

**Costs and Benefits of Audit Committee Regulation:  
Evidence from the 1999 NYSE and NASDAQ Exchange Rule Changes**

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## Abstract

We examine market reactions to the 1999 rule changes approved by the SEC for the NYSE and NASDAQ to require all listed firms to have a fully-independent audit committee with at least three directors within 18 months of passage. On the benefit side, we find no evidence that the market perceived the new regulation to dampen earnings management or fraudulent accounting restatements, two of the benefits put forth by the SEC throughout the regulatory process. To evaluate the costs of compliance, we take advantage of the fact that at the time of the passage and through the subsequent 18 months, listed firms were required to have a minimum of two independent directors on their boards. Thus, to comply with the new audit committee standard, many firms needed to add one independent director. We find that cross-sectional abnormal returns are significantly lower for firms with just two independent board directors prior to the regulation. As evidence of a direct cost, firms with only two independent board directors increased their board size more significantly than firms with three or more independent board directors. As evidence of an indirect cost, we classify firms as being optimal or sub-optimal with respect to having a board with two independent directors. We then show that optimal firms suffered the greatest shareholder wealth losses, consistent with a cost of them being “pushed” of out optimality by the new regulation. Given the D.C. Circuit’s recent invalidations of SEC rulemaking efforts on the ground that the SEC failed to meet a review standard that weighs both the costs to firms as well as the benefits to investors (Cox and Baucom, 2012), our paper takes a step in addressing these concerns.

## 1. Introduction

In this study, we present new evidence on the costs and benefits behind mandated audit committee composition for publicly-listed firms by exploiting a natural experiment in audit committee structure created by a stand-alone exogenous change in audit committees. Specifically, we examine cross-sectional market reactions around the SEC's approval of the 1999 NYSE and NASDAQ rule changes that amended audit committee requirements for (almost) all listed companies. The new rule mandated that, within 18 months, listed companies must have audit committees composed of at least three members, all of whom are independent of management.<sup>1</sup> The rule changes were concordant with those recommended by the Blue Ribbon Committee (BRC) Report (1999), which placed an independent, well-functioning audit committee as the key oversight mechanism of financial reporting. In July 2002, the Sarbanes-Oxley Act of 2002 (SOX) incorporated these requirements into Section 301, thus validating the "view" that the net benefits to investors from these requirements were positive.<sup>2</sup>

An empirical analysis of the perceived costs and benefits to listed firms from enacting this regulation should yield relatively clean results. First, unlike subsequent corporate governance laws, for example SOX or the Dodd-Frank Act of 2010, which encompass many goals and disparate rules, the 1999 regulation is relatively contained; that is, it relates to changes in the board's standing audit committee only. Thus, there is little ambiguity as to which sections of the regulation the market is reacting. Second, unlike the passage of SOX and the Dodd-Frank Act, there was little to no political jockeying or uncertainty as to how the 1999 audit committee rule would evolve. The SEC and the

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<sup>1</sup> The rules allowed for a very limited opt out of one affiliated director.

<sup>2</sup> The SEC finalized Section 301 in April 25, 2003, giving firms until the earlier of their first annual shareholders meeting after January 15, 2004 or October 31, 2004 to fully comply. (see SEC Release Nos. 33-8220 and 34-47654 on [www.sec.gov/rules/final/33-8220.htm](http://www.sec.gov/rules/final/33-8220.htm))

exchanges were concordant on the changes to the listing standards, and together they worked on submitting these changes to the SEC for final approval.<sup>3</sup> Third, the 1999 rule changes preceded the passage of SOX and the accounting scandals of Enron and WorldCom by at least 20 months. Thus, in many ways, the 1999 change to audit committee standards can be viewed as a “stand-alone” corporate governance event.

The aims of this study are twofold. The first goal is to draw a clearer picture of the association between wholly-independent audit committees and/or audit committee size and shareholder value. Previous cross-sectional studies relating these two audit committee composition variables and accounting outcomes yield conflicting results on the net benefits of audit committee composition in improving financial accounting reporting and, by extension, shareholder wealth.<sup>4</sup> These studies, however, are plagued by the observation that audit committee composition is endogenously determined by the firm to maximize firm value (see Klein, 2002a). The 1999 regulation represents an exogenous shock to audit committee composition as it now required all listed firms to move (or stay) to a minimum three person wholly-independent audit committee. Examining market reaction to these new rules overcomes some of the endogeneity issues and allows us to assess better the link between shareholder value and audit committee composition. For example, if full independence increases shareholder value, then we should observe significantly positive stock price reactions for those firms with less than 100% independent audit committees, but little to no stock price reactions for those firms that already have fully-independent audit committees.

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<sup>3</sup> The SEC received 25 comment letters on the proposed rule change. Twenty-two letters favored the proposal, but offered some modifications, for example, the determinants of what constitutes a “significant business relationship” as it pertained to the independence of audit committee members. Three letters opposed the proposal, primarily on the premise that boards and firms should have more flexibility in determining their audit committee structures. See SEC Release No. 34-42233 (<http://www.sec.gov/rules/sro/ny99390.htm>) for a description of the comment letters.

<sup>4</sup> See section 3 for a discussion of some of these studies.

The second goal is to assess the costs of mandating firms to move to minimum three person wholly-independent audit committees. Our setting offers a relatively straightforward way to do this. At the time of the regulatory adoption, the compliance costs were minimal for most firms. As we show, many firms already had audit committees consistent with the joint mandate; further, many non-compliant firms “merely” had to reshuffle their independent committee member assignments to comply with the new rule changes. However, a significant number of firms were unable to comply with the new regulation because their boards did not contain the requisite number of independent directors. The reason for this is that at the time of the rule change NYSE and NASDAQ listing standards mandated listed firms to have at least two independent board directors. For these firms, at least one additional independent member would have to be added to their boards in order for them to become compliant within the requisite 18 months. We therefore hypothesize that compliance costs to the new regulations will be highest for those firms that have only two independent board members prior to the regulatory change.

The importance of evaluating the expected costs of new regulation has taken on new dimensions in the United States. Recently, the D.C. Circuit invalidated SEC rulemaking efforts on the ground that the SEC failed to meet a review standard that weighs both the costs to firms as well as the benefits to investors (Cox and Baucom, 2012). Notably, in a 2011 decision, the court castigated the SEC for failing “adequately to quantify the certain costs or to explain why these costs could not be quantified.”<sup>5</sup> Whereas many papers examine the net benefits or costs of proposed regulations by regressing the stock returns on existing governance structures and firm characteristics (e.g., Zhang, 2007; Li et al., 2008; Larcker et al., 2011; Black and Kim, 2012), few papers have been able to examine explicitly the costs associated with the new regulations. Two exceptions are Zhang (2007),

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<sup>5</sup> See *Business Roundtable and Chamber of Commerce of the United States v. Securities and Exchange Commission* (647 F.3d 1148 (D.C. Cir. 2011)).

who finds that the prohibition of non-audit services causes compliance costs, and Iliev (2010), who shows that SOX imposed costs of Section 404 on small firms in terms of higher audit fees and lower long-term stock returns.<sup>6</sup>

The empirical results in our paper support the view that the market perceived the institution of the three-person fully-independent audit committee as having little to no net benefits to the firm, and in many cases, caused non-compliant firms to incur substantive direct and indirect costs.

Overall, we find a statistically significant negative average cumulative abnormal stock return (CAR) of -1.82% over the specific event dates leading up to and including the approval by the SEC of the new listing requirements. This indicates that, on average, the market assigned a net cost to compliance.

When we analyze the two components of the regulation — moving to a fully-independent audit committee and having at least three members — we discover that the market placed no net benefit (or cost) on firms being in or out of compliance with the independence mandate, but a significant net cost on being out of compliance to having less than three members on the audit committee. Further examination of the audit committee size mandate reveals that firms with only two independent directors prior to the rule change approval were the ones with the most negative CARs, i.e., they bore the greatest net costs of compliance.

Separating net benefits (costs) into its respective benefits and costs yields new insights into this regulation and on regulatory processes in general. Following the SEC Chairman's justification for proposing the new rules, we propose that the benefits of the regulation were to be a mitigation of both earnings management and accounting reporting fraud (Levitt, 1998). Our empirical analyses, however, do not support the view that the market interprets these rules as being effective in meeting these goals.

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<sup>6</sup> Zhang (2007) and Chhaochharia and Grinstein (2007), and Gao et al. (2009) report findings that are consistent with Iliev's results.

In fact, we come to the opposite interpretation; cross-sectional CARs are negatively related to our proxies for accounting fraud and earnings management, and these CARs are even more negatively related to poor financial reporting for firms that were out of compliance with either component. We interpret these findings as evidence that the market believed that the rules, as given, were not sufficient to attenuate poor accounting reporting quality. The subsequent accounting scandals following the institution of the rule changes, coupled with the US Congress' approach to incorporate the audit committee composition changes within a wider regulatory scope in SOX, suggests that the market was prescient in its assessment of the effectiveness of the 1999 regulatory changes.

In analyzing costs, we try to document both direct and indirect costs of compliance. As for direct costs, we find that board expansion within the requisite 18 months is greater for firms that had only two independent directors, as well as for firms that had less than three audit committee members, when compared to their counterparts. In contrast, we find no evidence that firms that had less than wholly-independent audit committees added (or removed) directors at a different rate than those with 100% independent audit committees. We interpret this latter result as evidence that independent directors may be viewed as fungible and that compliance to the independence standard could be achieved by moving independent directors around existing board committees.

As for indirect costs, we rely on the literature suggesting that boards and/or board committees are endogenously chosen to maximize firm value (e.g., Demsetz and Lehn, 1985) and propose that firms that are legally forced to move out of equilibrium suffer declines in shareholder value. We use extant empirical papers (Klein, 2002a; Linck et al., 2008) to model economic determinants behind audit committee independence and board size, and then classify firms as picking their board or audit committee structures as optimal or sub-optimal. We find no evidence of an indirect cost of legally moving firms from less-than-fully-independent audit committees to fully independent audit

committees. The cross-sectional variation in CARs is not lower for firms that optimally chose to maintain audit committees that are not 100% independent. However, we do find strong evidence that firms that optimally chose a board with two independent directors had significant declines in shareholder value around the event dates.

This paper contributes to two fields of research: corporate governance and securities regulation. Its primary contribution to corporate governance is to present relatively clean results on the merits of audit committee independence and size using a natural experiment, the adoption of the 1999 audit committee listing standards. Our research design is in the spirit of other papers that use event study methodologies to examine the net benefits of the newly-proposed regulations (e.g., Li et al., 2008; Chhaochharia and Grinstein, 2007; Larcker et al., 2011). However, these studies examine bundled regulations; in contrast, the 1999 regulation is fairly simple and straight-forward. In this respect, our study is similar to Ahern and Dittmar (2012), who examine the impact on shareholder value surrounding a 2003 law that required Norwegian firms' directors to be comprised at least 40% women. Further, our study is less tainted by confounding events, although we acknowledge that the event dates are concurrent with the expansion of the internet bubble.

The paper's primary contribution to securities regulation is that it tries to determine both the costs and benefits of regulatory compliance. In particular, we demonstrate both direct and indirect costs of compliance as measured by an increase in board size and forcing firms to move out of optimal board composition.

## **2. Event Dates Leading Up to Regulatory Changes**

The changes to the exchange listing standards related to audit committees grew out of the Blue Ribbon Committee Report (BRC Report, 1999), which was created at the behest of SEC Chairman



Arthur Levitt. We compile a list of events related to this process by searching the SEC website and Factiva for announcements and notices of filings; we supplement this search by including the list of press releases contained in the BRC Report and in Backman (1999).

The list of events is detailed in Table 1. In total, we document eight events. Unlike previous studies that examine share price reactions around legislative events (e.g., Zhang, 2007; Li et al., 2008; Larcker et al., 2011), there were few negotiations and no input from Congress or the Executive branch of the U.S. government. The dates span September 28, 1998 to December 14, 1999.

The process began on September 28, 1998 when SEC Chairman Arthur Levitt delivered a speech expressing concern about the quality of financial reporting in the U.S (Event #1). On that date, Levitt announced that the “NYSE and NASD will sponsor a ‘blue ribbon’ panel drawn from the various constituencies of the financial community to make recommendations on strengthening the role of audit committees in overseeing the corporate financial reporting process.” (SEC, 1998a) The mandate of the eleven member panel, co-chaired by John Whitehead and Ira Millstein, was to issue a report within 90 days with a list of recommendations for improving audit committee effectiveness.<sup>7</sup> The names of the remaining nine members of the panel were announced on October 6, 1998 (Event #2). The announcement emphasized that the panel is composed of “corporate and industry leaders” (SEC, 1998b).<sup>8</sup> A call for public comments on possible recommendations by the Panel was announced on November 4, 1998 (Event #3). This announcement capped the comment period to December 1, 1998, provided information about the forthcoming December 9, 1998 public hearing (Event #4), and contained a list of topics to be considered, the latter including the question of “should each member of an audit committee be required to be independent?” (BRC Report, 1999).

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<sup>7</sup> John Whitehead is a former Deputy Secretary of State and a retired Co-Chairman and Senior Partner of Goldman Sachs. Ira Millstein is a senior partner of Weil Gotshal & Manges, a large corporate law firm.

<sup>8</sup> The nine additional members were three persons from large corporations, two persons from Big 4 accounting firms, the CEOs from NYSE and NASD, respectively, the CEO of TIAA-CREF, and the former controller general of the U.S.

The BRC Report was released on February 8, 1999 (Event #5). The report contains ten separate recommendations. The first seven recommendations are proposed changes in NASDAQ and NYSE listing requirements. Recommendation 1 deals with the definition of an independent audit committee director. Recommendations 2 and 3 provides for audit committees to have at least three directors, all of whom are independent, as defined in recommendation 1. Recommendations 4 through 7 deal with the existence, disclosure and details of an audit committee charter. Recommendation 8 and part of 10 are directed towards the Audit Standards Board (ASB) of the AICPA. Specifically, Recommendation 8 requires the company's auditor to discuss the auditor's judgments about the quality of the company's accounting principles with the audit committee, and Recommendation 10 extends this to auditor quarterly reviews. Recommendations 9 and part of 10 target the SEC. Recommendation 9 requires 10-K filings to contain a letter from the audit committee disclosing several mandated details about the audit process. Recommendation 10 recommends a SAS 71 financial review for all quarterly (10-Q) statements.<sup>9</sup>

On September 2, 1999 (Event #6), the SEC obtained board approval to file proposed rule changes to audit committee standards for NYSE and NASDAQ listed companies. Dual Notices of Filing of proposed changes for the NYSE and NASDAQ were made on October 6, 1999 (Event #7). The proposed changes were virtually identical to those contained in Recommendations 1 through 7, with two key exceptions. Both exchanges allowed for a limited opt out of the 100 percent independence requirement, and the NASDAQ allowed companies with sales less than \$25 million to establish and maintain an audit committee of at least two members, a majority of whom are

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<sup>9</sup> A SAS 71 review consisted principally of applying analytical procedures to financial data and making inquiries of the company's officers responsible for financial and accounting matters. It was superseded in November 2002 by SAS 100 which ratcheted up the requirements. In December 2003, the PCAOB issued Auditing Standard 1 which further refined the standards used in the interim financial review.

independent. The NYSE and NASDAQ rule changes were approved by the SEC on December 14, 1999 (Event #8).

### **3. Cost and Benefits of Proposed Changes and Hypothesis Development**

The NYSE and NASDAQ listing changes adopted by the SEC are predicated on the joint assumptions that a corporation's audit committee can adequately protect its shareholders from "haphazard or fraudulent disclosure" (SEC, 1978), and that this monitoring is best achieved by three or more independent (outside) directors.

In this section, we propose several costs and benefits to firms moving to a fully-independent audit committee, and to firms moving to an audit committee of three or more directors. Basically, we present three non-mutually exclusive hypotheses (in the alternative form). The first is that if the new requirement is perceived by the market to be beneficial to shareholders, then firms out of compliance will earn higher market returns around the event dates than firms that already comply. Alternatively, if firms endogenously select audit committee characteristics to maximize firm value, then firms out of compliance will earn lower or negative market returns. The second hypothesis is that the market reaction for non-compliant firms is positively related to the benefits derived from enhanced monitoring of the financial reporting system. The third hypothesis is that the market reaction for non-compliant firms is negatively related to the costs of compliance.

#### *3.1. 100% Independent Audit Committees*

The audit committee's main duties include meeting regularly with the company's internal and external auditors, and reviewing the company's internal accounting controls, public releases of

financial information, and the scope of the audit.<sup>10</sup> These functions help alleviate the agency problems between management and shareholders by facilitating the timely release of unbiased information, thus reducing the information asymmetry between insiders and outsiders. Fama and Jensen (1983) argue that outside board members are best placed to carry out tasks that involve agency problems between internal managers and shareholders.

However, Coase (1937), Pfeffer and Selancik (1978), Williamson (1983), Fama and Jensen (1983), and Demsetz (1991) present analytical models in which inside or affiliated directors provide firm-specific economic needs as board members. The economic needs include transfer of specialized information and linkages between the firm and its external environments. Klein (2002a) presents empirical evidence that audit committee independence varies cross-sectionally via supply and demand channels for monitoring the firm's accounting reporting environment. Anecdotally, only 43% of firms in the S&P 500 had 100% independent audit committees in 1991-1993 (Klein, 2002a); in this study, 52% of the sample firms have fully independent audit committees in 1997. These papers suggest that the new regulation would place indirect costs to non-compliant firms by pushing them out of their value-maximizing audit committee independence structure.

Many empirical papers examine the association between a firm having a fully-independent audit committee and the quality of its public financial reports.<sup>11</sup> The vast majority of these studies present evidence that 100% independent audit committees are associated with a lower likelihood of the

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<sup>10</sup> In 1977, the SEC and Killearn Properties Inc. came to an agreement in which Killearn agreed to form an audit committee. In the consent decree, the SEC specifically stated that these would be the duties of the newly-formed audit committee (Birkett, 1986).

<sup>11</sup> Historically, the SEC and the NYSE first endorsed the concept of an audit committee composed of non-executive directors in 1940 in response to the SEC's investigation of the McKesson & Robbins accounting scandal. However, no U.S. stock exchange mandated the existence of an audit committee until 1978, when the NYSE amended its listing standards to require all listed firms to maintain an audit committee composed solely of directors deemed (by the board) to be independent of management. The NASDAQ and AMEX followed suit in 1989 and 1993, respectively, although neither exchange required the committee to be fully independent of management.

firm committing financial fraud (e.g., McMullen and Raghunandan, 1996; Abbott et al., 2000; Beasley et al., 2010), having an accounting restatement (e.g., Abbott et al., 2004), or aggressive earnings management (Bédard et al., 2004).<sup>12</sup> In addition, SOX, in 2002, and the NYSE and NASDAQ, in 2003, made sweeping changes to the corporate governance structures of listed firms by, among other things, mandating firms to have more independent boards of directors, audit, compensation, and nominating committees. Chhaochharia and Grinstein (2007), Wintoki (2007), Li et al. (2008), and Armstrong et al. (2012) find evidence consistent with these changes being beneficial to the market as a whole, and specifically to firms that previously managed earnings. If shareholders expect the full independence rule to alleviate the information asymmetry between shareholders and management, then we would expect the market reaction to the new rules to be more positive for firms with less than fully independent audit committees.

On the other hand, Agrawal and Chadra (2005) and Beasley et al. (2010), find no association between 100% independent audit committees and restatements or fraud, respectively, and Klein (2002b) finds no cross-sectional relation between earnings management and fully-independent audit committees, although she reports a negative association between earnings management and majority-independent audit committees. These results suggest no association between market returns and whether the firm is in or out of compliance at the time of the regulatory change.<sup>13</sup>

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<sup>12</sup> Other studies find a positive association between completely independent audit committees and various accounting outcomes, for example, Abbott et al., 2003 (audit fees), Lee et al., 2004 (auditor resignations), Bronson et al., 2009 (likelihood that an auditor gives a going concern report to financially distressed firms, and auditor dismissals after the receipt of the going concern),

<sup>13</sup> The evidence on the association between financial reporting outcomes and the percentage of independent directors on audit committees is also mixed; Carcello and Neal (2000; 2003) Klein (2002b), Bédard et al. (2004) and Vafeas (2005) find positive associations whereas Xie et al. (2003), Felo et al. (2003), Yang and Krishnan, (2005) and Larcker et al. (2007) find no associations. Similarly, Yang and Krishnan (2005), Davidson et al. (2005), and Lin et al. (2006) find negative relations between audit committee size and financial reporting outcomes, while, no association between the two is found by Beasley (1996), Xie et al. (2003), and Farber (2005).

### *3.2. Three or more Audit Committee Members*

The rationale behind the SEC's requirement for an audit committee to have three or more directors is tenuous, at best. In the consent decree between Killearn Properties Inc. and the SEC, Killearn agreed to form an audit committee of three outside directors (Birkett, 1986). The BRC Report (1999) calls for the establishment of audit committees with at least three members. Neither the consent decree nor the BRC Report (1999) offers a rationale for choosing the number three.

Prior empirical research yields mixed conclusions on the association between having three or more audit committee directors and accounting outcomes. Beasley et al. (2010) find a negative association between fraud and having audit committees of at least three members. Abbott et al. (2004) and Bédard et al. (2004) find no relation between a firm's audit committee having three or more directors and restatements or aggressive earnings management, respectively. If the market perceives an advantage to audit committees having three or more directors, then we would observe more positive returns for audit committees out of compliance, with firms experiencing recent fraudulent accounting behavior benefiting most from the new regulation.

However, given the overlapping regulation that a listed firm was required to have minimum of two independent directors on its board, we posit that firms with only two independent directors will be forced to incur direct costs of compliance. (We note that the two independent director rule was not changed until 2003 when a majority independent board listing requirement was established). At the minimum, these firms will incur tangible compliance costs by having to recruit at least one new independent director. In addition, we hypothesize that firms may choose endogenously overall board structures with less than three independent board members. Several papers, e.g., Boone et al. (2007), Linck et al. (2008), and Coles et al. (2008) show that board size varies cross-sectionally with the costs and benefits of the board's monitoring and advising roles. We propose, therefore, that firms that

optimally choose boards with less than three independent directors will incur indirect costs of compliance due to them being forced to move into a sub-optimal overall board structure.

## **4. Data, Variable Measurement, and Descriptive Statistics**

### *4.1. Data*

We obtain board data from RiskMetrics' directors' database (formerly IRRC database). RiskMetrics contains information on company directors, for example, committee membership, independence, work experience, and board tenure. Since the initial event date is September 28, 1998 (Levitt's speech), we use the most recent board and audit committee structure prior to that date. We begin with 1,472 distinct firms.

Daily stock return data are from CRSP; we require individual firm and market return data for days 0 and +1 for each of the eight events, where day 0 is the event date listed in Table 1.<sup>14</sup> Firm characteristic data, for example, total assets and book value of equity are from Compustat. We exclude financial firms [Standard Industrial Classification (SIC) codes 6000 through 6999] because our metric of earnings management is not applicable to financial firms. Excluding all firms without the required CRSP and Compustat data yields a final sample of 1,227 distinct firms.

By using publicly available data prior to the initial event date, we avoid a look-ahead bias in our tests. Thus all of the benefit and cost proxy variables used in our analyses are available to the market throughout the event period.

### *4.2. Variable Measurement*

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<sup>14</sup> We also did the analyses over days -1 through +1. The results and conclusions reported in this paper are robust to including the day prior to the announcement date. However, from reading the Wall Street Journal and The New York Times, we were unable to find any public leakage of any of the eight announcements prior to day zero, and therefore, we believe that using the two day window [0,+1] is a more accurate depiction of the stock market reaction.

Testing the hypotheses requires us to have measures of financial fraud, earnings management, and equilibrium models for a firm having 100% audit committee independence or 3 or more independent board directors.

#### 4.2.1 Financial Fraud and Earnings Management

The Levitt Speech, the BRC Report, and the SEC releases emphasize that the purpose of the new listing requirement is to increase the quality of financial disclosure, where quality is defined as reducing the likelihood of financial fraud and earnings management. Levitt (1998) specifically mentions earnings restatements as an example of accounting fraud; he also provides examples of firms manipulating earnings by booking sales prematurely and by writing off assets prematurely.

We use the incident of a fraudulent accounting restatement from 1996 through Levitt's speech as a measure of fraud. Using a database compiled by Andrew Leone,<sup>15</sup> from the United States Government Accountability Office (GAO, 2002) we are able to separate fraud-based restatements from error-based restatements.

Given Levitt's references to booking sales and writing-off assets prematurely, we use the modified Jones model (Dechow et al., 1995), which explicitly uses sales and PP&E as variables, to measure earnings management. Specifically:

$$ACCR_{it}/TA_{it-1} = \beta_0 + \beta_1[1/TA_{it-1}] + \beta_2[(\Delta SALES_{it} - \Delta AR_{it})/TA_{it-1}] + \beta_3[PPE_{it}/TA_{it-1}] + \varepsilon_{it} , \quad (1),$$

where  $ACCR$  is total accruals, calculated as income before extraordinary items minus operating cash flows;  $TA$  is total assets;  $\Delta SALES$  is annual change in sales;  $\Delta AR$  is annual change in net accounts receivable; and  $PPE$  is gross property, plant, and equipment. Equation (1) is estimated for each two-digit SIC industry and year with a minimum of 10 observations. The abnormal accrual is the firm's

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<sup>15</sup> See [sbaleone.bus.miami.edu](http://sbaleone.bus.miami.edu). Hennes et al. (2008) use a subset of this sample in their paper. According to the website, the database has been updated subsequently by Andrew Leone.



actual accrual minus the fitted accrual from equation (1). Following many other studies, we define *EM* as the absolute value of the abnormal accrual, with a larger number indicating more earnings management.

#### 4.2.2 Two Independent Board Directors

Although the new regulation specifies that listed firms must have an audit committee of three or more independent directors, the regulation requiring listed firms to have at least 2 independent directors on the full board did not change. We define *Ind2* as a dummy variable indicating if the firm's board had only two independent directors.

#### 4.2.3 Indirect Costs: Optimal vs. Suboptimal Audit Committee Composition for Firms out of Compliance

Klein (2002a) tests for endogeneity of audit committee independence by estimating a probit model of 100% audit committee independence on supply and demand factors for a sample of firms listed on the S&P 500 during 1991 through 1993. She finds evidence that audit committee independence is associated with firm-specific economic factors.

We follow Bryan et al. (2012) and use the inverse Mill's ratio from a probit selection model to determine whether it is optimal or sub-optimal for boards to have 100% audit committee independence. First, we estimate the determinants fully-independent boards by estimating Klein's (2002a) model. Specifically:

$$\begin{aligned} \Pr(100\% \text{ AudInd}_{it} = 1) = & \beta_0 + \beta_1 \ln(\text{BdSize})_{it} + \beta_2 \% \text{IndDir}_{it} + \beta_3 \text{M/B} + \beta_4 \text{Losses}_{it} \\ & + \beta_5 \text{Leverage}_{it} + \beta_6 \text{CEOonCC}_{it} + \beta_7 5\% \text{BlockonAC}_{it} \\ & + \beta_8 \text{IndDirOwn}_{it} + \beta_9 \ln(\text{FirmSize})_{it} + \varepsilon_{it} \end{aligned} \quad (2),$$

where  $i$  indicates firm;  $t$  indicates year, which is the full year for firm  $i$  prior to the Levitt speech;  $\ln$  is the natural log transformation;  $100\%AudInd$  is a dummy indicating if a firm has as fully-independent board;  $BdSize$  is the number of board directors;  $\%IndDir$  is the percentage of independent directors on the board;  $M/B$  is the market value of equity divided by the book value of equity;  $Losses$  is a dummy indicating if the firm incurred accounting losses in the last two consecutive years;  $Leverage$  is total liabilities divided by total assets;  $CEOonCC$  is an indicator if the CEO is the Chair of the compensation committee;  $5\%BlockonAC$  is an indicator if at least one 5% outside blockholder sits on the audit committee;  $IndDirOwn$  is the percentage of total beneficial ownership by independent directors; and  $FirmSize$  is the firm's total assets. Summary statistics on the regression for equation (2) are in Panel A of the Appendix.

The inverse Mill's ratio for firms with fully independent audit committees ( $100\%AudInd_{it} = 1$ ) is defined as  $\varphi(\beta'X)/\Phi(\beta'X)$ ; the ratio for firms with less than fully independent audit committees ( $100\%AudInd_{it} = 0$ ) is defined as  $-\varphi(\beta'X)/\{1 - \Phi(\beta'X)\}$ , where  $\beta'X$  is the fitted value from equation (2) and  $\varphi(\cdot)$  and  $\Phi(\cdot)$  denote standard normal cdf and pdf, respectively. The inverse Mill's ratio is equivalent to the residuals from a probit regression and can be interpreted as the deviation from the optimal selection model. However, by construction, greater deviation from the optimal produces higher (more positive) values for firms with fully independent audit committees ( $100\%AudInd_{it} = 1$ ) and lower (more negative) values for firms without ( $100\%AudInd_{it} = 0$ ). Among the firms with fully independent audit committees ( $100\%AudInd_{it} = 1$ ), those with an inverse Mill's ratio below the group median are defined as having an optimal fully independent audit committee and those with an inverse Mill's ratio above the group median are defined as sub-optimal (i.e., better off having a fully-independent audit committee). For firms with less than fully independent audit committees

(100% $AudInd_{it} = 0$ ) those above the group median are defined as optimal and those below the group median are defined as sub-optimal (i.e., better off not having a fully-independent audit committee).

#### 4.2.4 Indirect Costs: Optimal vs. Suboptimal Board Composition for Firms Out of Compliance

Several papers (Boone et al., 2007; Linck et al., 2008; Coles et al., 2008) regress board composition on firm and other board characteristics to examine cross-sectional variations in board structure. One main takeaway of these papers is that board structure is endogenous, varying in consistent ways with the costs and benefits of the board's advisory and monitoring roles (Fama and Jensen, 1983; Hermalin and Weisbach, 1998; Adams and Ferreira, 2007).

We estimate the determinants of having three or independent directors on the board using the board independence model in Linck et al. (2008).<sup>16</sup> Specifically:

$$\begin{aligned} \Pr(Ind3_{it} = 1) = & \beta_0 + \beta_1 Size_{it} + \beta_2 Lev_{it} + \beta_3 \ln(Seg)_{it} + \beta_4 FirmAge_{it} + \beta_5 FirmAge_{it}^2 + \beta_6 M/B_{it} \\ & + \beta_7 R\&D_{it} + \beta_8 RetVol_{it} + \beta_9 CEOOwn_{it} + \beta_{10} IndDirOwn_{it} + \beta_{11} FCF_{it} \\ & + \beta_{12} ROA_{it-1} + \beta_{13} CEOAge_{it} + \beta_{14} Duality_{it} + \varepsilon_{it} \end{aligned} \quad (3),$$

where  $i$  indicates firm;  $t$  indicates year, which is the full year for firm  $i$  prior to the Levitt speech;  $Ind3$  is a dummy indicating if the firm's board has three or more independent directors;  $Size$  is the logarithm of the market value of equity;  $Lev$  is short- and long-term debt divided by lagged total assets;  $Seg$  is the number of business segments;  $FirmAge$  is the number of years the firm has been on the CRSP database;  $M/B$  is market value of equity divided by book value of equity;  $R\&D$  is research and development expenses divided by lagged total assets;  $RetVol$  is monthly return volatility over the firm's fiscal year;  $CEOOwn$  is the percent of shares owned by the CEO;  $IndDirOwn$  is the percent of beneficial ownership by all independent directors;  $FCF$  is operating plus investing cash flow divided

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<sup>16</sup> The independent variables used by Linck et al. (2008) overlap considerably with those used by Boone et al. (2007) and Coles et al. (2008).

by lagged total assets; *ROA* is return on assets, defined as income before extraordinary items divided by lagged total assets; *CEOAge* is the age of the CEO; and *Duality* is a dummy indicating if the CEO is also the Chair of the board. Summary statistics for the regression on equation (3) are in Panel B of the Appendix.

The inverse Mill's ratio for firms with fully independent audit committees ( $\text{Ind3}_{it} = 1$ ) is defined as  $\varphi(\beta'X)/\Phi(\beta'X)$ ; the ratio for firms with less than fully independent audit committees ( $\text{Ind3}_{it} = 0$ ) is defined as  $-\varphi(\beta'X)/\{1 - \Phi(\beta'X)\}$ , where  $\beta'X$  is the fitted value from equation (3) and  $\varphi(\cdot)$  and  $\Phi(\cdot)$  denote standard normal cdf and pdf, respectively. For firms with three or more independent directors ( $\text{Ind3}_{it} = 1$ ), those with an inverse Mill's ratio below the group median are defined as optimal and those with an inverse Mill's ratio above the group median are defined as sub-optimal. Among firms with two independent directors ( $\text{Ind3}_{it} = 0$ ), those above the group median are defined as optimal and those below the group median are defined as sub-optimal.

#### 4.3. Descriptive Statistics

Table 2 contains descriptive statistics for the full sample. Panel A contains board and audit committee data from the most recent annual shareholder meeting date prior to Levitt's speech on September 28, 1998 (event #1). For the sample of 1,227 firms, 87.9% of the firms had three or more independent board members, with the remaining firms having only two independent board members. We use the classification of independent directors in the RiskMetrics database, following Coles et al. (2008) and Duchin et al. (2010).

The next three rows contain audit committee data. 81.9% of the firms had a standing audit committee with at least three members (composed of independent and non-independent directors). 52.4% of the audit committees were composed of independent directors only (albeit various committee

sizes). As for compliance with the new regulation, only 40.6% of the firms in the sample had a fully-independent audit committee with at least three members. Thus, many firms needed to either shift their board members around or add new independent board members to eventually comply with the new regulation.

Panel B presents summary statistics for risk factors associated with market returns (Fama and French, 1992) and our measures of fraud and earnings management. The average market value of equity is \$5.0 billion, which is larger than the median firm size of \$1.1 billion, suggesting that our sample is positively skewed by the addition of some very large firms. The mean and median is also substantially greater than the \$1.7 billion (\$132 million) mean (median) that we calculate (untabulated) for the full Compustat/CRSP universe (financial firms excluded). The average book-to-market ratio is 0.42, which is also greater than its median of 0.37. The mean and median compare to 0.51 and 0.43 for the Compustat/CRSP sample (untabulated). *EM*, our measure of earnings management has a mean (median) of 0.06 (0.04). Only 1 percent of the full sample (12 firms) had a fraudulent restatement from 1996 through September 28, 1998 (event #1).

## **5. Empirical Analysis**

### *5.1. Overall Market Reaction*

We first examine how the market reacted to the new regulation by computing abnormal returns (CARs) for each event, as well as the cumulative abnormal return summed over the eight events. The daily abnormal return is the firm's raw return minus the CRSP value-weighted market index (VWRETX). CAR is accumulated over the [0, +1] two day window, where day 0 is the event date shown in Table 1.

Table 3 presents the mean abnormal returns for each event and for the combined eight events. Because these abnormal returns capture both the perceived benefits and costs of the regulation, we view these CARs as a starting point for our future analyses. Seven of the eight events are significantly different from zero, with the only non-significant event being event #4, the announcement of the public hearing in New York City. Aggregating the eight events into one cumulative abnormal return yields an overall negative market reaction of -1.82% ( $p < 0.01$ ). Thus, the average market reaction to the new regulation is that its expected costs would exceed its expected benefits for the firms in our sample.

## 5.2. Cross-Sectional Analysis: Compliance/Non-Compliance

We next examine cross-sectional variation in abnormal market returns by whether the firm was in or out of compliance with the new regulations prior to Levitt's speech. We estimate the following two regressions:

$$CAR_i = \gamma_0 + \gamma_1 OCC_i + \gamma_2 Size_i + \gamma_3 B/M_i + \varepsilon_i \quad (4a)$$

$$CAR_i = \gamma_0 + \gamma_1 OOCAudInd_i + \gamma_2 OOCAudSize_i + \gamma_3 Size_i + \gamma_4 B/M_i + \varepsilon_i \quad (4b).$$

$CAR$  is the  $CAR$  summed over the eight event dates. In (4a),  $OCC$  is a dummy indicating if the firm is out of compliance with the dual requirement of full audit committee independence and a three-person minimum. In (4b),  $OOCAudInd$  is a dummy indicating if the firm is out of compliance with the 100% fully-independent audit committee requirement, and  $OOCAudSize$  is a dummy indicating if the firm is out of compliance with the minimum three-person audit committee requirement.  $Size$  and  $B/M$  are control variables, defined as the natural log of the firm's market value of equity and the book-to-market ratio of equity, respectively.  $Size$  and  $B/M$  are calculated at the end of the fiscal year prior to the Levitt speech.

Panel A of Table 4 presents the regression results. The coefficient on *OCC* in row (1) is significantly negative at the 0.01 level. The regression results in column (2) reveal that the negative coefficient on *OCC* is driven by firms that are out of compliance with the audit committee size requirement. The coefficient on *OCCAudSize* is significantly negative ( $p < 0.05$ ), signifying that the market reaction across firms is lower for firms with audit committees currently containing less than three members. In contrast, the coefficient on *OCCAudInd* is insignificantly different from zero, suggesting that the market reaction across firms does not differ between firms that were in or out of compliance with having fully-independent audit committees. The coefficients on the control variables, *Size* and *B/M* are significantly positive at the 0.01 levels.

To shed further light on these findings, we present in Panel B the average CARs by whether the firm was in or out of compliance prior to Levitt's speech. The CAR for firms in compliance with the audit committee 100% independence requirement is -1.22%, compared to -1.81% for firms out of compliance. The difference in CARs is 0.59%, which is insignificantly different from zero at conventional statistical levels. Firms out of compliance with the minimum three director size regulation have a CAR of -4.57%, which is significantly different than the CAR of -0.82% for firms in compliance ( $p < 0.01$ ).

The findings in Table 4 suggest that, *ceteris paribus*, the market placed little to no net benefit on the 100% independence requirement. One interpretation behind this finding is that the costs and benefits of moving to a fully-independent audit committee canceled each other out. A second interpretation is that the requirement was not perceived by the market as adequately addressing firms with poor audit quality. We examine these two interpretations in the next section.

The significantly negative coefficient on *OCCAudSize*, coupled with the negative CAR of -4.57% for the group of firms with two or less directors, is consistent with the view that the market

perceived the mandate of expanding the audit committee from two to three directors as having a net cost to out-of-compliance firms. The prime interpretation behind these findings is that the costs exceeded the benefits of mandating firms to move from two to three (or more) directors. We examine this interpretation in the next section.

### 5.3. Benefits and Costs of Moving Into Compliance

We next examine cross-sectional variation in abnormal returns as it relates to the benefits and costs of firms moving into compliance. We estimate variations of the following regression:

$$CAR_i = \gamma_0 + \gamma_1 OOCAudInd_i + \gamma_2 OOCAudSize_i + \gamma_3 Benefit_i + \gamma_4 Cost_i + \gamma_5 Size_i + \gamma_6 B/M_i + \varepsilon_i \quad (5)$$

where *Benefit* is represented by a firm having a fraudulent restatement (*Fraud*) in the two years prior to the Levitt speech and by the amount of earnings management (*EM*) exhibited in the year prior to the Levitt speech. Our hypothesis is that the market reaction to the new regulation will be greater for firms with poorer financial reporting quality. *Cost* represents the costs to the firm of being out compliance. We initially define *Cost* as *Ind2*, the dummy indicating if the firm's board has only two independent directors. Our hypothesis is that the market reaction to the new regulation will be negatively associated with *Ind2*.

#### 5.3.1. Benefits

Table 5 contains the regression summary statistics. In Column (1), we examine the cross-sectional variation in market returns to the firm's recent financial reporting quality. The coefficients on *Fraud* and *EM* are significantly negative, meaning that firms with poor reporting quality as measured by a recent fraudulent restatement or higher earnings management elicit a more negative stock price reaction.



The negative coefficients on *Fraud* and *EM* are consistent with the view that the market perceives the proposed regulations as being ineffective in curtailing poor financial reporting quality.<sup>17</sup>

To examine this possibility further, we estimate the following regression:

$$\begin{aligned} \text{CAR}_i = & \gamma_0 + \gamma_1 \text{OCCAudInd}_i + \gamma_2 \text{OCCAudSize}_i + \gamma_3 \text{Benefit}_i + \gamma_4 (\text{OCCAudInd}_i * \text{Benefit}_i) \\ & + \gamma_5 (\text{OCCAudSize}_i * \text{Benefit}_i) + \gamma_6 \text{Size}_i + \gamma_7 \text{B/M}_i + \varepsilon_i \end{aligned} \quad (6).$$

The coefficients on the interactive terms,  $(\text{OCCAudInd} * \text{Benefit})$  and  $(\text{OCCAudSize} * \text{Benefit})$  specifically test for whether the negative coefficient on *Benefit* is more or less pronounced for firms currently out of compliance on either the independence or size dimension.

As column (2) shows, the coefficients on the interactive terms with *Fraud* as the measure of *Benefit* are significantly negative when interacted with *OCCAudInd* ( $p < 0.01$ ) or with *OCCAudSize* ( $p < 0.05$ ). The coefficients on the interactive terms with *EM* as the measure of benefit are negative, but statistically insignificant at conventional levels. These findings indicate that the market reacts more negatively to firms that are out of compliance to the fully-independent and to the three-person-minimum audit committee requirements for firms that recently committed fraud. We interpret these findings as a market perception that the new rules may not be sufficient to curtail future accounting fraudulent behavior by firms. We note that, in many respects, the market was perceptive in its interpretation of the 1999 regulation. Within the next two years, many egregious accounting frauds, e.g., Enron, Xerox, and WorldCom occurred. These highly-visible frauds led to the passage of SOX in 2002, which enveloped the 1999 requirements in a spectrum of other regulatory actions aimed specifically at curtailing accounting fraud and earnings management. These other regulations included the formation of the PCAOB, the certification of the financial statements by the CEO and CFO, and better transparency of certain financial disclosures.

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<sup>17</sup> An alternative, but not plausible explanation, is that the market likes fraudulent accounting or earnings management and does not want to see the end of these practices. We dismiss this interpretation.

### 5.3.1 Costs of Compliance: Having 2 Independent Board Directors

We begin examining the costs of compliance by including *Ind2*, the dummy variable indicating if the firm has only two independent directors on its board. For these firms to comply with the 1999 regulation, they must increase the number of independent directors by at least one. The results are presented in column (3) of Table 5.

The coefficient on *Ind2* is -0.034 and it is significantly negative at the 0.05 level. Thus, the cross-sectional CARs are more negative for firms that have only two independent directors on the board. In addition, the coefficient on *OCCAudSize*, although negative, becomes insignificantly different from zero when *Ind2* is added to the regression shown in column (1). This finding is consistent with *Ind2* subsuming the negative effect of the firm being out of compliance with respect to the audit committee size regulation.

To further illustrate the effects of *Ind2* on the cross-sectional CARs, we partition the firms by *Ind2* and calculate their CARs by group. The mean [median] abnormal returns (untabulated) for the 149 firms with 2 independent directors is -6.39% [-5.30%], compared to -0.82% [0.65%] for the 1,078 firms with 3 or more independent directors. The difference in the mean CARs is -5.57%, which is significantly different from zero ( $p < 0.01$ ). The Wilcoxon z-statistic is 5.39 ( $p < 0.01$ ). Thus, in economic terms, shareholders of firms with less than the requisite number of independent directors to comply with the new regulation earn substantially more negative returns than shareholders of firms that are in an *ex ante* position to comply.

### 5.3.2 Costs of Compliance: Forcing Firms out of Optimality

If audit committee composition is endogenously determined, then, on average, firms pick audit committee independence and audit committee size to maximize firm value. One artifact of this argument is that out-of-compliance firms optimally choose an audit committee that is not fully independent and/or has an audit committee or a board with only two independent directors. Therefore, any regulation that moves them out of compliance should be accompanied by negative stock returns.

In this section, we model the firm's decision to choose a fully-independent audit committee (Klein, 2002a) and a board of at least three independent directors (Linck et al., 2008), respectively. We then use the inverse Mill's ratios to classify firms as being in or out of equilibrium with respect to each corporate governance factor (see Sections 4.2.3 and 4.2.4). Our main hypothesis is that out-of-compliance firms that we classify as having an optimal board or audit committee structure will be more negatively impacted by the new regulation.

In column (4), we examine optimal audit committee independence. Specifically:

$$\begin{aligned} CAR_i = & \gamma_0 + \gamma_1 OOCAudInd_i + \gamma_2 OOCAudSize_i + \gamma_3 Benefit_i + \gamma_4 Ind2_i + \gamma_5 (OptimalAudInd)_i \\ & + \gamma_6 (OOCAudInd * OptimalAudInd)_i + \gamma_7 Size_i + \gamma_8 B/M_i + \varepsilon_i, \end{aligned} \quad (7),$$

where *OptimalAudInd* is a dummy indicating if the firm optimally has chosen a fully-independent or non-fully-independent audit committee.

In column (5), we examine optimal number of independent directors. Specifically:

$$\begin{aligned} CAR_i = & \gamma_0 + \gamma_1 OOCAudInd_i + \gamma_2 OOCAudSize_i + \gamma_3 Benefit_i + \gamma_4 Ind2_i + \gamma_5 (OptimalNumInd)_i \\ & + \gamma_6 (Ind2 * OptimalNumInd)_i + \gamma_7 Size_i + \gamma_8 B/M_i + \varepsilon_i, \end{aligned} \quad (8),$$

where *OptimalNumInd* is a dummy indicating if the firm optimally has chosen a board with three or more or with two independent directors.

The key coefficient in equations (7) and (8) is  $\gamma_6$ , which indicates the effect on CARs for firms that are optimally out of compliance with the 1999 regulatory standard.

In column (4), the coefficient on  $\gamma_6$  is insignificantly different from zero. This finding, coupled with the insignificant coefficient on *OCCAudInd* supports the view that the market is indifferent to whether the firm's audit committee is in or out of compliance with the 100% independence rule. However, in column (5), the coefficient on  $\gamma_6$  is significantly negative (coefficient = -0.070 ( $p < 0.01$ )). This finding, taken in tandem with the now insignificant coefficient on *Ind2* supports the hypothesis that shareholder value declines mainly for firms with two independent directors that are being forced out of optimality by the new regulation. We consider this negative stock price reaction to be an indirect cost of regulation.

Column (6) presents the regression with both audit committee independence and number of independent board member optimality measures. The results in column (6) are consistent with those reported in columns (4) and (5).

### 5.3.3 Costs of Compliance: Adding an Additional Director

In this section, we examine if firms increase their board size to comply with new regulation. We are particularly interested in seeing what firms with an inadequate number of independent directors do to gain compliance. An increase in board size would be indicative of a direct cost to the firm, as it entails tangible search costs of adding a new board member.

We measure change in board size between fiscal years 1997 and 2000. We choose this three year window because firms have 18 months to comply with the new rule. Since shareholder meetings occur in the calendar year after the fiscal year-end, we capture most of the board changes within this time period without bumping into the Enron scandal of 2001.

Table 6 contains the empirical results. We present the changes in board size by initial audit committee independence (Panel A), initial audit committee size (Panel B), and initial board independence (Panel C).

In Panel A, we report no significant difference in the change in board size by whether the firm had a fully-independent audit committee. The mean difference between the two groups of firms is 0.12 (t-statistic = 1.29). We interpret this finding as evidence that the firm can shift independent directors from other board functions to the audit committee, and therefore has no need to expand its board size.

The results in Panels B and C support the view that there is a difference in the change in board size by whether the firm has the requisite number of independent board members on the audit committee (Panel B) or on the board (Panel C). As Panel B illustrates, firms with audit committees of at least three directors reduced their board size, on average, by 0.21 directors, whereas firms with two or less audit committee members increased board size by 0.41 directors. The difference of -0.63 is significant ( $p < 0.01$ ). In Panel C, firms with two independent directors increase their board size, on average, by 0.54 directors, compared to a mean reduction of -0.19 for firms with at least three independent directors. The difference of -0.72 is significantly different from zero ( $p < 0.01$ ). Wilcoxon z-statistics produce similar interpretations for both panels.

We interpret the results in Panel B and C as evidence of a direct cost to firms to reach compliance with the 1999 regulation.

## **6. Small Firm Effects**

Several studies, for example, Chhaochharia and Grinstein (2007), Gao et al. (2009), and Iliev (2010), examine the costs of SOX on small firms and find evidence consistent with small firms bearing

relatively large costs associated with complying with SOX. In this section, we examine if there is similar evidence for the institution of the 1999 regulation.

The regression results presented thus far include *Size* as a control variable. The coefficient on *Size* is significantly positive across all specifications, indicating that the cross-sectional variation in CARs is higher (or less negative) for larger firms. Thus, there is indirect evidence that smaller firms have lower abnormal stock returns.

However, the progression of the approval of the new listing standards affords us a direct test of the market's perception of the costs to smaller firms. Recall that the SEC changes were preceded by the establishment of the "Blue Ribbon Committee," which released its report and recommendations on February 8, 1999 (event #5). In that report, the BRC specifically exempted listed companies with a market capitalization of \$200 million or more from its requirements.<sup>18</sup> Prior to that event, there was no mention of a red line based on firm size (see BRC Report, 1999). Thus, the insertion of this exemption should have been a surprise to the market.

To see the market reaction to the exclusion of firms with a market capitalization below \$200 million, we divide the sample into firms above and below this amount and calculate the CAR for each group of firms over the two-day period surrounding event 5. We calculate the market capitalization on the event date. The results are in Table 7.

As Panel A shows, 91 firms in our sample have a market capitalization below \$200 million, compared to 1,131 firms with a market capitalization of \$200 million or more. The mean CAR for firms below \$200 million is 1.16%; the mean CAR for firms of at least \$200 million market capitalization is 0.67%. Although the former group has a larger stock price reaction, the difference of 0.49% is not statistically different from zero. Comparison of medians yields a similar conclusion.

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<sup>18</sup> See Recommendation 1 on the definition of independence and Recommendation 2 on audit committee independence and size (BRC Report, 1999).

In Panel B, we isolate those firms that have only two independent directors, arguing that this group of firms bears the greater brunt of the costs of compliance. For these firms, 134 have a market capitalization at least \$200 million, whereas 15 have a market capitalization less than \$200 million. The results in Panel B bear out the notion that smaller firms (defined as a market capitalization of less than \$200 million) are perceived by the market to be most disadvantaged by the new regulation. The mean CAR for the smaller firms is 2.66%, compared to -0.32% for the larger firms. The mean difference in CARs between the two groups is -2.98% ( $p < 0.05$ ). The median CARs yield similar results, although the Wilcoxon z-statistic is at the 0.11 level ( $z\text{-stat} = -1.62$ ). In summary, we find evidence supporting previous studies that small firms bear disproportionate costs to complying with new regulations.

## **7. Robustness Tests**

### *7.1 Monte Carlo Simulation*

Event studies, by definition, are interventions in which the daily stock returns capture news about the firm. One criticism about using regression analysis in which the dependent variable is the cumulative abnormal return is that on non-event days, the coefficients on the independent variables are assumed to be zero. This may not be true, however. For example, if audit committee independence is endogenous, then it is related to various firm characteristics, which may be correlated with the stock returns in the same direction as we find in Tables 4 and 5. Thus, the results we report in this paper may be due to omitted correlated variables or other model misspecifications.

To address this concern, we pick eight random non-event days in 1998-1999 and re-estimate the equations in Table 5. We iterate this procedure one thousand times and retain coefficient estimates from each of the iterations. Following Larcker et al. (2011), we test for whether the coefficients from

Table 5 are different from the average of the one thousand non-event day coefficients using the distribution of the one thousand non-event day coefficients. The null hypothesis is that the coefficients are the same. By rejecting the null hypothesis, we are able to rule out the possibility that the results in Table 5 are being driven by factors other than the news contained in the eight actual events.

The results of this Monte Carlo simulation are shown in Table 8. For each column,  $\beta$  is the coefficient from Table 5 and  $E[\beta]$  is the average coefficient of the one-thousand iterations. As the table illustrates, the coefficients on most of the significant variables in Table 5 are significantly different from the Monte Carlo coefficients. Specifically, in column (1), *OCCAudSize*, *Fraud*, and *EM* are negative and are significantly different from their Monte Carlo estimates. In columns (3) and (4), *Ind2* is different from its Monte Carlo coefficient and in columns (5) and (6) the interactive term, *Ind2\*OptimalBdSize* is significantly different from the non-event coefficients. In conclusion, Table 8 presents results that are consistent with the view that the results in Table 5 are driven by the regulatory announcements rather than test misspecifications.

## 7.2 Alternative Measures of CAR

We measure abnormal returns over the  $[0, +1]$  window, in which the announcement date is on day zero. However, there might be some leakage of information on the day (or days) prior to the event date, which means that we are not capturing the market's temporal path of information. To account for this possibility, we do two things. First, we use Factiva to examine news stories surrounding our day zero to see if, in fact, there is a leakage of information. We find no such news. Second, we expand the abnormal return window to days  $[-1, +1]$  and re-do our analyses. The analyses and interpretation of the results are robust to the expanded window, although the results are weaker.



We also recognize that market-adjusted abnormal returns may not adequately capture other risk factors. In particular, given how firm size is correlated with corporate governance mechanisms, we are concerned that even after controlling for firm size, we might be picking up some biases in the CARs related to firm size. To account for this possibility, we re-do our analyses using size-adjusted returns, which is the actual return minus the CRSP size-matched decile return. Our analyses and interpretation of the results are robust to using size-adjusted returns.

### *7.3 Alternative Measurements of Independent Variables*

In our analyses, *Fraud* is a dummy variable indicating if a firm had a fraudulent restatement prior to Event #1. We use *Fraud* as a proxy for poor financial reporting quality. However, over the same time period, firms also had restatements of accounting information that, while not fraudulent, were inconsistent with generally accepted accounting standards. Therefore, we create a new variable, *Restatement*, which includes all restatements and use that variable instead of *Fraud* in Table 5. The coefficient on *Restatement* and its interaction with *OCCAudSize* are significantly negative in all regressions, although its coefficients are less negative than *Fraud* throughout the analyses.

In our analyses, *EM* is the absolute value of the modified Jones model abnormal accrual. However, the Jones model has been criticized as not capturing earnings management in a meaningful way. Although no earnings management measure is without its problems, we substitute another common measure of accrual quality, based on Dechow and Dichev (2002). This measure is the rolling three-year standard deviation of the residuals from the regression of this year's working capital accruals on prior year, current year, and subsequent year cash flow, each deflated by its lagged total assets. Following Dechow and Dichev (2002), a higher standard deviation of residuals is evidence of higher earnings management. Our results are robust to using this alternative measure of earnings

management. The coefficients in Table 5, for example, remain insignificantly different from zero with the Dechow-Dichev metric.

We use the inverse Mill's ratio to classify firms as optimal or sub-optimal with respect to audit committee independence and the number of independent directors on the board. In the analyses, we choose a cut-off at the median for each group to determine if the firm has optimally chosen its corporate governance structure. However, observations close to the median are not very different from each other; further the models that produce these inverse Mill's ratios are incomplete at best. Thus, we may have many misclassifications in our sample, particularly, those close to the median.

To remedy this concern, we re-classify sub-optimal firms with two different cutoff points. The results with these specifications are in Table 9. In columns (1) through (3), we use the absolute value of the mean inverse Mill's ratio to separate optimal from sub-optimal firms. In columns (4) through (6), the cut-off point is at the 75<sup>th</sup> percentile of the absolute value of the inverse Mill's ratio, defining the 25% of firms furthest from a “zero error” as having a sub-optimal governance structure.

The main variables of interest are the interactive terms, (*OCCAudInd\*OptimalAudInd*) and (*Ind2\*OptimalBdSize*). As the table illustrates, the results are robust to the alternative cut-off points. The coefficients on (*OCCAudInd\*OptimalAudInd*) remain insignificantly different from zero, whereas the coefficients on (*Ind2\*OptimalBdSize*) are still significantly negative at the 0.01 levels, respectively.

In summary, we conclude that our main results are robust to the measurement of many key independent variables.

## 8. Summary and Conclusions

We present new evidence on the costs and benefits behind mandated audit committee composition for publicly-listed firms by exploiting a natural experiment in audit committee structure

created by a stand-alone exogenous change in audit committees. Specifically, we examine cross-sectional market reactions around the SEC's approval of the 1999 NYSE and NASDAQ rule changes that amended audit committee requirements for (almost) all listed companies. The new rule mandated that, within 18 months, listed companies must have audit committees composed of at least three members, all of whom are independent of management .

Overall, we find a negative cumulative market reaction to the new regulation, consistent with the interpretation that the market interpreted the institution of the three-person, fully-independent audit committee to incur, on average, net costs to out-of-compliance firms. Further examination reveals that these costs are related to firms moving to compliance with the three-person standard but not with the fully-independent standard.

The lead-up to the change in the audit committee listing standards came in a speech by then SEC Chairman Arthur Levitt, who specifically cited the mitigation of fraudulent accounting and earnings management by firms as two benefits from the newly-proposed rules changes. Our study finds no evidence that the market believed that the new standard would achieve these goals – in fact, we find that cross-sectional CARs are negatively related to earnings management and with the incidence of a recent fraudulent accounting restatement. We interpret these results as the market construing the new rules as being inadequate to dampen earnings manipulation. We believe that the market had foresight in making this evaluation, given the incidence of the Enron and WorldCom scandal within two years, as well as the 2002 passage of SOX, which incorporated these regulations within a wider group of legislative regulations with the same goals.

Our paper takes advantage of another existing corporate governance standard to evaluate an explicit cost to compliance. At the time of the passage and through the subsequent 18 months, listed firms were required to have only two or more independent directors on their board of directors.

Therefore, for a significant subgroup of firms, compliance with the new audit committee listing standard required them to add an independent director to the board. We posit and find that the addition of the extra independent director for those firms with only two independent directors is costly to these firms. First, we find that cross-sectional variation in CARS is negatively related to whether firms had two independent directors. Second, these firms increased board size more significantly than firms with three or more independent board directors. We call this a direct cost as it entails the firm to incur the costs of searching for a new director. However, we hypothesize that the drop in stock price cannot be attributable to the search costs alone, and propose that there might be indirect costs of adding a new director. To this end, we model board independence and, using this model, classify firms with two independent directors only as being optimal or sub-optimal with regard to this one board structure. We find that firms with optimal boards of two independent directors suffer greater stock losses around the event dates than firms that sub-optimally have two independent directors. We call this an indirect cost of regulation as it is consistent with the market viewing firms being forced out of optimal board structures as being a value-destroying event.

Our study adds to the literature on the association between audit committee composition and market value. It also contributes to the literature on documenting expected costs and benefits to new regulations. Given the D.C. Circuit's recent invalidations of SEC rulemaking efforts on the ground that the SEC failed to meet a review standard that weighs both the costs to firms as well as the benefits to investors (Cox and Baucom, 2012), our paper takes an important step in addressing their concerns.

## Appendix

### Optimal vs. Sub-Optimal Boards of Directors

Panel A: Coefficients and Standard Errors on the Probit Model on the Audit Committee Being 100% Independent (N=1,462)

|             | Constant | ln(BdSize) | %IndDir  | M/B     | Losses  | Leverage |
|-------------|----------|------------|----------|---------|---------|----------|
| Coefficient | -0.304   | -0.777***  | 3.839*** | -0.006  | -0.003  | 0.124    |
| Std. Error  | (0.275)  | (0.144)    | (0.224)  | (0.005) | (0.183) | (0.192)  |

|             | CEOonCC | 5%<br>BlockonAC | IndDirOwn | ln(FirmSize) | Pseudo R <sup>2</sup> |
|-------------|---------|-----------------|-----------|--------------|-----------------------|
| Coefficient | -0.114  | -0.999***       | 1.046     | -0.031       | 0.207                 |
| Std. Error  | (0.256) | (0.233)         | (1.126)   | (0.032)      |                       |

All coefficients have signs consistent with predictions in Klein (2002a) except *ln(BdSize)* and *IndDirOwn*. The coefficient on *IndDirOwn* is not significant, in contrast to Klein (2002a).

Panel B: Coefficients and Standard Errors on the Probit Model on the Board Having Three or More Independent Directors (N=1,341)

|             | Constant | Size    | Lev     | ln(Seg) | FirmAge | FirmAge <sup>2</sup> | M/B     | R&D     |
|-------------|----------|---------|---------|---------|---------|----------------------|---------|---------|
| Coefficient | 0.528    | 0.098** | -0.166  | 0.230** | 0.004   | 0.000                | 0.013*  | 0.712   |
| Std. Error  | (0.496)  | (0.042) | (0.268) | (0.101) | (0.020) | (0.001)              | (0.007) | (0.769) |

|             | RetVol    | CEOOwn   | IndDirOwn | FCF     | ROA <sub>t-1</sub> | CEOAge  | Duality | Pseudo R <sup>2</sup> |
|-------------|-----------|----------|-----------|---------|--------------------|---------|---------|-----------------------|
| Coefficient | -3.212*** | -2.56*** | 6.070***  | 0.297   | -0.424             | 0.001   | 0.160   | 0.149                 |
| Std. Error  | (1.012)   | (0.424)  | (2.484)   | (0.236) | (0.407)            | (0.006) | (0.109) |                       |

Consistent with Linck et al. (2008), the coefficients on *Size* and *ln(Seg)* are statistically positive, and the coefficients on *RetVol* and *CEOOwn* are significantly negative. *IndDirOwn* is statistically positive, a result consistent with Linck et al.'s (2008) prediction, although contrary to their empirical findings.

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**Table 1**

## Description of Events

| Event | Description   | Date       |
|-------|---|------------|
| #1    | SEC Chairman Arthur Levitt announces formation of the BRC   | 9/28/1998  |
| #2    | SEC, NYSE and NASD announce who will be on the BRC  | 10/6/1998  |
| #3    | BRC announces request for public comments on recommendations  | 11/4/1998  |
| #4    | Public hearing held on recommendations in New York City   | 12/9/1998  |
| #5    | BRC Report released   | 2/8/1999   |
| #6    | SEC obtains board approval to file proposed exchange rule changes   | 9/2/1999   |
| #7    | SEC Notices of Filing of proposed rule changes amending audit committee requirements of listed companies on NYSE and NASDAQ | 10/6/1999  |
| #8    | Rule changes approved by SEC for NYSE and NASDAQ  | 12/14/1999 |

This table presents a description of the events leading up to the adoption of the changes in audit committee composition for firms listed on the NYSE or NASDAQ. Dates are compiled from the Securities and Exchange website ([www.sec.gov](http://www.sec.gov)), the Report and Recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC Report, 1999) and a search of Factiva.

**Table 2**

## Descriptive Statistics

## Panel A: Board and Audit Committee Composition

| Board and Audit Committee Composition                   | Percent of Sample |
|---|-------------------|
| Board has at least 3 independent board members          | 87.9%             |
| Audit Committee has at least 3 members                  | 81.9%             |
| Audit Committee is 100% independent                     | 52.4%             |
| Audit Committee is compliant with independence and size | 40.6%             |

## Panel B: Firm Characteristics

| Variables                     | Mean     | Q1     | Median   | Q3       | Std. Dev. |
|-------------------------------|----------|--------|----------|----------|-----------|
| Market value of equity (\$mm) | 5,000.18 | 494.76 | 1,127.85 | 3,305.61 | 15,082.70 |
| Size                          | 7.22     | 6.20   | 7.03     | 8.10     | 1.46      |
| B/M                           | 0.42     | 0.23   | 0.37     | 0.55     | 0.32      |
| EM                            | 0.06     | 0.02   | 0.04     | 0.08     | 0.07      |
| Fraud                         | 0.01     | 0.00   | 0.00     | 0.00     | 0.09      |

Panel A reports board of directors and audit committee composition on the shareholders' meeting date prior to the Levitt speech on September 28, 1998 (Event #1 in Table 1). Panel B presents summary statistics for selected firm characteristics. *Size* is the market value of equity measured as price times the number of shares of common stock, *B/M* is the book value of equity divided by the market value of equity. These variables are measured on the last day of the firm's fiscal year prior to the Levitt speech. *EM* is earnings management, using the modified Jones Model (Dechow et al., 1995). It is measured for the fiscal year ending prior to the Levitt speech. *Fraud* is a dummy indicating if the firm had a fraudulent restatement from January 1996 through the Levitt speech. The sample consists of 1,227 distinct firms.

**Table 3**

## Market Reaction to Exchange Listing Audit Committee Composition Events

| Event        | Description   | Date       | CAR    | t-statistic |
|--------------|---|------------|--------|-------------|
| #1           | SEC Chairman Arthur Levitt announces formation of the BRC   | 9/28/1998  | -0.73% | -5.60***    |
| #2           | SEC, NYSE and NASD announce who will be on the BRC  | 10/6/1998  | -0.55% | -3.13***    |
| #3           | BRC announces request for public comments on recommendations  | 11/4/1998  | 0.23%  | 1.70*       |
| #4           | Public hearing held on recommendations in New York City   | 12/9/1998  | -0.10% | -0.88       |
| #5           | BRC Report released   | 2/8/1998   | 0.70%  | 6.32***     |
| #6           | SEC obtains board approval to file proposed exchange rule changes   | 9/2/1999   | -0.87% | -8.69***    |
| #7           | SEC Notices of Filing of proposed rule changes amending audit committee requirements of listed companies on NYSE and NASDAQ | 10/6/1999  | -0.96% | -7.36***    |
| #8           | Rule changes approved by SEC for NYSE and NASDAQ  | 12/14/1999 | 0.45%  | 3.20***     |
| All 8 Events |   |            | -1.82  | -4.92***    |

This table presents the two-day cumulative average return (CAR) for each event leading up to the adoption of the listing requirement changes on audit committees for firms listed on the NYSE and NASDAQ. CAR is the raw return minus the CRSP value-weighted market return, cumulated over the [0,+1] window, where day zero is the event date. All 8 Events is the average accumulated CARs summed over the eight event dates. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

**Table 4**

## Regression Analyses

## Panel A: Cross-sectional Variation in Cumulative Average Returns (CARs)

|     | Constant             | OCC<br>AudInd     | OCC<br>AudSize      | OCC                  | Size                | B/M                 | N     | Adj. R <sup>2</sup> |
|-----|----------------------|-------------------|---------------------|----------------------|---------------------|---------------------|-------|---------------------|
| (1) | -0.177***<br>[0.024] |                   |                     | -0.022***<br>[0.008] | 0.019***<br>[0.003] | 0.044***<br>[0.016] | 1,227 | 0.04                |
| (2) | -0.153***<br>[0.025] | -0.009<br>[0.008] | -0.025**<br>[0.011] |                      | 0.018***<br>[0.003] | 0.042***<br>[0.016] | 1,227 | 0.04                |

## Panel B: CARs by In or Out of Compliance

| Audit Committee Independence Prior to Levitt's Speech |                                |  |   |  |
|---|--------------------------------|--|---|--|
|   | <i>100% Independent</i><br>(1) | <i>Less than 100% Independent</i><br>(2) | <i>Difference in CARs between (1) and (2)</i> | <i>t-stat for Difference between (1) and (2)</i> |
| CAR   | -1.22%                         | -1.81%                                   | -0.59%  | -0.77  |
| N   | 584                            | 643                                      |   |  |

  

| Audit Committee Size Prior to Levitt's Speech |                                    |                                     |   |  |
|---|------------------------------------|-------------------------------------|---|--|
|   | <i>At Least 3 Directors</i><br>(1) | <i>Less than 3 Directors</i><br>(2) | <i>Difference in CARs between (1) and (2)</i> | <i>t-stat for Difference between (1) and (2)</i> |
| CAR   | -0.82%                             | -4.57%                              | -3.75%  | -3.77***   |
| N   | 1,005                              | 222                                 |   |  |

Panel A presents regression coefficients and robust standard errors [in brackets] for the cross-sectional regression of CAR on out-of-compliance variables and control variables. CAR is the raw return minus the CRSP value-weighted market return, cumulated over the eight-event [0,+1] windows, where day zero is the event date. OCC is a dummy indicating if the firm is out of compliance with the dual requirement of full audit committee independence and a three-person minimum. OCCAudInd is a dummy indicating if the firm is out of compliance with the 100% fully-independent audit committee requirement. OCCAudSize is a dummy indicating if the firm is out of compliance with the minimum three-person audit committee requirement. Size is the natural log of the firm's market value of equity. B/M is the book-to-market ratio of equity, respectively. Panel B classifies the sample by whether the firm is in or out of compliance with respect to the audit committee 100% independence requirement or the three-person minimum audit committee size. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

**Table 5****Regressions of CARs on Compliance, Costs and Benefits of the 1999 Regulation**

| VARIABLES                       | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|---------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Constant                        | -0.131***<br>[0.026] | -0.138***<br>[0.026] | -0.121***<br>[0.027] | -0.118***<br>[0.027] | -0.098***<br>[0.026] | -0.092***<br>[0.027] |
| <i><b>Compliance</b></i>        |                      |                      |                      |                      |                      |                      |
| OCCAudInd                       | -0.010<br>[0.008]    | 0.000<br>[0.010]     | -0.004<br>[0.008]    | -0.009<br>[0.010]    | -0.004<br>[0.008]    | -0.012<br>[0.011]    |
| OCCAudSize                      | -0.022**<br>[0.010]  | -0.013<br>[0.013]    | -0.014<br>[0.011]    | -0.014<br>[0.011]    | -0.009<br>[0.011]    | -0.010<br>[0.011]    |
| <i><b>Benefits</b></i>          |                      |                      |                      |                      |                      |                      |
| Fraud                           | -0.125**<br>[0.052]  | -0.043<br>[0.049]    | -0.122**<br>[0.051]  | -0.122**<br>[0.051]  | -0.116**<br>[0.050]  | -0.115**<br>[0.050]  |
| EM                              | -0.171***<br>[0.053] | -0.056<br>[0.083]    | -0.173***<br>[0.054] | -0.173***<br>[0.054] | -0.145***<br>[0.054] | -0.144***<br>[0.054] |
| OCCAudInd*Fraud                 |                      | -0.203***<br>[0.056] |                      |                      |                      |                      |
| OCCAudInd*EM                    |                      | -0.110<br>[0.125]    |                      |                      |                      |                      |
| OCCAudSize*Fraud                |                      | -0.159**<br>[0.062]  |                      |                      |                      |                      |
| OCCAudSize*EM                   |                      | -0.164<br>[0.105]    |                      |                      |                      |                      |
| <i><b>Costs</b></i>             |                      |                      |                      |                      |                      |                      |
| Ind2                            |                      |                      | -0.034**<br>[0.014]  | -0.039***<br>[0.015] | -0.004<br>[0.016]    | -0.010<br>[0.017]    |
| OptimalAudInd                   |                      |                      |                      | -0.002<br>[0.010]    |                      | -0.005<br>[0.010]    |
| OCCAudInd*OptimalAudInd         |                      |                      |                      | 0.013<br>[0.016]     |                      | 0.019<br>[0.016]     |
| OptimalNumInd                   |                      |                      |                      |                      | 0.034***<br>[0.009]  | 0.035***<br>[0.009]  |
| Ind2*OptimalNumInd              |                      |                      |                      |                      | -0.070***<br>[0.025] | -0.071***<br>[0.026] |
| <i><b>Control Variables</b></i> |                      |                      |                      |                      |                      |                      |
| Size                            | 0.017***<br>[0.003]  | 0.017***<br>[0.003]  | 0.016***<br>[0.003]  | 0.015***<br>[0.003]  | 0.010***<br>[0.003]  | 0.010***<br>[0.003]  |
| B/M                             | 0.037**<br>[0.016]   | 0.038**<br>[0.016]   | 0.033**<br>[0.016]   | 0.033**<br>[0.016]   | 0.027*<br>[0.017]    | 0.027*<br>[0.017]    |
| Observations                    | 1,227                | 1,227                | 1,227                | 1,227                | 1,227                | 1,227                |
| Adjusted R-squared              | 0.06                 | 0.06                 | 0.06                 | 0.06                 | 0.07                 | 0.07                 |

This table presents regression coefficients and robust standard errors [in brackets] for the cross-sectional regression of CAR on out-of-compliance variables, benefits of compliance, costs of compliance and

control variables. *CAR* is the raw return minus the CRSP value-weighted market return, cumulated over the eight-event  $[0,+1]$  windows, where day zero is the event date. *OOCAudInd* is a dummy indicating if the firm is out of compliance with the 100% fully-independent audit committee requirement. *OOCAudSize* is a dummy indicating if the firm is out of compliance with the minimum three-person audit committee requirement. *Fraud* is a dummy indicating if the firm had a fraudulent restatement from January 1996 through the Levitt speech. *EM* is earnings management, using the modified Jones Model (Dechow et al., 1995). *Ind2* is a dummy variable indicating if the firm's board has only two independent directors. *OptimalAudInd* is a dummy indicating if the firm optimally has chosen a fully-independent or non-fully-independent audit committee. *OptimalNumInd* is a dummy indicating if the firm optimally has chosen a board with three or more or with two independent directors. *Size* is the natural log of the firm's market value of equity. *B/M* is the book-to-market ratio of equity, respectively. All variables are measured prior to the Levitt speech (Event #1). \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.



**Table 6****Changes in Number of Board Directorships Surrounding the Exchange Regulations****Panel A: 100% Audit Committee Independence Prior to Levitt's Speech**

|               | <i>100% Independent<br/>(1)</i> | <i>Less than 100%<br/>Independent<br/>(2)</i> | <i>Difference between<br/>(1) and (2)</i> | <i>t-stat<br/>(Wilcoxon z-stat)<br/>for difference<br/>between (1) and (2)</i> |
|---------------|---------------------------------|---|---|--|
| Mean Change   | -0.04                           | -0.16   | 0.12                                      | 1.29   |
| Median Change | 0.00                            | 0.00  |   | 1.10   |
| Obs.          | 584                             | 643   |   |  |

**Panel B: Three or More Directors on Audit Committee Prior to Levitt's Speech**

|               | <i>3 or More<br/>Directors</i> | <i>2 or Less Directors</i> | <i>Difference between<br/>(1) and (2)</i> | <i>t-stat<br/>(Wilcoxon z-stat)<br/>for difference<br/>between (1) and (2)</i> |
|---------------|--------------------------------|----------------------------|---|--|
| Mean Change   | -0.21                          | 0.41                       | -0.63                                     | -5.08***   |
| Median Change | 0.00                           | 0.00                       |   | -5.53***   |
| Obs.          | 1,005                          | 222                        |   |  |

**Panel C: Three or More Independent Directors on Board Prior to Levitt's Speech**

|               | <i>3 or More<br/>Independent<br/>Directors</i> | <i>Only 2 Independent<br/>Directors</i> | <i>Difference between<br/>(1) and (2)</i> | <i>t-stat<br/>(Wilcoxon z-stat)<br/>for difference<br/>between (1) and (2)</i> |
|---------------|--|---|---|--|
| Mean Change   | -0.19  | 0.54                                    | -0.72                                     | -4.98***   |
| Median Change | 0.00   | 0.00                                    |   | -5.25***   |
| Obs.          | 1078   | 149                                     |   |  |

This table presents the mean change in board size (number of directors) between fiscal year end 1997 and fiscal year end 2000. Panel A segments the sample by whether the firm was in compliance with the 100% audit committee independence standard prior to Levitt's speech (Event #1). Panel segments the sample by whether the firm was in compliance with the minimum three-person audit committee size prior to Levitt's speech. Panel C segments the sample by whether the firm's board had three or more independent directors prior to Levitt's speech. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

**Table 7**

## Small Firm Effect

Panel A: CARs for Event #5 (issuance of the BRC Report) for Firms Grouped by Large and Small Firms

|            | <i>&gt; Or = \$200<br/>Million Market<br/>Capitalization<br/>(1): Large Firms</i> | <i>&lt;\$200 Million<br/>Market<br/>Capitalization<br/>(2): Small Firms</i> | <i>Difference in CARs<br/>between (1) and (2)</i> | <i>t-stat<br/>(Wilcoxon z-stat)<br/>for difference<br/>between (1) and (2)</i> |
|------------|---|---|---|--|
| Mean CAR   | 0.67%   | 1.16%   | -0.49%  | -1.12  |
| Median CAR | 0.87%   | 1.31%   |   | -1.37  |
| Obs.       | 1,131   | 91  |   |  |

Panel B: CARs for Event #5 for Firms with 2 Independent Directors Only on their Boards

|            | <i>&gt; Or = \$200<br/>Million Market<br/>Capitalization<br/>(1): Large Firms</i> | <i>&lt;\$200 Million<br/>Market<br/>Capitalization<br/>(2): Small Firms</i> | <i>Difference in CARs<br/>between (1) and (2)</i> | <i>t-stat<br/>(Wilcoxon z-stat)<br/>for difference<br/>between (1) and (2)</i> |
|------------|---|---|---|--|
| Mean CAR   | -0.32%  | 2.66%   | -2.98%  | -2.27**  |
| Median CAR | -0.14%  | 2.09%   |   | -1.62  |
| Obs.       | 134   | 15  |   |  |

This table contains mean and median CARs for Event #5 (the issuance of the BRC Report on February 8, 1999) for firms classified by whether their market capitalizations exceed or are less than \$200 million. Panel A examines all of the firms in the sample. Panel B looks at the subset of firms that have only two independent directors on their boards prior to the Levitt speech. CAR is the raw return minus the CRSP value-weighted market return, cumulated over the [0,+1] window, where day zero is event date # 5. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

**Table 8**  
Monte Carlo Simulations

| VARIABLES               | (1)       |            | (2)       |            | (3)        |            | (4)        |            | (5)        |            | (6)        |            |
|-------------------------|-----------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|                         | $\beta$   | $E[\beta]$ | $\beta$   | $E[\beta]$ | $\beta$    | $E[\beta]$ | $\beta$    | $E[\beta]$ | $\beta$    | $E[\beta]$ | $\beta$    | $E[\beta]$ |
| Constant                | -0.131    | -0.012     | -0.138    | -0.012     | -0.121     | -0.012     | -0.118     | -0.013     | -0.098     | -0.016     | -0.092     | -0.018     |
|                         | [0.049]** |            | [0.039]** |            | [0.064]*   |            | [0.075]*   |            | [0.129]    |            | [0.161]    |            |
| OCCAudInd               | -0.010    | 0.000      | 0.000     | 0.003      | -0.004     | 0.000      | -0.009     | 0.001      | -0.004     | 0.000      | -0.012     | 0.001      |
|                         | [0.079]*  |            | [0.406]   |            | [0.293]    |            | [0.170]    |            | [0.288]    |            | [0.107]    |            |
| OCCAudSize              | -0.022    | 0.011      | -0.013    | 0.011      | -0.014     | 0.011      | -0.014     | 0.012      | -0.009     | 0.011      | -0.010     | 0.011      |
|                         | [0.028]** |            | [0.114]   |            | [0.07]*    |            | [0.074]*   |            | [0.107]    |            | [0.107]    |            |
| Fraud                   | -0.125    | 0.000      | -0.043    | 0.017      | -0.122     | 0.000      | -0.122     | -0.000     | -0.116     | -0.001     | -0.115     | -0.002     |
|                         | [0.027]** |            | [0.199]   |            | [0.030]**  |            | [0.031]**  |            | [0.037]**  |            | [0.039]**  |            |
| EM                      | -0.171    | 0.023      | -0.056    | 0.037      | -0.173     | 0.023      | -0.173     | 0.023      | -0.145     | 0.017      | -0.144     | 0.017      |
|                         | [0.031]** |            | [0.282]   |            | [0.030]**  |            | [0.030]**  |            | [0.043]**  |            | [0.043]**  |            |
| OCCAudInd*Fraud         |           |            | -0.203    | -0.062     |            |            |            |            |            |            |            |            |
|                         |           |            | [0.290]   |            |            |            |            |            |            |            |            |            |
| OCCAudInd*EM            |           |            | -0.110    | -0.038     |            |            |            |            |            |            |            |            |
|                         |           |            | [0.192]   |            |            |            |            |            |            |            |            |            |
| OCCAudSize*Fraud        |           |            | -0.159    | -0.025     |            |            |            |            |            |            |            |            |
|                         |           |            | [0.114]   |            |            |            |            |            |            |            |            |            |
| OCCAudSize*EM           |           |            | -0.164    | 0.015      |            |            |            |            |            |            |            |            |
|                         |           |            | [0.210]   |            |            |            |            |            |            |            |            |            |
| Ind2                    |           |            |           |            | -0.034     | -0.000     | -0.039     | -0.000     | -0.004     | -0.006     | -0.010     | -0.006     |
|                         |           |            |           |            | [0.005]*** |            | [0.004]*** |            | [0.468]    |            | [0.389]    |            |
| OptimalAudInd           |           |            |           |            |            |            | -0.002     | 0.002      |            |            | -0.005     | 0.002      |
|                         |           |            |           |            |            |            | [0.374]    |            |            |            | [0.255]    |            |
| OCCAudInd*OptimalAudInd |           |            |           |            |            |            | 0.013      | -0.001     |            |            | 0.019      | -0.002     |
|                         |           |            |           |            |            |            | [0.227]    |            |            |            | [0.137]    |            |
| OptimalNumInd           |           |            |           |            |            |            |            |            | 0.034      | -0.007     | 0.035      | -0.007     |
|                         |           |            |           |            |            |            |            |            | [0.021]**  |            | [0.020]**  |            |
| Ind2*OptimalNumInd      |           |            |           |            |            |            |            |            | -0.070     | 0.013      | -0.071     | 0.013      |
|                         |           |            |           |            |            |            |            |            | [0.006]*** |            | [0.006]*** |            |
| Size                    | 0.017     | 0.001      | 0.017     | 0.001      | 0.016      | 0.001      | 0.015      | 0.001      | 0.010      | 0.002      | 0.010      | 0.002      |
|                         | [0.015]** |            | [0.014]** |            | [0.021]**  |            | [0.024]**  |            | [0.140]    |            | [0.162]    |            |
| B/M                     | 0.037     | -0.010     | 0.038     | -0.010     | 0.033      | -0.010     | 0.033      | -0.010     | 0.027      | -0.009     | 0.027      | -0.009     |
|                         | [0.032]** |            | [0.029]** |            | [0.044]**  |            | [0.046]**  |            | [0.062]*   |            | [0.065]*   |            |

This table presents actual coefficients from Table 5.  $\beta$ , and average coefficients from 1,000 iterative regressions,  $E[\beta]$ , in which the eight dates selected for the CARs are randomly selected. The bracketed numbers are p-values testing whether  $\beta$  and  $E[\beta]$  are significantly different from each other. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

**Table 9**

Regression Results with Different Cut-offs for Measuring Optimal/Sub-Optimal Board and Audit Committee Compositions

| VARIABLES                      | <i>Inverse Mill's Ratio Cutoff<br/>at Mean Value</i> |                                    |                                    | <i>Inverse Mill's Ratio cutoff<br/>at 75<sup>th</sup> Percentile</i> |                                    |                                    |
|--------------------------------|--|------------------------------------|------------------------------------|--|------------------------------------|------------------------------------|
|                                | (1)  | (2)                                | (3)                                | (4)  | (5)                                | (6)                                |
| Constant                       | -0.117***<br>[0.027]                                 | -0.100***<br>[0.026]               | -0.090***<br>[0.027]               | -0.105***<br>[0.028]   | -0.125***<br>[0.027]               | -0.106***<br>[0.028]               |
| OCCAudInd                      | -0.010<br>[0.012]                                    | -0.003<br>[0.008]                  | -0.015<br>[0.012]                  | -0.018<br>[0.015]  | -0.002<br>[0.008]                  | -0.021<br>[0.015]                  |
| OCCAudSize                     | -0.014<br>[0.011]                                    | -0.006<br>[0.011]                  | -0.006<br>[0.011]                  | -0.015<br>[0.011]  | -0.005<br>[0.011]                  | -0.007<br>[0.011]                  |
| Fraud                          | -0.122**<br>[0.051]                                  | -0.114**<br>[0.050]                | -0.112**<br>[0.051]                | -0.122**<br>[0.051]  | -0.123**<br>[0.048]                | -0.122**<br>[0.049]                |
| EM                             | -0.173***<br>[0.054]                                 | -0.132**<br>[0.053]                | -0.130**<br>[0.053]                | -0.172***<br>[0.053]   | -0.121**<br>[0.053]                | -0.118**<br>[0.053]                |
| Ind2                           | -0.037**<br>[0.015]                                  | 0.010<br>[0.017]                   | 0.006<br>[0.018]                   | -0.037**<br>[0.014]  | 0.022<br>[0.022]                   | 0.020<br>[0.022]                   |
| OptimalAudInd                  | -0.004<br>[0.011]                                    |                                    | -0.010<br>[0.011]                  | -0.017<br>[0.012]  |                                    | -0.020*<br>[0.012]                 |
| <b>OCCAudInd*OptimalAudInd</b> | <b>0.011</b><br><b>[0.016]</b>                       |                                    | <b>0.022</b><br><b>[0.016]</b>     | <b>0.019</b><br><b>[0.017]</b>                                       |                                    | <b>0.026</b><br><b>[0.018]</b>     |
| OptimalNumInd                  |  | 0.046***<br>[0.009]                | 0.047***<br>[0.010]                |  | 0.056***<br>[0.012]                | 0.057***<br>[0.012]                |
| <b>Ind2*OptimalNumInd</b>      |  | <b>-0.097***</b><br><b>[0.026]</b> | <b>-0.099***</b><br><b>[0.026]</b> |  | <b>-0.086***</b><br><b>[0.027]</b> | <b>-0.088***</b><br><b>[0.027]</b> |
| Size                           | 0.015***<br>[0.003]                                  | 0.009***<br>[0.003]                | 0.008***<br>[0.003]                | 0.015***<br>[0.003]  | 0.010***<br>[0.003]                | 0.009***<br>[0.003]                |
| B/M                            | 0.033**<br>[0.016]                                   | 0.027<br>[0.017]                   | 0.027<br>[0.017]                   | 0.032**<br>[0.016]   | 0.032*<br>[0.016]                  | 0.031*<br>[0.016]                  |
| Observations                   | 1,227  | 1,227                              | 1,227                              | 1,227  | 1,227                              | 1,227                              |
| Adjusted R-squared             | 0.06   | 0.08                               | 0.08                               | 0.06   | 0.08                               | 0.08                               |

This table presents regression results for the same regressions presented in Table 5 with different cut-off values when defining *OptimalAudInd* and *OptimalNumInd*. *OptimalAudInd* is a dummy indicating if the firm optimally has chosen a fully-independent or non-fully-independent audit committee. *OptimalNumInd* is a dummy indicating if the firm optimally has chosen a board with three or more or with two independent directors. In columns (1) through (3), a cut-off at the absolute value of the mean inverse mills ratio is used to determine optimality, where a value that is below the absolute value of the mean is classified as optimal and a value greater than the absolute of the mean is classified as sub-optimal. In columns (4) through (6), a cut-off at the absolute value of the 25<sup>th</sup> percentile inverse Mill's ratio is used to determine optimality, where a value that is below the absolute value of the 25<sup>th</sup> percentile is classified as optimal and a value greater than the absolute of the 25<sup>th</sup> percentile is classified as sub-optimal. The other variables are defined in Table 5. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.