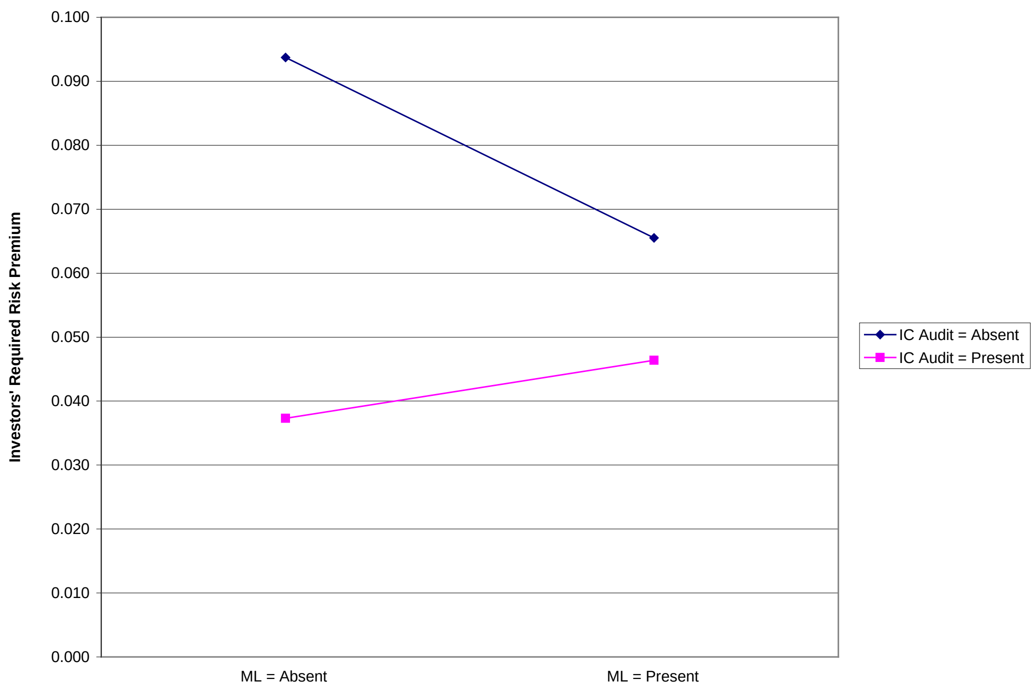
IC Audit = Internal control audit
ML = Manager's legal liability for ICFR disclosures

Figure 5: Observed ML and IC Audit Interaction on Investors' Behaviors

Panel A: Dependent Variable = Investor Confidence



Panel B: Dependent Variable = Required Risk Premium



IC Audit = Internal control audit
ML = Manager's legal liability for ICFR disclosures

Table 1
Dependent Variables Means and Frequency by Round

Round	Mean IC_SPENDING	Frequency IC_DISCLOSURE	Mean CONFIDENCE	Mean PREMIUM
1	71.65	3	3.00	18.1 %
2	73.00	1	5.00	4.5 %
3	68.95	4	4.51	3.8 %
4	74.20	4	4.68	-0.6 %
5	56.85	5	4.35	3.5 %
6	54.95	2	4.58	5.1 %
7	53.26	4	4.60	4.8 %
8	63.16	3	4.33	7.0 %
9	48.21	5	4.37	7.0 %
10	48.16	5	4.26	5.2 %
11	45.21	4	4.42	3.1 %
12	49.53	3	3.07	0.1 %
13	58.26	4	3.44	8.6 %
14	51.47	4	3.77	6.7 %
15	59.58	3	3.68	7.0 %
16	61.79	3	4.09	5.9 %
17	58.00	4	4.25	4.5 %
18	61.95	1	3.37	0.1 %
19	49.37	3	4.04	5.6 %
20	59.47	2	4.39	3.6 %
Average	58.35	3.35	4.11	6.2 %

IC_SPENDING = Mean of managers’ internal control spending in dollars
IC_DISCLOSURE = Frequency of managers disclosing ineffective internal control within each round
CONFIDENCE = Self-reported investor confidence in the reported earnings: 1=very low, 7=very high
PREMIUM = Risk premium calculated as a percentage of reported earnings: 1 – [(Reported earnings less price paid) divided by reported earnings] * 100

Table 2: Managers' Internal Control Spending Behavior

Panel A: Means (Standard Deviations)

IC Audit	ML: Absent	ML: Present	Overall
Absent	45.31 (31.06)	57.46 (38.35)	51.39
Present	62.92 (30.80)	68.93 (35.44)	66.26
Overall	53.14	63.20	58.43

Panel B: ANOVA

Source of Variation	**Ndf**	**Ddf**	**F-Value**	**p**[a]
Between – Subjects				
ML	1	16	2.01	0.09
IC Audit	1	16	5.15	0.02
ML x IC Audit	1	16	0.23	0.32
Within-Subjects				
Round	19	284	1.15	0.30
Round x ML	19	284	0.53	0.95
Round x IC Audit	19	284	1.74	0.03
Round x ML x IC Audit	19	284	0.59	0.91

IC Audit = Internal control audit
ML = Manager's legal liability for ICFR disclosures
[a] Given the directional predictions, we report one-tailed p-values for the main effect of ML and IC Audit, and ML x IC Audit interaction when results are in the predicted direction. All other p-values presented are two-tailed.

Table 3: Managers' ICFR Disclosures

Panel A: Summary of Managers' ICFR Disclosures

IC Audit	ML Absent	ML Present	Overall
Absent	(32)[a]	(29)	(61)
Present	(4)	(16)	(20)
Overall	(36)	(45)	(81)

Panel B: ANOVA

Source of Variation	**df**	**χ^2**	**p[c]**
ML	1	2.73	0.05
IC Audit	1	2.80	0.95[d]
ML x IC Audit	1	2.05	0.08
IC_RISK	15	3.68	0.06

IC Audit = Internal control audit
ML = Manager's legal liability for ICFR disclosures
IC_RISK = Risk that ICFR is not effective based on ICFR spending
[a] Represents the frequency managers disclose that ICFR is not effective over 20 rounds.
[b] Represents the number of IC disclosure decisions for all managers over 20 rounds.
[c] Given the directional predictions, we report one-tailed p-values for the main effect of ML and IC Audit, and ML x IC Audit interaction when results are in the predicted direction. All other p-values presented are two-tailed.
[d] The p-value for the main effect of IC audit equals (1 – α/2), given that results are not in the predicted direction for H2b.

Table 4: Results for Investor Confidence

Panel A: Means (Standard Deviations)

IC Audit	ML Absent	ML Present	Overall
Absent	3.24 (2.04)	4.61 (1.84)	3.93
Present	4.17 (1.78)	4.43 (2.02)	4.32
Overall	3.65	4.52	4.11

Panel B: ANOVA

Source of Variation	**Ndf**	**Ddf**	**F-Value**	**p[a]**
Between – Subjects				
ML	1	54	21.63	<0.01
IC Audit	1	54	4.68	0.02
ML x IC Audit	1	54	9.94	<0.01
Within-Subjects				
Round	19	1,006	6.86	<0.01
Round x ML	19	1,006	1.23	0.22
Round x IC Audit	19	1,006	3.92	<0.01
Round x ML x IC Audit	19	1,006	1.23	0.22

IC Audit = Internal control audit
ML = Manager's legal liability for ICFR disclosures
[a] Given the directional predictions, we report one-tailed p-values for the main effects of ML and IC Audit, and ML x IC Audit interaction when results are in the predicted direction. All other p-values presented are two-tailed.
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Table 5: Results for Required Risk Premium

Panel A: Means (Standard Deviations)

IC Audit	ML Absent	ML Present	Overall
Absent	9.4% (9.8%)	6.6% (9.9%)	8.0%
Present	3.7% (8.4%)	4.6% (10.3%)	4.2%
Overall	6.9%	5.6%	6.3%

Panel B: ANOVA

Source of Variation	**ndf**	**Ddf**	**F-Value**	**P**[b]
Between – Subjects				
ML	1	16	0.54	0.24
IC Audit	1	16	7.10	0.01
ML x IC Audit	1	16	1.85	0.10
Within-Subjects				
Round	19	268	3.73	<0.01
Round x ML	19	268	0.97	0.50
Round x IC Audit	19	268	1.48	0.09
Round x ML x IC Audit	19	268	1.20	0.26

Panel C: Planned Contrasts

ML	**IC Audit**	**(1) Weights**	**(2) Weights**	**(3) Weights**	**(4) Weights**
Absent	Absent	0.094		0.094	
Absent	Present	0.037			0.037
Present	Absent		0.066	0.066	
Present	Present		0.046		0.046
F- statistics		7.72	0.89	2.34	0.19
(P-value)[d]		(<0.01)	(0.18)	(0.07)	(0.34)

IC Audit = Internal control audit
ML = Manager's legal liability for internal control disclosures
[b] Given the directional predictions, we report one-tailed p-values for the main effects of ML and IC Audit, and ML x IC Audit interaction when results are in the predicted direction. All other p-values presented are two-tailed.
[d] Given the directional predictions, we report one-tailed p-values for the contrast analysis.