AUDIT COMMITTEE CHARACTERISTICS AND MONITORING EFFECTIVENESS

By

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A dissertation submitted to the Graduate Faculty in Business
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy, The City University of New York

2005

UMI Number: 3187467

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

This manuscript has been read and accepted for the
Graduate Faculty in Business in satisfaction of the
Dissertation requirements for the degree of Doctor of Philosophy

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Abstract

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Abstract: This dissertation examines the contribution of audit committee characteristics; independence, financial expertise, firm provided support of the audit committee, and oversight to audit committee monitoring effectiveness. An agency framework of the firm and the mandates of the Sarbanes-Oxley legislation motivate the selection of these characteristics. The study uses a proprietary database of survey responses by audit committee directors and firms' corporate secretaries, in a period just prior to and an initial period post-compliance with the Sarbanes-Oxley Act. Results provide evidence that an independent audit committee requires firm-specific financial knowledge. A possible explanation is this type of competency replaces the valuable contribution otherwise provided by inside directors. In certain settings, firm provided support in the form of training and sufficiency of information also improves monitoring effectiveness. The findings have implications for evaluating the efficacy of the Sarbanes-Oxley legislation.

ACKNOWLEDGEMENTS

I am very grateful for the direction, support, and ongoing encouragement that the members of my committee: Suzanne Morsfield, Marilyn Neimark, Bharat Sarath, Joseph Weintrop, chair, and Jianming Ye provided throughout my Ph.D. program. I want to especially acknowledge the unfailing guidance of my advisor Joseph Weintrop.

I am very fortunate to have received financial support from Deloitte & Touche LLP, and the Robert Zicklin Center for Corporate Integrity. I have also received cooperation and guidance from Dr. William Crist, former Chair of the Board of Administration of The California Public Employees' Retirement System and Mr. David Smith, President of The Society of Corporate Secretaries & Governance Professionals.

I have benefited from the valuable advice, insight, and mentoring of Arthur Ainsberg, Board of Trustee of the Baruch College Fund, Ann Brandwein, Associate Dean of Baruch College, and Lawrence Kalbers of Loyola Marymount University.

I have enjoyed a very supportive relationship with my fellow Ph.D. students including Alex, Aliza, Abraham, Ariel, Chuck, Cary, Fengyun, Mahmud, Philip, and Tao.

I am grateful for the loving support of my husband, Jeff, and children Isabella and Sam, the opportunity to pursue this course of study from Bharat, and the memories of my parents, always inspiring me to pursue my dreams.

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Chapter 1: Introduction

The financial reporting failures that became publicly known at the beginning of the twenty first century precipitated the passage of the Sarbanes-Oxley Act of 2002. The rationale that was offered to politically justify its passage was the need to restore the much ballyhooed "investor confidence". The Sarbanes-Oxley Act imposed greater regulation and penalties on the officers and directors of publicly owned corporations and brought audit firms that audit public companies under federal regulation.

The Sarbanes-Oxley Act significantly achieved corporate responsibility through the additional requirements and responsibilities it imposed on audit committees. Accordingly, it becomes important to understand what the optimal characteristics of audit committees should be. The objective of this dissertation is to provide evidence of a set of optimal audit committee characteristics that would satisfy the Sarbanes-Oxley requirements.

This dissertation employs an agency framework of the firm and the Sarbanes-Oxley regulations to examine audit committee monitoring effectiveness as a function of audit committee independence, financial expertise, firm provided support, and degree of audit committee oversight.

In an agency framework of the firm, the board of directors and the audit committee evolve as monitoring mechanisms because of a separation of ownership from control and a possible divergence of the incentives of outside shareholders and managers. A body of academic literature on audit committees examines the

economic demand for independent and active audit committees (Klein, 2002, Menon and Williams, 1994, and Deli and Gillan, 2000). These studies present empirical evidence that firms' audit committees are more likely to be independent and active when this divergence of incentives (agency friction) is greater. This body of literature paves the way for research on the import to monitoring effectiveness of more independent and active audit committees. However, this body of research does not fully answer the question of whether audit committee formation is purely the result of an economic need for monitoring. Audit committees with certain characteristics may provide an appearance of monitoring, possibly to limit exposure of the firm to lawsuits or to deflect regulators from intervening in the firm's internal governance processes (Menon and Williams, 1994, Beasley, 1996, Kalbers and Fogarty 1998). It is therefore important to empirically examine whether audit committee characteristics likely to contribute to effective monitoring are indeed related to outcomes associated with effective monitoring.

Another stream of literature seeks to establish this link. Within this group are studies that, for example, consider the incidence of SEC enforcement actions (Beasley, 1996 and Dechow, Sloan, and Sweeny, 1995) or discretionary accruals (Klein, 2002 and Xie, Davidson, and DaDalt, 2001) as measures of monitoring effectiveness. As this body of literature evolves over time, we add to our understanding of characteristics that may contribute to stronger, more effective monitoring mechanisms, but we have yet to reach a consensus on the optimal set of internal governance characteristics. Or, even the optimal definition of a particular

characteristic. [1] The Sarbanes-Oxley Act of 2002 provides the impetus for this study's examination of audit committee monitoring effectiveness as a function of a broad set of characteristics. Furthermore, the ongoing disclosure of firms engaging in questionable or fraudulent accounting and financial reporting practices, post Sarbanes-Oxley prompts this study's investigation of the efficacy of certain provisions of the legislation.

1.1. Overview of research questions and methodology.

This study evaluates audit committee monitoring effectiveness as a function of a set of characteristics; independence, financial expertise, firm provided support, and degree of audit committee oversight. The characteristics examined are drawn from prior literature (independence, expertise in general, and oversight activity) and from the requirements that the Sarbanes-Oxley Act imposes on audit committees (independence, financial expertise, resources and support provided by the firm, and mandated responsibilities). The study considers three different empirical implementations of monitoring effectiveness, managers' discretionary accrual choices as a measure of earnings quality, the earnings response coefficient as a measure of the value relevance of earnings, and return on assets as a measure of firm performance. The primary research objective is to determine the relation between monitoring effectiveness and this set of audit committee characteristics.

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[1] For example, Fannie Mae independent directors met regulatory criteria for independence, but had an array of personal, business, and political relationships that could impair independent judgment. See The Wall Street Journal, Mae Day: Fannie's Now at Mercy of Outsiders --- Boards' Independent Directors Take the Lead With Regulators; Some Have Their Own Conflicts? 9/24/2004

A second research question draws on prior empirical literature, which provides certain evidence of an economic demand for independent and active audit committees when the level of agency friction is higher (Menon & Williams, 1994, Klein, 2002, and Deli & Gillan, 2000). This study considers a broader set of audit committee characteristics to investigate this question; is the relation between monitoring effectiveness and audit committee characteristics more pronounced when the level of agency friction is higher? The agency literature suggests that when managerial shareholdings are higher, there is a greater alignment between the incentives of managers and outside shareholders. Empirical studies support this agency view (Warfield, Wild, and Wild, 1995). Consistent with prior literature, this study considers managerial shareholdings to represent the level of agency friction.

The academic literature documents that inside board members contribute valuable expertise to the monitoring process (Bushman, Chen, Engel, & Smith, 2004, Klein, 1998). With the passage of the Sarbanes-Oxley Act, there is now a mandate that excludes insiders from the audit committee. All audit committee members must satisfy independence criteria. Sarbanes-Oxley also mandates disclosure of the presence of a financial expert on the audit committee. This study investigates the interactive effect of independence and financial expertise on monitoring effectiveness, and posits that audit committees require financial expertise to mitigate the loss of insider expertise.

Finally, the selected set of characteristics, are drawn from the Sarbanes-Oxley legislation. To the extent that firms voluntarily adopted Sarbanes-Oxley' mandated characteristics and competencies prior to required compliance, the results of this

study provide insight to the efficacy of this major corporate governance legislation. The study also provides a more direct test of the efficacy of the Sarbanes-Oxley mandates during an initial post-compliance period.

In order to augment publicly disclosed data and to formulate extended measures of the audit committee characteristics, a pilot survey was administered to public company audit committees for the pre-Sarbanes-Oxley compliance period of 2000 and 2001. Two institutions cooperated during the pilot survey phase of this study. The California Public Employees' Retirement System (CalPERS) and the Society of Corporate Secretaries & Governance Professionals (SCS), contributed their valuable insight during the design of the survey instrument. Each organization actively engages in efforts to improve firms' corporate governance. Each organization expressed their support of this study in a cover letter that accompanied the survey.

A follow up survey was administered with the cooperation of the SCS during May 2005, covering an initial post-compliance period of 2003.The objective of the follow up survey is to assess the impact, if any, of changes in measured audit committee characteristics on monitoring effectiveness in the initial post-Sarbanes-Oxley compliance period.

1.2. Summary of results.

The results presented in this study are based on an analysis of 227 firms during 2000 and 2001, a period just prior to required compliance with the Sarbanes-

Oxley Act, and 81 firms during 2003, the initial post-Sarbanes-Oxley compliance period. This study does not find evidence of a relation between independence and monitoring effectiveness, when the empirical definition of independence is the absence of certain affiliations using firms' exchange listing requirements as the benchmark. Since this study evaluates a period of time just prior to compliance with Sarbanes-Oxley, the exchange listing criteria are more stringent than in earlier periods. This result suggests that mixed findings of earlier studies may be explained by differences in the criteria employed to determine whether or not a specific type of affiliation impaired independence.

However, in the setting of earnings quality, and when an extended definition of audit committee independence is considered, the expected outcome is observed. When audit committees act independently, that is to say, audit committees' conduct outside investigations, consult with outside experts, and meet privately with the internal and external auditors, earnings quality is higher. Hence, the absence of certain affiliations with management is not a sufficient condition for independence. Audit committees must act independently.

This study further questions the presumptive reliance by regulators upon independence as a condition for audit committee monitoring effectiveness by providing evidence of an interactive effect of independence and a specific type of financial expertise, in-depth knowledge of the financial operations of the firm. The study builds upon prior literature which provides evidence of the valuable contribution of insiders and suggests that financial expertise, acquired through in-depth knowledge of the firm's financial operations, is needed to compensate for the

loss of insider expertise in the strictly independent audit committee. The study provides evidence of the contribution of financial expertise to monitoring effectiveness, when this expertise is acquired through in-depth knowledge of the firm's financial operations. Financial expertise, acquired through occupation as a CPA, public auditor, or CFO does not contribute to monitoring effectiveness.

The results also demonstrate the importance of top management support of the audit committee. The relation between support and monitoring effectiveness may be non linear, that is to say, audit committees may be effective up to some threshold of support; support beyond that threshold may have the unexpected effect of aligning incentives of the audit committee to those of management. When the analysis is performed conditional on the level of agency friction, this study provides evidence that the impact of support on monitoring effectiveness is more pronounced when agency friction is high.

In the financial performance setting, the incremental contribution of oversight is observed, suggesting that the execution of specific responsibilities improves audit committee monitoring effectiveness.

A test of whether there are any differences in audit committee monitoring effectiveness from the pre-to post-Sarbanes periods is not conclusive. The test relies on data drawn from 2003, while compliance with the Sarbanes-Oxley Act is phased in commencing July 2003. Hence, it is too early in the post-Sarbanes period to draw conclusions about the efficacy of this legislation.

1.3. Contributions to the literature.

This study contributes to the existing literature by evaluating a greater number of the characteristics that are thought to contribute to monitoring effectiveness, than has been previously done. Second, the study uses proprietary survey data to employ broader measures of these audit committee characteristics than have been available to prior researchers. The extended definitions add clarity to certain mixed findings presented in existing studies. This study's examination of the interactive effect of independence and financial expertise raises questions about regulators presumptive reliance on independence, given earlier studies that document the valuable contributions made by insiders. Finally, by using pre-Sarbanes-Oxley and post-Sarbanes-Oxley data, the study contributes insights into the efficacy of the Sarbanes-Oxley requirements.

1.4. Organization of the dissertation.

The remainder of this dissertation is organized in the following manner. A review of the literature in Chapter 2, and an overview of recent regulation to strengthen firms' audit committees in Chapter 3 motivate the research questions stated in Chapter 4. The research method is described in Chapter 5, and the empirical results in Chapter 6. Finally, Chapter 7 provides a summary of the study, conclusions, and research extensions.

Chapter 2: Literature review

It is long recognized that in large, complex organizations, owners (shareholders) delegate decision making to internal managers and that this separation of ownership from control gives rise to the need for monitoring mechanisms because the goals pursued by managers may not always be congruent with those of shareholders (Fama, 1980, Fama and Jensen, 1983). The agency theory literature refers to "agency costs" of structuring contracts, monitoring, and bonding in response to this lack of goal congruence.

The board of directors is at the apex of the decision-making hierarchy within the firm and is one of the mechanisms for monitoring management on behalf of firm owners. The audit committee is part of the board of directors and as such is at the apex of the decision hierarchy. Even a firm's board of directors must delegate certain decision-making to senior managers and does so by including these insiders as directors on the board and its committees to contribute their firm specific expertise to the decision making process. Monitoring may be hierarchical, but may also occur among decision makers of the same level. Competition between same-level decision makers may stimulate mutual monitoring since sharing and accessing information may improve decision outcomes, enhance decision makers' reputations, and increase the value of their opportunity wages. The independent director may function as a referee to oversee this competition (Fama, 1980). The independent audit committee may function not only as a monitor of management, but also as a mutual monitor of

the board, since the board includes senior managers and other non-independent directors. [2]

The agency literature provides a framework for researchers to investigate whether or not there is an economic demand for an audit committee to monitor firm management. The agency literature also suggests characteristics likely to contribute to the effectiveness of the board and its committee as monitoring mechanisms. As cited earlier, inside directors may contribute valuable firm-specific knowledge while outside directors may stimulate productive competition among decision makers. Jensen (1993) further suggests that board culture influences monitoring effectiveness. For example, a board that encourages debate may reduce CEO influence over board decision-making. Boards may monitor more effectively if the CEO does not set the board agenda or control the flow of information to the board. The two separate sections that follow will respectively review the empirical literature with respect to the economic demand for an audit committee to monitor management and the characteristics investigated as possible determinants of audit committee (or full board) monitoring effectiveness.

2.1. Economic demand for an audit committee to monitor management.

Several studies identify factors that suggest the existence of agency frictions and posit that the firm is more likely to have an independent, active audit committee when agency frictions (the potential for agency costs) are relatively greater. An

[2] An important feature of the Sarbanes-Oxley Act is the mandate that each member of the audit committee be independent.

effective audit committee, as a control mechanism, should reduce agency costs to the firm by constraining management from pursuing incentives that do not maximize firm value. The studies discussed in this section consider managerial stock ownership, leverage, auditor quality, board composition, firm size, and board size to indicate the level of agency friction. For example, if firms' managers hold larger shares of equity, there will likely be a convergence of incentives and those firms will have relatively lower agency friction. Leverage represents possible agency friction between shareholders and creditors, which may be increasing with the proportion of debt in the firm's capital structure (Jensen and Meckling, 1976). The presence of a higher proportion of independent directors may represent a relatively higher level of agency friction between shareholders and managers of the firm.

Menon and Williams (1994) assert that a firm's board may form a separate audit committee, but the board may not necessarily rely on that committee to monitor management. Their study provides a setting to examine two related questions. First, is there an economic demand for an audit committee? Second, given the formation of an audit committee, do boards' actually rely on the committee to monitor management? [3] A relation between agency friction and the existence of an audit committee provides evidence with respect to the first question. They find that CPA type and board independence are related to the formation of an audit committee. A relation between agency friction and an independent or active audit committee (proxies for an effective control mechanism) provides evidence that firms' boards

[3] Menon and Williams randomly select 200 over-the counter firms during 1986-1987. During this period, OTC firms were not required to form audit committees. 22% of the firms included in their final sample did not have separate audit committees.

actually rely on the audit committee to monitor management. Menon and Williams find that firms with a relatively higher proportion of outsiders on their boards are more likely to have independent audit committees. [4] They also find that large firms and firms with a relatively higher proportion of outsiders on their boards have more active audit committees. Large firms are more likely to reap a net benefit from the costly features of this monitoring mechanism. Menon and Williams contribute certain evidence that boards rely on the audit committee to monitor management. However, they acknowledge that their findings are consistent with another possible explanation. Boards may form audit committees for appearance, possibly to protect directors from liability.

Kalbers and Fogarty (1998) build on institutional theory to investigate another possible, sociological explanation, for firms to form audit committees. Firms may create a symbolic or cosmetic structure that meets normative standards and is observable to the firm's external constituents. The function of this normative, cosmetic structure is to deflect attention from the internal operating core of the organization. If the audit committee were serving a cosmetic rather than a control function, one would expect a weak association or no association between agency variables and audit committee effectiveness. Kalbers and Fogarty find no relation between the audit committee and the following agency variables; managerial ownership, director ownership, leverage, or director independence.

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[4] Menon and Williams implement a dichotomous variable to define audit committee independence that is set to 0 if at least one audit committee member is an insider and 1 if the audit committee is composed entirely of outsiders. An insider is an audit committee member that is also an officer of the firm. Therefore, using this definition, an independent audit committee may not include insiders, but it may include affiliated directors; former employees, relatives, or directors having financial ties to the firm. Menon and Williams define audit committee activity as the frequency of annual audit committee meetings.

Klein (2002) considers an independent audit committee to be a more effective monitor of senior management. Klein (2002) finds that firms having larger boards and boards that include a higher proportion of independent members have more independent audit committees. [5] Unlike Menon and Williams, Klein finds that large firms have less independent audit committees. Klein also presents evident that the following factors reduce the demand for audit committee independence; growth opportunities, recent consecutive losses, the presence of non-inside block holders on the board, and the level of outside director shareholdings. Financially distressed firms report earnings with relatively lower value relevance to investors. Hence, these firms may choose not to undertake costly monitoring (more independent audit committees). Greater uncertainty and operational complexity associated with growth firms may increase demand for inside directors who contribute firm specific expertise. The presence of an institutional shareholder on a firm's board or relatively higher levels of outside director shareholdings may serve as substitute monitoring mechanisms to an independent audit committee. Klein does find that firms with growth opportunities, recent consecutive losses, block holders on the audit committee, and outside directors with relatively higher levels of shareholdings, have less independent audit committees.

Deli & Gillan (2000) also evaluate firm characteristics that may represent agency friction and the economic demand for accounting certification but in relation

[5] Klein (2002) pools observations from 1992 and 1993 of S & P 500 firms. All firms in the final sample have separate audit committees. Klein defines audit committee independence as the percentage of outside directors on the audit committee. An outside board of director is a person that has no relation to the firm other than as a director.

to an independent and active audit committee. [6] They find that firms with growth opportunities and higher levels of managerial stock ownership are less likely to have independent and active audit committees. Consistent with Menon & Williams, but contrary to Klein's finding, in their sample larger firms are more likely to have independent and active audit committees.

Bushman, Chen, Engel, and Smith (2004) consider another definition of the demand for board monitoring; the timeliness of reported earnings. If reported earnings are not timely, then firms' boards are less able to evaluate managers' strategic plans, actions, and performance. Firms' boards must incorporate more costly characteristics in their internal governance mechanisms to compensate when reported earnings are less useful in their decision-making. Bushman et al. posit that when earnings are not timely, firms' boards substitute characteristics such as the following, smaller boards, a mix of inside and outside directors but a relatively higher proportion of inside directors, and of the outside directors, a greater number who have experience in the firm's industry and are of relatively higher quality. [7]

In a sample of 784 Fortune 1000 firms, they find that when earnings are not timely, firms' boards do include a higher proportion of inside directors. The outside directors present on the board are of relatively higher quality. They also present evidence of an inverse relation between the timeliness of earnings and a composite

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[6] As in Klein (2002), an independent director is a person with no relation to the firm other than as a director.

[7] Bushman, Chen, Engel & Smith (2000) consider an outside director to be a director who is not currently or formerly an officer of the firm, or a relative of an officer of the firm. An outside director is an industry expert if the outside director has had executive experience in the same Fama and French industry grouping as the firm. An outside director is of relatively higher quality if that director serves on a greater number of outside boards.

governance measure that considers board size, the presence of board insiders, outside director industry expertise and outside director quality.

While the studies referenced in this section provide certain evidence on the economic demand for the audit committee to monitor management, certain studies raise an important question. Is the audit committee a cosmetic structure or does the committee effectively execute its duties as a monitor? There is a presumption in several of the aforementioned studies that an operational audit committee is effective if it is independent or active (Klein, 2002, Menon and Williams, 1994, Deli and Gillan, 2000). While these characteristics may contribute to effective monitoring, they may not sufficiently describe the most vital characteristics required of an effective monitor. As a result, the studies may be biased against findings of a significant economic demand for an audit committee to monitor management. Certain studies (Klein, 2002 and Deli and Gillan, 2000) present evidence that alternate monitoring mechanisms may supplant the need for an independent or active audit committee. However, the studies do not evaluate the degree of control an effective audit committee may provide given other sources of monitoring.

In the following section, I review existing literature to identify full board or audit committee characteristics heretofore examined, and the relation, if any, to monitoring effectiveness. This body of literature provides further insight to the economic contribution of the audit committee.

2.2. Full board/audit committee characteristics and monitoring effectiveness.

This section reviews the literature that investigates the empirical relation between characteristics of firms' boards of directors or the audit committee and monitoring effectiveness. This body of literature employs a number of different empirical proxies for outcomes that may be associated with monitoring effectiveness. Two studies focus on the incidence of Auditing Enforcement Releases (AAERs) as a measure of monitoring effectiveness. Beasley (1996) examines a sample of 75 firms subject to AAERs during 1991-1992 for fraudulent financial reporting, because management either intentionally issued material misleading financial statements or misappropriated assets. Beasley estimates a logit regression in which the 75 fraud firms are matched to 75 non-fraud firms on the basis of stock exchange, firm size, industry, and year, to assess whether the likelihood of financial statement fraud varies with board composition. [8] Beasley finds that when boards have higher proportions of outside directors the likelihood of financial statement fraud decreases. Beasley examines the effect of other board of director characteristics on the likelihood of financial statement fraud. He finds that the likelihood of financial statement fraud is also decreasing in outside director shareholdings, outside director tenure, and board size. Firms whose board members hold more outside directorships have increased likelihood of financial statement fraud. Finally, Beasley presents evidence that the presence of an audit committee does not reduce the likelihood of financial statement

[8] Beasley defines board composition along the dimension of outsiders versus insiders. Outside directors are all directors that are not currently employed by the firm.

fraud. The mere presence of an audit committee may not improve monitoring effectiveness if the committee does not vigilantly fulfill its oversight responsibilities.

Beasley's finding of a positive relation between the number of outside directorships and the likelihood of financial statement fraud is not consistent with that of Bushman, Chen, Engel & Smith (2004) whose results suggest that boards optimally include higher quality outside directors, which they define as directors serving on a greater number of outside boards. Bushman et al. suggest that reputation quality increases as the number outside directorships held by outside board members increases but Beasley suggests that when board members hold more outside directorships they have less time to effectively monitor management.

Dechow, Sloan, and Sweeney (1996) consider the incidence of earnings manipulations as a measure of monitoring effectiveness and examine a sample of firms that were issued AAERs during the period of 1982 to 1992 for failing to comply with GAAP. They provide evidence that managers are motivated to manipulate earnings (accounting choices outside the boundaries established by GAAP) when their firms need external financing (to lower their cost of capital) or are near technical default of debt covenants. They also seek to determine whether managers have the opportunity to manipulate earnings by examining the relation between certain internal governance characteristics and the incidence of earnings manipulation. They find that AAER firms have a significantly greater proportion of insiders on the board (a board member who is also an officer of the firm), and are less likely to have audit committees. Dechow et al. apply factor analysis to the governance variables and identify two latent internal governance factors. They consider one factor to represent

"low oversight of management" since this factor is negatively correlated with the presence of an audit committee, and positively correlated with the percentage of insiders on the board, the percentage of shares owned by insiders on the board, and whether the firm's CEO is also the firm's founder. Dechow et al. find that the likelihood of earnings manipulation increases when the "low oversight of management" factor is interacted with variables that represent the need for external financing and nearness to debt covenant default. They conclude that a weak internal governance structure is an important catalyst for earnings manipulation; managers are more likely to engage in earnings manipulation provided they have not only the incentive but also the opportunity.

A study by Carcello and Neal (2003) is also among the group of studies that examine some type of financial reporting failure as a measure of audit committee monitoring effectiveness. In this case, Carcello and Neal examine a sample of firms that receive going concern opinions by their external auditors and a matched group of firms that receive clean opinions. Within this sample, 50% of firms that receive each type of opinion dismissed their external auditor following the opinion. Carcello and Neal consider an effective audit committee to be one that protects the firm's external auditor from dismissal following auditor issuance of a going concern opinion. They examine audit committee independence (affiliated versus non-affiliated), governance expertise, financial expertise, and stock ownership. [9] Carcello and Neal hypothesize a positive relation between audit committee director stock ownership and the likelihood

[9] Carcello and Neal (2003) define an affiliated audit committee director as a director who may have current or prior experience as an officer or employee of the company or a related entity, may be a relative of senior management, may have financial ties to the firm or be an interlocking director). They define governance expertise as the average number of other outside directorships held by audit committee directors.

of auditor dismissal following a going concern opinion. Audit committee directors would incur losses because of an expected negative stock price reaction to the opinion. Carcello and Neal find that the presence of affiliated directors and relatively higher levels of audit committee director stock ownership are associated with an increased likelihood of auditor dismissal. They find no relation between financial expertise and monitoring effectiveness, while governance expertise is associated with a decreased likelihood of auditor dismissal. Their result that auditor dismissal following a going concern opinion is increasing with audit committee director stock ownership is consistent with Klein (2002). However, their result is not consistent with Beasley's finding that the likelihood of financial statement fraud is decreasing with audit committee director stock ownership.

Other studies contribute to the analysis of audit committee and board characteristics and monitoring effectiveness using experimental and survey methods to develop measures of monitoring effectiveness. McDaniel, Martin, and Maines (2002) design an experiment to differentiate between the effects of financial expertise and financial literacy on audit committee members' judgments of financial reporting quality. They find that a financial expert is able to discern certain quality shortcomings in financial reporting issues that a financial literate member is not able to discern. These financial reporting quality shortcomings are typically recurring, less widely publicized in the financial press, and more difficult to identify.

Kalbers and Fogarty (1993) examine the association between support provided by the firm and audit committee effectiveness. They measure audit committee effectiveness based upon responses to survey item scales of effectiveness

along three dimensions; overall financial reporting, the annual audit and the external auditor, and internal controls and the internal auditor. Their definition of support considers the perceived timeliness, usefulness, and reliability of information provided by senior management, including the internal auditor, to the audit committee, the perceived tone of top management in providing a supportive atmosphere for the audit committee, and the perceived working relationship between the audit committee and the chief executive officer, chief financial officer, chief internal auditor, and external auditors. Kalbers and Fogarty found that support provided by the firm is positively related to audit committee monitoring of the annual audit and the external auditor.

Several studies consider discretionary accruals to be a measure of audit committee monitoring effectiveness (Klein, 2002, Bedard, Chtourou, and Courteau, 2004, and Xie, Davidson, and DaDalt, 2001). Klein (2002) asserts that an independent audit committee serves to negotiate differences between management and the outside auditor. Therefore, an independent audit committee contributes to the accuracy of financial reporting and to the reduction of earnings management. Klein finds a significant inverse relationship between audit committee independence and earnings management using two definitions of audit committee independence, the percentage of outside directors on the audit committee and a committee that has a majority of outside directors. However, Klein does not find a significant relation between earnings management and audit committee independence, when the definition of audit committee independence requires that all audit committee directors are independent. The Sarbanes-Oxley Act now mandates this definition of independence.

Bedard, Chtourou, and Courteau (2004) report a very different finding from that of Klein. They select a sample from all 1996 Compustat firms that includes 200 firms with the most extreme discretionary accruals (50% positive, and 50% negative) and 100 firms with discretionary accruals not significantly different from zero to examine the relation between audit committee characteristics and aggressive earnings management. They find that the effect of independence on discretionary accruals is significant when the committee is 100% independent, but not significant when the committee has a majority of independent members. They suggest that a majority of independent audit committee members may not be sufficient to constrain aggressive earnings management in this sample of smaller firms. [10] Audit committee activity is not related to discretionary accruals in this sample of firms, during a period prior to the Sarbanes-Oxley Act.

Xie, Davidson, and DaDalt (2001) examine audit committee composition along two dimensions; outsider versus affiliated, and expertise. [11] They test whether independent, expert, and active audit committees constrain earnings management. They define committee activity as the annual number of audit committee meetings, and find that audit committees with relatively higher proportions of outside corporate members and outside investment banking members are associated with a lower

[10] The median of total assets of this sample of firms is 42.84 million for the extreme positive, 216.81 million for the extreme negative, and 1,583.83 million for remaining subsample of firms. The median of total assets of the sample examined by Klein (2002) is 3,145 million.

[11] Xie, Davidson, and DaDalt define an affiliated director as a person having some relationship with the firm or its executives. They define an outside director as a person whose only relationship to the firm or its executives is through the board of directors. The researchers also measure expertise by classifying directors according to whether they are currently or were previously executives in publicly held corporations ("corporate"), in financial institutions ("financial"), or lawyers ("legal").

incidence of earnings management. The also find that more active audit committees are associated with relatively lower levels of earnings management.

Finally, a number of empirical studies consider some measure of firm performance as a proxy for monitoring effectiveness of the full board or its separately standing committees. For example, Klein (1998) provides evidence of a positive relation between firm performance and investment or finance committees with relatively higher proportions of inside directors. Firm performance is measured using Jensen's measure of productivity, return on assets, and 12 month cumulated raw returns. This result is consistent with the prediction that insiders are required on these committees to provide specialized knowledge to ratify management strategies and investment decisions. Klein finds that this relation holds for committee composition. The relation does not hold when the explanatory variable is simply an indicator of whether or not there is a separately standing investment or finance committee. Moreover, Klein does not find the existence or proportion of outsiders on the audit committee to be related to firm performance. This result fails to provide support of a hypothesis that independent audit committee directors improve monitoring effectiveness.

Gompers, Ishii, and Metrick (2003) evaluate a sample of firms with respect to 24 indicators of the degree of shareholder rights. They aggregate the shareholder rights variables to form a governance score that is highest when shareholder rights are lowest. Gompers et al. find that significant abnormal returns are realized in a trading strategy that buys the portfolio consisting of firms with the strongest shareholder rights, and sells short the portfolio of firms with the weakest shareholder rights. As

expected, measures of firm performance including Tobin's Q, net profit margin, and sales growth are inversely related to the shareholder rights score.

The above discussion summarizes the contribution of the literature prior to passage of the Sarbanes-Oxley Act in identifying important characteristics of boards and their audit committees that contribute to effective monitoring. The composition studies generally focus on whether board members are insiders, affiliated, or outsiders in an effort to assess whether or not board members are independent of management. However, there are considerable differences across studies in terms of how the researchers define independence, making it difficult to evaluate the contribution of independence to monitoring effectiveness. Furthermore, the composition studies present mixed evidence with respect to the relative contribution of insiders and outsiders to monitoring effectiveness. Klein, 1998 and Bushman et al., 2004, document that inside directors contribute valuable firm specific expertise. Klein, 2002 and Bedard et al., 2004 differ on the degree of independence that constrains earnings management. The compensation studies also examine member expertise (Bushman et al., 2004, Xie, Davidson, and DaDalt 2001). These studies implement different definitions of expertise (number of outside directorships that a director holds, or the setting of the director's principal employment), and present mixed results. Empirical differences such as these may reflect data constraints or researcher interests, but they also reflect rapidly changing regulations. As the number of financial reporting failures mounted in recent years, regulators stepped up their efforts to improve the effectiveness of firms' internal corporate governance mechanisms including the audit committee.

The following section provides a history of this recent legislation, culminating with the Sarbanes-Oxley Act. This overview helps to illuminate differences in empirical implementations of board and audit committee characteristics that may have been driven by regulatory changes over time. This overview further motivates the research questions detailed in Chapter 4.

Chapter 3: Overview of recent regulation to strengthen firms' audit committees

3.1. Regulation pre-Sarbanes-Oxley.

In September 1998, the SEC, the NYSE, and the NASDAQ jointly announced the formation of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (hereafter referred to as the Blue Ribbon Committee). The objective of this committee was to develop a set of guidelines for implementation by the SEC, the NYSE, NASDAQ, and AMEX (hereafter referred to as Self Regulatory Organizations- SROs), and the accounting profession to strengthen the effectiveness of audit committees in their oversight of firms' financial reporting. According to the Blue Ribbon Committee, the audit committee is one of three groups involved in monitoring the financial reporting process and forms a "three-legged stool" with the firm's financial management and the outside auditors. However, "the audit committee must be "first among equals" in this process, since the audit committee is an extension of the full board, and hence the ultimate monitor." [12] The Blue Ribbon Committee's efforts culminated with a report that included 10 specific recommendations to achieve effective oversight by the audit committee.

In December 1999, the SEC issued a ruling to improve disclosure with respect to firms' audit committees, "based in large measure on recommendations made by the Blue Ribbon Committee". [13] All firms, including small business issuers,[14] must

[12] Report and Recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees

[13] U.S. Securities and Exchange Commission Final Rule: Audit Committee Disclosure Release No. 34-42266; File No. S7-22-99.

disclose in their proxy statements whether their audit committee members are independent. To do so, NASDAQ quoted firms or firms listed on the NYSE or the AMEX are to apply the appropriate SRO definition of independence. Appendix C provides the SRO definition of independence and the specific financial and other affiliations between the director or a family member of the director and the firm that preclude independence. All other issuers are required to specify the particular definition they applied to evaluate the independence of their audit committee members. In addition, all firms must provide certain disclosures about non-independent audit committee members. This disclosure must explain the Board's decision to appoint a non-independent director to the audit committee and the circumstances that preclude independence. The SEC stated: "While companies are required to provide in their proxy statements certain disclosures that relate to the independence of directors, we thought that it was important to make the disclosure about all of the audit committee members' independence explicit and clear for shareholders".

The SEC ruling also required firms to disclose whether their boards created a charter to govern the audit committee. The SROs specified the charter requirements. Finally, the SEC required firms to include an audit committee report in their proxy statements. In this report, the audit committee is required to disclose whether or not it recommends to the full board that it include the financial statements in the Annual Report on Form 10-K for filing with the SEC. To determine its recommendation, the audit committee must consider its review of the audited financial statements and

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[14] Regulation S-B defines a "small business issuer" as a company with less than $25 million in revenues and market capitalization.

certain discussions it must have with management and the outside auditor. The SEC stated: "We believe that additional disclosures about a company's audit committee and its interaction with the company's auditors and management will promote investor confidence in the integrity of the financial reporting process."

The SEC disclosure ruling did not specifically address the Blue Ribbon Committee's recommendation that all members of the audit committee be financially literate, and that at least one member of the audit committee has accounting or related financial management expertise. The Blue Ribbon Committee defined financial management expertise as past employment experience in finance or accounting, requisite professional certification in accounting, or any other comparable experience or background which results in the individual's financial sophistication, including being or having been a chief executive officer, chief financial officer, or other senior officer with financial oversight responsibilities. The NYCE, AMEX, and NASDAQ adopted rule changes amending their audit committee requirements to be consistent with this Blue Ribbon Committee recommendation.

During this period, the financial press disclosed numerous cases of financial reporting improprieties. In some cases the financial transactions and reporting transgressions elevated to the level of fraud. Numerous reports of independent investigations placed the blame squarely on the board and its committees for their failure to monitor management effectively. For example, the Senate Committee responsible for investigating the collapse of Enron concluded in its report that the

Enron Board failed in its fiduciary responsibilities to safeguard Enron shareholders. [15] The Board failed to unravel the distorted financial picture created by management through its use of related party financial transactions and off balance sheet activities. The Senate Committee implicitly attributed this failure to an apparent lack of independence of the board from senior management. Another example is WorldCom. WorldCom disclosed more than 9 billion dollars in earnings restatements and eventually filed for Chapter 11 bankruptcy protection. A report of an independent investigation initiated by WorldCom's new board stated "the outside Directors had little or no involvement in the Company's business other than through attendance at Board meetings." Moreover, the audit committee "needed an understanding of the Company it oversaw in order to be effective." [16] The financial press often cited WorldCom's failure as the catalyst enabling passage of the Sarbanes-Oxley legislation.

3.2. The Sarbanes-Oxley Act.

The Sarbanes-Oxley Act addressed many issues to improve investor confidence; this discussion briefly summarizes the mandates pertaining to the audit committee. Appendix B and C provide detail to support this discussion and the subsequent discussion of extended measures of audit committee characteristics in Chapter 4. The Sarbanes- Oxley Act directed the SEC to implement rules requiring

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[15] Permanent Subcommittee on Investigations of the Committee on Governmental Affairs United States Senate, Report 107-70, 107th Congress, 2d Session, The Role of the Board of Directors in Enron's Collapse

[16] Report of Investigation by the Special Investigative Committee of the Board of Directors of WorldCom, March 31, 2003.

firms to disclose whether or not their audit committees include at least one financial expert and provided guidelines for the SEC to consider in defining the term 'financial expert'. The legislation prescribed that the committee undertake certain responsibilities. The committee must engage, compensate, and monitor the external auditor. The legislation further provided the audit committee with specific authority to execute these responsibilities. The external auditor must report directly to the audit committee.

The Sarbanes-Oxley Act mandated support to the audit committee to improve disclosure and the flow of information to the committee. The committee must establish procedures to address complaints pertaining to accounting, internal controls, and auditing matters. The committee must provide a forum that allows employees to raise concerns about questionable accounting or auditing practices without fear of any breach of their confidentiality or anonymity.

Sarbanes-Oxley required that each member of the audit committee must be independent according to specific criteria; firms' boards of directors may no longer appoint a non-independent director to the committee. Sarbanes-Oxley elevated the criteria for independence by imposing new restrictions on financial and other relationships between directors and the firm (see Appendix C). Finally, Sarbanes-Oxley provided the audit committee with the authority to hire outside advisors and independent counsel and mandated the firm to provide resources to compensate any advisors the committee may engage.

Chapter 4: Research questions

The discussion in Chapter 3 briefly summarizes a series of changes commencing with the Blue Ribbon Commission and culminating with the Sarbanes-Oxley Act, that affect firms' disclosure practices as well as the composition, specific responsibilities and authority of public company audit committees. I consider the regulatory changes over time to identify a set of characteristics regulators associate with audit committee monitoring effectiveness. The regulatory changes (i) impose more restrictions on financial and other affiliations between the firm and the audit committee member, the member's family, and the member's professional affiliations, (ii) require disclosure about the existence and nature of financial expertise, (iii) provide the committee with specific authority, resources, and support, (iv) direct the committee to undertake specific responsibilities.

Certain empirical studies (Beasley, 1996, Menon and Williams, 1994, Kalbers and Fogarty, 1998) question the role of the audit committee. The audit committee has little or no economic purpose if it is a merely symbolic or cosmetic structure. The body of literature that examines whether specific audit committee characteristics are related to outcomes associated with monitoring effectiveness provides insight to this question. Certain ranges of independence constrain earnings management (Klein 2002, Bedard, Chtourou, and Courteau, 2004). Firm provided support facilitates audit committee monitoring of the audit process (Kalbers and Fogarty, 1993). This study evaluates audit committee monitoring effectiveness as a function of a set of audit committee characteristics:

Audit committee monitoring effectiveness = *f*(independence, financial expertise, firm provided support, oversight)

The audit committee characteristics examined are drawn from prior literature (independence, expertise in general, and oversight activity) and from the requirements that the Sarbanes-Oxley Act imposes on audit committees (independence, financial expertise, resources and support provided by the firm, and mandated responsibilities). By examining a set of audit committee characteristics this study provides additional evidence on the economic importance of audit committees, and takes a step toward unifying numerous studies offering evidence on different subsets of this function of audit committee characteristics. Specifically, this study tests the following hypothesis:

H_1: *There is a positive relation between audit committee monitoring effectiveness and the following characteristics; audit committee independence, audit committee financial expertise, firm provided support, and degree of audit committee oversight.*

The empirical literature provides certain evidence on the economic demand for independent and active audit committees. Specifically, there is a greater likelihood of independent or active audit committees when agency friction is higher (Menon & Williams, 1994, Klein, 2002, and Deli & Gillan, 2000). This study tests the following hypothesis:

H_2: *The positive relation between audit committee monitoring effectiveness and the following characteristics; audit committee independence, audit committee financial expertise, firm provided support, and the degree of audit committee oversight is more pronounced when the level of agency friction is higher.*

In addition, there is some evidence that the presence of insiders may contribute valuable expertise (Bushman, et al., 2004, Klein, 1998). With the passage of the Sarbanes-Oxley Act, there is now a mandate of 100% independence along with recognition that financial expertise may improve audit committee monitoring effectiveness. The empirical studies of audit committees, pre-compliance with the Sarbanes-Oxley Act, present mixed results on the value of financial expertise. It is certainly possible that other types of expertise facilitate effective monitoring (for example, Xie, Davidson, and DaDalt, 2001 find that members with corporate experience constrain earnings management, while Carcello and Neal, 2003 find that audit committee members with financial expertise do not prevent auditor dismissal following going concern reports). Financial expertise may become more important as audit committees with all independent members sustain a loss of firm specific expertise that insiders would otherwise provide. To explore the possible interaction between independence and financial expertise, this study will test the following hypothesis:

H_3: *There is a positive relation between audit committee monitoring effectiveness and the interaction of audit committee independence and financial expertise.*

Finally, the Sarbanes-Oxley Act is the major corporate governance legislation passed in recent years and significantly affects the composition and responsibilities of the audit committee. To explore the impact, if any, of the Sarbanes-Oxley Act on audit committee monitoring effectiveness, the study will test the following hypothesis:

H_4: *The positive relation between audit committee monitoring effectiveness and the following characteristics, audit committee independence, audit committee financial expertise, firm provided support, and degree of audit committee oversight is more pronounced in the period post compliance with the Sarbanes-Oxley Act.*

Chapter 5: Research method

5.1. Survey of public company audit committees.

As discussed in Chapter 3, the passage of the Sarbanes-Oxley Act motivates this study of audit committee monitoring effectiveness as a function of audit committee independence, financial expertise, firm provided support, and degree of audit committee oversight. Existing literature investigating the efficacy of the board of directors in general, or the audit committee specifically, relies principally on archival data. This study relies on a survey of public company audit committees. The survey items were carefully chosen to extend the definitions of audit committee characteristics examined and include characteristics targeted by Sarbanes-Oxley, but not heretofore examined.

The California Public Employees' Retirement System (CalPERS) and the Society of Corporate Secretaries & Governance Professionals (SCS), contributed their valuable insight during the design of the survey instrument. Each organization actively engages in efforts to improve firms' corporate governance. Each organization expressed their support of this study in a cover letter that accompanied the survey.

5.1.1. Pilot survey pre-Sarbanes-Oxley.

The pilot survey requested information about public company audit committees during 2000 and 2001, a period prior to Sarbanes-Oxley compliance. However, the survey instrument was not actually administered until January 2003. [17] Therefore, the pilot survey contains items that reflect the mandates of the Sarbanes-Oxley Act and certain SEC proposed rulings (the final SEC implementation rulings occurred following the survey administration). To a certain extent, public company audit committees that responded affirmatively to the survey items voluntarily conformed to the composition, competencies, and responsibilities mandated by the Sarbanes-Oxley Act.

I pre-tested the pilot survey for content validity through a series of interviews with directors on corporate boards, audit committee directors, accounting practitioners, and corporate governance experts. In some cases, I administered an initial survey to these individuals. I selected the final pilot survey items based upon the guidance provided by the cooperating institutions, accounting faculty, and pre-testing results. The complete pilot survey is presented in Appendix A.

5.1.2. Follow up survey post-Sarbanes Oxley.

The follow up survey was administered to all Society of Corporate Secretaries & Governance Professional public company members listed in the organizations'

[17] The lapse in time from the conclusion of the 2002 proxy season to January 2003 was the result of time needed to design, test, and implement the pilot survey.

most recent membership directory as of April 2005. The content of the follow up survey generally conformed to the pilot survey, to facilitate a preliminary analysis of the impact, if any, of changes in measured audit committee characteristics on monitoring effectiveness during the pre-Sarbanes-Oxley versus post-Sarbanes-Oxley periods. The follow up survey elicits information about public company audit committees for the years 2003 and 2004. The analysis of any change between the 2-year period prior to Sarbanes-Oxley, and the 2-year period post-Sarbanes-Oxley is preliminary for two reasons. First, the SEC final rulings of the principal sections of the legislation that pertain to audit committees, Section 407 (audit committee financial expert) and Section 301 (standards relating to listed company audit committees) require compliance, at the earliest, in firms' annual reports for the fiscal year ending on or after 7/15/2003. Appendix B provides additional detail on the compliance dates, and terms of the rulings. Secondly, consistent with other corporate governance studies that measure the effect of governance characteristics with a lag (Weir, Laing, and McKnight, 2002), inclusion of audit committee data for the year 2004 requires certain financial data for 2005, which is not yet available. Therefore, this study considers one year of data (2003) for a preliminary tests of whether the impact of audit committee characteristics on monitoring effectiveness is more pronounced post-Sarbanes (Hypothesis 4 of this study).

To ensure consistency of the measures across four years, the follow up survey elicits identical information to the pilot survey, with a few exceptions. In some cases, items included in the pilot survey measures were omitted from the follow up survey (all respondents answered one item affirmatively; several items did not significantly

load onto any factors in the factor analytic procedure). The discussion that follows provides an overview of the survey items.

5.1.3. Survey instrument.

The existing academic literature defines audit committee independence according to whether or not there are certain affiliations between the audit committee director and the firm's senior management (Menon and Williams, 1994, Beasely, 1996). However, there is no apparent consensus within the academic literature in terms of the specific affiliations that may impair independence. As a result, the definition of independence is not consistent across studies. This study employs two definitions of independence. The first definition requires that an independent director satisfy the firm's exchange listing requirements for independence during the period of this study. This definition provides a basis to evaluate independence according to regulatory standards in effect in the pre-Sarbanes-Oxley period. The standards are detailed in Appendix C. Using regulatory standards as a benchmark produces a measure that is not biased by researchers' criteria. The SRO criteria relate to whether the director is an employee, whether there is a family relationship between the director and a current or previously employed executive officer of the firm, and whether there are certain financial or other professional affiliations between the director and the firm.

However, the Sarbanes-Oxley Act further limited director affiliations to the firm, suggesting that directors technically deemed independent prior to compliance

with the Act may have had some type of affiliation with the firm that could impair independent judgment. Hence, a measure based on the absence of affiliations in the pre-Sarbanes period may contain measurement error. The independence section of the survey includes additional items to represent independence. For example, the survey items elicit information about the frequency of private meetings between the audit committee and the internal auditors and external auditors. Post Sarbanes-Oxley, the SROs formally require these private meetings. [18]

Jensen (1993) asserts that when the CEO sets the board's meeting agenda, the board's ability to monitor effectively is constrained. The survey elicits the percentage of the audit committee meeting agenda that is set by the audit committee and by management. The survey also provides the number of audit committee members that have had prior experience with the firm's external auditor. The SROs strictly prohibit this affiliation post-Sarbanes-Oxley.

The Sarbanes-Oxley Act provided guidelines for the SEC to consider upon ruling on the manner in which an audit committee director may acquire financial expertise. These guidelines reflect specific occupational and professional qualifications. The financial expertise section of the survey is consistent with these guidelines to ascertain the number of audit committee members that have CPAs, public company audit experience, experience auditing financial statements of comparable entities, and experience as a CFO or principal financial officer. However, the literature recognizes the valuable contributions of insiders that have firm-specific expertise (Fama, 1980, Bushman, et al., 2004, Klein, 1998). Therefore,

[18] U.S. Securities and Exchange Commission NASD and NYSE Rulemaking: Relating to Corporate Governance, Release No. 34-48745; File Nos. SR-NYSE-2002-33, SR-NASD-2002-77, SR-NASD-2002-80, SR-NASD-2002-138, SR-NASD-2002-139, and SR-NASD-2002-141.

the survey also includes items to assess the extent of audit committee members' in-depth knowledge of the firm's business operations, financial transactions, financial performance, business risk, internal controls, and audit scope.

Jensen (1993) suggests that the flow of information from management to the board improves monitoring effectiveness. Kalbers and Fogarty (1993) consider support provided by the firm to reflect the timeliness, usefulness, and reliability of information provided to the audit committee by the firm's senior management and internal auditor, and the tone of top management in providing a supportive atmosphere for the audit committee. The survey includes a number of items to measure the flow of information from management to the committee, such as whether audit committee members have access to company records, facilities, and personnel. Additional survey items relate to the frequency and sufficiency of management information updates. The survey also includes items to measure the extent and type of training the firm provides to audit committee directors.

Finally, the existing academic literature typically defines oversight in terms of committee activity, and measures activity as the frequency of audit committee meetings. To extend the measure of audit committee oversight, the survey includes specific activities governance experts associate with effective oversight, such as whether or not the audit committee reviews key financial transactions including special items, loan or receivable losses, off balance sheet activities, and pension return estimates. The survey also includes an item to determine whether or not the audit committee reviews earnings press releases and earnings guidance provided to

analysts and rating agencies. The SROs require the audit committee to discuss this item with management in the post Sarbanes- Oxley period. [19]

The preceding discussion highlights the choice of individual survey items, ex ante, to provide relevant and reliable data to measure the audit committee characteristics examined in this study; independence, financial expertise, oversight, and firm provided support. The sample selection and description in Section 5.2 provides the context to evaluate the results of this study and to draw inferences about the generalizability of these results. The discussion of the empirical measures of each audit committee characteristic in Section 5.3 includes an assessment of the reliability of these measures.

5.2. Pre and post-Sarbanes sample selection and description.

As shown in Table 1, I administered the pilot survey to all SCS members provided the member is a public company (1,728 firms). Each year, CalPERS' performs corporate governance screenings of firms in its passive investment portfolio. In 2002, CalPERS screened 838 firms from its total number of holdings based on data availability. I administered the pilot survey to all 838 firms. 251 firms responded to the survey constituting a 10% response rate. Of these firms, 17 duplicate responses were discovered and 7 firms were not identified. This reduced the sample to 227 firms. Not all respondents provided answers to all survey items. 99 firm-year

[19] Report of Investigation by the Special Investigative Committee of the Board of Directors of WorldCom, March 31, 2003.

observations were deleted due to incomplete responses. The final pilot sample consists of 355 firm-year observations.

The follow up survey was administered during May 2005. It was sent to all ASCS public company firms listed in the organizations' most recent membership directory as of April 2005. Due to a change in leadership at CalPERS, final approval from this organization was still pending at the time of the follow up survey administration. The final sample of 75 firms provides an opportunity to examine any differences in measured audit characteristics and their relation to monitoring effectiveness between the pre and post-Sarbanes compliance periods, on a preliminary basis.

To explore the possibility of self-selection bias in the pilot and follow up samples, Table 2 provides selected financial measures to compare two groups, all firms surveyed, and the sample group of firms that responded. Panel A provides the results of the comparison of the two groups from the pilot survey while Panel B provides the results of the follow up sample comparison. In the pilot study, pre-Sarbanes, the t test for differences in the means establishes a statistically significant difference in the mean value of return on assets. Table 2 also reports results of the nonparametric Wilcoxon test based upon a ranking comparison of the two groups. The p values of this test show a statistically significant difference in the mean value of the ratio of market to book value of equity. Overall, the results do not strictly preclude the possibility that the pilot sample respondents self selected based on financial performance. However, Panel B establishes that there are no statistically significant differences in the mean values of any of the financial measures in the

follow up survey groups, based upon both the t test and the nonparametric Wilcoxon test.

Table 3 provides a description of the pilot sample. Nearly 98% of audit committee members are independent according to the SRO listing requirement of the firm. The audit committees in this sample average 3 members and meet on average 5 times each year. The sample firms' audit committee members hold an average of 6 outside directorships. They meet privately approximately three times annually with the outside auditor and two times annually with the internal auditors. An average of .08% of audit committee members had prior employment or consulting experience with the firms' outside auditor. An audit committee member with this particular affiliation would no longer be regarded as independent. Although the results of Table 2 do not eliminate the possibility of self-selection bias, the descriptive information about this sample of firms' audit committees suggests significant voluntary compliance with the Sarbanes-Oxley Act.

Table 4 provides a description of the follow up survey sample. On average, this sample of firms held more frequent meetings annually (6 times per year versus 5 times per year in the pre-Sarbanes period). The follow up sample firms also met more frequently with the firms' outside auditors (4 versus 3 meetings in the pre-Sarbanes period) and internal auditors (3 versus 2 meetings in the pre-Sarbanes period). 96% of the post-Sarbanes sample of audit committees reviewed earnings press releases compared to 84% in the pre-Sarbanes period.

5.3 Variable measurements.

5.3.1 Audit committee variable measurements.

The survey included a separate section for each audit committee characteristic, with a range of 12 to 20 individual items included to develop measures of each audit committee characteristic. As a result of the large number of items relevant to each characteristic, I apply factor analysis to reduce the survey items (based upon the factor-loading matrix for each characteristic) to a smaller number of composite variables to represent the latent factors. I use principal component analysis to account for the maximum portion of the variance present in the original set of variables with a minimum number of these variables.

As a result of applying factor analysis to the survey item responses, I construct eight measures of the four key audit committee monitoring effectiveness characteristics, as shown in Table 5. The table also provides the Cronbach's coefficient alpha for each variable, except ALLIND, which is not obtained using the factor analytic procedure. Cronbach's coefficient alpha is a measure of the internal consistency of items aggregated to represent a latent construct. The larger the overall coefficient alpha, the more likely that the aggregated items contribute to a reliable measure of the latent construct.

I construct two measures of independence. The first measure of audit committee independence (ALLIND) is the proportion of audit committee directors that are independent according to the firm's exchange listing requirements. I employ

this measure to determine whether the results of earlier studies with respect to independence apply to this sample, but I use regulatory standards as a benchmark to limit error in measurement.

The extended measure of independence, INDEP1, considers the annual number of private meetings between the audit committee and the internal auditor as well as the audit committee and the outside auditor. This measure also reflects the number of independent investigations the committee conducted annually as well as the number of times within the year that the committee engaged outside experts. I employ this measure of independence to reflect the Sarbanes-Oxley mandates.

I construct three measures of financial expertise that explain 68.74% of the variance in the data in this section of the survey (all of the factor loading matrices are not provided herein). FINEXP1 considers the number of audit committee members that have CPAs, have public company audit experience, and experience auditing financial statements of comparable entities. FINEXP2 considers the number of audit committee members whose principal employment is in the capacity of CFO, and the number of audit committee members who also have prior financial experience in the sample firm's industry sector. FINEXP3 is an aggregation of eight items that have factor loadings ranging from .769 to .871. The items reflect in-depth knowledge of the financial transactions and operations of the firm.

The resulting financial expertise variables provide an opportunity to explore the impact, if any, of the SEC implementation ruling of Section 406, which broadens the guidelines in the Sarbanes-Oxley Act, concerning how an audit committee financial expert may acquire financial expertise. The FINEXP3 measure also

provides an opportunity to test Hypothesis 3 using the interaction of FINEXP3 and INDEP1. Evidence of interactive effects of firm specific financial expertise and independence would provide support of the hypothesis that a certain kind of financial expertise, namely expertise arising from in-depth knowledge of the firm's financial operations, can replace the valuable contribution that non-independent audit committee members may have provided in the pre-Sarbanes period.

I construct 3 measures of support that explain 57.59% of the variance present in the original variables in this section of the survey. SUPP1 considers specific types of training the firm may provide to its audit committee members, as well as the sufficiency of information that management provides to the committee. SUPP2 considers the annual frequency of management updates on changes in exposure to specific types of risk. SUPP3 is a reflection of audit committee member opinion on whether their remuneration is commensurate with the amount of time the audit committee member spends on firm business, and whether their remuneration is commensurate with the responsibility the audit committee member undertakes on behalf of the firm.

The factor analytic procedure resulted in the loading of all 21 survey oversight items onto one factor. I therefore constructed the (OVER) metric as the percentage of 21 survey items the audit committee reviewed. These items include the firm's exposure to significant risk (derivatives, off balance sheet activities, and related party transactions), financial reporting areas that might be subject to earnings management (loan or receivable losses, pension return estimates, and revenue recognition, etc.), planned versus reported results, prospective estimates, press releases, and earnings

guidance provided by management (see the survey document, Appendix A, for the complete listing of oversight items).

As an initial test of concurrent validity, I correlate the measures I form with measures of audit characteristics considered in the academic literature. Academic researchers commonly employ the frequency of annual audit committee meetings as a proxy for audit committee activity and audit committee oversight (Xie, Davidson, and DaDalt, 1990, Bedard, Chtourou, and Courteau, 2004, for example). I find that the annual number of audit committee meetings is positively correlated with INDEP1, SUPP2, and OVER. I find that ALLIND, a dichotomous variable set to 1 if all members of the audit committee are independent according to their firm's exchange listing requirements, zero otherwise, is positively correlated with SUPP2 and negatively correlated with FINEXP3. FINEXP3 is a measure of the audit committee's in-depth knowledge of the firm's financial transactions. This negative correlation provides preliminary support that a loss of insider membership on the committee may also cause a loss of firm-specific expertise. The academic literature also considers the number of outside directorships held as an indicator of director expertise. I find that the number of outside directorships held by all members of the audit committee is positively correlated with INDEP1, FINEXP3 and OVER.

5.3.2. Measures of monitoring effectiveness.

5.3.2.1. Managers' discretionary accrual choices.

The use of managers' discretionary accrual choices, as a proxy for monitoring effectiveness, is motivated by positive accounting theory. In this framework accounting numbers are used for contracting, monitoring, and performance evaluation purposes. Ex ante, the contracting parties to the firm jointly establish an accepted set of accounting procedures that provide managers the opportunity to make discretionary choices within the boundaries of this set (Watts and Zimmerman 1990). Managers are afforded discretion and presumably contracting parties' benefit because managers can make choices using their expertise and knowledge of the firm. In this case, the reported accounting numbers would more closely reflect the underlying economic substance of the firm's operations. However, managers may believe that users of reported accounting numbers may not perfectly distinguish between choices that are a better match of the underlying economic condition (higher earnings quality) and choices that may represent managers own self interests. If so, managers have the incentive to act in their own self interests. The reported accounting numbers may not as closely reflect the underlying economic substance of the firm's operations, and managers' discretionary accrual choices result in reported accounting numbers of lower quality.

The academic literature provides evidence on managers' self interested or opportunistic choices. Certain evidence is provided with respect to managing real

transactions. For example, Dechow and Sloan (1991) contribute evidence that CEO's spend less on R&D during their final years in office. Other studies consider discretionary choices of accruals. For example, McNichols and Wilson (1988) examine a single type of accrual, the provision for bad debts, and document results consistent with earlier evidence provided by Healy (1995) in support of the bonus plan hypothesis. Managers choose income-decreasing accruals when income is extremely high (income exceeds a bonus plan cap) or extremely low (to take a big bath). Other studies contribute to the body of literature on managers' self-interested incentives using models that provide estimates of total discretionary accruals of a period rather than accruals relating to a single accounting treatment. For example, Jones (1991) provides evidence of income decreasing accruals prior to applications for tax relief, and Teoh, Welch and Wong (1998) document income increasing discretionary accruals just prior to firms' initial and seasoned equity issues. In the governance literature, Klein, 2002, Peasnell, Pope, and Young (2000), and Xie, Davidson, and DaDalt (2001) use composite estimates of discretionary accruals.

Guay, Kothari, and Watts (1996) perform tests of market returns on the components of earnings estimated from five different accruals models. They present evidence that of the five models; only the Jones and modified-Jones models provide incremental explanatory power by disaggregating total accruals into components of discretionary and non-discretionary accruals. A separate study of alternate accrual estimation models conducted by Dechow, Sloan, and Sweeney (1995) documents an over rejection of the null hypothesis of no earnings management in a sub sample of firms with extreme financial performance. Dechow, et al. also present additional

evidence that although each of the models examined have low power, the modified-Jones model has relatively higher power than the other models examined.

In this study, I employ the cross-sectional version of the modified-Jones model to estimate manager's discretionary accounting accruals. The model provides an aggregate measure of discretionary accruals that reflects the net effect of all accounting choices. Furthermore, the literature provides evidence documenting the relatively higher power of the model.

I estimate discretionary accruals for my sample firms following the procedures used in Teoh, Welch, and Wong (1998). Teoh, Welch, and Wong (1998) estimate sample firms' discretionary accruals in two steps. In the first step, they estimate a cross-sectional version of the modified Jones model, industry-by-industry (two-digit SIC code) with the sample firm excluded. In the second step, they use coefficients generated from the first step regression to estimate discretionary accruals of a sample firm in the same industry and in the same year. The model estimated in the first step is:

$$TAC_{j,t}/ TA_{j,\,t-1}= \alpha_{j,t}\,[1/TA_{j,\,t-1}]+ \beta_{1j,t}\,[\Delta SALES_{j,t}\,/TA_{j,\,t-1}] + \beta_{2j,t}\,[PPE_{j,t}\,/TA_{j,\,t-1}] + \varepsilon_{j,t.} \qquad [1]$$

Where,

TAC_{jt} = Total accruals computed as the difference between net income (Compustat data 123) and cash flow from operations (Compustat data 308) for all j firms in each two-digit SIC code as the sample firm, excluding the sample firm

$\Delta SALES_{j,t}$ = $Sales_t – Sales_{t-1}$ (Compustat data 12)

$PPE_{j,t}$ = Property, plant and equipment in year t (Compustat data 7)

$TA_{j,\,t-1}$ = Beginning total assets (Compustat data 6)

$\varepsilon_{j,t}$ = Model residuals industry firm j year t

The dependent variable is winsorized to the top and bottom 1% and 99% values while the independent variables are truncated at the top and bottom 1% and 99% levels to adjust for influence of extreme observations (Ye 2004). Non-discretionary total accruals ($NDTAC_{i,t}$) for each sample firm for the fiscal years 2001 and 2002 are calculated as:

$$NDTAC_{i,t} = a[1/TA_{i,t-1}] + b_1[\Delta SALES_{i,t}/TA_{i,t-1} - \Delta REC_{i,t}/TA_{i,t-1}] + b_2[PPE_{i,t}/TA_{i,t-1}]. \quad [2]$$

Where,

$\Delta REC_{i,t}$ = $Receivables_t$ – $Receivables_{t-1}$ (Compustat data 2)

Finally, discretionary total accruals ($DTAC_{i,t}$) represent the difference between actual total accruals for firm i time t scaled by beginning total assets and non-discretionary total accruals for firm i time t:

$$DTAC_{it} = [TAC_{it}/TA_{i,t-1}] - NDTAC_{it.} \quad [3]$$

I use signed accruals rather than the absolute magnitude of accruals, to incorporate the differential effect of income increasing versus income decreasing accruals on earnings quality (Peasnell et al., 2000). For example, accounting conservatism rather than manager' self-interested choices may explain income-decreasing accruals. The use of signed accruals permits consideration of whether more effective audit committees can discern accrual choices that increase earnings quality versus those that decrease earnings quality.

The existing academic literature provides the basis to control for factors known to be associated with discretionary accruals. For example, managers may

select accruals to meet the requirements of debt covenants and avoid incurring costs of technical default (Christie and Zimmerman, 1994, Sweeney, 1994). The debt to equity ratio is employed to represent nearness to debt covenant violation (LEVERAGE). Managers' ex post choice of accruals to avoid costs of default may be viewed as a more efficient outcome for all of the contracting parties.

Managers of large firms incur lobbying costs to avoid imposition of regulatory constraints upon firms' accounting choices that may increase reported earnings and thereby increase firms' tax costs (Fields, Lys and Vincent, 2001, Jones, 1991). I employ the natural log of beginning of year total assets, as a measure of firm size to represent this incentive for manager's to make discretionary accounting choices (SIZE).

To control for the documented inverse relation between the magnitude of discretionary accruals and firms having extreme performance (Dechow et al., 1995) I use cash flow from operations deflated by lagged total assets (PERFORM).

Becker, Defond, Jiambalvo, and Subramanyam (1998) provide evidence that clients of non Big Six audit firms have income increasing discretionary accruals that are 1.5% of total assets higher than that of firms audited by a Big Six auditor. Francis, Maydew, and Sparks (1999) also contribute evidence on the relation between auditor quality and discretionary accruals. Firms audited by Big Six auditors have lower levels of unsigned discretionary accruals, and lower levels of both positive and negative discretionary accruals. Consistent with this body of literature, I control for the empirical relation between auditor quality and discretionary accruals using an indicator variable set to one if the audit firm is a Big Five firm (in the post-Sarbanes

sample, the indicator variable is set to one if the audit firm is one of the 4 largest audit firms), and zero otherwise.

5.3.2.2. Earnings response coefficient.

The earnings response coefficient is widely employed in the academic literature as a measure of the value relevance of accounting earnings. The earnings response coefficient is a measure of the association between abnormal market returns and unexpected earnings. Accountings earnings are a summary measure of a change in firm performance over a period of time, based upon GAAP principles and conventions. Market returns reflect the capital markets' measure of firm performance over a period of time. Over a finite time period, market returns may differ from earnings as a measure of performance for a variety of reasons such as the application of conservative accounting (the asymmetric recognition of gains versus losses), acquisition cost measures of assets, and expensing of certain intangibles. Market returns may also differ from earnings if managers act upon incentives to manage earnings opportunistically, and an efficient market "sees through" this earnings management.

Unexpected or abnormal returns are a measure of a revision to the market's expectation of future cash flows of the firm. Evidence of a positive association between unexpected or abnormal returns and unexpected earnings suggests that the market factors earnings changes into its revised expectations of firm value. In this case, earnings changes contain information about changes in future cash flows that is

value relevant to the capital markets. Ball and Brown (1968) first document the value relevance of earnings, by providing evidence that unexpected increases in earnings are indeed associated with positive abnormal returns and unexpected decreases in earnings are associated with negative abnormal returns. The difference in the rate of return between the two earnings portfolios in their sample was approximately 16.5%, cumulated over a 12-month period through the end of the month containing the annual earnings announcement. Nichols and Wahlen (2004) update the Ball and Brown study and provide additional evidence of a positive association between abnormal returns and unexpected earnings, using data from 1988 to 2002. They document a difference in the rate of return between the two earnings portfolios to be approximately 35%.

The test considering the ERC as a measure of monitoring effectiveness is an association study, beginning 9 months prior to the firm's fiscal year end and concluding 3 months following the fiscal year end. This long-term window includes the earnings announcement. Shorter window tests of information content may not provide evidence of a relation to returns (Francis and Schipper, 1999). The market may have already factored the information contained in earnings into securities prices based upon other sources of information prior to the earnings release (information leakage), if earnings are not timely. Earnings may have "information content" but that information may have been extracted from other sources (ie, managers' voluntary disclosures).

I estimate the standard contemporaneous one period return earnings model:

$$R_{j,t} = \alpha_{j,t} + \beta_{j,t} [UE_{j,t}/P_{j,t-1}] + \varepsilon_{j,t.} \qquad [4]$$

Where,

$R_{j,t}$ is the buy and hold cumulative monthly raw return of firm j for the 12-month period t commencing 9 months prior to the fiscal year end through 3 months following the fiscal year end. The 12-month cumulative return is adjusted by the CRSP value weighted market return. The parameter $\beta_{j,t}$ is the earnings response coefficient of firm j time t. $UE_{j,t}$ is the unexpected earnings per share of firm j time t; $EPS_t - E(EPS_t)$ scaled by price per share at the start of the return cumulation period ($P_{j,t-1}$). I also estimate the earnings response coefficient using an earnings level and change model consistent with Easton and Harris (1991). Easton and Harris (1991) document that level earnings provide additional explanatory power for returns. Their sensitivity tests provide evidence that their results are not driven by potential collinearity among the two earnings variables or bias in the coefficients given the possibility of cross-sectional correlation in the regression error terms. The earnings level and change model is:

$$R_{j,t} = \alpha_{j,t} + \beta_{j,t} [E_{j,t}/P_{j,t-1}] + \beta_{1j,t} [UE_{j,t}/P_{j,t-1}] + \varepsilon_{j,t.} \quad [5]$$

Where,

$E_{j,t}$ = earnings level per share EPS_t (Compustat data18/Compustat data25)

$UE_{j,t}$ = earnings change per share ($\Delta EPS_{t,t-1}$)

The models shown above employ EPS_{t-1} to proxy for the expected value of EPS_t given empirical evidence that the time series property of earnings follows a random walk (Ball and Brown, 1968). However, there is evidence that analyst forecasts provide a superior measure of the expected value of earnings than time series models do (Brown, Hagerman, and Zmijewski, 1987). Therefore, I reestimate

the above models using mean and median values of analyst consensus forecasts of annual earnings per share from IBES. In the model reestimates, $UE_{j,t}$ ($UE1_{j,t}$) = EPS_t minus the mean (median) analyst consensus forecast occurring at the start of the return cumulation period for the year end of the observation. In both model estimates, the earnings level and change variables are winsorized to the values of +/- 0.50 while the dependent variable is winsorized to the values of +/-3.00, to limit the influence of outliers on the regression results.

In tests of the relation between audit committee characteristics, and monitoring effectiveness, using the earnings response coefficient as a proxy for monitoring effectiveness, I control for other determinants of cross-sectional variation in the earnings response coefficient, based upon the academic literature. Kormendi and Lipe (1987) present evidence that the magnitude of the ERC is an increasing function of the persistence of earnings. They model the time series of the earnings innovation as a moving average process. Easton and Zmijewski (1989) also document that the magnitude of stock price reactions is a function of the time series process describing earnings changes, future earnings, and future cash flows. Easton and Zmijewski model persistence using quarterly earnings with a seasonal adjustment and as the slope coefficient from a regression estimate of next period analyst forecast revisions on recent forecast errors. Consistent with other governance studies, (Ghosh and Moon, 2005, Warfield, Wild, and Wild, 1995), the control for earnings persistence in this study, (PERSIST), is the first-order autocorrelation in earnings for 16 quarters. Easton and Zmijewski (1989) also find that the systematic risk, as a proxy for the expected rate of return, is another determinant of cross-sectional

variation in the ERC. Consistent with their study, the control for systematic risk in this study (BETA) is measured as the slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period. Finally, I control for growth (Collins and Kothari, 1989), size, and industry fixed effects.

5.3.2.3 Financial performance of the firm.

The literature providing a link between internal governance and financial performance of the firm is in its early stages. The studies evaluating characteristics of the full board and firm performance are generally motivated by the legal responsibilities of the board. According to the Business Roundtable, the board must "understand, review, and monitor implementation of the corporation's strategic plans, and understand and review annual operating plans and budgets." [20] Hence the Board influences managements' investment strategies and execution of those strategies. Given this influence, one would expect a relation between firm performance and board effectiveness. Since the audit committee is part of the full board, its members are also involved in evaluating, ratifying, and monitoring management's investment strategies.

Klein (1998) provides evidence of a positive relation between the percentage of insiders on the board's finance and investment committees, since these directors have specialized knowledge to evaluate and ratify long-term investment strategies. This study hypothesizes that for an independent audit committee to be effective, it

[20] The Business Roundtable, Principles of Corporate Governance, May 2002.

must include members with firm-specific knowledge of the financial operations of the business. Consequently, this study relies on Klein's findings to consider financial performance as an empirical proxy for audit committee monitoring effectiveness. Consistent with Klein, this study employs the return on assets as a measure of the financial performance of the firm, and controls for firm size (SIZE), the level of capital expenditures (CAPEX), and systematic risk, (BETA).

5.3.3. Variable distributions.

The distributions of dependent, audit committee, and control variables are provided in Table 6. The mean value of discretionary total accruals is –0.0022 .The mean value is not significantly different from zero (t-statistic 0.38). Of the total number of discretionary total accrual observations, 55.8% are positive (mean 0.0746, t-statistic 14.09), the remainder negative (mean –0.0854, t-statistic –4.37).

Klein (2002) examined audit committees of S&P 500 firms for years 1992 and 1993 using a sample of 692 firm-years. While the mean value of discretionary accruals is 0.004 in Klein's sample, as in this sample, that value is not statistically different from zero.

Klein's sample consists of 79.6% of directors who are outsiders. Klein defined outsiders as directors who have no affiliation with the company other than in their capacity as directors. However, given the proxy statement data available at the time of Klein's study, it would be very difficult to identify and exclude all affiliations.

In the pre-Sarbanes sample examined in this study, nearly 93% of directors are independent according to their firm's exchange listing requirement (ALLIND).

As shown on Table 6, there is a statistically significant difference in the mean values of MADJRET12 and PERFORM. The first measure is the 12 month market adjusted abnormal returns while PERFORM represents cash flow from operations scaled by beginning period assets. Both indicators of firm value decreased from the pre-to-post Sarbanes period. In addition, the post-Sarbanes firms have a mean LEVERAGE value that is significantly higher than the pre-Sarbanes sample. The reduction is cash flow from operations and increase in leverage suggests an increase in income increasing discretionary accruals. However, there is no significant difference in the mean value of discretionary accruals in the pre-to post-Sarbanes periods.

With respect to the audit committee characteristics, the mean value of INDEP1 is significantly greater in the post-Sarbanes period. Audit committees have increased the frequency in which they conduct independent investigations, hire outside investigators, and meet privately with the internal and external auditors. The difference in mean values of ALLIND is not statistically significant. While the SEC implementation ruling concerning the acquisition of financial expertise broadened the Sarbanes guideline to allow not only acquisition through occupation but also other relevant experience, the post-Sarbanes sample increased membership of CPAs and audit professionals (FINEXP1), but decreased membership of CFOs (FINEXP2). It is possible that firms wanted to signal high quality financial expertise by including CPAs and audit professionals on their audit committees. With respect to firm

provided support, the statistically significant decrease in SUPP2 (frequency of management updates on exposure to certain risks) from the pre-to post-Sarbanes period may be related to efforts by the audit committee to execute their responsibilities independent of management (as shown in the significant increase in INDEP1). Finally, the statistically significant increase in SUPP3 suggests that firms are adjusting audit committee member compensation in view of the significant added responsibilities imposed on the audit committee by the Sarbanes-Oxley Act.

Chapter 6: Empirical Results

6.1. Managers' discretionary accrual choices.

6.1.1. Univariate results.

In the academic literature, discretionary accruals are widely considered as an inverse measure of earnings quality (Shipper, 2002). In this study, I employ discretionary accruals as a measure of earnings quality, to proxy for monitoring effectiveness. Therefore, my hypotheses predict negative relations between the audit committee variables and discretionary accruals. Table 7 provides univariate results of the pilot sample. Of the audit committee characteristics examined, the significant variables are FINEXP2, FINEXP3, and SUPP2. The signs of FINEXP3 and SUPP2 are not in the expected direction.

However, contracting theory predicts, and the empirical literature provides supporting evidence of specific determinants of managers' discretionary accrual choices that must be controlled for in order to evaluate the incremental effect of audit committee monitoring on these choices. Thus, the univariate results do not tell a complete story because these results do not control for important determinants of discretionary accruals. I therefore perform multivariate tests that explicitly control for determinants of discretionary accruals identified by prior studies.

6.1.2. Multivariate test results.

6.1.2.1. Hypothesis 1.

Hypothesis 1 predicts that audit committee characteristics are positively related to monitoring effectiveness. However, the academic literature generally considers managers' discretionary accrual choices to be inversely related to earnings quality. Therefore, using discretionary accruals as a proxy for monitoring effectiveness, I expect to find an inverse relation. In order to test Hypothesis 1 in the pre-Sarbanes period, I estimate the following model:

$$DTAC_{i,t+1} = \alpha_0 + \alpha_1 INDEP1_i + \alpha_2 FINEXP1_i + \alpha_3 FINEXP2_i + \alpha_4 FINEXP3_i + \alpha_5 SUPP1_i + \alpha_6 SUPP2_i + \alpha_7 SUPP3_i + \alpha_8 OVERSIGHT_i + \alpha_9 BIG5_i + \alpha_{10} SIZE_i + \alpha_{11} LEVERAGE_i + \alpha_{12} PERFORM_i + \varepsilon_i.$$

The audit committee variables are defined in Table 5. The control variables, BIG5, SIZE, LEVERAGE, and PERFORM are defined in Table 8. Table 8 provides the results of tests of Hypothesis 1, after controlling for auditor quality, political costs, debt covenant restrictions, and the effect of extreme performance on the estimation of discretionary accruals. This study employs two distinct measures of independence. The model 1 regression estimate includes the INDEP1 variable. This extended measure of independence considers the extent of private meetings the audit committee may hold with either the internal or external auditors, whether the audit committee conducts independent investigations or consults with outside experts. The model 2 regression estimate includes the ALLIND variable. ALLIND is an indicator

variable set to 1 if all members of the audit committee conform to their firm's exchange listing independence requirements for the period of the study. Both models provide similar results. Neither the coefficient of INDEP1 nor that of ALLIND is significant. The lack of significance of the ALLIND variable is consistent with Klein (2002) who finds no relation between audit committees that are 100% independent and the adjusted absolute value of discretionary accruals.

Although univariate results show a relation between financial expertise acquired by occupation (CFO) and discretionary accruals, the multivariate tests of Hypothesis 1 fail to provide evidence of this relation of this overall. However, the coefficient of FINEXP3 is positive and significant in both the univariate and multivariate model estimations.

The SUPP2 variable is also positive and significant in the both the univariate and the multivariate tests of Hypothesis 1. The SUPP2 variable is a measure of the frequency of management updates on certain changes in exposure to risk. The multivariate tests of Hypothesis 1 show that an additional support variable, SUPP1, is now significant. SUPP1 is a measure of training provided to the audit committee and a determination of whether management provides sufficient information to allow the audit committee to effectively carry out its responsibilities. The negative estimated coefficient of SUPP1 is consistent with the expectation of an inverse relation between the examined audit committee characteristic and discretionary accruals that reduce earnings quality. The oversight variable is not significant.

Of the control variables, the estimated coefficient of leverage is negative and significant. This finding is not consistent with managers choosing income-increasing

accruals to avoid costly renegotiation of debt when firms are near default of debt covenant restrictions. The coefficient of firm size is positive and significant. This result is not consistent with a contracting explanation of lobbying in the political process, but may be performance related given that larger firms are more likely to have a greater magnitude of accruals. The estimated coefficients of auditor quality and extreme performance are not significant.

In the earnings quality setting, firm provided support is a necessary condition to facilitate execution of the audit committee's responsibilities. Financial expertise, when acquired through in-depth knowledge of the firm's financial operations is also important. However it is difficult to interpret whether this type of expertise has the effect of aligning the incentives of the audit committee with those of management or whether audit committees with this type of expertise can differentiate between accrual choices that distort or improve earnings quality.

6.1.2.2. Hypothesis 2.

Hypothesis 2 predicts that the relation between audit committee characteristics and monitoring effectiveness is more pronounced when the level of agency friction is high. In order to empirically examine this hypothesis, the level of managerial shareholdings is employed as a proxy for the level of agency friction (Wild, 1994). Managerial shareholdings are measured as the proportion of outstanding common shares held by the top five senior managers of the firm. An indicator variable, MGTOWN, is set to 1 if managerial shareholdings are less than the median

shareholdings of the firm's industry (low ownership) or 0 if the level of managerial shareholdings equal or exceed the median shareholdings of the firm's industry (high ownership). The following model is estimated for the pre-Sarbanes period:

$$\begin{aligned} DTAC_i = \quad & \gamma_0 + \gamma_1 INDEP1_i + \gamma_2 FINEXP1_i + \gamma_3 FINEXP2_i + \gamma_4 FINEXP3_i \\ & + \gamma_5 SUPP1_i + \gamma_6 SUPP2_i + \gamma_7 SUPP3_i + \gamma_8 OVERSIGHT_i \\ & + \gamma_9 MGTOWN_i + \gamma_{10} MGTOWN*INDEP1_i \\ & + \gamma_{11} MGTOWN*FINEXP1_i + \gamma_{12} MGTOWN* FINEXP2_i \\ & + \gamma_{13} MGTOWN*FINEXP3_i + \gamma_{14} MGTOWN*SUPP1_i \\ & + \gamma_{15} MGTOWN*SUPP2_i + \gamma_{16} MGTOWN_i*SUPP3_i \\ & + \gamma_{17} MGTOWN_i*OVER_i + \gamma_{18} BIG5_i + \gamma_{19} SIZE_i + \gamma_{20} LEVERAGE_i \\ & + \gamma_{21} PERFORM_i + \varepsilon_{i.}. \end{aligned}$$

Where the variables MGTOWN*INDEP1, MGTOWN*FINEXP1, MGTOWN*FINEXP2, MGTOWN*FINEXP3, MGTOWN*SUPP1, MGTOWN*SUPP2, MGTOWN*SUPP3, and MGTOWN*OVER represent the interaction between levels of managerial ownership and each audit committee characteristic. Table 9 provides results of the above model when estimated using the INDEP1 variable. The audit committee variables are defined in Table 5. The estimated coefficient of this extended measure of independence is significant and has the expected sign. The estimated coefficient of SUPP2 is also positive and significant, as in the univariate results and multivariate tests of Hypothesis 1. The estimated coefficient of the interactive variable (MTGOWN*SUPP2) is negative and significant. The sum of the coefficients $\gamma_6 + \gamma_{15}$ is significantly negative, suggesting that there will be fewer income increasing discretionary accruals when support is high

and the level of agency friction is also high (low managerial shareholdings). In this model estimate the coefficient of the auditor quality variable is significant but positive, while the coefficient of the performance variable is significant and negative as expected. The results (not shown) of the model estimated using the ALLIND measure of independence is similar, with one important exception; there is no relation between the ALLIND measure and managers' discretionary accrual choices.

Table 9, Model 4 provides regression results using the backward elimination selection procedure. This model is estimated since the variance inflation factors for MGTOWN, MGTOWN*SUPP2, and MGTOWN*OVER are substantially higher than 10, indicating the presence of multicollinearity. The variance inflation factor is an indicator of redundancy among the predictor variables. The estimated coefficients of FINEXP3, SUPP1, and SUPP2 continue to be significant in the reduced model, indicating the significant effects of these audit committee characteristics on managers' choices of accruals when managerial shareholdings are high. The signs of the coefficients remain as in earlier models. Both measures of support (SUPP1 and SUPP2) have a differential effect on discretionary accruals depending upon whether managerial ownership is high or low. A partial F test shows that SUPP2 is significantly related to abnormal accruals when managerial ownership is low (F value 8.72, Pr > F 0.0034).

The findings are consistent with the results of prior studies. There is evidence of cross-sectional variation in the demand for monitoring with respect to certain audit committee characteristics. The effect of independence on discretionary accruals is statistically significant when the test is conditioned on the level of agency friction.

The effect of support on discretionary accruals depends upon the level of agency friction.

6.1.2.3. Hypothesis 3.

The following model is estimated using the pre-Sarbanes sample to provide evidence with respect to Hypothesis 3, which predicts that the interaction of audit committee independence and financial expertise improves monitoring effectiveness.

$$DTAC_i = \delta_0 + \delta_1 INDEP1_i + \delta_2 INDEP1*FINEXP1_i + \delta_3 FINEXP1_i + \delta_4 INDEP1*FINEXP2_i + \delta_5 FINEXP2_i + \delta_6 INDEP1*FINEXP3_i + \delta_7 FINEXP3_i + \delta_8 SUPP1_i + \delta_9 SUPP2_i + \delta_{10} SUPP3_i + \delta_{11} OVER_i + \delta_{12} LEVERAGE_i + \delta_{13} EXTREME_i + \delta_{14} SIZE_i + \varepsilon_i.$$

The model includes three interactive variables as follows:

INTER1 = INDEP1*FINEXP1

INTER2 = INDEP1*FINEXP2

INTER3 = INDEP1*FINEXP3

This model is also estimated using the ALLIND variable in lieu of the extended INDEP1 variable.

Table 10 provides the results of the multivariate tests with respect to Hypothesis 3, employing the INDEP1 variable. In the full model estimation, the coefficient of the interactive variable INTER3 is significant. As in the multivariate results in support of Hypotheses 1 and 2, the coefficient of the SUPP1 variable is significant and in the expected direction, while the coefficient of the SUPP2 variable

remains positive and significant. Of the control variables, leverage and size remain significant, and their signs are of the same direction as in the model testing Hypothesis 1 and 2. The model estimate using the backward elimination method (model 6) provides similar results. All variables remaining in the model are significant at the 10% level. In this model, the coefficient of the INDEP1 variable is significant and in the expected direction. These findings add insight to prior studies, which provide mixed results on the benefits of inside versus outside directors. Independence when defined in terms of the Sarbanes-Oxley mandates is significant when estimated in a model that includes the interaction between this definition of independence and a definition of financial expertise that considers the audit committee director's in-depth firm specific financial expertise. Thus, a completely independent audit committee requires additional financial expertise since the committee no longer has the benefit of valuable firm specific expertise otherwise provided by non-independent directors.

Table 11 provides results of the model estimate to test Hypothesis 3 using the ALLIND in lieu of the extended INDEP1 variable. The results are substantially similar with the same exception. This independence variable, which classifies audit committee directors as independent if they meet the firm's exchange listing independence requirement, is not significant, nor has this variable been significant in any of the other model estimates.

6.1.2.4. Hypothesis 4.

The following model is estimated to test Hypothesis 4.

$$DTAC_i = \zeta_0 + \zeta_1 SOX_i + \zeta_2 INDEP1_i + \zeta_3 INDEP1*SOX_i + \zeta_4 FINEXP1_i + \zeta_5 FINEXP1*SOX_i + \zeta_6 FINEXP2_i + \zeta_7 FINEXP2*SOX_i + \zeta_8 FINEXP3_i + \zeta_9 FINEXP3*SOX_i + \zeta_{10} SUPP1_i + \zeta_{11} SUPP1*SOX_i + \zeta_{12} SUPP2_i + \zeta_{13} SUPP2*SOX_i + \zeta_{14} SUPP3_i + \zeta_{15} SUPP3*SOX_i + \zeta_{16} OVER_i + \zeta_{17} OVER*SOX_i + \zeta_{18}(\text{control variables})_i + \varepsilon_i.$$

Where,

SOX = an indicator variable set to 1 if the observation is post compliance with the Sarbanes-Oxley Act, and 0 otherwise. The audit committee variables are defined in Table 5, and the control variables in Table 12.

If the audit committee characteristics have a more pronounced effect on discretionary accruals post Sarbanes-Oxley, then the interaction of the audit committee variables and SOX should be significant. The results provided in Table 12 are consistent with earlier tests. Discretionary accruals are increasing with FINEXP3 and decreasing with SUPP1. However, in this preliminary test, none of the interactive variables are significant. While this result suggests that audit committee monitoring effectiveness did not change post-Sarbanes-Oxley, further analysis is needed. As indicated in Section 5.1.2, the data used to test this hypothesis is for 2003, and does not fully reflect compliance with the mandates of the Sarbanes-Oxley Act. Additional data is required to conduct a more meaningful analysis of any differences between the pre-and post-compliance periods.

6.1.2.5. Robustness tests.

In order to test for robustness of the results of tests for Hypothesis 1, 2, and 3, discretionary accruals are also estimated using the performance matched procedure as per Kothari, Leone, and Wasley (2005). Kothari et al. assert that performance matching on the basis of industry and return on assets controls for the established relation between extreme performance and accruals documented in Dechow et al. (1995). They provide evidence that performance matching is a better control than inclusion of a performance measure in the discretionary accruals estimation model since the former method achieves a lower rate of Type I errors. The discretionary accruals estimated from the performance matched procedure are deemed "abnormal" accruals, since discretionary accruals relating to factors other than the variable of interest to the researcher and to performance are, on average, equal for the sample and control firms. Hence, as acknowledged by Kothari et al., the "abnormal" accruals measure obtained from the performance matched procedure is not directly comparable to discretionary accruals obtained from the Jones or modified-Jones models. As shown in Table 13, a test of Hypothesis 2 provides similar results to that using the cross-sectional adaptation of the modified-Jones model. The SUPP1 variable remains negative and significantly related to abnormal accruals, while the SUPP2 variable remains positive and significantly related to abnormal accruals. A partial F test shows that SUPP2 is significantly related to abnormal accruals when managerial ownership is low (F value 4.97, Pr > F 0.0267). However, the performance matched procedure did not provide comparable results to those obtained

using the cross-sectional adaptation of the modified-Jones model in testing Hypotheses 1 and 2.

One explanation of the positive coefficients on the FINEXP3 and SUPP2 measures is the possibility that error in measurement of discretionary accruals may cause an upward bias in the estimated coefficients of the explanatory variables. The cross-sectional version of the modified-Jones model attempts to disaggregate total accruals into two separate categories, accruals that decrease earnings quality (discretionary accruals) and accruals that appropriately reflect the underlying economic substance of the firm's activities (non-discretionary accruals). The model may measure discretionary accruals with error given a possible misspecification of the economic determinants of non-discretionary accruals, a strong assumption, in the cross-sectional model, of homogeneity among firms in the same industry (accruals are assumed to be industry specific), or a failure of the model to appropriately disaggregate discretionary and non-discretionary accruals (Dechow, Sloan, and Sweeney 1995, Ye 2004, Kothari, Leone, and Wasley 2005).

Another explanation is that discretionary accruals may in fact be value relevant. Empirical studies provide support that manager' discretionary accrual choices produce earnings with greater value relevance. For example, Dechow (1994) provides evidence of a stronger contemporaneous association between stock returns and earnings than stock returns and realized cash flows over shorter measurement intervals that are increasing with the magnitude of aggregate accruals. This finding supports the hypothesis that accruals are a better measure of firm performance then cash flows when firms are not in a steady state. Cash flows have more severe timing

and matching problems when firms' working capital requirements, investing, and financing activities are more volatile. Subramanyam (1996) adds evidence to a growing body of literature on the value relevance of discretionary accruals. Subramanyam estimates discretionary accruals using the cross-sectional adaptation of the Jones model. In both univariate and multivariate regression estimates of returns on the components of earnings, Subramanyam presents evidence that not only nondiscretionary accruals, but also discretionary accruals contribute to the market's valuation of the firm. Nichols and Whalen (2004) also contribute to the body of literature providing evidence of a stronger association between accounting accruals and abnormal returns than cash flows and abnormal returns. The studies sited suggest that the results of a positive relation between FINEXP3 and SUPP2 may not be driven by error in the measurement of discretionary accruals, but may reflect the ability of the audit committee to effectively recognize when discretionary accruals are value relevant.

FINEXP3 is significantly related to discretionary accruals, while both FINEXP1 and FINEXP2 have no significant relation to discretionary accruals. FINEXP3 measures in-depth financial knowledge of the firm, while FINEXP1 and FINEXP2 measure occupational experience (CPA and CFO respectively). This result suggests that the Sarbanes-Oxley guideline for acquisition of financial expertise through occupation or professional experience does not improve monitoring effectiveness. While FINEXP3 is employed in this study to consider the type of expertise insiders would otherwise have provided to the audit committee, the fact that FINEXP3 is also a measure of financial expertise that is **not** acquired through

occupational credentials or experience (that of a CPA or CFO) is consistent with the SEC implementation ruling. The SEC broadened the manner in which a person could acquire financial expertise and still qualify as an audit committee expert. As stated by the SEC:

> We are convinced by the weight of the comments that the proposed requirement that an expert have direct experience preparing or auditing financial statements could impose an undue burden on some companies, especially small companies, that desire to have an audit committee financial expert. We also are persuaded by commenters' arguments that persons who have experience performing in-depth analysis and evaluation of financial statements should not be precluded from being able to qualify as audit committee financial experts if they possess the other four necessary attributes of an expert. We therefore have broadened this attribute by requiring an audit committee financial expert to have experience "preparing, auditing, analyzing or evaluating" financial statements. [21]

Hence, the results of this study provide support that a person with sufficient knowledge could perform effectively as a financial expert without having experience in one of the occupations listed in the Sarbanes-Oxley guidelines.

6.2. Earnings response coefficient.

6.2.1. Multivariate test results.

6.2.1.1. Hypothesis 1.

My hypotheses predict that audit committee characteristics contribute to monitoring effectiveness. Using the explanatory power of earnings for returns (the

[21] U.S. Securities and Exchange Commission Release Nos. 33-8177; 34-47235; File No. S7-40-02 Disclosure Required by Sections 406 and 407 of the Sarbanes-Oxley Act of 2002

earnings response coefficient) as an empirical implementation of monitoring effectiveness, the predicted signs of the significant variables in this model should be positive. In order to test Hypothesis 1, I estimate the following contemporaneous one period return earnings model (earnings change model) using data from the pre-Sarbanes period:

$$R_{j,t} = \eta_0 + \eta_1[UE_{j,t}/P_{j,t-1}] + \eta_2 INDEP1_{j,t} + \eta_3 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_4 FINEXP1_{j,t}$$
$$+ \eta_5 FINEXP1_{j,t}*[UE_{j}/P_{j,t-1}] + \eta_6 FINEXP2_{j,t} + \eta_7 FINEXP2_{j,t}*[UE_{j}/P_{j,t-1}]$$
$$+ \eta_8 FINEXP3_{j,t} + \eta_9 FINEXP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{10} SUPP1_{j,t}$$
$$+ \eta_{11} SUPP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{12} SUPP2_{j,t} + \eta_{13} SUPP2_{j,t}*[UE_{j,t}/P_{j,t-1}]$$
$$+ \eta_{14} SUPP3_{j,t} + \eta_{15} SUPP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{16} OVER_{j,t}$$
$$+ \eta_{17} OVER_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{17} LEVERAGE_{j,t} + \eta_{18} LEVERAGE_{j,t}*[UE_{j,t}/P_{j,t-1}]$$
$$+ \eta_{19} GROWTH_{j,t} + \eta_{20} GROWTH_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{21} PERSIST_{j,t}$$
$$+ \eta_{22} PERSIST_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{23} BETA_{j,t} + \eta_{24} BETA_{j,t}*[UE_{j,t}/P_{j,t-1}]$$
$$+ \eta_{25} SIZE_{j,t} + \eta_{27} SIZE_{j,t}*[UE_{j,t}/P_{j,t-1}]$$
$$+ \eta_{28} - \eta_{65} FIXED\ INDUSTRY\ EFFECTS_{j,t} + \varepsilon_{j,t}.$$

The variables of interest in the earnings level model are the interactions between each audit committee characteristic and unexpected earnings; $\eta_3 INDEP1*UE$, $\eta_5 FINEXP*UE$, $\eta_7 FINEXP2*UE$, $\eta_9 FINEXP3*UE$, $\eta_{11} SUPP1*UE$, $\eta_{13} SUPP2*UE$, $\eta_{15} SUPP3*UE$, $\eta_{13} SUPP2*UE$, and $\eta_{17} OVER*UE$.

The earnings level and change model is as follows:

$$R_{j,t} = \theta_0 + \theta_1[E_{j,t}/P_{j,t-1}] + \theta_2[UE_{j,t}/P_{j,t-1}] + \theta_3 INDEP1_{j,t} + \theta_4 INDEP1_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \theta_5 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_6 FINEXP1_{j,t} + \theta_7 FINEXP1_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \theta_8 FINEXP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_9 FINEXP2_{j,t} + \theta_{10} FINEXP2_{j,t}*[E_{j,t}/P_{j,t-1}]$$

$$+ \theta_{11}\text{FINEXP2}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{12}\text{FINEXP3}_{j,t} + \theta_{13}\text{FINEXP3}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{14}\text{FINEXP3}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{15}\text{SUPP1}_{j,t} + \theta_{16}\text{SUPP1}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{17}\text{SUPP1}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{18}\text{SUPP2}_{j,t} + \theta_{19}\text{SUPP2}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{20}\text{SUPP2}_{j,t}* [\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{21}\text{SUPP3}_{j,t} + \theta_{22}\text{SUPP3}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{23}\text{SUPP3}_{j,t}* [\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{24}\text{OVER}_{j,t} + \theta_{25}\text{OVER}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{26}\text{OVER}_{j,t}* [\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{27}\text{LEVERAGE}_{j,t} + \theta_{28}\text{LEVERAGE}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+\theta_{29}\text{LEVERAGE}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{30}\text{GROWTH}_{j,t} + \theta_{31}\text{GROWTH}_{j,t} *[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{32}\text{GROWTH}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{33}\text{PERSIST}_{j,t} + \theta_{34}\text{PERSIST}_{j,t}*[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{35}\text{PERSIST}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{36}\text{BETA}_{j,t} + \theta_{37}\text{BETA}_{j,t} *[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{38}\text{BETA}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{39}\text{SIZE}_{j,t} + \theta_{40}\text{SIZE}_{j,t} *[\text{E}_{j,t}/\text{P}_{j,t-1}]$$

$$+ \theta_{41}\text{SIZE}_{j,t}*[\text{UE}_{j,t}/\text{P}_{j,t-1}] + \theta_{42} - \theta_{79}\text{FIXED INDUSTRY EFFECTS}_{j,t} + \varepsilon_{j,t}.$$

The variables of interest in the earnings level and change model are the two interaction terms for each audit committee characteristic; $\theta_4 + \theta_5$(INDEP1), $\theta_7 + \theta_8$(FINEXP1), $\theta_{10} + \theta_{11}$(FINEXP2), $\theta_{13} + \theta_{14}$(FINEXP3), $\theta_{16} + \theta_{17}$(SUPP1), $\theta_{19} + \theta_{20}$(SUPP2), $\theta_{22} + \theta_{23}$(SUPP3), $\theta_{25} + \theta_{26}$(OVER).

Table 14 provides results of the earnings change model estimates using EPS_{t-1} as the expectation for next period earnings. The measure of UE_t is therefore $\Delta\text{EPS}_{t,t-1}$. Each model estimate reflects 279 observations (31 firm-year observations did not have sufficient information to measure returns or earnings, while 45 observations are missing beta). Model 1 provides univariate results of the earnings change model. The ERC (β_1) is significant at the 1% level. When the standard contemporaneous return earnings return model is estimated to examine the ERC conditioned on audit committee characteristics (Model 2), the adjusted R^2 of the model increases from .023

to .0831. Finally, Model 3 estimates the ERC conditioned on audit committee characteristics and variables controlling for cross-sectional determinants of variations in the ERC that are established in prior literature. The adjusted R^2 of this model is substantially the same as that of Model 2. Monitoring by the audit committee clearly improves the explanatory power of earnings. In Model 3, which includes all of the control variables, UE*INDEP1, and UE*FINEXP2, are significant, but in the opposite direction to that predicted.

Table 15 provides results of the earnings level and change model estimates, again using prior period earnings as the expectation of earnings. The univariate results of Model 4 are consistent with the findings of Easton and Harris (1991). The earnings level and change model substantially improves the explanatory power of earnings. The adjusted R^2 of the level and change model is 0.0838 while that of the change model is 0.023. Model 5 provides results of the earnings level and change model estimates without control variables. As in the earnings change model, the explanatory power of earnings conditioned on audit committee monitoring improves (the R^2 increases from 0.0838 to 0.1469). When the full model is estimated, to include all control variables (Model 6), the results provide evidence that INDEP1, FINEXP2, and SUPP3 have a significant effect on the ERC, but only SUPP3 is consistent with the prediction that the ERC is increasing with audit committee monitoring. None of the control variables are significant (the results of the industry fixed effect controls are not reported). SUPP3 is a measure of whether audit committee director compensation is commensurate with the significant responsibilities undertaken, and time spent executing those responsibilities. This

result suggests that the market compounds audit committee compensation into securities pricing, and is consistent with an agency framework of the firm; director compensation further aligns the incentives of directors and shareholders. This result is also consistent with evidence provided by Boumosleh (2004) of an inverse relation between director stock options and corporate interest rates.

Consistent with Brown, Griffin, Hagerman, and Zmijewski (1987), I reestimate the above models using mean and median values of analyst consensus forecasts of annual earnings per share as a proxy for expected earnings. The number of observations used in the regression estimates is 242 (75 observations are missing either market adjusted returns, earnings, or analyst forecast information, while 38 observations are missing beta). Table 16 provides results of the earnings change model using mean analyst consensus forecasts at the start of the return cumulation period as the proxy for expected earnings. Since the results using median analyst consensus forecasts are substantially similar, they are not reported separately. Model 7 provides a univariate estimate of the ERC. The adjusted R^2 is .1054 compared to 0.023 for the model using prior period earnings as the proxy for expected earnings. Similarly, Model 8 estimates the full model including all audit committee characteristics and control variables. The adjusted R^2 of the Model 8 estimate is .1895 compared to .0873 of the full model estimate using prior period earnings. The results suggest that analyst consensus forecasts provide a superior estimate of expected earnings, and that the audit committee incrementally contributed to the earnings response coefficient. In the full model (Model 8) using this alternate proxy of expected earnings, FINEXP2 is again significant but not in the expected direction.

Table 17 provides results of the level and change model estimate using mean values of analyst consensus forecasts of annual earnings per share as a proxy for expected earnings. The level and change model was also estimated using median values of analyst consensus forecasts of annual earnings per share as a proxy for expected earnings. Since the results of this estimate are substantially similar, they are not reported here. The adjusted R^2 of the univariate estimate of the level and change model using this alternate proxy for expected earnings is .1276 compared to an adjusted R^2 of .0837 in the univariate estimate using prior period earnings as the proxy for expected earnings. The univariate results of all model estimates in this study suggest that the best estimate of the ERC is obtained in a level and change model using analyst consensus forecasts to proxy for expected earnings. Model 10 of Table 17 provides results of the full model estimation. The results provide evidence supporting Hypothesis 1 that the ERC is increasing as FINEX1 and SUPP3 increase.

6.2.1.2. Hypothesis 4.

The following model is estimated to test Hypothesis 4 and provide evidence as to whether or not the effect of audit committee characteristics on the earnings response coefficient is significantly different from zero in the post-Sarbanes period:

$$R_{j,t} = \iota + \iota_1 \Delta E + \iota_2 SOX_j + \iota_3 INDEP1_{j,t} + \iota_4 INDEP1_{j,t} * \Delta E + \iota_5 SOX * INDEP1_{j,t} * \Delta E + \iota_6 FINEXP1_{j,t} + \iota_7 FINEXP1_{j,t} * \Delta E + \iota_8 SOX * FINEXP1_j * \Delta E + \iota_9 FINEXP2_{j,t} + \iota_{10} FINEXP2_{j,t} * \Delta E + \iota_{11} SOX * FINEXP2_{j,t} * \Delta E + \iota_{12} FINEXP3_{j,t} + \iota_{13} FINEXP3_{j,t} * \Delta E + \iota_{14} SOX * FINEXP3_{j,t} * \Delta E + \iota_{15} SUPP1_{j,t} + \iota_{16} SUPP1_{j,t} * \Delta E$$

$$+ \iota_{17} SOX{*}\text{SUPP1}_{j,t}{*}\Delta E + \iota_{18}\text{SUPP2}_{j,t} + \iota_{19}\text{SUPP2}_{j,t}{*}\Delta E + \iota_{20} SOX{*}\text{SUPP2}_{j,t}{*}\Delta E$$

$$+ \iota_{21}\text{SUPP3}_{j,t} + \iota_{22}\text{SUPP3}_{j,t}{*}\Delta E + \iota_{23}\text{SOX}{*}\text{SUPP3}_{j,t}{*}\Delta E + \iota_{24}\text{OVER}_{j,t}$$

$$+ \iota_{25}\text{OVER}_{j,t}{*}\Delta E + \iota_{26} SOX{*}\text{OVER}_{j,t}{*}\Delta E + \iota_{27}\text{LEVERAGE}_{j,t}$$

$$+ \iota_{28}\text{LEVERAGE}_{j,t}{*}\Delta E + \iota_{29} SOX{*}\text{LEVERAGE}_{j,t}{*}\Delta E + \iota_{30}\text{GROWTH}_{j,t}$$

$$+ \iota_{31}\text{GROWTH}_{j,t}{*}\Delta E + \iota_{32} SOX{*}\text{GROWTH}_{j,t}{*}\Delta E + \iota_{33}\text{PERSIST}_{j,t}$$

$$+ \iota_{34}\text{PERSIST}_{j,t}{*}\Delta E + \iota_{35} SOX{*}\text{PERSIST}_{j,t}{*}\Delta E + \iota_{36}\text{BETA}_{j,t} + \iota_{37}\text{BETA}_{j,t}{*}\Delta E$$

$$+ \iota_{38} SOX{*}\text{BETA}_{j,t}{*}\Delta E + \iota_{39}\text{SIZE}_{j,t} + \iota_{40}\text{SIZE}_{j,t}{*}\Delta E + \iota_{41} SOX{*}\text{SIZE}_{j,t}{*}\Delta E$$

$$+ \iota_{42} - \iota_{79}\text{FIXED INDUSTRY EFFECTS}_{j,t} + \varepsilon_{j,t}.$$

To improve clarity of the representation of the model, $[UE_{j,t}/P_{j,t-1}]$ is replaced by ΔE. The model is estimated using 279 observations pre-Sarbanes and 63 observations post-Sarbanes. The results are not presented, as the model estimate is not full rank.

6.3. Financial performance.

6.3.1. Multivariate results.

6.3.1.1.Hypothesis 1.

The following model is estimated to test the prediction that audit committee characteristics are positively related to firm performance in the pre-Sarbanes period:

$$\text{ROA}_i = \varsigma_0 + \varsigma_1\text{INDEP1}_i + \varsigma_2\text{FINEXP1}_i + \varsigma_3\text{FINEXP2}_i + \varsigma_4\text{FINEXP3}_i +$$
$$\varsigma_5\text{SUPP1}_I + \varsigma_6\text{SUPP2}_i + \varsigma_7\text{SUPP3}_i + \varsigma_8\text{OVERSIGHT}_i + \varsigma_9\text{SIZE}_i$$
$$+ \varsigma_{10}\text{CAPEX}_i + \varsigma_{11}\text{BETA}_i + \varepsilon_i.$$

Where,

ROA = income before extraordinary items/beginning of period total assets (data 18/data 6 beginning of period).

Table 18 provides the results of this model estimate. Model 1 considers the extended measure of independence (INDEP1). In this model, SUPP2 is significant, but not in the expected direction. Model 2 provides results of an estimate using ALLIND in lieu of INDEP1 as a measure of independence. In this estimate, both ALLIND and SUPP2 are significant, but not in the predicted direction.

6.3.1.2 Hypothesis 2.

This hypothesis considers the relation of audit committee characteristics to monitoring effectiveness, conditioned upon the level of agency friction. The following model is estimated, using pre-Sarbanes data and return on assets as a proxy for monitoring effectiveness:

$$
\begin{aligned}
ROA_i = \quad & \varphi_0 + \varphi_1 INDEP1_i + \varphi_2 FINEXP1_i + \varphi_3 FINEXP2_i + \varphi_4 FINEXP3_i \\
& + \varphi_5 SUPP1_i + \varphi_6 SUPP2_i + \varphi_7 SUPP3_i + \varphi_8 OVERSIGHT_i \\
& + \varphi_9 MGTOWN_i + \varphi_{10} MGTOWN*INDEP1_i \\
& + \varphi_{11} MGTOWN*FINEXP1_i \\
& + \varphi_{12} MGTOWN* FINEXP2_i + \varphi_{13} MGTOWN*FINEXP3_i \\
& + \varphi_{14} MGTOWN*SUPP1_i + \varphi_{15} MGTOWN*SUPP2_i \\
& + \varphi_{16} MGTOWN_i*SUPP3_i + \varphi_{17} MGTOWN_i*OVER_i \\
& + \varphi_{18} SIZE_i + \varphi_{19} CAPEX_i + \varphi_{20} BETA_i + \varepsilon_{i,}.
\end{aligned}
$$

Where the variables MGTOWN*INDEP1, MGTOWN*FINEXP1, MGTOWN*FINEXP2, MGTOWN*FINEXP3, MGTOWN*SUPP1, MGTOWN*SUPP2, MGTOWN*SUPP3, and MGTOWN*OVER represent the interaction between levels of managerial ownership and each audit committee characteristic. As shown in Table 19, SUPP1 is positively related to firm performance. However, when agency friction is high (managerial shareholdings are low), the positive impact of SUPP1 on financial performance of the firm is lessened. Nonetheless, SUPP1 is an audit committee characteristic positively related to monitoring effectiveness, across all three empirical proxies of monitoring effectiveness. Oversight and firm specific financial expertise also have a positive effect on monitoring effectiveness when agency friction is high.

6.3.1.3 Hypothesis 3.

This hypothesis predicts that monitoring effectiveness improves when an independent audit committee includes financial experts. The following model is estimated using return on assets as a proxy for monitoring effectiveness:

$$ROA_i = \chi_0 + \chi_1 INDEP1_i + \chi_2 FINEXP1_i + \chi_3 FINEXP2_i + \chi_4 FINEXP3_i + \chi_5 SUPP1_i + \chi_6 SUPP2_i + \chi_7 SUPP3_i + \chi_8 OVERSIGHT_i + \chi_9 SIZE_i + \chi_{10} BETA_I + \chi_{11} CAPEX_i + \chi_{12} INDEXP1_i + \chi_{13} INDEXP2_i + \chi_{14} INDEXP3_i + \varepsilon_i.$$

This model includes the following interactive variables:

INDEXP1 = INDEP1*FINEXP1

INDEXP2 = INDEP1*FINEXP2

INDEXP3 = INDEP1*FINEXP3

The results in Table 20 do not provide support of the interactive effects of independence and financial expertise on firm performance. Furthermore, as in the earnings quality, and value relevance settings, INDEP1 on its own is not significant, yet firm specific financial expertise is indeed significant. It is possible that only certain audit committee characteristics are of importance to the financial performance of the firm. Other characteristics may be more important with respect to this setting, when the composition of the full board is considered.

6.3.1.4 Hypothesis 4.

As a final test of whether the effect of audit committee characteristics on monitoring effectiveness (in the setting of financial performance) is more pronounced in the post-Sarbanes compliance period, the following model is estimated:

$$\begin{aligned} ROA_i = {} & \psi_0 + \psi_1 SOX_i + \psi_2 INDEP1_i + \psi_3 INDEP1*SOX_i + \psi_4 FINEXP1_i \\ & + \psi_5 FINEXP1*SOX_i + \psi_6 FINEXP2_i + \psi_7 FINEXP2*SOX_i \\ & + \psi_8 FINEXP3_i + \psi_9 FINEXP3*SOX_i + \psi_{10} SUPP1_i + \psi_{11} SUPP1*SOX_i \\ & + \psi_{12} SUPP2_i + \psi_{13} SUPP2*SOX_i + \psi_{14} SUPP3_i + \psi_{15} SUPP3*SOX_i \\ & + \psi_{16} OVER_i + \psi_{17} OVER*SOX_i + \psi_{18} SIZE + \psi_{19} SIZE*SOX_i \\ & + \psi_{20} BETA + \psi_{21} BETA*SOX_i + \psi_{22} CAPEX_i + \psi_{23} CAPEX_i*SOX_i + \varepsilon_i. \end{aligned}$$

Where, SOX= an indicator variable set to 1 if the observation is post compliance with the Sarbanes-Oxley Act, and 0 otherwise. The results of this model estimate are presented in Table 21.

Unlike the earnings quality and value relevance settings, the test considering ROA as a financial performance measure shows that in the post compliance period, FINEXP1*SOX is significant but opposite to the predicted effect, while SUPP1*SOX is significant and positive. This finding emphasizes the importance of support, when measured as the sufficiency of the informational flow from management, and firm provided training, not only in the pre-Sarbanes compliance period, but this effect is more pronounced in the post-Sarbanes compliance period.

Chapter 7: Summary, Conclusions, and Research Extensions

In an agency framework of the firm, given a separation of ownership from control, the firm's board of directors and its separately standing audit committee evolve as internal monitoring mechanisms in response to the lack of goal congruence between management and outside shareholders. Regulators have expanded disclosure of audit committee composition and practices, and the most recent Sarbanes-Oxley legislation mandated that the audit committee have specific authority, resources, and responsibilities. The economic demand for audit committees and increased regulatory efforts to strengthen the audit committee motivate this study of audit committee characteristics likely to be associated with monitoring effectiveness.

This study relies on proprietary survey data to augment publicly disclosed data and to formulate extended measures of audit committee characteristics based upon the mandates of Sarbanes-Oxley. The study evaluates the contribution of audit committee independence, financial expertise, firm provided support of the audit committee, and degree of audit committee oversight to monitoring effectiveness. Three empirical implementations of monitoring effectiveness are considered; managers' discretionary accrual choices, the earnings response coefficient, and return on assets as a measure of firm performance.

The initial period of study is 2000-2001, a period just prior to compliance with the terms of the Sarbanes-Oxley Act. Therefore, to the extent those firms' audit committees voluntarily adopted Sarbanes-Oxley' mandated characteristics and competencies prior to required compliance, the results of this study provide insight to

the efficacy of this major legislation. This study also provides a more direct, but still preliminary assessment of the efficacy of the Sarbanes-Oxley mandates using 2003 public company audit committee data. The assessment is preliminary because compliance with Sarbanes-Oxley is phased in starting July 2003. Therefore, the data for the year 2003 does not reflect full compliance with all of the Sarbanes mandates.

The results call into question the presumptive reliance upon independence as a condition for audit committee monitoring effectiveness. This study finds no evidence of a relation between independence and monitoring effectiveness, when independence is defined according to the firm's exchange listing standards. One possible explanation for this apparent contradiction to findings of earlier studies may lie in the definition of independence employed. The criteria employed by the SROs during the period of this study are certainly more stringent than they were in the past. In addition, the earlier studies defined independence based on the absence of certain affiliations (Klein, 2002, Deli and Gillan, 2000). Given the myriad of possible affiliations, and changing regulatory prescriptions about affiliations over time, it is possible earlier findings were biased by measurement error.

However, the results do provide evidence that independent audit committees constrain discretionary accrual choices, when audit committees are conducting outside investigations, consulting with outside experts, and privately meeting with their firms' internal and external auditors. Hence, independence, based upon the absence of certain affiliations with management is not a sufficient condition for monitoring effectiveness. This study finds that audit committees must act independently. Moreover, independence in action is important when audit

committees include members with in-depth knowledge of the firm's financial operations. This result builds on prior literature that provides evidence that in certain settings, inside directors contribute valuable firm specific expertise.

The interactive effect of independence and firm-specific financial expertise has implications to evaluating the efficacy of the Sarbanes-Oxley legislation. Completely independent audit committees, even those including a "financial expert" may not be effective monitors. Financial expertise acquired as an accountant, auditor, or principal financial officer may not be as important as in-depth knowledge of the firm's financial operations. This finding is consistent with the SEC implementation ruling enabling firms to designate audit committee financial experts with other relevant experience.

The results provide mixed evidence on the contribution of firm provided support to audit committee-monitoring effectiveness. Audit committees that benefit from firm provided training and sufficient information from management are more likely to constrain discretionary accruals, while audit committees receiving more frequent information updates from management are less likely to constrain discretionary accruals. It is possible that a reliance on the firm to provide resources and information undermines the audit committee director's ability to monitor independently and effectively. This finding illustrates a tension between regulatory mandates to strengthen independence and simultaneously strengthen firm provided support of the audit committee. An audit committee director must be independent of the firm while simultaneously relying on the firm to provide necessary resources.

This potential conflict may impact any net benefit to the firm and its investors of compliance with Sarbanes-Oxley.

When the relation between returns and earnings (the earnings response coefficient) is considered as a measure of monitoring effectiveness, the compensation of audit committee directors becomes important. The evidence suggests that audit committees compensation that is commensurate with effort and significant responsibilities improves the value relevance of earnings. It is not surprising that director compensation may affect the returns earning relation since compensation is observable. However, the finding suggests audit committee monitoring is improved because compensation aligns the interests of audit committee directors and shareholders.

When the relation between financial performance (return on assets) and audit committee characteristics is examined, the results reinforce those of alternate tests using discretionary accruals and earnings relevance as proxies for monitoring effectiveness. Return on assets is increasing with management provided training and when management provides sufficient information to enable the committee to execute its monitoring duties. Return on assets is also increasing with a specific type of audit committee member competency; that of in-depth knowledge of the firm's financial operations. Finally, when financial performance is considered, the incremental contribution of oversight is observed. There is a positive relation between return on assets and audit committee oversight.

These results suggest several additional avenues of research. First, the empirical definition of independence requires refinement given a presumptive

reliance by regulators on audit committee director independence to improve monitoring effectiveness. Possible refinements include considering the tenure of the audit committee director, and the existence of interlocking directorships, other than the compensation committee interlock that is already prohibited by the SROs.

Additionally, what are the incentive effects of compensation on audit committee director monitoring effectiveness? Among this sample, experts with in-depth knowledge of the firm are more important. But the initial post-Sarbanes period shows a significant increase in the number of CPAs and CFOs serving on the audit committee. Would monitor effectiveness improve if audit committee directors receive differential compensation based upon the nature of expertise the member provides?

Finally, the Sarbanes-Oxley Act is the major corporate governance legislation passed in recent years that significantly affects the composition and responsibilities of the audit committee. The preliminary analysis is inconclusive since compliance with all of the requirements was not fully in place during 2003. Additional study is needed to evaluate audit committee effectiveness over a longer period of time, post full compliance with the Sarbanes-Oxley Act.

Table 1
Sample Selection

	Pilot Survey		Follow up Survey	
Total Number of Firms Surveyed:			(2003 data only)	
ASCS public company members 1,728			1,714	
CalPERS' passive portfolio 838	2,566		NA 1,714	
Less: survey returns due to address defects	42		26	
Subtotal	2,524	100%	1,688	100%
Number of responses	251	9.94%	83	4.91%
Duplicate responses	17		-	
Non identified responses	7		2	
Number of useable responses	227		81	
Number of observations (2 firm years per response)	454		(1 year) 81	
Less: Firm-year observations deleted due to incomplete responses	99		6	
Final sample (**number of firm-year observations)**	355		75	

Table 2
Comparison of Financial Measures of Surveyed Firms with Sample Firms

Panel A – Pilot Survey

Variable		Surveyed Firms	Sample Firms	t-test p value	Wilcoxon p value
ROA	Mean	-0.0020	0.0289	0.0119**	0.3909
	St. Dev.	0.5370	0.1333		
CFO	Mean	0.0870	0.0894	0.7651	0.9905
	St. Dev.	0.2397	0.1248		
MB	Mean	3.1245	2.4542	0.1093	0.0559***
	St. Dev.	15.4412	5.4451		
PE	Mean	16.5302	17.297	0.8910	0.3516
	St. Dev.	195.748	75.648		
GROWTH	Mean	0.1111	0.1088	0.9022	0.9143
	St. Dev.	0.4151	0.3023		
N		2503	305		

Panel B – Follow Up Survey

Variable		Surveyed Firms	Sample Firms	t-test p value	Wilcoxon p value
ROA	Mean	0.0220	0.1104	0.1689	0.9166
	St. Dev.	0.3249	0.5383		
CFO	Mean	0.0827	0.0983	0.1466	0.8345
	St. Dev.	0.1795	0.0783		
MB	Mean	7.0304	2.9460	0.3190	0.2963
	St. Dev.	152.6367	5.2513		
PE	Mean	19.3600	19.3865	0.9965	0.5309
	St. Dev.	193.5378	27.6984		
GROWTH	Mean	0.0894	-0.0379	0.1383	0.9166
	St. Dev.	0.3987	0.7204		
N		1420	75		

Pilot survey data pooled over two years (2000 and 2001)
Follow up survey data 2003
Data from Compustat

ROA = income before extraordinary items (data18) / beginning of year total assets (data6)
CFO = cash flow from operations (data308) / beginning of year total assets
MB = market value of equity (common shares outstanding * price per share)/book value of equity (data 199*data25)/data60
PE = price per share/basic earnings per share excluding extraordinary items (data199/data58)
GROWTH = change in sales/beginning of year total assets ($data12_{t,t-1}$)/data6

Table 3
Sample Description
Pre-Sarbanes

Variable	N	Mean	Lower Quartile	Median	Upper Quartile	Std Dev
Net income(loss) MM$	347	0.0180	0.0073	0.0281	0.0634	0.1146
Cash flow from operations MM$	304	0.0885	0.0379	0.0879	0.1422	0.1062
Total Assets MM$	347	14077.27	633.46	1680.36	7133.70	54446.07
Number of members	355	3.9521	3.00	4.00	5.00	1.1647
Percentage of independent members	353	0.9800	100.00	100.00	100.00	8.3154
Number of outside directorships	324	5.6111	2.00	5.00	8.00	4.5947
Annual frequency of meetings	353	5.1501	4.00	5.00	6.00	2.2683
Meetings with outside auditor	338	3.2041	2.00	3.00	4.00	1.8496
Meetings with internal auditor	302	2.8113	1.00	3.00	4.00	2.1070
Reviews off balance sheet activities	298	0.8758	1.00	1.00	1.00	0.3303
Reviews related party transactions	330	0.8879	1.00	1.00	1.00	0.3160
Reviews earnings press releases	351	0.8405	1.00	1.00	1.00	0.3667
Prior experience with outside auditor	347	0.0836	0.00	0.00	0.00	0.2771

Data from Compustat
Net income = data18/lagged total assets
Cash flow from operations = data308/lagged total assets
Total Assets = data6

Table 4
Sample Description
Post-Sarbanes

Variable	N	Lower Mean	Lower Quartile	Upper Median	Upper Quartile	Std Dev
Net income (loss) MM$	75	-0.0396	0.0071	0.0245	0.0552	0.6856
Cash flow from operations MM$	64	0.0480	0.0339	0.0699	0.1270	0.2039
Total Assets MM$	74	10471	341.94	2131.53	6841.80	23561.63
Number of members	75	4.0267	3.00	4.00	5.00	1.1505
Percentage of independent members	75	0.9867	100.00	100.00	100.00	0.0658
Number of outside directorships	69	5.8551	2.00	5.00	9.00	4.3699
Annual frequency of meetings	74	6.5676	4.00	6.00	8.00	2.5270
Meetings with outside auditor	74	4.1216	3.00	4.00	5.00	2.2992
Meetings with internal auditor	70	3.8000	2.00	4.00	5.00	2.6408
Reviews off balance sheet activities	67	0.8507	1.00	1.00	1.00	0.3590
Reviews related party transactions	71	0.8873	1.00	1.00	1.00	0.3184
Reviews earnings press releases	75	0.9600	1.00	1.00	1.00	0.1973
Prior experience with outside auditor	75	0.1200	0.00	0.00	0.00	0.3271

Data from Compustat
Net income = data18/lagged total assets
Cash flow from operations = data308/lagged total assets
Total Assets = data6

Table 5
Audit Committee Variable Definitions

Variable Name	Coefficient Alpha	Variable Definition (Aggregation of Survey Items)
INDEP1	.6969	Summation of: Number of annual meetings Number of private meetings with internal or external auditors Number of independent investigations Number of times the committee engages outside experts
ALLIND	NA	Dichotomous variable set to 1 if all committee members meet their exchange listing independence requirements, 0 otherwise
FINEXP1	.7568	Number of members that have CPAs, have public company audit experience, have experience auditing financial statements of comparable entities
FINEXP2	.4093	Number of members whose principal employment is in the capacity of CFO and who have prior financial experience in the firm's industry sector
FINEXP3	.9355	Members' in-depth knowledge of the firm's business operations, financial transactions, financial performance relative to industry peers, accounting principles/practices relative to industry norms, risk exposure, internal controls, internal audit scope, external audit scope
SUPP1	.8620	Sufficiency of information management provides + Management provided training in audit committee member responsibilities, company operations, GAAP changes, new or proposed accounting or auditing topics, changes in international auditing standards, regulatory changes, audit scope, financial oversight responsibilities, significant or complex or unusual transactions
SUPP2	.9374	Frequency of management updates on changes in exposure to risk from unusual transactions, derivative contracts, off balance sheet activities, related party transactions
SUPP3	.8195	Remuneration commensurate with time and significant responsibility
OVER	.8591	Percentage of specific responsibilities the audit committee undertakes, measured as the number of responsibilities the respondent selected over a total of 21 possible responsibilities

Table 6
Audit Committee Variable Descriptive Statistics

Variable		Pre-Sarbanes	Post-Sarbanes	p-value for the difference
DTAC1	N	285	58	
	Mean	0.0075	0.0017	0.6994
	Std.Dev.	0.1082	0.0769	
MADJRET12				
	N	279	63	
	Mean	0.2837	0.1535	0.0657***
	Std.Dev.	0.4802	0.6058	
CHANGE	N	279	63	
	Mean	-0.0141	0.0074	0.2189
	Std.Dev.	0.1221	0.1399	
LEVEL	N	279	63	
	Mean	0.0353	0.0393	0.8171
	Std.Dev.	0.1191	0.1345	
ROA	N	231	54	
	Mean	0.0368	0.0287	0.4403
	Std.Dev.	0.0678	0.0748	
Audit Committee Variables				
INDEP1	Mean	10.8394	14.4133	<.0001*
	Std.Dev.	5.5794	6.1668	
ALLIND	Mean	0.9296	0.9600	0.2536
	Std.Dev.	0.2562	0.1973	
FINEXP1	Mean	1.4789	1.7467	0.0910***
	Std.Dev.	2.0548	2.1378	
FINEXP2	Mean	1.6254	1.1067	0.0014**
	Std.Dev.	1.5360	1.1806	
FINEXP3	Mean	22.2648	22.4133	0.9216
	Std.Dev.	11.7693	12.3705	
SUPP1	Mean	7.9747	8.1333	0.5674
	Std.Dev.	2.2099	2.0423	
SUPP2(SQ)	Mean	2.8320	2.3618	0.0032**
	Std.Dev.	1.2211	1.3638	
SUPP3	Mean	1.3662	1.6933	0.0005*
	Std.Dev.	0.8377	0.6970	
OVER	Mean	0.8091	0.8229	0.4611
	Std.Dev.	0.1759	0.1391	
N		355	75	
Control variables				
BIG5	N	285	58	
	Mean	0.9684	0.9828	0.4778
	Std.Dev.	0.1752	0.1313	
SIZE	N	285	58	

Table 6 continued

	Mean	7.3771	7.0598	0.3047
	Std.Dev.	1.7363	2.2026	
LEVERAGE	N	285	58	
	Mean	0.6217	0.6866	0.014**
	Std.Dev.	0.2347	0.2600	
PERFORM	N	285	58	
	Mean	0.0942	0.0460	0.0955***
	Std.Dev.	0.0999	0.2123	
BETA	N	279	63	
	Mean	0.8525	0.8162	0.5444
	Std.Dev.	0.4295	0.4272	
PERSIST	N	279	63	
	Mean	0.2788	0.2323	0.3772
	Std.Dev.	0.5190	0.3363	
CAPEX	N	231	54	
	Mean	0.0809	0.0789	0.9133
	Std.Dev.	0.1268	0.1038	

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = Supp2** $^{(1/2)}$
Data from Compustat
$DTAC_{it}$ = $[TAC_{it} /TA_{i, t-1}]$ - $NDTAC_{it}$
TAC = Net income(data 123) - Cash flow from operations (data 308)
TA = lagged data 6
$NDTAC_{i,t}$ = $a[1/TA_{i, t-1}]+ b_1[\Delta SALES_{i,t}/TA_{i, t-1} - \Delta REC_{i,t}/TA_{i, t-1}]+ b_2[PPE_{i,t}/TA_{i, t-1}]$

a, b_1, and b_2 are the estimated coefficients of a first stage cross-sectional regression by industry of all Compustat firms in the sample firm's industry, excluding the sample firm, the regression estimate is using the modified-Jones model; ΔSALES are sales in $year_t$ minus sales in $year_{t-1}$(data 12), ΔREC are receivables in $year_t$ minus receivables in $year_{t-1}$(data 2) and PPE are property, plant, and equipment (data 7).

SIZE = ln(data6)
LEVERAGE =debt/assets (data6 – data60)/data6
BIG5 = 1 if outside auditor if one of the 5 largest audit firms (one of the 4 largest audit firms post-Sarbanes);0 otherwise
GROWTH = beginning of year (MVE + BV liabilities/total assets)
PERFORM = cash flow from operations/beginning of year total assets (data308/lag data6)
LEVEL = EPS_t (data18/ data25)
CHANGE = $\Delta EPS_{t,t-1}$ (data 18, $_{t,t-1}$)
ROA = data 18/beginning of period total assets (data 6)
CAPEX =data 128/data 12

Table 6 continued

Data from CRSP

MADJRET12 = buy and hold cumulative monthly raw return of firm j for the 12-month period t commencing 9 months prior to the fiscal year end through 3 months following the fiscal year end. The 12-month cumulative return is adjusted by the CRSP value weighted market return

PERSIST = first-order autocorrelation in earnings for 16 quarters

BETA = slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period

, *,*** Indicates significance at the 1, 5 and 10 percent level respectively (two-tailed tests)

Table 7
Univariate Results
Discretionary Accruals as a Measure of Monitoring Effectiveness

	Predicted Sign	Intercept	Coefficient
INDEP1	−	0.0155	-0.0002
		(12.27)	(-0.21)
ALLLIND	−	0.0146	-0.0046
		(0.74)	(-0.23)
FINEXP1	−	0.0072	0.0003
		(1.03)	(1.13)
FINEXP2	−	0.0017	0.0062***
		(0.21)	(1.79)
FINEXP3	−	-0.0107	0.0010**
		(-0.89)	(2.13)
SUPP1	−	0.0319	-0.0037
		(0.96)	(-0.90)
SUPP2(SQ)	−	-0.0494	0.0167***
		(-1.60)	(1.69)
SUPP3	−	-0.0236	0.0197
		(-1.23)	(1.64)
OVER	−	0.0013	0.0110
		(0.05)	(0.36)

Univariate regressions of DTAC on each of the audit committee variables.

$DTAC_{it} = [TAC_{it} / TA_{i, t-1}] - NDTAC_{it}$

Data from Computsat
TAC (total accruals) = Net income(data 123) - Cash flow from operations (data 308)
TA = lagged data 6
$NDTAC_{i,t} = a[1/TA_{i, t-1}] + b_1[\Delta SALES_{i,t}/TA_{i, t-1} - \Delta REC_{i,t}/TA_{i, t-1}] + b_2[PPE_{i,t}/TA_{i, t-1}]$

a, b_1, and b_2 are the estimated coefficients of a first stage cross-sectional regression by industry of all Compustat firms in the sample firm's industry, excluding the sample firm, the regression estimate is using the modified-Jones model; ΔSALES are sales in $year_t$ minus sales in $year_{t-1}$(data 12), ΔREC are receivables in $year_t$ minus receivables in $year_{t-1}$(data 2) and PPE are property, plant, and equipment (data 7)

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = Supp2** $^{(1/2)}$

* *,*** Indicates significance at the 5 and 10 percent level respectively (two-tailed tests)

Table 8
Test of Hypothesis 1
Discretionary Accruals as a Measure of Monitoring Effectiveness

Model 1: $DTAC_{i,t+1} = \alpha_0 + \alpha_1 INDEP1_i + \alpha_2 FINEXP1_i + \alpha_3 FINEXP2_i + \alpha_4 FINEXP3_i + \alpha_5 SUPP1_i + \alpha_6 SUPP2_i + \alpha_7 SUPP3_i + \alpha_8 OVERSIGHT_i + \alpha_9 BIG5_i + \alpha_{10} SIZE_i + \alpha_{11} LEVERAGE_i + \alpha_{12} PERFORM_i + \varepsilon_i$

Model 2: $DTAC_{i,t+1} = \beta_0 + \beta_1 ALLIND_i + \beta_2 FINEXP1_i + \beta_3 FINEXP2_i + \beta_4 FINEXP3_i + \beta_5 SUPP1_i + \beta_6 SUPP2_i + \beta_7 SUPP3_i + \beta_8 OVERSIGHT_i + \beta_9 BIG5_i + \beta_{10} SIZE_i + \beta_{11} LEVERAGE_i + \beta_{12} PERFORM_i + \varepsilon_i$

Variable	Predicted Sign	Model 1 Coefficient	(t value)	Model 2 Coefficient	(t value)
Intercept		-0.0416	-0.39	-0.0400	-0.35
INDEP1	−	-0.0024	-1.04	-	
ALLIND	−	-		-0.0002	-0.00
FINEXP1	−	-0.0039	-0.65	-0.0049	-0.81
FINEXP2	−	-0.0033	-0.37	-0.0036	-0.41
FINEXP3	−	0.0029**	2.39	0.0026**	2.20
SUPP1	−	-0.0124**	-2.14	-0.0125**	-2.14
SUPP2(SQ)	−	0.0283**	2.69	0.0269**	2.55
SUPP3	−	0.0160	1.06	0.0168	1.11
OVER	−	-0.0853	-1.09	-0.0869	-1.14
BIG5		0.0723	1.00	0.0729	1.01
SIZE		0.0159**	1.99	0.0136***	1.73
LEVERAGE		-0.1899	-3.55	-0.1892**	-3.54
PERFORM		0.0671	0.57	0.0763	0.65
Adj R^2		0.0706		0.0637	
F		2.83		2.65	
Pr > F		0.0011		0.0022	
N		290		290	

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = Supp2**$^{(1/2)}$

Data from Compustat
SIZE = ln(data6)
LEVERAGE = debt/assets (data6 – data60)/data6
BIG5 = 1 if outside auditor if one of the 5 largest audit firms; 0 otherwise
GROWTH = beginning of year (MVE + BV liabilities/total assets)
PERFORM = cash flow from operations/beginning of year total assets (data308/lag data6)

* *,*** Indicates significance 5 and 10 percent level respectively (two-tailed tests)

Table 9
Test of Hypothesis 2
Discretionary Accruals as a Measure of Monitoring Effectiveness

Model 3: $DTAC_i = \gamma_0 + \gamma_1 INDEP1_i + \gamma_2 FINEXP1_i + \gamma_3 FINEXP2_i + \gamma_4 FINEXP3_i + \gamma_5 SUPP1_i + \gamma_6 SUPP2_i + \gamma_7 SUPP3_i + \gamma_8 OVERSIGHT_i + \gamma_9 MGTOWN_i + \gamma_{10} MGTOWN*INDEP1_i + \gamma_{11} MGTOWN*FINEXP1_i + \gamma_{12} MGTOWN_* FINEXP2_i + \gamma_{13} MGTOWN*FINEXP3_i + \gamma_{14} MGTOWN*SUPP1_i + \gamma_{15} MGTOWN*SUPP2_i + \gamma_{16} MGTOWN_i*SUPP3_i + \gamma_{17} MGTOWN_i*OVER_i + \gamma_{18} BIG5_i + \gamma_{19} SIZE_i + \gamma_{20} LEVERAGE_i + \gamma_{21} PERFORM_i + \varepsilon_i$

Model 4: Reduced estimate of Model 3 using the backward elimination selection procedure (table includes only those variables left in the model that are significant at the 10% level)

Variable	Predicted Sign	Model 3 Coefficient	t Value	Model 4 Coefficient	F Value
Intercept	−	-0.0747	-1.07	-0.0499	1.29
INDEP1	−	-0.0026	-1.70***		
FINEXP1	−	0.0052	1.20		
FINEXP2	−	0.0012	0.19		
FINEXP3	−	0.0007	0.76	0.0009	2.73***
SUPP1	−	-0.0058	-1.51	-0.0073	5.17**
SUPP2(SQ)	−	0.0162	2.22**	0.0178	7.77**
SUPP3	−	0.0098	0.99		
OVER	−	0.0455	0.72		
MGTOWN	−	0.0219	0.26		
MGTOWN*INDEP1	−	0.0025	1.04		
MGTOWN*FINEXP1	−	-0.0052	-0.80		
MGTOWN*FINEXP2	−	-0.0047	-0.49		
MGTOWN*FINEXP3	−	0.0002	0.16		
MGTOWN*SUPP1	−	0.0064	1.03	0.0082	5.19**
MGTOWN*SUPP2	−	-0.0256	-2.20**	-0.0280	8.72**
MGTOWN*SUPP3	−	-0.0238	-1.39		
MGTOWN*OVER	−	0.0092	0.10		
BIG5		0.0805	2.16**	0.0793	4.82**
SIZE		-0.0060	-1.15		
LEVERAGE		0.0496	1.54		
PERFORM		-0.2507	-3.49**	-0.2420	12.19**
Adj R^2		0.0832			
F		2.11	5.03		
Pr > F		0.0039	<.0001		
N		258	258		

Refer to Table 5 for audit committee variable definitions.

SUPP2(SQ) = $Supp2^{**(1/2)}$

Table 9 continued

MGTOWN	= indicator variable set to 1 if proportion of managerial shareholdings < median industry managerial shareholdings; 0 otherwise, shareholdings of the top 5 executives of the firm are obtained from Execucomp
BIG5	= 1 if outside auditor if one of the 5 largest audit firms; 0 otherwise
SIZE	= ln(data6)
LEVERAGE	= debt/assets (data6 – data60)/data6
PERFORM	= cash flow from operations/beginning of year total assets (data308/lag data6)

* *,*** Indicates significance 5 and 10 percent level respectively (two-tailed tests)

Table 10
Test of Hypothesis 3
Discretionary Accruals as a Measure of Monitoring Effectiveness using INDEP1 as the Measure of Independence

Model 5: $DTAC_i = \delta_0 + \delta_1 INDEP1_i + \delta_2 INDEP1*FINEXP1_i + \delta_3 FINEXP1_i + \delta_4 INDEP1*FINEXP2_i + \delta_5 FINEXP2_i + \delta_6 INDEP1*FINEXP3_i + \delta_7 FINEXP3_i + \delta_8 SUPP1_i + \delta_9 SUPP2_i + \delta_{10} SUPP3_i + \delta_{11} OVER_i + \delta_{12} LEVERAGE_i + \delta_{13} EXTREME_i + \delta_{14} SIZE_i + \varepsilon_i$

Model 6: Reduced estimate of Model 5 using the backward elimination selection procedure (table includes only those variables left in the model that are significant at the 10% level)

	Model 5		Model 6	
Variable	Coefficient	t Value	Coefficient	F Value
Intercept	0.0099	0.09	0.0470	0.40
INDEP1	-0.0096	-1.50	-0.0096	8.09**
FINEXP1	-0.0014	-0.11		
FINEXP2	0.0180	0.89		
FINEXP3	-0.0023	-0.82		
SUPP1	-0.0120	-2.06**	-0.0134	5.71**
SUPP2(SQ)	0.0251	2.33**	0.0257	6.71**
SUPP3	0.0170	1.13		
OVER	-0.0730	-0.93		
BIG5	0.0705	0.97		
SIZE	0.0178	2.19**	0.0189	6.22**
LEVERAGE	-0.1903	-3.57**	-0.2015	15.35**
PERFORM	0.0835	0.71		
INTER1	-0.0003	-0.31		
INTER2	-0.0021	-1.23		
INTER3	0.0005	2.05**	0.0003	8.15**
Adj R^2				
F	2.65		5.54	
Pr > F	0.0009		<.0001	
N	290		290	

Refer to Table 5 for audit committee variable definitions.
SUPP2(SQ) = Supp2**(1/2)
INTER1 = INDEP1*FINEXP1
INTER2 = INDEP1*FINEXP2
INTER3 = INDEP1*FINEXP3
BIG5 = 1 if outside auditor if one of the 5 largest audit firms; 0 otherwise
SIZE = ln(data6)
LEVERAGE = debt/assets (data6 – data60)/data6
PERFORM = cash flow from operations/beginning of year total assets (data308/lag data6)
* *,*** Indicates significance 5 and 10 percent level respectively (two-tailed tests)

Table 11
Test of Hypothesis 3
Discretionary Accruals as a Measure of Monitoring Effectiveness using ALLIND as a Measure of Independence

Model 7: $DTAC_i = \kappa_0 + \kappa_1 ALLIND_i + \kappa_2 INDEP1*FINEXP1_i + \kappa_3 FINEXP1_i + \kappa_4 INDEP1*FINEXP2_i + \kappa_5 FINEXP2_i + \kappa_6 INDEP1*FINEXP3_i + \kappa_7 FINEXP3_i + \kappa_8 SUPP1_i + \kappa_9 SUPP2_i + \kappa_{10} SUPP3_i + \kappa_{11} OVER_i + \kappa_{12} LEVERAGE_i + \kappa_{13} EXTREME_i + \kappa_{14} SIZE_i + \varepsilon_i.$

Model 8: Model 7 estimated using backward elimination selection procedure (table includes only those variables left in the model that are significant at the 10% level)

Variable	Model 7 Coefficient	t Value	Model 8 Coefficient	F Value
Intercept	-0.0456	-0.39	-0.0177	0.06
ALLIND	0.0014	0.03		
FINEXP1	-0.0018	-0.14		
FINEXP2	0.0296	1.57	0.0310	4.08**
FINEXP3	0.0005	0.25		
SUPP1	-0.0126	-2.16	-0.0141	6.22**
SUPP2(SQ)	0.0284	2.67**	0.0273	7.42**
SUPP3	0.0164	1.09		
OVER	-0.0975	-1.26		
BIG5	0.0635	0.87		
SIZE	0.0149	1.88***	0.0167	4.81**
LEVERAGE	-0.1913	-3.58**	-0.2014	15.27**
PERFORM	0.0733	0.62		
INTER1	-0.0003	-0.27		
INTER2	-0.0030	-1.97***	-0.0034	7.48**
INTER3	0.0002	1.38	0.0002	7.04**
Adj R^2	0.0711			
F	2.47		4.68	
Pr > F	0.0020		<.0001	
N	290		290	

Refer to Table 5 for audit committee variable definitions.

SUPP2(SQ) = Supp2**$^{(1/2)}$
BIG5 = 1 if outside auditor if one of the 5 largest audit firms; 0 otherwise
SIZE = ln(data6)
LEVERAGE = debt/assets (data6 – data60)/data6
PERFORM = cash flow from operations/beginning of year total assets (data308/lag data6)

Table 11 continued

INTER1 = INDEP1*FINEXP1
INTER2 = INDEP1*FINEXP2
INTER3 = INDEP1*FINEXP3

* *,*** Indicates significance 5 and 10 percent level respectively (two-tailed tests)

Table 12
Test of Hypothesis 4
Discretionary Accruals as a Measure of Monitoring Effectiveness

$$DTAC_i = \zeta_0 + \zeta_1 SOX_i + \zeta_2 INDEP1_i + \zeta_3 INDEP1*SOX_i + \zeta_4 FINEXP1_i + \zeta_5 FINEXP1*SOX_i + \zeta_6 FINEXP2_i + \zeta_7 FINEXP2*SOX_i + \zeta_8 FINEXP3_i + \zeta_9 FINEXP3*SOX_i + \zeta_{10} SUPP1_i + \zeta_{11} SUPP1*SOX_i + \zeta_{12} SUPP2_i + \zeta_{13} SUPP2*SOX_i + \zeta_{14} SUPP3_i + \zeta_{15} SUPP3*SOX_i + \zeta_{16} OVER_i + \zeta_{17} OVER*SOX_i + \zeta_{18}(\text{control variables})_i + \varepsilon_i$$

Variable	Parameter Estimate	t Value
Intercept	-0.0301	-0.57
SOX	0.2033	1.21
INDEP1	-0.0009	-0.80
INDEP1*SOX	0.0004	0.15
FINEXP1	0.0018	0.62
FINEXP1*SOX	-0.0058	-0.72
FINEXP2	0.0002	0.05
FINEXP2*SOX	-0.0120	-0.83
FINEXP3	0.0012	2.11**
FINEXP3*SOX	-0.0016	-1.19
SUPP1	-0.0051	-1.80***
SUPP1*SOX	0.0075	0.82
SUPP2 (SQ)	0.0075	1.47
SUPP2*SOX	-0.0170	-1.38
SUPP3	0.0019	0.26
SUPP3*SOX	-0.0031	-0.13
OVER	0.0042	0.11
OVER*SOX	-0.1325	-1.16
LEVERAGE	0.0508	1.84***
LEVERAGE*SOX	0.0623	0.90
$\delta_{10} + \delta_{11}$	0.1131	3.13**
BIG5	0.0812	2.33**
BIG5*SOX	-0.1409	-1.20
SIZE	-0.0055	-1.42
SIZE*SOX	0.0007	0.07
PERFORM	-0.1657	-2.77*
PERFORM*SOX	0.3491	3.47*
$\delta_{18} + \delta_{19}$	0.1835	5.12**
GROWTH	-0.0106	-3.42*
GROWTH*SOX	0.0004	0.02
F Value	2.18	
Pr > F	0.0008	
R-Square	0.1575	
Adj R-Sq	0.0852	
N	343	

Table 12 continued

Refer to Table 5 for audit committee variable definitions.

SUPP2(SQ) = Supp2**$^{(1/2)}$
SOX = an indicator variable set to 1 if the observation is post compliance with the Sarbanes-Oxley Act, and 0 otherwise
BIG5 = 1 if outside auditor if one of the 5 largest audit firms (one of the 4 largest audit firms post-Sarbanes); 0 otherwise
SIZE = ln(data6)
LEVERAGE = debt/assets (data6 – data60)/data6
PERFORM = cash flow from operations/beginning of year total assets (data308/lag data6)
GROWTH = ((data 25 * data 199) + (data6 – data 60))/beginning data6
, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 13
Sensitivity Tests (using performance matched accruals)

Model 10: PMATCH= v_0INDEP1 + v_1FINEXP1+ v_2FINEXP2 + v_3FINEXP3
+ v_4SUPP1 + v_5SUPP2 + v_6SUPP3 + v_7OVER + v_8MGTOWN
+ v_9MGTOWN*INDEP1 + v_{10}MGTOWN*FINEXP1
+ v_{11}MGTOWN*FINEXP2 + v_{12}MGTOWN*FINEXP3
+ v_{13} MGTOWN*SUPP1 + v_{14}MGTOWN*SUPP2
+ v_{15}MGTOWN*SUPP3 + v_{16}MGTOWN*OVER + v_{17}BIG5
+ v_{18}SIZE + v_{19}LEVERAGE

Estimated using backward elimination selection procedure, this table reflects all variables left in the model that are significant at the 10% level.

Variable	Coefficient	F value
Intercept	-0.0804	3.78
SUPP1	-0.0055	3.02
SUPP2(SQ)	0.0166	6.85
OVER	0.0809	3.05
MGTOWN*INDEP1	0.0036	4.25
MGTOWN*SUPP2	-0.0163	4.97

The Jones model is estimated to compute discretionary accruals for each sample firm/year observation as follows:

$TAC_{jt}/ TA_{j, t-1}= \beta_{0j,t} + \beta_{1j,t}[1/TA_{j, t-1}]+ \beta_{2j,t}[\Delta SALES_{j,t} /TA_{j, t-1}] + \beta_{3j}[PPE_{j,t} /TA_{j, t-1}] + \varepsilon_{j,t}$

As per Kothari et al. (2005), the model includes an intercept term to improve correction for heteroscedasticity. An industry-by-industry least squares regression is estimated using all firms with the same two-digit SIC code as the sample firm but excluding the sample firm. Industries are eliminated if there are fewer than 10 observations in a given year. Observations are eliminated if there is not sufficient data to estimate the accruals model or if the absolute value of total assets scaled by lagged total assets exceeds 1. All variables are winsorized at the 1st and 99th percentiles.

Each sample firm is matched to a control firm by industry (2 digit SIC code) and by the closest ROA_t. Discretionary accruals for the control firms are the residuals from the above model estimate.

Pmatch = Jones model discretionary accrual of the sample firm – Jones model residual of the control firm

Refer to Table 5 for audit committee variable definitions.

Additional variables used to test Hypothesis 2:

MGTOWN = indicator variable set to 1 if proportion of managerial shareholdings < median industry managerial shareholdings; 0 otherwise

Table 14
Tests of Hypothesis 1
Earnings Response Coefficient as a Measure of Monitoring Effectiveness
(change model using prior period earnings as a proxy for expected earnings)

$$R_{j,t} = \eta_0 + \eta_1[UE_{j,t}/P_{j,t-1}] + \eta_2 INDEP1_{j,t} + \eta_3 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_4 FINEXP1_{j,t} + \eta_5 FINEXP1_{j,t}*[UE_j/P_{j,t-1}] + \eta_6 FINEXP2_{j,t} + \eta_7 FINEXP2_{j,t}*[UE_j/P_{j,t-1}] + \eta_8 FINEXP3_{j,t} + \eta_9 FINEXP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{10} SUPP1_{j,t} + \eta_{11} SUPP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{12} SUPP2_{j,t} + \eta_{13} SUPP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{14} SUPP3_{j,t} + \eta_{15} SUPP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{16} OVER_{j,t} + \eta_{17} OVER_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{17} LEVERAGE_{j,t} + \eta_{18} LEVERAGE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{19} GROWTH_{j,t} + \eta_{20} GROWTH_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{21} PERSIST_{j,t} + \eta_{22} PERSIST_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{23} BETA_{j,t} + \eta_{24} BETA_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{25} SIZE_{j,t} + \eta_{27} SIZE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \eta_{28} - \eta_{65} FIXED\ INDUSTRY\ EFFECTS_{j,t} + \varepsilon_{j,t}$$

	Model 1(ERC) Parameter		Model 2 (ERC) Parameter		Model 3 (ERC) Parameter	
Variable	Estimate	t Value	Estimate	t Value	Estimate	t Value
Intercept	0.2928	10.23*	0.2002	1.21	0.4531	0.84
UE	0.6408	2.75*	-0.7182	-0.37	2.1439	0.77
INDEP1			-0.0041	-0.76	-0.0091	-1.24
UE*INDEP1			-0.0953	-1.60	-0.1289	-1.69***
FINEXP1			-0.0146	-0.94	-0.0214	-1.17
UE*FINEXP1			-0.5413	-3.05*	-0.2288	-0.99
FINEXP2			-0.0028	-0.14	0.0042	0.17
UE*FINEXP2			-0.4174	-2.44**	-0.5214	-2.27**
FINEXP3			-0.0017	-0.69	-0.0024	-0.75
UE*FINEXP3			0.0486	1.91***	0.0316	1.02
SUPP1			-0.0053	-0.39	-0.0052	-0.30
UE*SUPP2			-0.4972	-2.72*	-0.2639	-1.22
SUPP2(SQ)			0.0508	2.12**	0.0359	1.33
UE*SUPP2			0.5216	2.34**	0.2993	1.09
SUPP3			0.0184	0.51	0.0579	1.26
UE*SUPP3			0.4818	1.63	0.5679	1.36
OVER			0.1137	0.62	0.1510	0.69
UE*OVER			7.1282	3.71*	2.8264	1.05
LEVERAGE					0.0603	0.23
UE*LEVERAGE					-0.9403	-0.45
GROWTH					-0.0062	-0.28
UE*GROWTH					0.7234	1.10
SIZE					-0.0242	-0.89
UE*SIZE					0.0833	0.35
BETA					-0.2520	-2.36**

Table 14 continued

UE*BETA			-1.7524	-1.90***
PERSIST			0.0807	0.63
UE*PERSIST			0.2472	0.78
F Value	7.56	2.48	1.41	
Pr > F	0.0064	0.0012	0.0365	
R-Square	0.0266	0.1391	0.3007	
Adj R-Sq	0.023	0.0831	0.0873	
N	279	279	279	

Refer to Table 5 for audit committee variable definitions.

Data from Compustat

SUPP2(SQ)	= Supp2**$^{(1/2)}$
UE_t	= $\Delta EPS_{t,t-1}$ (data 18/ data 25, $_{t,t-1}$)
LEVERAGE	= debt/assets (data6 – data60)/data6
GROWTH	= ((data 25 * data 199) + (data6 – data 0))/beginning data6
SIZE	= ln(data6)
PERSIST	= coefficient from a regression of EPS_t on EPS_{t-1} (data 19) for 16 quarters prior to the fiscal year end of the sample firm
FIXED INDUSTRY EFFECTS	= dummy variable set to 1 for each 2-digit SIC code of the sample firm, 0 if the firm is not in that 2-digit SIC code

Data from Crsp

BETA	= coefficient from a regression of return on value weighted market return for a period of 60 months prior to the fiscal year end of the sample firm

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 15
Tests of Hypothesis 1
Earnings Response Coefficient as a Measure of Monitoring Effectiveness (earnings level + earnings change using prior period earnings as a proxy for expected earnings)

$$R_{j,t} = \theta_0 + \theta_1[E_{j,t}/P_{j,t-1}] + \theta_2[UE_{j,t}/P_{j,t-1}] + \theta_3 INDEP1_{j,t} + \theta_4 INDEP1_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_5 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_6 FINEXP1_{j,t} + \theta_7 FINEXP1_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_8 FINEXP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_9 FINEXP2_{j,t} + \theta_{10} FINEXP2_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{11} FINEXP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{12} FINEXP3_{j,t} + \theta_{13} FINEXP3_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{14} FINEXP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{15} SUPP1_{j,t} + \theta_{16} SUPP1_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{17} SUPP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{18} SUPP2_{j,t} + \theta_{19} SUPP2_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{20} SUPP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{21} SUPP3_{j,t} + \theta_{22} SUPP3_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{23} SUPP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{24} OVER_{j,t} + \theta_{25} OVER_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{26} OVER_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{27} LEVERAGE_{j,t} + \theta_{28} LEVERAGE_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{29} LEVERAGE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{30} GROWTH_{j,t} + \theta_{31} GROWTH_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{32} GROWTH_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{33} PERSIST_{j,t} + \theta_{34} PERSIST_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{35} PERSIST_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{36} BETA_{j,t} + \theta_{37} BETA_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{38} BETA_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{39} SIZE_{j,t} + \theta_{40} SIZE_{j,t}*[E_{j,t}/P_{j,t-1}] + \theta_{41} SIZE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \theta_{42} - \theta_{79} FIXED\ INDUSTRY\ EFFECTS_{j,t} + \varepsilon_{j,t}$$

	Model 4		Model 5		Model 6	
	Parameter		Parameter		Parameter	
Variable	Estimate	t Value	Estimate	t Value	Estimate	t Value
Intercept	0.2336	7.58*	0.1850	0.62	0.7693	1.01
E	1.3375	4.40*	-0.7658	-0.21	-4.2568	-0.65
UE	-0.2049	-0.69	-1.0968	-0.29	6.1282	0.93
ERC	1.1326	20.21*	-1.8625	0.82	1.8714	0.43
INDEP1			-0.0109	-1.25	-0.0240	-1.98**
E*INDEP1			0.1089	1.06	0.2638	1.70***
UE*INDEP1			-0.2279	-1.93***	-0.4161	-2.43**
$\theta_4 + \theta_5$			-0.1190	3.61***	-0.1523	3.70**
FINEXP1			0.0074	0.34	0.0193	0.65
E*FINEXP1			-0.2883	-1.13	-0.4476	-1.15
UE*FINEXP1			-0.0339	-0.12	0.5965	1.51
$\theta_7 + \theta_8$			-0.3222	2.88***	0.1489	0.30
FINEXP2			0.0178	0.76	0.0041	0.12
E*FINEXP2			-0.2861	-1.20	-0.2084	-0.51
UE*FINEXP2			-0.2587	-1.19	-0.6159	-1.75***
$\theta_{10} + \theta_{11}$			-0.5448	6.46**	-0.8243	6.12**
FINEXP3			-0.0002	-0.05	-0.0022	-0.39
E*FINEXP3			-0.0221	-0.53	0.0059	0.09
UE*FINEXP3			0.0545	1.52	0.0186	0.32
$\theta_{13} + \theta_{14}$			0.0324	1.06	0.0245	0.37
SUPP1			0.0115	0.50	0.0095	0.29
E*SUPP1			-0.0969	-0.35	-0.0669	-0.18
UE*SUPP1			-0.1021	-0.36	0.1630	0.44
$\theta_{16} + \theta_{17}$			-0.1990	0.93	0.0961	0.12

Table 15 continued

SUPP2(SQ)	0.0860	2.35**	0.0306	0.62
E*SUPP2	-0.7605	-1.69***	-0.2166	-0.34
UE*SUPP2	0.7464	1.76***	0.2854	0.56
$\theta_{19}+\theta_{20}$	-0.0142	0.00	0.0688	0.03
SUPP3	-0.0256	-0.55	0.0806	1.31
E*SUPP3	0.8030	1.41	-0.0286	-0.04
UE*SUPP3	0.2517	0.45	0.8998	1.25
$\theta_{22}+\theta_{23}$	1.0546	10.81*	0.8712	3.28***
OVER	-0.2350	-0.89	-0.5037	-1.48
E*OVER	6.0029	1.88***	10.5519	2.45**
UE*OVER	2.1729	0.61	-6.4796	-1.41
$\theta_{25}+\theta_{26}$	8.1758	14.78*	4.0724	1.62
LEVERAGE			0.2186	0.55
E*LEVERAGE			-2.5377	-0.57
UE*LEVERAGE			0.4603	0.11
$\theta_{28}+\theta_{29}$			-2.0775	0.63
GROWTH			-0.0197	-0.77
E*GROWTH			0.0224	0.03
UE*GROWTH			-0.0325	-0.04
$\theta_{31}+\theta_{32}$			-0.0101	0.00
PERSIST			0.2338	1.43
E*PERSIST			-2.7271	-1.34
UE*PERSIST			2.6274	1.46
$\theta_{34}+\theta_{35}$			-0.0997	0.05
BETA			-0.1060	-0.82
E*BETA			-1.1791	-0.68
UE*BETA			-0.2156	-0.13
$\theta_{37}+\theta_{38}$			-1.3947	1.65
SIZE			-0.0498	-1.42
E*SIZE			0.0984	0.25
UE*SIZE			-0.1020	-0.28
$\theta_{40}+\theta_{41}$			-0.0036	0.00
F Value	13.70	2.84		1.67
Pr > F	<.0001	<.0001		0.0022
R-Square	0.0903	0.2267		0.3989
Adj R-Sq	0.0837	0.1469		0.1603
N	279	279		279

Refer to Table 5 for audit committee variable definitions.

Table 15 continued

SUPP2 = Supp2**$^{(1/2)}$
Data from Compustat

$E_{j,t}$	= earnings level per share EPS_t (Compustat data18/Compustat data25)
$UE_{j,t}$	= earnings change per share ($\Delta EPS_{t,t-1}$)
SUPP2(SQ)	= Supp2**$^{(1/2)}$
UE_t	= $\Delta EPS_{t,t-1}$ (data 18/ data 25, $_{t,t-1}$)
LEVERAGE	= debt/assets (data6 – data60)/data6
GROWTH	= ((data 25 * data 199) + (data6 – data 0))/beginning data6
SIZE	= ln(data6)
PERSIST	= coefficient from a regression of EPS_t on EPS_{t-1} (data 19) for 16 quarters prior to the fiscal year end of the sample firm
FIXED INDUSTRY EFFECTS	= dummy variable set to 1 for each 2-digit SIC code of the sample firm, 0 if the firm is not in that 2-digit SIC code
Data from Crsp	
BETA	= coefficient from a regression of return on value weighted market return for a period of 60 months prior to the fiscal year end of the sample firm

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 16
Tests of Hypothesis 1
Earnings Response Coefficient as a Measure of Monitoring Effectiveness
(earnings change using analyst forecasts as a proxy for expected earnings)

$$R_{j,t} = \lambda_0 + \lambda_1[UE_{j,t}/P_{j,t-1}] + \lambda_2 INDEP1_{j,t} + \lambda_3 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_4 FINEXP1_{j,t} + \lambda_5 FINEXP1_{j,t}*[UE_{j}/P_{j,t-1}] + \lambda_6 FINEXP2_{j,t} + \lambda_7 FINEXP2_{j,t}*[UE_{j}/P_{j,t-1}] + \lambda_8 FINEXP3_{j,t} + \lambda_9 FINEXP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{10} SUPP1_{j,t} + \lambda_{11} SUPP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{12} SUPP2_{j,t} + \lambda_{13} SUPP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{14} SUPP3_{j,t} + \lambda_{15} SUPP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{16} OVER_{j,t} + \lambda_{17} OVER_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{17} LEVERAGE_{j,t} + \lambda_{18} LEVERAGE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{19} GROWTH_{j,t} + \lambda_{20} GROWTH_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{21} PERSIST_{j,t} + \lambda_{22} PERSIST_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{23} BETA_{j,t} + \lambda_{24} BETA_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{25} SIZE_{j,t} + \lambda_{27} SIZE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \lambda_{28} - \lambda_{65} FIXED\ INDUSTRY\ EFFECTS_{j,t} + \varepsilon_{j,t}$$

	Model 7		Model 8	
Variable	Coefficient	t Value	Coefficient	t Value
INTERCEPT	0.3274	10.79*	0.9672	1.78***
UE	2.7847	5.42*	-3.0950	-0.39
INDEP1			-0.0121	-1.51
UE*INDEP1			-0.2250	-1.05
FINEXP1			-0.0149	-0.70
UE*FINEXP1			0.9288	1.49
FINEXP2			-0.0225	-0.85
UE*FINEXP2			-2.1681	-2.11**
FINEXP3			-0.0011	-0.32
UE*FINEXP3			0.0851	0.72
SUPP1			-0.0108	-0.59
UE*SUPP1			0.1890	0.37
SUPP2(SQ)			-0.0096	-0.33
UE*SUPP2			0.1364	0.17
SUPP3			0.0027	0.05
UE*SUPP3			0.6205	0.57
OVER			0.7392	2.88*
UE*OVER			8.5528	1.04
LEVERAGE			0.1383	0.49
UE*LEVERAGE			-5.6783	-0.90
GROWTH			-0.0664	-2.51**
UE*GROWTH			0.4595	0.30
SIZE			-0.0689	-2.16**
UE*SIZE			0.7296	1.07
BETA			-0.2226	-1.97***
UE*BETA			-1.6741	-0.68
PERSIST			-0.0607	-0.73
UE*PERSIST			-2.3630	-0.88
F Value	29.39		1.89	
Pr > F	<.0001		0.0006	
R-Square	0.1091		0.4014	

Table 16 continued

Adj R-Sq	0.1054	0.1895
N	242	242

Refer to Table 5 for audit committee variable definitions.

SUPP2(SQ)	= Supp2**(1/2)|
UE_t	= EPS_t – the mean analyst consensus forecast occurring at the start of the return cumulation period for the year end of the observation
LEVERAGE	= debt/assets (data6 – data60)/data6
GROWTH	= ((data 25 * data 199) + (data6 – data 0))/beginning data6
SIZE	= ln(data6)
PERSIST	= coefficient from a regression of EPS_t on EPS_{t-1} (data 19) for 16 quarters prior to the fiscal year end of the sample firm
FIXED INDUSTRY EFFECTS	= dummy variable set to 1 for each 2-digit SIC code of the sample firm, 0 if the firm is not in that 2-digit SIC code
Data from Crsp	
BETA	= coefficient from a regression of return on value weighted market return for a period of 60 months prior to the fiscal year end of the sample firm

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 17
Tests of Hypothesis 1
Earnings Response Coefficient as a Measure of Monitoring Effectiveness
(earnings level + earnings change using analyst forecasts as a proxy for expected earnings)

$$R_{j,t} = \omega_0 + \omega_1[E_{j,t}/P_{j,t-1}] + \omega_2[UE_{j,t}/P_{j,t-1}] + \omega_3 INDEP1_{j,t} + \omega_4 INDEP1_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_5 INDEP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_6 FINEXP1_{j,t} + \omega_7 FINEXP1_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_8 FINEXP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_9 FINEXP2_{j,t} + \omega_{10} FINEXP2_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{11} FINEXP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{12} FINEXP3_{j,t} + \omega_{13} FINEXP3_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{14} FINEXP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{15} SUPP1_{j,t} + \omega_{16} SUPP1_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{17} SUPP1_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{18} SUPP2_{j,t} + \omega_{19} SUPP2_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{20} SUPP2_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{21} SUPP3_{j,t} + \omega_{22} SUPP3_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{23} SUPP3_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{24} OVER_{j,t} + \omega_{25} OVER_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{26} OVER_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{27} LEVERAGE_{j,t} + \omega_{28} LEVERAGE_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{29} LEVERAGE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{30} GROWTH_{j,t} + \omega_{31} GROWTH_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{32} GROWTH_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{33} PERSIST_{j,t} + \omega_{34} PERSIST_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{35} PERSIST_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{36} BETA_{j,t} + \omega_{37} BETA_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{38} BETA_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{39} SIZE_{j,t} + \omega_{40} SIZE_{j,t}*[E_{j,t}/P_{j,t-1}]$$
$$+ \omega_{41} SIZE_{j,t}*[UE_{j,t}/P_{j,t-1}] + \omega_{42} - \omega_{79} \text{FIXED INDUSTRY EFFECTS}_{j,t} + \varepsilon_{j,t}$$

	Model 9 Parameter		Model 10 Parameter	
Variable	Estimate	t Value	Estimate	t Value
Intercept	0.21792	4.29*	0.9246	1.07
LEVEL1	1.65056	2.67*	-2.2558	-0.28
UE	1.40756	1.95**	-15.9234	-1.40
ERC	3.05812	34.93*	-18.1792	4.03**
INDEP1			-0.0333	-2.19**
E*INDEP1			0.4103	2.12**
UE1*INDEP1			-0.4566	-1.69***
ω4 + ω5			-0.0463	0.04
FINEXP1			0.0690	1.54
E*FINEXP1			-0.9813	-1.74***
UE1*FINEXP1			2.3209	2.46**
ω7+ ω8			1.3396	4.15**
FINEXP2			-0.0646	-1.24
E*FINEXP2			0.6217	0.88
UE1*FINEXP2			-1.9777	-1.71**
ω10+ ω11			-1.3560	1.66
FINEXP3			-0.0023	-0.26
E*FINEXP3			0.0433	0.41
UE1*FINEXP3			0.0860	0.53
ω13+ ω14			0.1293	0.84
SUPP1			0.0268	0.62
E*SUPP1			-0.3760	-0.73
UE1*SUPP1			1.2326	1.83***

Table 17 continued

ω16+ ω17		0.8566	2.08
SUPP2		0.0134	0.17
E*SUPP2(SQ)		-0.6412	-0.64
UE1*SUPP2		-0.0013	0.00
ω19+ ω20		-0.6425	0.48
SUPP3		0.1792	1.54
E*SUPP3		-1.9581	-1.42
UE1*SUPP3		3.8825	1.96***
ω22+ ω23		1.9245	2.43***
OVER		0.0825	-0.14
E*OVER		10.2682	1.39
UE1*OVER		-5.0056	-0.48
ω25+ ω26		5.2626	0.33
LEVERAGE		0.5084	1.08
E*LEVERAGE		-6.8355	-1.09
UE1*LEVERAGE		8.0645	0.93
ω28+ ω29		1.2290	0.03
GROWTH		-0.0447	-1.28
E*GROWTH		-1.1079	-1.66***
UE1*GROWTH		1.0980	0.67
ω31+ ω32		-0.0100	0.00
PERSIST		0.0689	0.30
E*PERSIST		-1.4650	-0.71
UE1*PERSIST		-4.6554	-1.49
ω34+ ω35		-6.1203	4.41**
BETA		-0.1269	-0.69
E*BETA		-0.0612	-0.02
UE1*BETA		0.4866	0.13
ω37+ ω38		0.4255	0.03
SIZE		-0.1104	-1.71***
E*SIZE		0.7765	0.92
UE1*SIZE		0.5581	0.54
ω40+ ω41		1.3345	2.86***
F Value	18.63	2.04	
Pr > F	<.0001	<.0001	
R-Square	0.1349	0.4896	
Adj R-Sq	0.1276	0.2499	
N	242	242	

Refer to Table 5 for audit committee variable definitions.

Table 17 continued

SUPP2(SQ)	= Supp2**$^{(1/2)}$|
LEVEL1	= value/price (IBES Actual reported EPS/IBES Price at the start of the return cumulation period)
$UE1_t$	= EPS_t – the mean analyst consensus forecast occurring at the start of the return cumulation period for the year end of the observation
LEVERAGE	= debt/assets (data6 – data60)/data6
GROWTH	= ((data 25 * data 199) + (data6 – data 0))/beginning data6
SIZE	= ln(data6)
PERSIST	= coefficient from a regression of EPS_t on EPS_{t-1} (data 19) for 16 quarters prior to the fiscal year end of the sample firm
FIXED INDUSTRY EFFECTS	= dummy variable set to 1 for each 2-digit SIC code of the sample firm, 0 if the firm is not in that 2-digit SIC code
Data from Crsp	
BETA	= coefficient from a regression of return on value weighted market return for a period of 60 months prior to the fiscal year end of the sample firm

* *,*** Indicates significance at the 5 and 10 percent level respectively (two-tailed tests)

Table 18
Tests of Hypothesis 1
ROA as a Measure of Monitoring Effectiveness

Model1: $ROA = \varsigma_0 + \varsigma_1 INDEP1 + \varsigma_2 FINEXP1 + \varsigma_3 FINEXP2 + \varsigma_4 FINEXP3 + \varsigma_5 SUPP1 + \varsigma_6 SUPP2 + \varsigma_7 SUPP3 + \varsigma_8 OVERSIGHT + \varsigma_9 SIZE + \varsigma_{10} CAPEX + \varsigma_{11} BETA$

Model2: $ROA = \varsigma_0 + \varsigma_1 ALLIND1 + \varsigma_2 FINEXP1 + \varsigma_3 FINEXP2 + \varsigma_4 FINEXP3 + \varsigma_5 SUPP1 + \varsigma_6 SUPP2 + \varsigma_7 SUPP3 + \varsigma_8 OVERSIGHT + \varsigma_9 SIZE + \varsigma_{10} CAPEX + \varsigma_{11} BETA$

Variable	Model 1 Coefficient	t Value	Model 2 Coefficient	t Value
Intercept	0.1134	3.48*	0.1491	4.01*
INDEP1	-0.0007	-0.79		
ALLIND			-0.0341	-1.92***
FINEXP1	0.0009	0.39	0.0009	0.37
FINEXP2	-0.0019	-0.36	-0.0009	-0.27
FINEXP3	0.00060	1.36	0.0004	0.93
SUPP1	0.0001	0.04	0.0004	0.20
SUPP2(SQ)	-0.0067	-1.76***	-0.0065	-1.71***
SUPP3	-0.0044	-0.77	-0.0054	-0.96
OVER	0.0167	0.59	0.0104	0.38
SIZE	-0.0070	-2.51**	-0.0074	-2.68*
BETA	-0.0180	-2.29**	-0.0195	-2.51**
CAPEX	-0.0518	-1.46	-0.0538	-1.53
F Value	2.09		2.4	
Pr > F	0.0218		0.0078	
R-Square	0.0952		0.1077	
Adj R-Sq	0.0498		0.0629	
N	231		231	

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = $Supp2^{**(1/2)}$
SIZE= ln(data 6)
BETA = slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period
CAPEX=data 128/data12
, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 19
Test of Hypothesis 2
ROA as a Measure of Monitoring Effectiveness

$$ROA_i = \varphi_0 + \varphi_1 INDEP1_i + \varphi_2 FINEXP1_i + \varphi_3 FINEXP2_i + \varphi_4 FINEXP3_i + \varphi_5 SUPP1_i + \varphi_6 SUPP2_i + \varphi_7 SUPP3_i + \varphi_8 OVERSIGHT_i + \varphi_9 MGTOWN_i + \varphi_{10} MGTOWN*INDEP1_i + \varphi_{11} MGTOWN*FINEXP1_i + \varphi_{12} MGTOWN_* FINEXP2_i + \varphi_{13} MGTOWN*FINEXP3_i + \varphi_{14} MGTOWN*SUPP1_i + \varphi_{15} MGTOWN*SUPP2_i + \varphi_{16} MGTOWN_i*SUPP3_i + \varphi_{17} MGTOWN_i*OVER_i + \varphi_{18} SIZE_i + \varphi_{19} CAPEX + \varphi_{20} BETA_i + \varepsilon_i.$$

Variable	Coefficient	t Value
Intercept	0.0722	1.54
INDEP1	0.0009	0.68
FINEXP1	-0.0022	-0.55
FINEXP2	0.0062	1.16
FINEXP3	-0.0001	-0.13
$\varphi_4 + \varphi_{13}$	0.0010	2.96***
SUPP1	0.0055	1.86***
SUPP2	-0.0054	-0.97
$\varphi_6 + \varphi_{15}$	-0.0125	4.11**
SUPP3	-0.0033	-0.42
OVER	0.0191	0.39
$\varphi_8 + \varphi_{17}$	0.0984	4.13**
MGTOWN	0.0470	0.80
MGTOWN*INDEP1	-0.0028	-1.51
MGTOWN*FINEXP1	0.0023	0.44
MGTOWN*FINEXP2	-0.0107	-1.46
MGTOWN*FINEXP3	0.0011	1.11
MGTOWN*SUPP1	-0.0091	-2.08**
MGTOWN*SUPP2	-0.0071	-0.85
MGTOWN*SUPP3	-0.0032	-0.25
MGTOWN*OVER	0.0793	1.14
SIZE	-0.0082	-2.49**
BETA	-0.0290	-3.25*
CAPEX	-0.0456	-1.24
F Value	2.38	
Pr > F	0.0013	
R-Square	0.2006	
Adj R-Sq	0.1165	
N	211	

Table 19 continued

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = Supp2**(1/2)
SIZE= ln(data 6)
BETA = slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period
CAPEX=data 128/data12

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 20
Tests of Hypothesis 3
ROA as a Measure of Monitoring Effectiveness

$$ROA = \chi_0 + \chi_1 INDEP1 + \chi_2 FINEXP1 + \chi_3 FINEXP2 + \chi_4 FINEXP3 + \chi_5 SUPP1 + \chi_6 SUPP2 + \chi_7 SUPP3 + \chi_8 OVERSIGHT + \chi_9 SIZE + \chi_{10} BETA\ \chi_{11C} APEX + \chi_{12} INDEXP1 + \chi_{13} INDEXP2 + \chi_{14} INDEXP3 + \varepsilon_{i.}$$

Variable	Coefficient	t Value
Intercept	0.1292	3.56 *
INDEP1	-0.0029	-1.30
FINEXP1	-0.0043	-0.95
FINEXP2	-0.0120	-1.46
FINEXP3	0.0008	0.82
SUPP1	0.0001	0.07
SUPP2(SQ)	-0.0084	-2.13 **
SUPP3	-0.0046	-0.82
OVER	0.0244	0.86
SIZE	-0.0061	-2.12 **
BETA	-0.0157	-1.97 ***
CAPEX	-0.0516	-1.45
INDEXP1	0.0004	1.32
INDEXP2	0.0011	1.46
INDEXP3	0.0000	-0.40
F Value	1.97	
Pr > F	0.0213	
R-Square	0.1132	
Adj R-Sq	0.0557	
N	231	

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) = Supp2**$^{(1/2)}$
SIZE= ln(data 6)
BETA = slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period
CAPEX=data 128/data12
INDEXP1 = INDEP1* FINEXP1
INDEXP2 = INDEP1* FINEXP2
INDEXP3 = INDEP1* FINEXP3

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Table 21
Tests of Hypothesis 4
ROA as a Measure of Monitoring Effectiveness

$$ROA_i = \alpha + \psi_1 SOX_i + \psi_2 INDEP1_i + \psi_3 INDEP1*SOX_i + \psi_4 FINEXP1_i + \psi_5 FINEXP1*SOX_i + \psi_6 FINEXP2_i + \psi_7 FINEXP2*SOX_i + \psi_8 FINEXP3_i + \psi_9 FINEXP3*SOX_i + \psi_{10} SUPP1_i + \psi_{11} SUPP1*SOX_i + \psi_{12} SUPP2_i + \psi_{13} SUPP2*SOX_i + \psi_{14} SUPP3_i + \psi_{15} SUPP3*SOX_i + \psi_{16} OVER_i + \psi_{17} OVER*SOX_i + \psi_{10...}(\text{control variables})_i + \varepsilon_i$$

Variable	Coefficient	t Value
Intercept	0.1101	3.41*
SOX	-0.0722	-0.99
INDEP1	-0.0007	-0.86
INDEP1*SOX	0.0020	1.08
FINEXP1	0.0008	0.34
FINEXP1*SOX	-0.0106	-1.84 ***
FINEXP2	-0.0013	-0.38
FINEXP2*SOX	0.0155	1.50
FINEXP3	0.0006	1.42
FINEXP3*SOX	-0.0008	-0.82
SUPP1	0.0000	0.02
SUPP1*SOX	0.0109	1.72***
SUPP2(SQ)	-0.0066	-1.68***
SUPP2*:SOX	0.0104	1.14
SUPP3	-0.0049	-0.85
SUPP3*SOX	0.0115	0.67
OVER	0.0166	0.58
OVER*SOX	-0.0993	-1.21
SIZE	-0.0065	-2.53 **
BETA	-0.0164	-2.25 **
CAPEX	-0.0643	-1.88 ***
F Value	1.5	
Pr > F	0.0801	
R-Square	0.1025	
Adj R-Sq	0.0343	
N	284	

Refer to Table 5 for all audit committee variable definitions.

SUPP2(SQ) =Supp2**$^{(1/2)}$
SOX =an indicator variable set to 1 if the observation is post compliance with the Sarbanes-Oxley Act, and 0 otherwise.
SIZE = ln(data 6)
BETA = slope coefficient from a regression of monthly firm returns on monthly value weighted market returns for a 60-month period
CAPEX =data 128/data12

Table 21 continued

, *,*** Indicates significance at the 1, 5, and 10 percent level respectively (two-tailed tests)

Appendix A (Survey Instrument)

Financial expertise

The following is a list of attributes that may apply to individual members of your audit committee during 2003 and 2004. For each year, please indicate the number of members of your audit committee each attribute applies to:

	2003	2004
CPA	____	____
Public audit experience	____	____
Experience auditing financial statements of comparable entities	____	____
Experience as a CFO or principal financial officer	____	____
Prior experience as a CFO in the industry sector of your firm	____	____
In-depth knowledge of your firm's:		
Business operations	____	____
Financial transactions	____	____
Financial performance in relation to a group of industry peers	____	____
Accounting principles and practices in relation to industry norms	____	____
Exposure to internal and external business risk	____	____
System of internal controls	____	____
Internal audit scope	____	____
External audit scope	____	____

Audit committee support

Please provide the following information for each year:	2003	2004

Please indicate the approximate frequency (number of times per year) of management updates on changes in exposure to risk from:

Unusual transactions	____	____
Derivative contracts	____	____
Off balance sheet activities	____	____
Related party transactions	____	____

Did management provide sufficient information to allow the audit committee to effectively carry out its responsibilities?

Yes	_____	_____
No	_____	_____

Do audit committee members receive training in the following areas?

Responsibilities as an audit committee member	□ Yes	□ No
Company operations	□ Yes	□ No
GAAP changes	□ Yes	□ No

New or proposed accounting and auditing topics that may affect the firm

□ Yes

□ No

Changes in international accounting standards	□ Yes	□ No
Regulatory changes that may affect the firm	□ Yes	□ No
Audit scope (internal and external)	□ Yes	□ No
Financial oversight responsibilities	□ Yes	□ No

Significant, complex, and/or unusual transactions and their financial statement effects

□ Yes □ No

Do audit committee members have outside training courses paid for by the company?

□ Yes □ No

In your opinion, is the remuneration to audit committee directors commensurate with the amount of time a director spends conducting committee business?

□ Yes □ No

In your opinion, is the remuneration to audit committee directors commensurate with the significant responsibility a director assumes as a member of this committee?

□ Yes □ No

Audit committee oversight

Does the audit committee review:

Unusual or non-recurring items such as restructuring charges and asset valuation/write downs □ Yes □ No

Loan or receivable losses □ Yes □ No

Warranty, product, and environmental liability □ Yes □ No

Derivative disclosures □ Yes □ No

Off balance sheet activities □ Yes □ No

Related party transactions □ Yes □ No

Pension return estimates □ Yes □ No

All loans to senior executives, employees, or other entities having a business relationship with the firm and the disposition of these loans □ Yes □ No

Changes in accounting principles □ Yes □ No

Changes in accounting estimates □ Yes □ No

Revenue recognition □ Yes □ No

Prospective estimates disclosed in Management's Discussion and Analysis □ Yes □ No

Consistency of the facts presented in the financial statements with those in Management's Discussion and Analysis and other non-financial statement disclosures □ Yes □ No

Significant issues that may impact the credibility of interim accounting and reporting □ Yes □ No

Interim financial statements in relation to budgets or projections for the period □ Yes □ No

Company compliance with debt covenants and security indentures

□ Yes □ No

Legal matters that could have an impact on the company's financial statements

□ Yes □ No

Policies and procedures to consider officers' expenses and perquisites

□ Yes □ No

Earnings press releases and earnings guidance provided to analysts and rating agencies □ Yes □ No

The consistency of reported and planned financial results □ Yes □ No

Significant balance sheet changes or changes in trends or important financial relationships □ Yes □ No

	2003	**2004**
Enter the total number of outside directorships held by all audit committee members.	____	____

Audit committee independence

Please provide the following information for each year:	2003	2004
Number of audit committee members	_____	_____
Number of independent audit committee members	_____	_____
Annual number of audit committee meetings	_____	_____
Annual number of private audit committee meetings with the external auditor	_____	_____
Annual number of private audit committee meetings with the internal auditor	_____	_____
What percentage of a typical audit committee meeting agenda is set by the audit committee?	____%	____%

Approximately how many independent investigations did the audit committee conduct?

_____ _____

Approximately how many times did the audit committee hire outside experts?

_____ _____

Did the audit committee have a dedicated staff?

Yes _____ _____
No _____ _____

Did any members of the audit committee have prior experience (employment or consultancy) with the firm's external auditor?

Yes _____ _____
No _____ _____

Comparative data

The following information will be used solely for providing each respondent with an analysis of the survey results that includes comparative statistics based upon industry and firm characteristics.

	2003	**2004**
Number of directors on the full board	____	____
Number of independent directors on the full board	____	____
Primary industry	$ ____	$ ____
Total assets	$ ____	$ ____
Book value of equity	$ ____	$ ____
Market value of equity	$ ____	$ ____

Appendix B
SEC Implementation of Sarbanes-Oxley Audit Committee Requirements

SEC Release Nos. 33-8177; 34-47235 File No. S7-40-02	SEC Release Nos. 33-8220; 34-47654 File No. S7-02-03
Section 407	Section 301
Effective March 3,2003	Effective April 25,2003
Small business issuers compliance date: Annual report of fiscal year ending on or after 12/15/2003	Small business issuers and foreign listed companies compliance date: July 31, 2005
Remaining companies compliance date: Annual report of fiscal years ending on or after 7/15/2003	Remaining companies compliance date: Earlier of the first annual shareholders Meeting after 1/15/2004 or 10/31/2004
Requires disclosure of whether or not the company's audit committee includes at least one "audit committee financial expert"	Criteria for independence: Audit committee member must not accept consulting, advisory, or other fees (directly or indirectly) from the company other than as a member of the board Audit committee director may not be an affiliated person of the company or any of the company's subsidiaries
Definition of "audit committee financial expert"	Audit committee responsibilities: Appointment, compensation, retention and oversight of the registered public accounting firm
Criteria for acquisition of audit committee financial expertise (through one or more of 4 specific criteria)	Authority to approve all auditor engagement fees Resolution of disagreements between management and the outside auditor Preapprove any non audit services
A company that does not have an audit committee financial expert must explain why	Establish procedures to receive and handle complaints about accounting, internal controls, or auditing matters Establish procedures for employees to confidentially, and anonymously submit concerns about questionable accounting or auditing matters
A company that does have an audit committee financial expert must disclose the expert's name and whether or not the named expert is independent	Authority to engage outside advisors, including counsel Firm must provide funding for advisors and ordinary administrative expenses of the committee

Appendix C

Independence Criteria

SRO pre-Sarbanes	SRO post-Sarbanes
The board of directors determines whether or not the board member has a relationship that would interfere with the exercise of independent judgment	The board of directors must determine affirmatively that the director has no material relationship with the firm (either directly or as a partner, shareholder or officer of an organization that has a relationship with the firm)
Persons not independent:	Persons not independent:
Employee of the firm or its affiliates, currently or during the past 3 years	Employee of the firm would not be independent until 3 years after the end of the relationship Employment as an Interim Chair or CEO would not disqualify a director from being considered independent following that employment
Receipt of compensation, other than for board service or retirement benefits, exceeding $60,000 during the prior fiscal year (NASDAQ and AMEX, the NYSE does not have a specific materiality threshold)	Receipt of compensation by the director or a family member of the director in excess of $60,000 per year (NASDAQ) $100,000 per year (NYCE) would not be independent until 3 years after the payments ceased
A director whose immediate family member is a current executive officer or has been an executive officer during the past 3 years	A director who is a family member of a person who is employed by the company or any parent or subsidiary of the company during the past 3 years
Partner, controlling shareholder, or executive officer of any for-profit business that in the current or past 3 years made payments to or received payments from the firm that exceed the greater of 5% of that firm's consolidated gross revenues or $200,000 (NASDAQ and AMEX, the NYSE does not have a specific materiality threshold)	A director who is an executive officer or an employee of a company that in the current or past 3 years made payments to or received payments from the firm that exceed the greater of 2% of that firm's consolidated gross revenues or $1 million would not be independent until 3 years after the payment falls below this threshold (NASDAQ director or family member who is a partner in, a controlling shareholder or an executive officer of a company where the payments exceed the greater of 5% of the consolidated gross revenues or $200,000)
	If the director is an executive officer of a charitable organization where the

SRO pre-Sarbanes	SRO post-Sarbanes
	payment exceeds the above thresholds: NYSE – disclosure in annual proxy statement or annual report on Form10-K if the company does not file an annual proxy statement NASDAQ-the director is not independent (excluding non-discretionary charity match programs)
	NASDAQ-any partner in a law firm that receives payments from the firm is not allowed to serve on the audit committee
Compensation committee interlock	Compensation committee interlock – 3 year look-back
	A director or family member who is a current or prior partner or prior employee of the company's outside auditor during the past 3 years is not independent Directors who have participated in the preparation of the financial statements of the company during the past 3 years cannot serve on the audit committee

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