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An Empirical Analysis of the Relation Between Corporate Governance and Management Fraud

presented by

Mark Swearingen Beasley

has been accepted towards fulfillment of the requirements for

PhD degree in Accounting

Major professor

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AN EMPIRICAL ANALYSIS OF THE RELATION BETWEEN CORPORATE GOVERNANCE AND MANAGEMENT FRAUD

By

Mark Swearingen Beasley

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Department of Accounting

1994

ABSTRACT

AN EMPIRICAL ANALYSIS OF THE RELATION BETWEEN CORPORATE GOVERNANCE AND MANAGEMENT FRAUD

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This study is an empirical examination of the relation between board of director composition and the occurrence of management fraud. Economic theory of the firm suggests that unique board of director composition may help to reduce management fraud. This study exploits variations in board of director composition to examine this theory, which no prior study has empirically tested.

The research methodology involves logit cross-sectional regression analysis that examines differences in board of director composition between seventy-five fraud firms and seventy-five no-fraud firms. Each of the seventy-five fraud firms was matched with a no-fraud firm on the basis of firm size, industry, national stock exchange where the firm's stock trades, and time period because review of the management fraud and corporate governance research indicates that these variables may be associated with both management fraud and board of director composition. In addition, four control variables were included in the logit model to control for differences in other non-board characteristics.

The logit regression results confirm the predicted relation between board of director composition and the occurrence of management fraud. No-fraud firms have significantly higher percentages of outside members on the board of directors than fraud firms, and the outside directors of no-fraud firms have significantly greater ownership levels in the firm, longer tenures on the board of directors, and fewer outside directorships in other firms. Managers who serve on the board of directors of fraud and no-fraud firms differ in the extent of their ownership in the firm only when they hold moderate levels of outstanding shares of common stock - between 5% and 25%. Chairpersons of fraud firms are not more likely to hold managerial positions, such as CEO or president, than chairpersons of no-fraud firms, and CEO tenure does not differ between fraud and no-fraud firms. Finally, this study demonstrates the importance of an active audit committee of the board given that no-fraud firms compared to fraud firms are significantly more likely to have an active audit committee.

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to my dissertation committee - Dr. Alvin Arens, Dr. Kathy Petroni, Dr. Mary Bange, and Dr. Frank Boster for their invaluable encouragement and sincere commitment of time and effort on my behalf. I especially want to thank my chairperson, Al Arens, for the tremendous support he has provided throughout my doctoral program.

I am grateful to the American Institute of Certified Public Accountants for their financial support. I am also grateful to the Institute of Internal Auditors for their generous support, which made possible the timely completion of this dissertation.

I would like to especially thank Dr. C. Wayne Alderman, Dr. Daniel M. Guy, and Mr. Donald L. Neebes for being such positive role models for me.

I express deep appreciation to my parents, Bill and Ann Beasley, for their love, patience and dedication throughout my life and for showing me how to accomplish life's difficult goals. Thank you to my sisters, Melanie and Melinda, who are always cheering me on and to my wife's parents, Jim and Janice Johnson, for allowing me to take their daughter to Michigan for four fun years.

I would like to thank my son, Johnson, for showing me the real joy of life. Finally, I am deeply grateful to my wife, Beth, who has endured this process with me. Her love, encouragement, patience, and confidence in me has made this possible. Without her, I would have never made it.

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CHAPTER 1 - INTRODUCTION

This study is an empirical examination of the relation between corporate governance and the occurrence of management fraud. The focus of this study is on an important corporate governance mechanism: the board of directors. There are wide variations among firms in board of director composition, such as the degree of outsiders who serve on the board of directors, their affiliations with other organizations, and the degree of share ownership by management versus outsiders [Baysinger and Butler (1985), Jensen and Warner (1988)]. Economic theory of the firm suggests that unique board of director composition may help to reduce management fraud. This study exploits variations in board of director composition to examine this theory.

Economic theory of the firm suggests that the board of directors is an important corporate governance mechanism within modern day corporations [Fama and Jensen (1983a)]. The board of directors is the ultimate internal control mechanism within the firm that arises out of the separation of decision control and residual risk-bearing [Fama (1980), Fama and Jensen (1983a)]. As the apex of decision control, one of the board of director's primary responsibilities is to monitor management decisions and actions.

Management fraud is one example of the agency problem that arises out of the separation of decision control and residual risk-bearing. Because most of the day-to-day actions of boards of directors are unobservable, management fraud provides a unique setting where the monitoring role of the board of directors can be examined ex post. Specifically, this study tests economic theory that suggests board of director composition impacts the board's effectiveness as a monitor of management for the prevention of management fraud.

Little is known about the relation of board of director composition and the occurrence of management fraud. Previous studies examining characteristics of firms experiencing management fraud primarily identify "red flag" indicators that suggest the presence of management fraud. These studies note the existence of "weak internal control environments" for fraud firms [Merchant (1987), Loebbecke, Eining, and Willingham (1989), Bell, Szykowny, and Willingham (1991)]. However, none of these studies explicitly examines board of director composition. Separately, the corporate governance literature includes empirical studies that examine the effectiveness of the board of directors as a monitor of management in acute agency settings; however, none of these studies examines the agency problem of management fraud.

While the primary purpose of this study is to test economic theory about the relation of board of director composition and management fraud, this study will also contribute to the management fraud and corporate governance literatures. Even though the purpose of this study is not to develop a predictive model of management fraud, this study contributes to the development of future management fraud predictive models by providing evidence of a relation between board of director composition and management fraud. It also contributes to the corporate governance literature by studying an acute agency problem not previously examined.

The remainder of this chapter is organized as follows. Section 1.1 summarizes the underlying theory used to motivate the study of several hypotheses about the relation of board of director composition and the occurrence of management fraud. Section 1.2 discusses the motivation for empirically examining board of director composition in settings of management fraud. Section 1.3 briefly overviews the sample selection and

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research design that is used to examine the hypotheses. Section 1.4 summarizes the organization of the remainder of the dissertation.

1.1 Overview of Hypotheses Examined

Fama and Jensen (1983a) conceptualize that the board of directors in the modernday corporation is created by stockholders who delegate responsibilities to the board because it is too costly for each stockholder to individually monitor management. This delegated responsibility for monitoring management makes the board of directors the ultimate internal control mechanism within the firm.

Economic theory suggests that the board of directors is an important part of the governance structure of large business corporations and that board of director composition, such as degree of outside director representation, quality, and ownership are relevant factors for board effectiveness. This theory is used in this study to motivate several hypotheses about the relation of board of director composition and the occurrence of management fraud. The first hypothesis predicts that the board of directors is composed of fewer "outside" members for fraud firms than for no-fraud firms. The second and third hypotheses predict that outside members of the board of directors of fraud firms are of lower "quality" and hold smaller ownership stakes than outside directors of no-fraud firms, respectively. The fourth hypothesis predicts that managers (i.e., insiders) who serve on the board of directors have lower ownership stakes in fraud firms than managers of no-fraud firms.

Critics of board of director governance often argue that the board of directors is not an effective monitor of management. They believe that boards of directors are ineffective because management can generally override outside director monitoring by dominating the board of directors through management's influence on the selection of outside directors, control of the agenda of board of director meetings, and delivery of internal information to outside members [Mace (1986), Patton and Baker (1987)]. This study develops and examines three additional hypotheses about board of director composition that may influence the extent of power management can use to override monitoring by outside directors. One hypothesis predicts that the chairperson of the board of directors holds a managerial position, such as chief executive officer (CEO) or president, more often for fraud firms than for no-fraud firms. A second hypothesis predicts that the average outside director tenure of CEO's for no-fraud firms. A third hypothesis predicts that the average outside director tenure on the board of directors is shorter for fraud firms than for no-fraud firms than for no-fraud firms than for no-fraud firms than for no-fraud firms is longer than the tenure of CEO's for no-fraud firms. A third hypothesis predicts that the average outside director tenure on the board of directors is shorter for fraud firms than for no-fraud firms.

Agency theory suggests that one of the mechanisms that a board of directors may establish to minimize the occurrence of management fraud is the audit committee. Audit committees are designed to reduce information asymmetries between management and the board of directors by serving as a conduit for information flow to the board [Pincus, Rusbarsky, and Wong (1989)]. This study examines a final hypothesis predicting that the board of directors has an active audit committee less often for fraud firms than for no-fraud firms.

1.2 Motivation

The primary motivation of this study is to provide empirical evidence of whether board of director composition and management fraud are related in the manner predicted by economic theory. While this is the first study to empirically test this economic theory

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about board of director composition in a setting of management fraud, this is not the first acknowledgement of a possible link between board of director composition and management fraud. The board of directors as a corporate governance mechanism for the prevention of management fraud is often discussed by the financial press, regulators, and standard setters.

Because of substantial estimated economic loss by investors and creditors, the issue of management fraud receives significant attention, often front page headlines, in the financial press.¹ In these reports, there is a documented perception of a relation between board of director composition and the occurrence of management fraud. For example, <u>The New York Times</u> (April 30, 1993) reported that in the wake of material fraudulent financial reporting, the Leslie Fay Company announced its board of directors elected two additional outside members "to give its board a more independent character." And, <u>The Wall Street Journal</u> (August 30, 1993) reported that in response to Clayton Homes Inc.'s alleged failure to internally investigate a possible management fraud, two of the firm's outside board members resigned.

The significance of management fraud in today's business community has received significant attention by regulators and standards-setters who often discuss the importance of the board of directors as a corporate governance mechanism that assists in the prevention of management fraud. The National Commission on Fraudulent Financial Reporting (commonly referred to as The Treadway Commission) was created in the mid-

¹ Examples of financial reports of management fraud by <u>The Wall Street Journal</u> include allegations of management fraud at Clayton Homes Inc. (August 17, 1993), Leslie Fay Company (February 23, 1993), Comptronix Corporation (December 14, 1992), Phar-Mor Corporation (August 4, 1992) and Cascade International (November 21, 1991).

1980s with the objective of identifying causal factors that can lead to fraudulent financial reporting. In 1987, the Treadway Commission issued numerous recommendations, some of which suggest changes in the structure of boards of directors.² More recently, the AICPA's Public Oversight Board stated in its 1993 Special Report that "the responsibilities of corporate boards and their audit committees for the integrity of management and financial reports should be pinpointed and reinforced and the appropriate authorities should adopt measures to assure that it is" (p. 50). Congress is considering H.R. 574, "Financial Fraud Detection and Disclosure Act," that would place certain responsibilities on boards of directors to inform the Securities and Exchange Commission (SEC) when notified by auditors that adequate remedial actions have not been taken against management in cases involving illegal acts. Recently, the Federal Deposit Insurance Corporation (FDIC) implemented new requirements for insured depository institutions to establish audit committees made up of independent directors who, for certain large institutions, must include individuals with banking or financial expertise and cannot include "large customers" of the institutions.

Because the public looks to the independent auditor to detect management fraud, auditing professional standards-setters also have a vested interest in obtaining knowledge about the empirical relation between board of director composition and the occurrence of management fraud. Palmrose (1987) notes that management fraud accounts for about half of the litigation cases against auditors. Auditing professional standards highlight the

 $^{^2}$ For example, the Treadway Commission (1987, p. 40) stated that audit committees composed of independent directors would help reduce the occurrence of fraudulent financial reporting.

importance of the board of directors in the financial reporting process by requiring the auditor to "obtain sufficient knowledge of the control environment to understand management's and the board of director's attitude, awareness, and actions concerning the control environment" [par. 20 of AICPA SAS No. 55, "Consideration of the Internal Control Structure in a Financial Statement Audit"]. Interestingly, however, while auditing professional standards include "red flag" indicators of the possibility of management fraud in SAS No. 53, "The Auditor's Responsibility to Detect and Report Errors and Irregularities," those indicators do not address potential board of director characteristics that may be uniquely associated with the occurrence of management fraud.

Future allegations of management fraud are likely to continue. In one study, eighty-seven percent of managers surveyed were willing to commit fraud in one or more cases presented to them. Over half were willing to overstate assets, forty-eight percent were willing to establish insufficient return reserves for defective products, and thirty-eight percent would pad a government contract [The Wall Street Journal, March 1, 1990, p.1]. In another study, seventy-six percent of surveyed firms report that they experienced fraud within the last year, and over two-thirds of the firms believe that fraud will become more of a problem in the future [KPMG Peat Marwick (1993)].

The issue of management fraud and the likelihood of its continued existence is of significance to numerous affected parties. As a result, this study's empirical examination of the relation between board of director composition and the occurrence of management fraud may provide important insights for board of director governance policies.

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1.3 Overview of Sample Selection and Research Design

The firms examined in this study consist of 75 fraud firms that are matched with 75 no-fraud firms (the control firms). The fraud firms are those that have allegedly experienced management fraud as reported in an Accounting and Auditing Enforcement Release by the Securities and Exchange Commission (SEC) from 1982 through 1991 or as reported under the caption of "Crime-White Collar Crime" in <u>The Wall Street Journal Index</u> from 1980 through 1991.³ The fraud firms are matched with control firms based on industry, firm size, national exchange where common stock is traded, and time period because board of director composition may vary systematically with these variables [Baysinger and Butler (1985), Rosenstein and Wyatt (1990)], and they may be associated with management fraud. Additionally, other firm-specific characteristics are included in the regression model (described later in this section) to control for other endogenous factors that may be associated with both board of director composition and the likelihood of management fraud.

This study's definition of management fraud is limited to two types. The first type of management fraud includes fraudulent financial reporting whereby management intentionally issues materially misleading financial statement information to outside users. The second type of management fraud includes misappropriation of assets by top management. For purposes of this study top management includes the chairperson, vice chairperson, chief executive officer, president, chief financial officer, and controller. This study does not include cases of fraud by employees not considered as top

³ The SEC began issuing Accounting and Auditing Enforcement Releases in 1982.

management because those employees are generally not subject to direct monitoring by the board of directors.

The statistical methodology underlying the empirical test is a logit regression in which the dependent variable (FRAUD) is dichotomous; a fraud is known to exist or is not known to exist. Three cross-sectional logit models are examined. The first logit model examines the hypotheses using a definition of outside directors that is consistent with the national stock exchanges. The second logit model examines the hypotheses using a more restrictive definition of an outside director that is consistent with previous corporate governance research. The third model includes a piecewise logit regression model that explores whether levels of firm ownership held by outside and management board of directors are linearly related to the occurrence of management fraud.

1.4 Organization of the Dissertation

The remainder of the dissertation is organized into five chapters. Chapter Two develops the underlying economic theory and summarizes previous empirical research to motivate eight hypotheses about board of director composition and the occurrence of management fraud. Chapter Three describes the sample selection process by explaining how fraud firms are identified and matched with no-fraud firms. Chapter Four details the research design of the study and Chapter Five contains the empirical results of the study. Chapter Six includes a summary of the study and describes inherent limitations associated with the study's research design.

CHAPTER 2 - THEORY AND HYPOTHESES DEVELOPMENT

This chapter develops the underlying theory for eight hypotheses about the relation of board of director composition and the occurrence of management fraud. Such theory suggests that an important function of the board of directors is to monitor management. This chapter builds on that theory and related empirical research to highlight characteristics of the board of directors that may impact the board's effectiveness in monitoring management for the prevention of management fraud.

Section 2.1 describes the underlying economic theory that motivates the board of directors as an important monitor of management. Section 2.2 highlights the management fraud literature and indicates how this study contributes to that body of research by examining characteristics of the board of directors not previously empirically examined. Section 2.3 highlights the corporate governance literature and emphasizes how this study contributes to that research by examining an acute agency problem - management fraud - not previously explored. Section 2.4 builds on the underlying economic theory and previous empirical research to motivate eight hypotheses about specific board of director characteristics examined in this study. Section 2.5 emphasizes the importance of controlling for board size when examining these characteristics. Section 2.6 summarizes this chapter.

2.1 Underlying Theory: The Monitoring Role of the Board of Directors

The purpose of this section is to describe the underlying economic theory of the firm that suggests the board of directors has an important responsibility to monitor management for the prevention of management fraud. As described in this section, this theory suggests that stockholders engage a board of directors to minimize agency

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problems that arise out of the separation of decision control and residual risk-bearing. This study uses the setting of management fraud as an agency problem example to test the theory about the monitoring role of the board of directors.

This economic theory is based on the view that firms are legal fictions that serve as a nexus for a set of contractual relationships among self-interested individuals whereby ownership and control are separate [Alchian and Demsetz (1972), Jensen and Meckling (1976), and Fama (1980)]. Such separation arises when one or more individuals (the principal(s)) engage another individual (the agent) to perform some service on the principal's behalf. Contracts between the principal and agent are designed to limit divergences from the principal's interests; however, because such contracts are not costlessly written and enforced there will be some divergences between the agent's decisions and the principal's interests.

Economic theory suggests that there are both external and internal corporate governance mechanisms designed to minimize divergences that arise from the separation of ownership and decision control of the firm. External corporate governance mechanisms include the alienability of shares, limited liability, product and capital market competition, the market for corporate control, the managerial labor market, and corporation law [Williamson (1984)]. There are also potentially important internal mechanisms, such as competition among firm managers [Fama (1980), Fama and Jensen (1983a)], monitoring of holders of large share blocks [Shleifer and Vishny (1986)], and the focus of this study: the board of directors.

The board of directors as a corporate governance mechanism receives its authority from stockholders of corporations who often effectively delegate important responsibilities to boards of directors. Portfolio theory suggests that this delegation occurs because stockholders generally diversify their risks by owning securities in numerous firms. Such diversification creates a free-rider problem where no individual stockholder has a large enough incentive to devote resources to ensure that management is acting in the stockholders' interests. This lack of sufficient incentive occurs because it is costly for all stockholders to be involved in decision control [Grossman and Hart (1980), Fama and Jensen (1983a)]. While stockholders, as residual claimants, generally retain approval rights of board membership, control over most other decision functions are separated from residual risk-bearing in corporations.

The stockholder's delegation of internal corporate governance to the board of directors makes the board the common apex of decision control within both large and small corporate organizations [Fama and Jensen (1983a)]. The board of directors ratifies and monitors important decisions, and chooses, dismisses, and rewards important decision agents. The board of directors makes collusion between top-level management more difficult by decomposing decision management performed by managers and decision control performed by the board of directors. The board of directors often delegates most decision management functions and many decision control functions to internal agents, but it retains ultimate control over internal agents thereby making it the top-level court of appeals of the internal agent market [Fama and Jensen (1983a)]. The board of directors ensures the establishment of an appropriate internal control system within the firm and monitors top management's compliance with such system. As the ultimate internal control mechanism within the firm, the board of directors seeks to minimize the

expropriation of stockholder wealth by management. This study focuses on one example of such expropriation: management fraud.

Management fraud is one example of the agency problem where managers act self-interestedly in an attempt to expropriate stockholder wealth. As noted in Chapter 1, this study includes two types of management fraud where top management expropriates stockholder wealth by 1) misappropriating assets of the firm or 2) fraudulently reporting financial information by issuing materially misleading financial statements to outside users (e.g., current and future investors).

Because most of the day-to-day actions of boards of directors are unobservable, management fraud provides a unique setting whereby the characteristics of the board of directors that may affect the board's ability to effectively monitor management can be examined ex post. Management fraud often occurs when internal controls are weak [Loebbecke, Eining, and Willingham (1989)]. Firms in which a fraud by top management has occurred represent situations in which the board of directors may have failed to establish a system of internal controls or inadequately monitored management's compliance with such system of controls.

This study examines whether there is a relation between occurrences of management fraud and board of director composition. This study contributes to existing research because little is known about differences in boards of directors of fraud firms as compared to other firms. Neither previous research on management fraud nor corporate governance research examines whether there are unique board of director characteristics for firms experiencing management fraud. Sections 2.2 and 2.3 provide an overview of previous management fraud and corporate governance research. Specific

empirical findings from these earlier studies are discussed more extensively as part of the development of hypotheses in Section 2.4.

2.2 The Management Fraud Literature

Prior to the early 1980's, there had been little empirical management fraud research and most of the speculations noted lacked empirical support [Albrecht, Romney, Cherrington, Payne, and Roe (1982)]. The earliest comprehensive study about management fraud dates back to 1978 when Peat Marwick commissioned experts in many relevant disciplines to participate in a multidisciplinary symposium about management fraud [Elliott and Willingham (1980)].

Most of the management fraud research conducted during the 1980s is descriptive. Based on the analysis of fraud cases as well as the review of research in other disciplines such as organizational behavior, psychology, and criminology, researchers highlight characteristics of firms experiencing management fraud that include both financial ratios and non-financial characteristics [Elliott and Willingham (1980), Albrecht, Romney, Cherrington, Payne and Roe (1982), Merchant (1987), National Commission on Fraudulent Financial Reporting (1987), Loebbecke and Willingham (1988), Loebbecke, Eining, and Willingham (1989)]. These researchers suggest that the identified factors are possible predictors of management fraud and commonly refer to them as "red flag" indicators of fraud [Sorenson and Sorenson (1978), Romney, Albrecht, and Cherrington (1980), Loebbecke, Eining, and Willingham (1989), AICPA's SAS No. 53 (1992)].

Interestingly, this previous management fraud research does not empirically examine whether the "red flag" characteristics identified are unique to firms experiencing management fraud. The earlier studies only include firms where management fraud was alleged to have occurred and excludes firms where fraud was not present.

A recent study by Bell, Szykowny, and Willingham (1991) attempts to validate these "red flag" characteristics identified in the previous management fraud research by empirically examining whether the "red flag" characteristics of fraud firms differ from no-fraud firms. Their examination is based on surveys of audit partners who previously served on a fraud or no-fraud firm engagement. The particular "red flag" characteristics they examine are based on factors summarized in the AICPA's SAS No. 53, "The Auditor's Responsibility to Detect and Report Errors and Irregularities," and in Loebbecke and Willingham (1988). Bell et al. (1991) identify those factors that are present on an univariate basis significantly more often for fraud firms compared to nofraud firms. Figure 1 summarizes the twenty-two factors they identify as being significantly different between fraud and no-fraud firms. Thirteen factors are from SAS No. 53 and 9 factors are from Loebbecke and Willingham (1988).

While these factors are significantly different between fraud and no-fraud firms on an individual basis, Bell et al. (1991) note that some factors that are significant on an stand-alone basis may be highly correlated and not incrementally significant when combined with other factors in a predictive model. They use their survey results to build a decision aid predictive model for assessing the likelihood of management fraud and find that not all of the 22 factors are significant in the combined model.

It is important to note that the "red flag" indicators in Figure 1 do not address board of director composition. However, several of the significant factors imply that the

22 Management Fraud Predictive Factors ¹		
13 Factors From SAS No. 53:		
Weak internal control environment		
Management decisions dominated by single person or group		
Management attitude unduly aggressive		
Management places undue emphasis on earning projections		
Management's reputation in business community is poor		
Inadequate profitability relative to industry		
Organization is decentralized without adequate monitoring		
Doubt about the entity's ability to continue as a going concern		
Many contentious or difficult accounting issues		
Significant difficult-to-audit transactions		
Management is overly evasive when responding to audit inquiries		
Management has engaged in frequent disputes with auditors		
Accounting personnel exhibit inexperience or laxity in performing duties (Misstatements in prior periods)		
9 Factors From Loebbecke and Willingham (1988):		
Company is in a period of rapid growth		
Company has inexperienced management		
A conflict of interest exists within the company		
Company is confronted with adverse legal circumstances		
Auditor's experience with management indicates degree of dishonesty		
Client personnel exhibits strong personality anomolies		
Management places undue pressure on auditors		
Management has engaged in opinion shopping		
Management displays significant disrespect for regulatory bodies		

¹ Source: Bell, Szykowny, and Willingham (1991)

Figure 1 22 Red Flag Indicators That Differ Significantly Across Fraud and No-Fraud Firms

board of directors of fraud firms may be ineffective in monitoring management. Examples include:

Company has a weak internal control environment. Management decisions are dominated by single individual or group. Management exhibits strong personal anomalies. Management is unduly aggressive. Management's reputation in business community is poor. Company has an inexperienced management. Accounting personnel exhibit inexperience or laxity in performing duties.

Other management fraud research examines implications of using "red flag" checklists as decision aids in the audit risk evaluation process. Results from these studies are mixed. Pincus (1989) finds that auditors who do not use "red flag" checklists outperform those who do in an experimental setting. Hackenbrack (1993) finds that auditors have different opinions about the amount of fraud risk indicated by specific "red flag" indicators and concludes that one reason for this disagreement is that auditors with different client experience (e.g., large versus small clients) have systematically different perceptions of the importance of a selected "red flag" factor.

The collective review of this management fraud research suggests that an important component of the firm - the board of directors - has not been explicitly examined. These studies suggest the importance of the board of directors by consistently noting the significance of "weak internal control environments" for many of the firms experiencing fraud [Albrecht and Romney (1986), Merchant (1987), Loebbecke, Eining, and Willingham (1989), Bell, Szykowny, and Willingham (1991)]. For example, Loebbecke et al. (1989) note that "Our findings support the importance of the control environment.... Where controls are weak, a significant condition exists that would allow either management fraud, defalcations, or an error to occur." (p. 25). Pincus's (1989)

believes that auditors who do not use "red flag" checklists outperform those who do in her experimental setting because non-users are more likely to consider additional items, such as the competence and strength of the board of directors and/or the audit committee, which were not included on the checklists provided to auditors in her study.

The purpose of this study is to test economic theory about the monitoring role of the board of directors in a setting of management fraud. By doing so, this study also provides empirical evidence about characteristics of a potential red-flag indicator - the board of directors - that is excluded from existing predictive models. While the purpose of this study is not to develop a predictive model of management fraud, this study contributes to the development of future management fraud predictive models by providing evidence of a relation between board of director composition and management fraud. Such evidence suggests the importance of considering board of director composition when developing future predictive models.

2.3 The Corporate Governance Literature

This section briefly highlights the focus of previous corporate governance empirical research. Details about specific empirical findings are not presented in this section. Instead, findings relevant to this study are included where appropriate in the development of hypotheses in Section 2.4.

Because most of the day-to-day actions of boards of directors are unobservable, attempts by empirical researchers to isolate the monitoring effects of boards of directors either consider some aspect of firm performance or concentrate on the boards' observable actions for acute agency problems. None of these studies examines the issue of management fraud but they suggest that there may be a link between board of director composition and monitoring management for the purpose of minimizing agency problems such as management fraud.

Studies that examine the relation of board of director composition and firm performance find a weak positive relation at best [MacAvoy, Cantor, Dana, and Peck (1983), Baysinger and Butler (1985)] while others find no relation [Hermalin and Weisbach (1991)]; however, these studies are criticized for the lack of control of the multitude of endogenous and exogenous factors that influence firm performance [Hermalin and Weisbach (1991)]. Other studies find that boards of directors, as well as other internal monitoring mechanisms, monitor management by forcing top management turnover when firms perform poorly, particularly for firms with high proportions of outside directors [Coughlan and Schmidt (1985), Warner, Watts, and Wruck (1988), Weisbach (1988)]. Poor stock performance leads to changes in board of director composition with inside directors being replaced with outside directors [Hermalin and Weisbach (1988)].

Additional studies support the monitoring role performed by outside directors by examining board of director composition for firms experiencing acute governance problems. In general, these studies suggest that the board of directors, particularly outside directors, serve as effective monitors of management in situations involving corporate takeovers [Brickley and James (1987), Byrd and Hickman (1992), Kini, Kracaw, and Mian (1993)], management buyouts [Lee, Rosenstein, Rangan, and Davidson (1992)], greenmail payments [Klein and Rosenfeld (1988), Kosnik (1987), (1990)], and firms with golden parachutes (Cochran, Wood, and Jones (1985), Singh and Harianto (1989)]. This study contributes to the existing corporate governance literature by empirically examining whether there is a relation between board of director composition and management fraud. This study expands the corporate governance literature by examining the board of directors in an acute agency setting not previously explored.

2.4 Development of Hypotheses

Motivation of eight hypotheses about board of director composition and management fraud is provided in Sections 2.4.1 through 2.4.5 that follow. Figure 2 summarizes these eight hypotheses.

Hypotheses		Predicted Relation With Occurrence of Management Fraud	
Representation of Outside Directors			
H1:	% of Outside Members on Board	Inverse	
Quality of Outside Directors			
H2:	Quality of Outside Members on Board	Inverse	
Ownership Stakes In Firm:			
H3:	Held By Outside Directors on Board	Inverse	
H4:	Held By Management on Board	Inverse	
Management Power:			
H5:	Chairperson is also CEO or President	Direct	
H6:	CEO's Tenure on Board	Direct	
H7:	Average Outside Director Tenure on Board	Inverse	
Audit Committees:			
H8:	% of Firms with Active Audit Committees	Inverse	

Figure 2 Summary of Hypotheses About Board of Director Characteristics and Management Fraud

2.4.1 Representation of Outsiders on the Board. Economic theory of the firm suggests that the composition of individuals who serve on the board of directors is an important factor in creating a board that is an effective monitor of management actions. For reasons discussed in the paragraphs that follow, boards of directors are generally composed of both firm management and outsiders (non-employees). Understanding the representation of managers and outsiders on the board of directors is important as noted by Baysinger and Butler (1985) who state that "discussion of the role of the board in a theory of corporate governance without discussing board composition is as inappropriate as discussing the theory of the firm and ignoring the internal structure of the organization" (p. 121).

Because the board of directors must be able to use information from the internal monitoring system, the board of directors of a corporation often includes several of the organization's top managers [Fama and Jensen (1983a)]. Management's presence on the board of directors can improve the amount and quality of information from the internal monitoring system.

Because inside board of director members (those who are the firm's top managers) are generally more influential than outside members, the board of directors is not an effective device for decision control unless it limits the decision discretion of individual top managers [Fama and Jensen (1983a)]. Managers employ huge informational advantages due to their full-time status and insider knowledge. As a result, the board of directors can easily become an instrument of management, sacrificing the interests of stockholders [Williamson (1984)]. Domination by top management on the board of directors may lead to collusion and transfer of stockholder wealth [Fama (1980)].

The viability of the board of directors as a market-induced mechanism for lowcost internal transfer of control should be enhanced by the inclusion of outside (nonmanagement) directors who are disciplined for their services by the market, which prices outside directors according to their performance as referees [Fama (1980)]. The purpose of an outside board of director is to act as an arbiter in disagreements among internal managers and carry out tasks that involve serious agency problems between internal managers and residual claimants [Fama and Jensen (1983a)]. Baysinger and Butler (1985) note that "corporate reform proposals predict (implicitly) that corporations with boards having a higher proportion of monitoring [independent] directors will better serve shareholders' objectives than corporations with boards having a smaller proportion of such directors" (p. 114).

Existing empirical research provides evidence about the importance of including outside directors on the board for purposes of monitoring management. For example, Weisbach (1988) finds that the positive relation between poor firm stock performance and subsequent CEO turnover is strongest for firms with boards of directors with high proportions of outside directors. Lee, Rosenstein, Rangan, and Davidson (1992) find that shareholder wealth increases in management buyouts when boards of directors are dominated by outside directors. Kosnik (1987, 1990) finds that firms resisting greenmail payments have more outside directors relative to boards of directors of firms not resisting greenmail. Brickley and James (1987) find managerial consumption of perquisites represented by excessive expenditures in salaries in the banking industry is negatively related to the percentage of outside members on the board of directors. Mayers, Shivdasani, and Smith (1994) find that mutual life insurance firms relative to stock life

insurance firms have boards that employ larger fractions of outside directors. They attribute this difference to the fact that ownership rights are inalienable in mutual life insurance companies because ownership rights are held by policyholders and such rights are not separable from policies. Without such separation, a hostile takeover is impossible. Thus, mutual boards of directors have more outside directors because they serve as a major substitute monitoring mechanism for external capital markets.

While there is numerous recent empirical research on corporate governance, Weisbach (1988) notes that "understanding the role of the outside directors remains an important and unresolved question" (p. 432). Hermalin and Weisbach (1991) note that "the extent to which boards oversee management and to which this monitoring depends on the composition of the board are important and unresolved empirical questions" (p. 101).

Trends in practice suggest there is perceived value in the role played by outside directors. The percentage of outsiders present on boards of directors is increasing with outside directors comprising a board majority of 94% of manufacturing firms polled in 1992 compared with 86% in 1989 and 71% in 1972 [The Wall Street Journal, August 19, 1993, (p. 1)]. Evidence suggests that stockholders value outside directors as exhibited by the positive abnormal stock return Rosenstein and Wyatt (1990) find when management-chosen outside directors are added to the board of directors.

The requirements of the national stock exchanges also suggest that inclusion of outside directors on the board of directors is important. The national stock exchanges specify certain audit committee composition requirements, which in turn affect board of director composition. In June 1978, the New York Stock Exchange (NYSE) established a requirement that firms must have audit committees composed entirely of independent directors. An independent director is one who is not a part of current management. The other exchanges are less strict. The American Stock Exchange (AMEX) recommends but does not require audit committees composed entirely of independent directors. In 1987, the National Association of Securities Dealers (NASDAQ) established a requirement that audit committees be composed of at least a majority of independent directors.

The previously discussed underlying theory, prior empirical research, and anecdotal observations suggest that the composition of the board of directors may be related to the prevention of management fraud. Particularly, the above suggests that having a higher percentage of outside directors increases the board of director's effectiveness as a monitor of management for the prevention of management fraud.

The following hypothesis is examined:

H1: The proportion of outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

2.4.2 Quality of Outside Board Members. The mere presence of outsiders on the board of directors does not ensure that the board is an effective monitor of management. Boards of directors with similar percentages of outside directors may vary in their effectiveness as a monitor of management depending on whether outside directors have incentives to maintain reputations as quality directors.

Fama (1980) argues that the external market for outside directorships provides an incentive for outside directors to maintain reputations as decision experts. The presence of this external market encourages outside board members to use their performance as

an outside director to signal that (1) they are decision experts, (2) they understand the importance of diffuse and separate decision control, and (3) they can work within such decision control systems [Fama and Jensen (1983a)]. This market rewards and punishes outsiders based on their performance as a director.

The above discussion suggests that the board of director's ability to effectively monitor management may be a function of the quality of outside directors who serve on the board. Given that the occurrence of management fraud is an example of where the board of directors has ineffectively monitored management, there is an expectation that outside directors for fraud firms are of lower quality as compared to outside directors of no-fraud firms.

The following hypothesis is examined:

H2: The quality of outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

The number of additional directorships held by outside directors is used as a proxy for outside director quality, consistent with Byrd and Hickman (1992) and Shivdasani (1993). This proxy for outside director quality is based on Fama's (1980) view that the external market for outside directors rewards and punishes outside directors for their director performance. According to this view, the market rewards quality directors with additional directorships and punishes directors for poor performance by restricting their opportunities to serve on boards of directors of other firms.¹

¹ Kaplan and Reishus (1990) find that top managers in poor performing firms (e.g., dividend reducing firms) have fewer opportunities to serve as outside directors for other firms. Gilson (1990) finds that directors who leave boards of distressed firms hold approximately one-third fewer directorships three years after their departures.
2.4.3 Board Members' Ownership Stakes. Agency theory suggests that a high stake in a company's outstanding equity should provide individual directors with a strong incentive to promote firm activities that increase a firm's value because this increases the value in the director's own investment [Jensen and Meckling (1976)]. Empirical evidence by Feroz, Park, and Pastena (1991) suggests that the firm's owners have an incentive to prevent management fraud to protect their investment in the firm. They find that allegations by the SEC of financial reporting violations (due to either error or management fraud) are associated with average two-day abnormal returns of -13%. Thus, the agency theory argument and empirical evidence suggests that as the extent of ownership in the firm by both outside directors as well as managers who serve on the board of directors increases, the occurrence of management fraud should decrease. This relationship is further developed in Sections 2.4.3(i) and 2.4.3(ii).

2.4.3(i) Outside Board Members' Ownership Stakes. While the agency definition of board of director monitoring presumes that outside directors serve to protect the interests of stockholders, such protection should increase as outside members' degree of ownership in the firm increases. Monitoring the performance of top management requires time and effort. Without a personal financial interest in the firm or control over a large block of votes, an outside director will be more reluctant to second-guess poor management decisions [Morck, Shleifer, and Vishny (1988)]. Outside directors with high equity ownership interests in the firm are less likely to engage in decisions that have negative consequences for stockholder wealth [Walkling and Long (1984)]. Outside directors whose ownership stakes in the firm are low appear more like an employee rather than an investor because they receive only cash compensation as a director. A director with a sizeable stake in a firm is more likely to question and challenge management's proposals [Mace (1986), Patton and Baker (1987)]. And, the presence of an outside director with large ownership in the firm who asks discerning questions frequently encourages other outside directors to get involved [Mace (1986)]. Jensen (1993) argues that encouraging outside board members to hold substantial equity interests would provide better incentives for monitoring top management.

Recent empirical studies support the importance of firm ownership by outside directors. Kosnik (1990) finds outside directors' resistance of greenmail payments is most likely if outside directors own a large amount of equity relative to their cash compensation. Shivdasani (1993) finds equity ownership by outside directors of hostile targets is significantly lower than that by outside directors of non-targets. These empirical studies suggest that ownership in the firm provides incentives for outside directors to monitor management closely to prevent management fraud.

The following hypothesis is examined:

H3: The extent of firm ownership by outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

2.4.3(ii) Top Management's Ownership Stake. As stressed by Berle and Means (1932), when managers hold little equity in the firm and shareholders are too dispersed to enforce value maximization, corporate assets may be deployed to benefit managers rather than shareholders. Jensen and Meckling (1976) theorize that stock ownership by management can reduce the underlying agency problem: the more stock management owns, the stronger their motivation to work to raise the value of the firm's stock. As their stakes rise, managers pay a larger share of agency costs and are less likely to squander corporate wealth. This suggests a negative relation between the extent of management's ownership stake in the firm and the occurrence of management fraud.

Empirical research suggests that management ownership in the firm can serve as a substitute for other controls over management actions. When managers' ownership stakes in the firm represent the bulk of their personal wealth, it affects their incentives [Jensen and Murphy (1985), Jensen and Warner (1988)]. Jensen and Murphy (1990) show that the vast majority of direct incentives of top managers comes through stock ownership. Because of the significance of firm ownership to management's personal wealth, top management's ownership in the firm may lead to less demand for alternative anti-agency measures such as a strong board of outside directors in firms where management owns a large fraction of stock. Weisbach (1988) finds the fraction of outside directors is negatively correlated with shareholdings of top management, which is consistent with the view that monitoring by outside directors and the direct incentives created by management's stock ownership are substitute methods of control.

This study focuses on two types of management fraud: misappropriation of assets and fraudulent financial reporting. It is possible that the negative relation between the extent of management ownership and the occurrence of management fraud may depend on the type of management fraud committed.

The negative relation between management ownership in the firm and management fraud is expected to hold for occurrences of misappropriation of assets. If management owns α % of outstanding shares, their net gain from misappropriating \$1 dollar of assets is (\$1- α (\$1)). As management ownership of outstanding shares increases, the net gain from misappropriating assets decreases.

The negative relation between management ownership in the firm and management fraud is expected to hold for fraudulent financial reporting occurrences when management has a long-term investment horizon and believes that the probability of detection is high. In that case, while fraudulently reporting financial information may artificially increase firm value, management's assessment that the benefits of this artificial increase are temporary and do not exceed the costs of a decline in value of their stock holdings (as well as other penalties) when the fraudulent reporting is revealed. Thus, as stock ownership by management increases, the perceived net cost to management increases, consistent with the expected negative relation.

The following hypothesis is examined:

H4: The extent of ownership in the firm held by managers who serve on the board of directors is lower for firms experiencing management fraud compared to control firms.

Alternatively, it is possible that the negative relation may not hold when management has a short-term investment horizon and believes that the probability of detection is low. In that case, the benefits of fraudulently reporting financial information and artificially inflating firm value exceed the costs of a decline in value of their stock holdings (as well as other penalties) when the financial reporting is revealed. Thus, as stock ownership by management increases, the perceived net benefit to management increases, which is not consistent with the hypothesis.

As a result, additional analysis will be performed for the subset of fraudulent financial reporting cases of management fraud examined in this study. As discussed in Chapter 3, the vast majority of management fraud occurrences examined in this study represent occurrences of fraudulent financial reporting and not misappropriation of assets. The additional analysis of fraudulent financial reporting occurrences may offer insights about the relation between the extent of management ownership and the occurrence of fraudulent financial reporting. Due to the small number of occurrences of misappropriation of assets, a separate analysis of asset misappropriation will not be performed.

2.4.4 Management Power. The ability of outside board of director members to effectively monitor management may be impacted by management's ability to exert power to override such monitoring. Jensen (1993) argues that board culture is an important component of board of director failure. The great emphasis on politeness and courtesy at the expense of truth and frankness in boardrooms is both a system and cause of failure in the control system. He argues that by rewarding consent and discouraging conflicts, chief executive officers (CEOs) have the power to control the board of directors.

The CEO's power to control the board of directors is often attributed to the belief that the CEO has by far the strongest voice in determining who is on the board of directors, even though boards have nominating committees [Mace (1986), Vancil (1987), Patton and Baker (1987)]. As a result, directors' ties to management and the CEO are often stronger than the ties to stockholders because directors are captives of top management. Non-management directors refrain from overt criticism of management's behavior to not jeopardize board of director seats [Patton and Baker (1987)].

Additionally, the CEO often determines the board of director's agenda and information given to the board of directors. This limitation on information severely

hinders the ability of even highly trained board members to contribute effectively to the monitoring and evaluation of the CEO and other top management [Jensen (1993)].

The management fraud literature suggests that management power may affect management's ability to act fraudulently. Loebbecke, et.al., (1989) find that in seventyfive percent of the fraud cases examined, operating and financial decisions are dominated by a single person. This suggests that the extent of power held by managers who serve on the board of directors may allow those managers to override monitoring by the board of directors for purposes of committing management fraud.

This study examines three measures of board of director characteristics that may influence management's ability to override monitoring by outside directors. These three measures are in addition to any power management derives from significant stock ownership (ownership is addressed in connection with Hypothesis 4). The first measure considers whether the chairpersons of fraud firms are more likely to hold a managerial position in the firm relative to chairpersons of no-fraud firms. The second measure considers whether there are differences in the CEO's tenure on the board of directors between fraud and no-fraud firms. The third measure considers whether there are differences in outside director tenures on boards of fraud firms relative to no-fraud firms. These three measures are further developed in Sections 2.4.3(i) through 2.4.3(iii) that follow.

2.4.4(i) Managerial Positions Held by Chairperson. In many firms, it is common for the chairperson to also hold managerial positions in the firm. The function of the chairperson is to run board of director meetings and oversee the process of hiring, firing, evaluating, and compensating the CEO. Clearly, the CEO cannot perform this function

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apart from his or her personal interests [Jensen (1993)]. Without the direction of an independent leader, it is much more difficult for the board of directors to perform its critical function. When the chairperson of the board of directors yields great power by holding a management position in the firm, the decision processes of the board of directors appear to be dominated by an individual. In a company where the chairperson is also the CEO or president, power is concentrated in one individual and possibilities for checking and balancing powers of the CEO or president are eliminated [Chaganti, Mahajan, and Sharma (1985)]. Such situations signal the absence of separation of directors to be effective, it is important to separate the CEO and chairperson/president positions [Jensen (1993)].

The following hypothesis is examined:

H5: The chairperson of the board of directors holds managerial positions more often for firms experiencing management fraud compared to control firms.

2.4.4(ii) CEO Board Tenure. The extent of the CEO's tenure of service on the board of directors may indicate the extent of power held by that individual. An established CEO has relatively more power than a new CEO [Hermalin and Weisbach (1988)]. A CEO who has successfully maintained a position on the board of directors for long periods of time may use his/her seniority to override monitoring by outside members for purposes of committing management fraud.

The following hypothesis is examined:

H6: The CEO's tenure on the board of directors is longer for firms experiencing management fraud compared to control firms.

In addition to examining whether CEO tenure differs between fraud and no-fraud firms as predicted by hypothesis 6, it is important to control for differences in CEO tenure across fraud and no-fraud firms because CEO tenure may effect who is selected to serve on the board as a director. Hermalin and Weisbach (1988) find that insiders are added to the board of directors toward the end of a CEO's tenure to be groomed as potential successors and that insiders leave just before and after a CEO change.

2.4.4(iii) Outside Director Tenure. The potential for CEO power may be further enhanced if the average tenure of outside directors is low. In such situations, the CEO may be capable of exerting power over more recently appointed, shorter tenured outside directors for purposes of overriding outside director monitoring. The outside director's lack of seniority may affect his/her ability to scrutinize top management. Newer members on the board of directors may be more susceptible to group pressures to conform. Kosnik (1990) finds that outside directors are significantly more likely to resist greenmail payments as their average tenure on the board of directors increases.

The following hypothesis is examined:

H7: The average outside director's tenure on the board of directors is shorter for firms experiencing management fraud compared to control firms.

2.4.5 Active Audit Committees. Often the board of directors delegates the responsibility for the oversight of financial reporting to an audit committee [The National Commission on Fraudulent Financial Reporting (1987), AICPA's SAS No. 53, AICPA's Public Oversight Board (1993)]. Audit committees can be viewed as monitoring mechanisms that are voluntarily employed in high agency cost situations to improve the quality of information flows between principal and agent. Audit committees provide a

direct line of communication between the board of directors and the auditor thereby reducing the information asymmetries between management and the board [Pincus, Rusbarsky, and Wong (1989)]. The audit committee enhances the board of director's capacity to act as a management control by providing the board of directors with more detailed knowledge and complete understanding of financial statements and other financial information issued by the company. The existence of an audit committee may be perceived as indicating higher quality monitoring [Pincus et al. (1989)]

Despite decades of encouragement, audit committees were rare until the late 1970s and are still not universal [Pincus et al. (1989)]. Audit committees were first suggested as vehicles of communication between external auditors and boards of directors in the aftermath of McKesson and Robbins fraud case in the 1930s. Despite the growth in the number of audit committees, Pincus et al. (1989) report that a 1988 followup study on the implementation of the National Commission on Fraudulent Financial Reporting recommendations notes that companies continue to not create audit committees. That study surveyed 8564 public companies, receiving 1014 replies, and found that while 82% of respondents (including NYSE companies) had an audit committee, only 53% of smaller companies had audit committees. These results must be interpreted with caution due to the possibility of non-response bias.²

The audit committee can play an important role in preventing and detecting management fraud [The National Commission on Fraudulent Financial Reporting (1987)].

² Recall that the audit committee requirements of the national stock exchanges are discussed in Section 2.4.1.

According to Sommer (1991), an audit committee may often be the first non-management personnel to identify a potential irregularity.

Sommer (1991) notes that having an audit committee as part of the board governance structure and having an effective audit committee are different matters. Respondents to the KPMG Peat Marwick (1993) fraud survey believe that one of the factors contributing to the occurrence of management fraud is that firms have inadequate audit committees. The AICPA's Public Oversight Board (1993) reports "that in too many instances the audit committees do not perform their duties adequately and in many cases do not understand their responsibilities" (p. 50). Research on audit committee effectiveness is limited. Whether audit committees are actually discharging their responsibilities remains insufficiently understood [Kalbers and Fogarty (1993)].

While an audit committee is designed to improve the quality of information between the principal and agent, the effectiveness of the audit committee is eliminated if the audit committee is never allowed to meet. Proxy statements disclose the number of meetings per year held by the audit committee. For purposes of this study, an "active" audit committee represents an audit committee meeting at least once during the year.

The following hypothesis is examined:

H8: The extent to which the board of directors has an active audit committee is lower for firms experiencing management fraud compared to control firms.

2.5 Controlling for Board Size

It is important to control for differences in the size of the board of directors when examining these eight hypotheses. In the case of the representation by outside directors, a given percentage of outside director representation on the board, say 25%, translates to one outside director for a board size of four members and to three outsiders for a board size of twelve. While the two firms have the same percentage (25%) of outsiders on the board of directors, the effectiveness of those outsiders may differ between the two firms. For the firm with twelve members, the three outsiders may be able to band together with stronger voice to influence board of director action more effectively than the sole outsider on the board of directors of the firm with only four board members. Board size may affect other board of director characteristics examined such as audit committee formation. Small-sized boards may not believe there is a need to create an audit committee separate of the board of directors.

Board size is included in this study as a control variable rather than testing a hypothesis about differences in board size due to conflicting expectations about the effects of board size on management fraud. Some researchers believe that a smaller board of directors plays a controlling function whereas a larger board of directors may not be able to function effectively as a controlling body leaving management relatively free [Chaganti, Mahajan, and Sharma (1985)]. This view is consistent with Jensen (1993) who believes larger boards are easier for the CEO to control. Others believe larger boards may be valuable for the breadth of its "services". Chaganti et al. (1985) find that firms filing for Chapter 11 bankruptcy protection have smaller boards than no-failed firms suggesting that a larger board is more effective in preventing corporate failure.

2.6 Summary

This chapter describes how the occurrence of management fraud provides a unique setting to test the theory of the board of directors as a monitor of management. Using management fraud as an example of the agency problem that arises from the separation of decision control and residual-risk bearing, this chapter builds upon agency theory and existing management fraud and corporate governance research to motivate the examination of whether there are differences in eight characteristics of boards of directors between fraud and no-fraud firms. Chapter 3 describes how fraud and no-fraud firms are selected for this study.

CHAPTER 3 - SAMPLE SELECTION AND DESCRIPTION

This chapter describes the sample used in this study to examine the eight hypotheses developed in Chapter 2. The sample consists of 150 publicly traded firms. Seventy-five of the 150 firms represent the "fraud firms" because each of these firms had an occurrence of management fraud publicly reported during the period 1980 - 1991. Each of the fraud firms was matched with a no-fraud firm thereby creating a choice-based sample of 75 fraud and 75 no-fraud firms.

Section 3.1 explains how the fraud firms were identified. Section 3.2 describes how a no-fraud firm was matched with each fraud firm. Section 3.3 highlights univariate differences in board of director composition between fraud and no-fraud firms. Section 3.4 highlights differences in other firm characteristics between fraud and no-fraud firms that will be considered in this study because they may be associated with the likelihood of management fraud and board of director composition. Section 3.5 summarizes this chapter.

3.1 Fraud Firm Selection

Identifying a sample for this study began with the search of publicly traded firms experiencing management fraud. The sample was limited to public rather than privatelyheld firms because the data examined in this study includes information only available in proxy statements and financial statements filed with the SEC. Two sources were used to identify the fraud firms.

The first source of fraud firms was Accounting and Auditing Enforcement Releases (AAERs) issued by the SEC. A firm reported in an AAER was included as a sample fraud firm if the SEC accused top management of violating Rule 10(b)-5 of the

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1934 Securities Exchange Act (the 1934 Act).¹ Rule 10(b)-5 requires the <u>intent</u> to deceive, manipulate, or defraud [Commerce Clearing House SEC Accountant's Handbook (1993)].

The second source of fraud firms was <u>The Wall Street Journal Index (WSJ Index</u>) caption of "Crime-White Collar Crime." Other possible captions, such as "Fraud," "Management Fraud," "Embezzlement," are not provided in the <u>WSJ Index</u>. The only other related captions are "Crime" and "Crime-Organized Crime;" however, those two captions include articles about occurrences not related to management fraud, such as drug-trading, murder, and tax evasion. In most cases, the firms identified in the <u>WSJ</u> <u>Index</u> were also reported in AAERs. However, because the time lag between a management fraud occurrences noted in the <u>WSJ Index</u> are yet to be reported in an AAER. Therefore, all fraud firms reported by the <u>WSJ Index</u> that were not addressed in an AAER were included as a sample fraud firm.

A fraud firm identified from these two sources is included in the sample if the appropriate proxy and financial statement data filed with the SEC in the fiscal year preceding the first occurrence of the management fraud is available.² Such proxy and financial statement data were hand collected from the Q-Data SEC Files (the Q Files) that

¹ Feroz, Park, and Pastena (1991) note that the SEC only pursues cases where the probability of SEC success is high and where the allegations involve material violations.

² For some firms, the proxy examined may have been filed with the SEC in the fiscal year the management fraud took place but before the fraud was discovered. For example, if the management fraud occurred in 1986 and 1987, the 1986 proxy may be examined if the 1985 proxy is not available in the Q Files.

are on microfiche. Information about the specific financial reporting periods affected by the management fraud was obtained from the AAER or <u>WSJ Index</u>. For fraud firms identified from AAERs, the related AAER notes the time period of the alleged fraud. For fraud firms identified from the <u>WSJ Index</u>, the related <u>WSJ</u> articles were reviewed to determine when the first report of the alleged fraud appeared.

The AAERs and the <u>WSJ Index</u> appear to be reasonable sources for identifying management fraud occurrences for two reasons. First, almost all of the applicable AAERs contain a disclosure that management personnel involved in the management fraud consented to the final judgment action imposed by the SEC.³ Second, for fraud firms identified by review of the <u>WSJ Index</u>, management personnel involved has(ve) either resigned, been terminated, or indicted by a grand jury. Management's consent, resignation, termination, or indictment disclosed by these two sources suggests a high level of seriousness of the management fraud allegation. Thus, the fraud occurrences included in this study appear to represent serious instances of management fraud.

These two sources provided a sample of seventy-five fraud firms for examination in this study. As noted in Figure 3, sixty-seven of the seventy-five fraud firms came from the review of 1982-1991 AAERs, which include AAERs #1-#348. The remaining eight fraud firms came from the review of the 1980-1991 <u>WSJ Index</u>. AAERs and the <u>WSJ Index</u> issues after 1991 were not reviewed to allow at least two subsequent years

 $^{^3}$ In a small number of AAERs, the SEC did not disclose whether or not management consented to the SEC's final judgment. This lack of disclosure of management's consent does not imply that management is challenging the SEC's allegation of management fraud. Instead, it appears that the SEC inadvertently omitted the consent disclosure.

Number of Accounting & Auditing Enforcement Releases (AAERs) 1982-1991			
Less:			
	AAERs not involving management fraud (e.g., unintentional misapplication of GAAP) or AAERs expanding other AAERs (e.g., duplicate AAERs for same firm)	(198)	
	AAERs affecting firms with no available proxy or financial statement data	(64)	
	AAERs affecting banks or insurance firms experiencing management fraud	(16)	
	AAERs affecting firms where no matching no-fraud firm can be identified	(3)	
Subtotal of fraud firms identified by reviewing AAERs			
Add:	Allegations of management fraud reported by the <u>Wall Street Journal</u> but not reported in an AAER	8	
Total number of fraud firms included in study			

Figure 3 Identification of 75 Fraud Firms

to verify that the related matched no-fraud firms have not experienced management fraud (the process of matching no-fraud firms with each fraud firm is described in Section 3.2). Also, as summarized in Figure 3, 198 of the 348 AAERs were excluded because they do not involve management fraud as defined for this study (e.g., they involve unintentional misapplications of GAAP) or they represent AAERs that expand other AAERs (e.g., duplicate AAERs involving the same firm), 64 AAERs were excluded due to the lack of proxy and financial statement data availability, and three were excluded because no-fraud firms could not be identified using the matching criteria specified in Section 3.2.⁴ Finally, sixteen AAERs were excluded because they involve banks and insurance institutions. Banks and insurance institutions were excluded to be consistent with Hermalin and Weisbach (1988) who note that bank boards have characteristics that differ

⁴ The Q Files do not contain financial statements for all public companies.

from industrial firms and Mayers, Shivdasani, and Smith (1994) who suggest that insurance company boards may have unique board characteristics.⁵

Figure 4 shows that the majority of fraud firms represent occurrences of fraudulent financial reporting rather than misappropriation of assets.⁶ Sixty-seven of the seventy-five fraud firms experienced fraudulent financial reporting and eight firms experienced misappropriation of assets. Thus, 89.3% of the management fraud cases in this study represent instances of fraudulent financial reporting. This is consistent with the findings of the National Commission on Fraudulent Financial Reporting (1987) that note 87% of the SEC enforcement actions in 1982-1986 dealt with fraudulent financial reporting.

As noted in Figure 4, almost all of the fraudulent financial reporting sample firms in this study came from the review of AAERs. Many of these fraudulent financial reporting occurrences were also reported in the <u>WSJ Index</u>; however, only two additional fraudulent financial reporting occurrences were found in the review of the <u>WSJ Index</u> that were not also covered in an AAER. Two of the misappropriation of asset occurrences were identified during the review of the AAERs. The large number of

⁵ Fama and Jensen (1983b) discuss unique characteristics of financial organizations. They note that there is a special form of diffuse control inherent in the redeemable claims of financial organizations. Specifically, claimholders (i.e., bank depositors and insurance policyholders) can independently withdraw resources that deprive management control over assets.

⁶ One might argue that the fraudulent financial reporting instances also include an implicit misappropriation of assets. For example, management may receive additional compensation if fraudulently reported financial information increases bonuses that are paid as a function of accounting-based earnings.

fraudulent financial reporting occurrences in the AAERs reflects either the more common occurrence of fraudulent financial reporting rather than misappropriation of assets in the population or the SEC's enforcement bias towards fraudulent financial reporting occurrences. All other misappropriation of assets occurrences came from the review of the <u>WSJ Index</u>.

	Source of Fraud Firms					
Type of Management Fraud	Accounting & Auditing Enforcement Releases (AAERs) #1-348 1982-1991	<u>Wall Street Journal Index</u> "Crime - White Collar" 1980-1991	Total			
Fraudulent Financial Reporting	65	2	67			
Misappropriation of Assets	2	6	8			
Total	67	8	75			

Figure 4 Source of Fraud Firm by Type of Management Fraud

3.2 Matching Fraud Firms with No-Fraud Firms

A comparison sample of seventy-five no-fraud firms was created by matching a

no-fraud firm with each fraud firm based on the following requirements:

- 1. <u>Stock Exchange.</u> The common stocks of a fraud firm and its matched no-fraud firm trade on the same national stock exchange (NASDAQ, AMEX, NYSE).
- 2. <u>Firm Size</u>. All firms within the particular national stock exchange category per the annual COMPUSTAT tape that are in the same industry (see step 3) as the fraud firm were selected if those firms are similar in firm size. Firms are considered similar in firm size if the current market value of common equity is within \pm 30% of the current market value of common equity for the fraud firm in the year preceding the year of the management fraud.⁷

⁷ Kaplan and Reishus (1990) created a comparison sample using a cutoff of $\pm 50\%$. While this study's use of $\pm 30\%$ may appear as a large range, most of the fraud firms and related control firms are within $\pm 20\%$. Given that the mean market value of



- 3. <u>Industry.</u> All firms identified in steps 1 and 2 were reviewed to identify a nofraud firm within the same four-digit SIC code as the fraud firm. The no-fraud firm selected was the one that had a current market value of common equity closest to the current market value of common equity of the fraud firm (or total assets if market data was not available). If no four-digit SIC code firm match was identified, the same procedure was performed to identify a firm with the same three-digit SIC code. If no three-digit match was identified, the same procedures were performed to identify a two-digit SIC code match.
- 4. <u>Time Period</u>. A no-fraud firm identified in steps 1 through 3 was included in the final sample if proxy and financial statement data was available for the time period used to collect data from the proxy and financial statements of the related fraud firm.

The matching of no-fraud firms will result in some misclassification if a firm classified as a no-fraud firm had an occurrence of management fraud that has yet to be detected. To minimize this likelihood, the <u>WSJ Index</u> was reviewed from 1980 through 1994 to verify that there was no report of a management fraud for that no-fraud firm. Also, all AAERs were reviewed to verify that there was no SEC enforcement action against the no-fraud firm. The intent of this procedure was to reduce the likelihood of such misclassification error. Misclassification errors should by minimal given that the likelihood of a management fraud in a random sample is assumed to be small. Note, however, that the misclassification of a no-fraud firm biases against observing the hypothesized relations.

common equity of the fraud firms is \$127.6 million, the related control firm size could range from \$89.3 million to \$165.9 million. There is no reason to believe that such a range has a significant effect on board characteristics.

⁸ If market value information is not available on the COMPUSTAT tape or in the Daily Stock Price Record, fraud and no-fraud firms were matched based on total assets at the end of the fiscal year preceding the occurrence of the management fraud.

As a result of the matching procedures 1 through 4, fraud and no-fraud firms should not differ significantly by the type of national stock exchange where a firm's common stocks trade, firm size, industry, and time period. It is important that the fraud and no-fraud firms are similar in these variables because prior research suggests that board characteristics may vary systematically with these variables [Baysinger and Butler (1985), Rosenstein and Wyatt (1990), Shivdasani (1993), Mayers, Shivdasani, and Smith (1994)], and they may also be associated with management fraud as discussed further in Section 3.4. Finally, such matching is consistent with the matching process used in previous corporate governance empirical studies. Based on the descriptive information discussed in the next paragraph, the matching of these four variables appears reasonable.

Table 1 shows that the fraud and no-fraud firms are of similar size based on total assets, net sales, and current market value of common stock.⁹ Fraud firms have mean (median) total assets of \$103.2 million (\$11.1 million), and no-fraud firms have mean (median) total assets of \$79.6 million (\$12.5 million). The mean (median) net sales for fraud firms are \$102.3 million (\$13.0 million) as compared to \$93.1 million (\$12.9 million) for the no-fraud firms, respectively. For the subset of 50 fraud and 50 no-fraud firms with available common stock market value information, the mean (median) current market value of common equity is \$127.6 million (\$26.6 million) for fraud firms as compared to a mean (median) of \$124.6 million (\$23.7 million) for no-fraud firms. None of the above size measures are statistically different between fraud and no-fraud firms based on paired data t-tests and Wilcoxon matched-pair signed-rank tests.

⁹ Fifty firms were matched on current market value of common stock. However, because market value information was not available for twenty-five fraud firms, no-fraud firms for those twenty-five fraud firms were matched based on total assets.



 Table 1

 Matching of Fraud Firms and No-Fraud Firms

	(\$ in thousands)			
	Fraud Firms Mean [Median] (Standard Deviation)	No-Fraud Firms Mean [Median] (Standard Deviation)		
Total Assets	\$103,192 [11,130] (316,734) n=75	\$79,626 [12,487] (221,187) n=75		
Net Sales	\$102,285 [13,043] (262,875) n=75	\$93,078 [12,936] (257,451) n=75		
Current Market Value of Equity ¹	\$127,630 [26,563] (263,370) n=50	\$124,590 [23,660] (257,690) n=50		
Stock Traded on: NASDAQ AMEX NYSE	62 4 9	62 4 9		
Match Based On: 4 Digit SIC Codes 3 Digit SIC Codes 2 Digit SIC Codes	19 32 <u>24</u> 75			
First Year of Fraud: 1979 - 3 1982 1980 - 6 1983 1981 - 3 1984	- 9 1985 -11 -13 1986 - 5 - 4 1987 -11	1988 - 3 1989 - 6 1990 - <u>1</u> 75		

Market price information was available for fifty of the seventy-five fraud firms. Thus, no-fraud firms were matched based on current market value of equity for those fifty firms. For the remaining twenty-five fraud firms, no-fraud firms were matched based on total assets.

1

Table 1 also shows that the sample fraud firms and related no-fraud firms are also closely matched based on national stock exchange, industry, and time period. The sample includes sixty-two fraud firms whose common stocks trade on the NASDAQ Exchange, four firms whose shares trade on the AMEX, and nine firms whose shares trade on the NYSE. All no-fraud firms trade on the same national exchange as the fraud firm. The sample includes fraud firms representing fifty-seven different four-digit SIC codes, which does not suggest clustering by industry type. Figure 5 includes a list of those industries. Nineteen of the seventy-five no-fraud firms have the same primary four-digit SIC code as the fraud firm, and thirty-two have the same primary three-digit SIC code. For twenty-four of the fraud firms, a suitable no-fraud firm match could only be obtained by matching two-digit SIC codes. Finally, the years when the fraud firms experienced a management fraud range from 1979-1990.

SIC Codes	Number of Fraud Firms	SIC Code Description for Fraud Firms	
1311	2	Crude Petroleum & Natural Gas	
2035		Pickled Fruits & Vegetables	
2295	1	Coated Fabrics	
2328	1	Men's, Youth's, Boy's Work Clothing	
2341	1	Women's Underwear & Nightwear	
2451	2	Mobile Homes	
2621	1	Paper Mills	
2819	1	Industrial Inorganic Chemicals	
2833	1	Medicinal Chemicals and Botanical Products	
2834	1	Pharmaceutical Preparations	
3241	1	Cement, Hydraulic	
3411	1	Metal Cans	
3499	1	Fabricated Metal Products	
3555	1	Printing Trades Machinery & Equipment	
3561	1	Pumps and Pumping Equipment	
3571	5	Electronic Computers	
3572	1	Computer Storage Devices	
3573	3	Flexible Magnetic & Memory Disks	
3577	1	Computer Peripheral Equipment	
3612	1	Power, Distribution, Special Transformers	
3635	1	Household Vacuum Cleaners	
3643	1	Current Carrying Wiring Devices	
3651	1	Radio & Television Receiving Sets	
3662	1	Radio & Television Transmitting Equipment	
3663	1	Radio, TV, Communication Equipment	
3674	2	Semiconductor Related Devices	
3693	1	Radiographic X-Ray Apparatus	
3811	1	Engineering, Laboratory, Scientific Instruments	
3822	1	Automatic Regulating Controls	

Figure 5 SIC Code Description for 75 Fraud Firms

SIC Code	Number of Fraud Firms	SIC Code Description for Fraud Firms	
3825	2	Electronic Measurement Instruments	
3829	1	Manufacturer of Measurement and Control Devices	
3841	2	Surgical Medical Instruments	
3944	1	Games, Toys - Children	
4213	1	Trucking	
4511	1	Contract Aviation Services	
4811	1	Telephone Communication	
4911	1	Distributor of Electric Power	
5051	1	Metals Service Centers-Wholesales	
5081	2	Commercial Machines & Equipment	
5082	2	Wholesale Construct. Equipment	
5086	1	Professional Equipment and Supplies	
5092	1	Scrap & Waste Materials	
527 1	1	Mobile Home Dealers	
5731	1	Radio, TV, Electric Stores	
5812	1	Eating Places	
6553	1	Cemetery Subdividers and Developers	
6722	2	Management Investment Co.	
6792	3	Oil Royalty Traders	
7311	1	Advertising Agencies	
7372	2	Prepackaged Software	
7373	1	CMP Integrated Systems Design	
7374	1	CMP Processing Data Preparation	
7389	1	Business Services	
7391	1	Research & Development Laboratories	
7394	2	Equipment Rental & Leasing Services	
8062	1	General Medical & Surgical Hospitals	
8731	1	Commercial Physical, Biological Research	
	75		

Figure 5 (cont'd)

3.3 Board Composition Differences Between Fraud and No-Fraud Firms

The purpose of creating this sample of fraud and no-fraud firms is to examine whether there are differences in board of director composition between fraud and nofraud firms in a manner predicted by economic theory. This section highlights that there are univariate differences in board of director composition between fraud and no-fraud firms examined in this study.

Table 2 contains univariate descriptive information about board of director characteristics for fraud and no-fraud firms. As reported in Table 2, fraud firms have on average (median) 6.20 (6.0) individuals serving on the board of directors while no-fraud firms have on average (median) 6.72 (6.0) board of director members. The board sizes of firms included in this study are smaller than boards of directors of firms examined in other corporate governance studies. For example, the board sizes of hostile takeover targets and control firms in Shivdasani (1993) are 11.32 and 10.96, respectively. The difference in board size is attributed to the heavy concentration of smaller NASDAQ firms in this study as compared to the primary focus on larger AMEX and NYSE firms in corporate governance studies such as Shivdasani (1993).

While similar in size, the composition of boards of directors differs across firms with boards of fraud firms having significantly fewer (p < .01) outside members and more management directors than no-fraud firms. Outside directors represent all directors who are not current employees of the firm. Fraud firms have boards with 50.4% (50%) of its members on average (median) composed of outside directors whereas no-fraud firms have boards with 64.7% (64.3%) of its members on average (median) composed of

Table 2								
Board	Structure	Statistics	on 7.	5 Fraud	and	75	No-Fraud	Firms

	mean [median] (standard deviation)			
Variable	Variable Name	Fraud Firms (n=75)	No-Fr aud Firms (n=75)	
Average size of board of directors	BOARDSZ	6.200 [6.000] (2.557)	6.720 [6.00] (2.633)	
% Non-managers on board	%OUTBOARD	50.4 [50.0] (22.1)	64.7*** [64.3]*** (15.9)	
Average # of other directorships held by non-managers on board	QUALBOARD	.999 [.670] (1.077)	.901 [.750] (.794)	
Cumulative % shares held by non- managers on board	OWNBOARD	5.40 [1.40] (8.40)	12.0*** [4.70]*** (15.1)	
Cumulative % shares held by managers on board	MGTBOARD	30.3 [26.5] (21.6)	21.3*** [16.9]*** (18.6)	
% of firms where Chairperson is also CEO or President	BOSS	.853	.733*	
CEO's board tenure (in years)	CEOTENURE	8.847 [7.000] (7.006)	10.560 [8.000] (8.687)	
Average board tenure for outside directors (in years)	OUTTENURE	3.786 [2.000] (3.835)	6.587*** [5.800]*** (4.531)	
% with active audit committees	ACTIVEAC	26.7	56.0***	

*, [**], (***)

Significantly different across firm type at less than the .10, [.05], (.01) level (one-sided when difference in direction predicted, two-sided otherwise) based on paired t-tests (or chi-square test) for means or Wilcoxon matched-pair sign-rank test for medians.

outside directors. Both mean and median differences are statistically significant at the .01 level using paired t-tests and Wilcoxon matched-pair signed-rank tests.

Outside members of both fraud and no-fraud firms hold, on average, one directorship in another firm. Recall from Chapter 2 that the number of additional directorships in other firms is the proxy for outside director quality. Thus, based on this proxy, the Table 2 descriptives suggests that outside director quality does not differ between fraud and no-fraud firms on a univariate basis.

Cumulative shares of common stock held by both outside and management directors differ significantly between fraud and no-fraud firms. Outside director mean (median) cumulative common stock ownership in fraud firms of 5.4% (1.4%) is significantly lower at the .01 (.01) level as compared to mean (median) outside director cumulative common stock ownership in no-fraud firms of 12.0% (4.7%). Management director mean (median) cumulative common stock ownership in fraud firms of 30.3% (26.5%) is significantly higher at the .01 level (.01 level) as compared to mean (median) management director cumulative common stock ownership in no-fraud firms of 21.3% (16.9%).

The chairperson holds managerial positions of CEO or president in 85% of fraud firms and 73.3% of no-fraud firms and such difference is statistically significant at the .10 level. While the CEO's tenure on the board is, on average, 8.9 years for fraud firms as compared to 10.6 years for no-fraud firms (not significantly different), the average tenure of outside directors is statistically longer for no-fraud firms compared to fraud firms. Average (median) tenure on the board is 3.8 years (2.0 years) for outside directors of fraud firms relative to an average (median) tenure of 6.6 (5.8) years for nofraud firms.

No-fraud firms are significantly (p < .01) more likely to have an active audit committee compared to fraud firms. Sixty-seven percent of the no-fraud firms have an audit committee of the board whereas only 41% of the fraud firms have an audit committee (not reported in Table 2). While a firm may have an audit committee, the firm may be "window dressing" by creating an audit committee that never meets. While 56% of no-fraud firms have an audit committee that met at least once during the year, only 27% of fraud firms have audit committees that met at least once during the year prior to the fraud.

3.4 Effects of Differences in Other Firm Characteristics

While the prior section documents that there are univariate differences in board of director characteristics between fraud and no-fraud firms, it is important that other non-board of director characteristics that are likely to be associated with the occurrence of management fraud and board of director composition be controlled for when testing the hypotheses. Failure to consider variables that may be correlated with the occurrence of management fraud and board of director composition may bias tests of the hypotheses. This section highlights procedures that serve to minimize the potential for correlated omitted variables in this study.

For an ideal test of the hypotheses, the fraud and no-fraud firms would only differ in board of director composition and whether or not a management fraud has occurred. In other words, the ideal test would include fraud and no-fraud firms whose probabilities for fraud are identical based on all non-board of director characteristics. Unfortunately, due to the extensive list of possible red flag indicators of management fraud identified in management fraud research, such matching of fraud and no-fraud firms is not practical.

Section 3.2 describes how fraud firms were matched with no-fraud firms on the basis of national stock exchange, industry, firm size, and time period. As noted in that section, these variables were used to match fraud and no-fraud firms because prior corporate governance research shows that board of director composition may vary systematically with these variables [Baysinger and Butler (1985), Rosenstein and Wyatt (1990), Shivdasani (1993), Mayers, Shivdasani, and Smith (1994)], and they are likely to be associated with occurrences of management fraud. The association of these four matching variables with management fraud and board of director composition is discussed next.

Firm size is likely to be associated with both management fraud and board of director composition. Management fraud research notes that decentralized firms are more likely than other firms to experience management fraud. Given that firm size may be associated with organizational structure - centralization versus decentralization - firm size is likely to be associated with occurrences of management fraud. Firm size is also likely to be associated with board of director composition. Larger firms are likely to have more outside directors because of their expertise in monitoring and project evaluation [Shivdasani (1993)]. Serving on the board of directors of a large corporation can also enhance a director's visibility and reputation, which will increase the likelihood that he/she will serve on additional boards of directors [Shivdasani (1993)]. Because

firm size is likely to be associated with both management fraud and board of director composition, it is important to match firms on the basis of firm size.

The industry in which the firm operates is likely to be associated with both management fraud and board of director composition. Management fraud research notes that increased management pressure due to inadequate profitability relative to industry peers often leads to management fraud. Industry trends such as increased competition may place undue emphasis on the firm's profits relative to the industry. As a result, industry trends and the probability for management fraud are likely to be associated. Additionally, management fraud research notes that firms experiencing many contentious and difficult accounting issues are more likely to experience management fraud. Because difficult accounting issues can be industry-specific, industry and the occurrence of management fraud are likely to be associated. The firm's industry is also likely to be associated with board of director composition. Firms in certain industries could require outside directors with a greater amount of industry-specific experience. Matching on the basis of industry serves as a control for the opportunities of directors to serve on other boards [Shivdasani (1993)]. Because of the association of industry with both management fraud and board of director composition, it is important to match firms on the basis of industry.

It is also important to match firms in the same time period because the likelihood of management fraud and changes in board of director composition are likely to vary across time. Economic conditions change over time, and those changes may affect the likelihood of management fraud. Recessionary periods may place undue pressure on management leading to concern about whether the entity will be able to survive. In response to that pressure, management may act fraudulently. The corporate governance literature notes that board of director composition varies across time as well. Baysinger and Butler (1985) find that board of director composition has been changing over time. They note that between 1970 and 1980, the proportion of outside directors increased. As noted in Section 2.4.1 of Chapter 2, <u>The Wall Street Journal</u> [August 19, 1993, p.1] reports similar increases through the early 1990s. Because the likelihood of management fraud and board of director composition are likely to vary over time, it is important that fraud and no-fraud firms be matched in the same time period.

Finally, it is important to match firms on the basis of the national stock exchange where the firms' common stocks trade because the type of exchange is likely to be associated with both management fraud and board of director composition. Firms that trade on the NASDAQ exchange are likely to have different characteristics from AMEX and NYSE firms. Some of those characteristics may be associated with occurrences of management fraud. For example, developing companies are likely to initially trade on the NASDAQ exchange. Developing companies may have newer, less experienced management personnel, and management fraud research notes that management fraud is more likely when management and accounting personnel are inexperienced. Thus, the type of national stock exchange may be associated with occurrences of management fraud. Additionally, the type of national stock exchange is associated with board of director composition, given that each of the exchanges have differing composition requirements. For example, as discussed in Section 2.4 of Chapter 2, the national stock exchanges have different requirements for how many non-management directors must serve on the audit committee. Because the type of national stock exchange is likely to be associated with both the occurrence of management fraud and board of director composition, it is important to match fraud and no-fraud firms on the basis of national stock exchange.

In addition to the four variables used to match fraud and no-fraud firms, there may be other firm-specific characteristics associated with the occurrence of management fraud and board of director composition that should be considered when evaluating the hypotheses. There are numerous red flag indicators of management fraud. However, only those that are likely to be associated with board of director composition are important to this study because their omission may otherwise create a potential correlated omitted variable bias.

Based on the review of the management fraud and corporate governance literatures, four additional firm-specific characteristics were identified for inclusion in this study. They were identified because they are likely to be associated with both the occurrence of management fraud and board of director composition. The four additional variables included in this study are:

- 1. Extent of firm growth.
- 2. Financial health of firm.
- 3. Length of time the firm's stock has publicly traded.
- 4. Extent of monitoring by blockholders.

Motivation for the inclusion of these four variables in this study, as well as how they differ between fraud and no-fraud firms, is described in subsections 3.4.1 through 3.4.4 that follow. These variables are included as control variables in the logit regression model (described extensively in Chapter 4) because it is more practical to include them

as control variables rather than consider them as part of the matching process. Table 3 contains the univariate descriptive information about these variables.

3.4.1 Growth. The extent of recent firm growth may be associated with the likelihood of management fraud and board of director composition. Thus, it is important to include a measure of firm growth in this study when evaluating the hypotheses.

One of the most significant management fraud red flag indicators noted in the management fraud research is the presence of rapid company growth. Bell et al., (1991) note that if the company has been experiencing rapid growth, management may be motivated to misstate the financial statements during a downturn to give the appearance of stable growth. In high growth situations, responsibility for overall decision making and segments of key decisions are spread across a number of individuals, and no one individual has sufficient authority or information to prevent or stop illegal activities. Extensive growth through a rapid expansion of sales, acquisition of a new division or firm, or entry into an unfamiliar line of business can weaken internal controls. Weak or non-existent internal controls can make fraud easier to commit and detection less likely [National Commission on Fraudulent Financial Reporting (1987)].

The extent of company growth may also be associated with board of director composition. In rapid growth situations, needed modifications to rules, procedures, and other control mechanisms, like the board of directors, often lag behind the growth of the firm. Necessary changes to board of director composition, such as the addition of outside members, may follow high growth periods. As a result, high growth firms may have few outside directors. Thus, firm growth and board of director composition may be correlated.

 Table 3

 Non-Board of Director Differences Across Fraud and No-Fraud Firms

	Variable Name	Fraud Firms Mean [Median] (Standard Deviation)	No-Fraud Firms Mean [Median] (Standard Deviation)
Average 2-year growth in total assets (in %)	GROWTH	103.8 [41.2] (199.3)	51.2** [20.7]*** (125.9)
% of firms in financial trouble before year of fraud	TROUBLE	.467	.280***
Length of time stock has traded on national exchange (in years)	AGEPUB	5.273 [1.500] (6.402)	8.744*** [10.500]*** (6.313)
% of common stock held by unaffiliated blockholders	BLOCKHLD	6.12 [0.00] (10.2)	7.73 [0.00] (13.2)

*, [**], (***) Significantly different across firm type at less than the .10, [.05], and (.01) level (one-sided) based on paired t-tests (or chi-square test) for means and Wilcoxon matched-pair sign-rank test for medians.
As reported in Table 3, fraud firms and no-fraud firms differ significantly in the extent of growth in assets for the two years preceding the year of the management fraud. The mean (median) growth in assets for fraud firms is 103.8% (41.2%) which is statistically greater than the mean (median) growth in assets for no-fraud firms of 51.2% (20.7%) at the .05 (.01) level based on paired t-tests (Wilcoxon matched-pair signed-rank tests).

Because the extent of firm growth may be associated with management fraud and board of director composition, the variable, GROWTH, is included as a control variable in this study. GROWTH represents the average change in total assets for the two years ending before the first year of the management fraud occurrence.¹⁰

3.4.2 Financial Health. The extent of the firm's financial health may be associated with the likelihood of management fraud and board of director composition. Thus, it is important to include a measure of financial health in this study when evaluating the hypotheses.

The management fraud literature notes that the degree of financial health may be associated with the likelihood of management fraud [Bell et al. (1991)]. Poor financial performance may cause management to place an undue emphasis on earnings and

¹⁰ Fraud and no-fraud firms also differ significantly (in the same direction) in mean (median) average two year growth in net sales at the .05 (.01) level. When average twoyear growth in net sales is used, the results discussed in Chapter 5 are not substantively different.

profitability thereby increasing the likelihood of management fraud. Bell et al., (1991) identify three red flag indicators that suggest management fraud is likely when:

- 1. There is inadequate profitability relative to the industry.
- 2. Management places an undue emphasis on earnings projections.
- 3. There is doubt about an entity's ability to continue as a going concern.

All three of these indicators suggest an association of financial health and the likelihood of management fraud.

The corporate governance literature suggests that the degree of financial health may also be associated with board of director composition. Gilson (1990) finds that a firm's financial distress causes significant changes in board of director composition with boards shifting to a higher number of directors who are creditors and blockholders subsequent to the onset of financial distress. Hermalin and Weisbach (1988) find that poor performance leads to changes in board composition with inside directors being replaced with outside directors. Other studies find that top management (i.e., president and CEO) turnover occurs subsequent to poor firm performance [Coughlan and Schmidt (1985), Weisbach (1988), Warner, Watts, and Wruck (1988)].

Because the degree of financial health may be associated with the likelihood of management fraud and board of director composition, the variable TROUBLE is included in this study as a control variable. Using a measure of financial trouble consistent with DeAngelo and DeAngelo (1990) and DeAngelo, DeAngelo, and Skinner (1994), TROUBLE is dichotomous with the value of one when a firm has reported at least three annual net losses in the six-year period preceding the first year of the management fraud. Otherwise, TROUBLE has a value of zero.

It is important to control for financial health in this study given that fraud and nofraud firms differ significantly in financial health, as reported in Table 3. Forty-seven percent of the fraud firms are in financial trouble whereas only twenty-eight percent of the no-fraud firms are in financial trouble. The difference between financial health is statistically significant at the .01 level.¹¹

3.4.3 Length of Time Publicly Traded. The length of time that a firm's common stock has traded publicly on a national exchange may be associated with the likelihood of management fraud and board of director composition. Thus, it is important to include a measure of the length of time the firm's common stock has publicly traded when evaluating the hypotheses.

The management fraud literature suggests that the length of time that a firm's common stock has traded in public markets may be associated with the likelihood of management fraud. The National Commission on Fraudulent Financial Reporting (1987, p. 29) notes that new public companies may have a proportionately greater risk of management fraud because management may be especially pressured to meet earnings expectations, given that they are new registrants in the market. Research on management fraud shows that management's undue emphasis on meeting earnings projections is a significant red flag indicator of management fraud.

The length of time that a firm's common stock has traded in public markets may also be associated with board of director composition. Before trading on a national

¹¹ The extent of financial trouble for both fraud and no-fraud firms is high. This is most likely due to the nature of the firms included in this sample. As previously noted, the bulk of this sample consists of NASDAQ firms. Given that newer, developing companies typically trade on the NASDAQ before trading on the AMEX or NYSE, the high percentage of financial trouble for both fraud and no-fraud firms appears reasonable.

exchange begins, a firm must make the necessary changes in board structure to satisfy the requirements of the exchange. Changes in board of director composition such as adding outside directors directly affects outside director tenure, which is a variable of interest in this study. When new registrants add outside directors to the board of directors, outside director tenure will likely be shorter than the outside director tenure of firms whose common stocks have traded publicly for long periods of time.

As reported in Table 3, fraud firms and no-fraud firms differ significantly in the length of time their respective common stocks have traded publicly on a national exchange. The mean (median) length in years of public trading of common stock on a national exchange for fraud firms is 5.27 years (1.5 years) which is statistically shorter than the mean (median) length of public trading of common stock for no-fraud firms of 8.74 years (10.5 years) at the .01 (.01) level based on paired t-tests (Wilcoxon matched-pair signed-rank tests).

Given that the length of time that the firm's common stock has traded publicly may be associated with the likelihood of management fraud and board of director composition, a measure of the length of time that the firm's common stock has traded publicly is included as a control variable in this study. The variable AGEPUB represents the number of years the firm's stock has traded on a national stock exchange. Information about the year when the firm began trading on a national stock exchange is obtained from the annual report or proxy statements examined, if disclosed. If there is no disclosure about the time period when the firm initially went public, the date of the initial filing of securities with the SEC is obtained from the SEC Workload File that is on microfiche. **3.4.4 Blockholders.** Large blockholders of common stock may be associated with the likelihood of management fraud and board of director composition. Thus, it is important to include a measure of the extent of blockholder ownership in the firm when evaluating the hypotheses of this study.

Large blockholders may reduce the likelihood of management fraud. Shleifer and Vishny (1986) note large block shareholders have incentives to monitor management and serve as an additional control mechanism. Large institutional investors are likely to closely scrutinize firm operations and hold boards responsible for corporate performance. Shivdasani (1993) finds that block ownership unaffiliated with management increases the likelihood of a hostile takeover attempt consistent with the view that blockholders serve as a corporate governance mechanism by facilitating takeover attempts to replace ineffective management. Increased monitoring by large blockholders may reduce the likelihood of management fraud.

Large blockholders may also be associated with board of director composition. Large blockholders may be able to influence who is selected to be a member of the board of directors. Gilson (1990) finds that increases in outside director representation on the board of directors is associated with increases in blockholder ownership in periods subsequent to a firm's poor performance. Brickley and James (1987) find a negative relation between concentration of stock ownership and proportion of outside directors for banks in states that restrict acquisitions.

As reported in Table 3, blockholders hold on average (median) 6.1% (0%) of the outstanding common shares of fraud firms whereas blockholders hold on average (median) 7.7% (0%) of the outstanding common shares of no-fraud firms. The mean

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(median) is not statistically different based on paired t-tests (Wilcoxon matched-pair signed-rank tests).

Because the extent of blockholder ownership in the firm may be associated with the likelihood of management fraud and board of director composition, the variable, BLOCKHLD, is included as a control variable in this study. BLOCKHLD represents the total percentage of outstanding shares of blockholders who hold at least 5% of outstanding shares and are not affiliated with management. Blocks held by family trusts, company employee stock ownership plans, and retirement plans are excluded because the voting rights associated with those shares are generally controlled by top management.

3.5 Summary

This chapter summarizes how firms experiencing management fraud were identified and how each of those firms were matched with a no-fraud firm for examination in this study. Section 3.3 shows that there are univariate differences in board of director composition between fraud and no-fraud firms. However, as noted in Section 3.4 it is important that other firm-specific differences between fraud and no-fraud firms be considered when evaluating the hypotheses about the relation of management fraud and board of director composition. This study includes four non-board of director characteristics as control variables in the logit regression model, which is described in the next chapter.

CHAPTER 4 - RESEARCH DESIGN

This chapter describes the research design for examining the eight hypotheses developed in Chapter 2 using the sample described in Chapter 3. The research design includes a logit regression model that cross-sectionally analyzes whether there are differences in board of director composition between fraud and no-fraud firms.

This chapter is organized as follows. Section 4.1 provides an overview of the appropriateness of using logit regression analysis for this study. Section 4.2 describes the main logit regression model that examines the hypotheses using a definition of outside directors that is consistent with definitions established by the national stock exchanges. Section 4.3 describes a separate logit regression model that examines the hypotheses using a more restrictive definition of an outside director that excludes the subset of outside directors who have some tie to management other than through their role as a director. Section 4.4 describes a piecewise logit regression model that examines whether there are differences in the predicted expectations about firm ownership held by outside and management directors at different levels of ownership - low, moderate, and high. Section 4.5 summarizes this chapter.

4.1 Appropriateness of Logit Regression

The research design of this study involves logit cross-sectional regression analysis. Logit regression, rather than ordinary least squares (OLS) regression, is used because the dependent variable, FRAUD, is dichotomous; a fraud is known to exist or is not known to exist. Stone and Rasp (1991) note that logit is preferred to OLS when the dependent variable is dichotomous. Also, logit regression is appropriate for choice-based samples, which is the nature of the sample in this study. This study uses a choice-based sample to identify differences in board of director composition between firms experiencing management fraud and firms not experiencing management fraud. Because this study examines board of director characteristics for 75 fraud and 75 no-fraud firms, this choice-based total sample of 150 firms comprises a sample in which 50% of the firms have experienced management fraud and 50% have presumably not experienced management fraud.

The proportion of fraud firms in the sample is likely to substantially differ from the proportion of fraud firms in the population. While there are no available estimates of the number of publicly traded firms experiencing management fraud, it is likely that the true rate of firms experiencing management fraud (as defined in this study) within the total population of publicly traded firms is certainly less than 50%. Therefore, the oneto-one matching process used in this study creates a choice-based sample that is different from pure random sampling.

As discussed by Palepu (1986), there is valid econometric justification for preferring a choice-based sample over a random sample because the number of fraud firms is likely to be small compared to the number of no-fraud firms in the population.¹ If a random sample were to be drawn from such a population, the sample would be likely to consist of an overwhelming majority of no-fraud firms and few fraud firms. The information content of such a sample for model estimation is quite small, leading to

¹ Palepu's (1986) comments are in terms of acquisition target and non-target firms. His comments are based on his critique of earlier empirical studies that use logit regression to develop predictive models for determining likely acquisition target firms. Zmijewski (1984) provides a similar critique of bankruptcy prediction studies. Dopuch, Holthausen, and Leftwich (1987) provide similar comments about choice-based sampling in the context of audit qualification prediction models.

imprecise parameter estimates. The sample can be enriched informationally by making the sample proportions of fraud and no-fraud firms more evenly balanced. Palepu (1986) reports that a choice-based sample of equal proportions is usually close-to-optimum design.

Logit regression analysis is the appropriate procedure where disproportionate sampling from two populations (i.e., the fraud and no-fraud firm populations) occurs.² Since the proportion of firms experiencing management fraud in the choice-based sample is most likely greater than in a random sample chosen from the population of publicly traded firms, ordinary maximum likelihood procedures would yield inconsistent and asymptotically biased estimates. Maddala (1991 p. 793) notes, however, that "there is nothing wrong with the logit analysis, and one does not need to use a weighting procedure. The coefficients of the explanatory variables are not affected by the unequal sampling rates from the two groups [i.e., fraud and no-fraud firm populations]. It is only the constant term that is affected." Thus, the bias in the estimated logit coefficients is captured entirely in the intercept term and does not affect the estimated slope parameters.

There are methods for correcting the bias in the constant term that results from the use of logit analysis with a choice-based sample. As discussed by Palepu (1986) those methods entail calculating the bias using the proportion of fraud firms in the sample and in the population of publicly traded firms. Unfortunately, it is difficult to estimate

² Generally a logit or probit model can be used except for the analysis of matched samples (i.e., fraud firms matched with no-fraud firms). For matched samples, the logit model is more convenient [Maddala (1991)].

the proportion of firms in the population that have experienced management fraud. Correcting for the bias in the constant term is important if the logit analysis is being used to obtain parameter estimates for purposes of developing a predictive model. However, if a researcher is only concerned with testing whether a set of variables bears a significant relationship to an event probability of a firm (i.e., the probability of fraud), testing the predictive accuracy of a model is not necessary [Palepu (1986)].

The use of logit analysis is appropriate for this study. As stated in Chapter 2, the purpose of this study is not to develop a predictive model of fraud. Instead, the purpose of this study is to examine whether there are differences in board of director composition between fraud and no-fraud firms. Because the consistent and unbiased slope coefficients are used to examine the hypotheses of this study, the bias in the constant term has no effect on the analysis of this study, and the logit regression is appropriate.³

T-tests of the significance of the coefficients of the individual parameters are used to examine the hypotheses in this study. Stone and Rasp (1991) show that logit t-tests are conservatively biased relative to ordinary least squares (OLS) t-tests, but that such bias is generally small and typically more common with small sample sizes (50 to 100). They go on to note that as sample size approaches 200, the conservative bias is minimized. The interpretation of t-tests of the individual parameters in this study is considered appropriate given that the sample size of 150 exceeds the cutoff in Stone and

³ Dopuch, Holthausen, and Leftwich (1987) compare an auditor qualification probit model based on a choice-based sample with 27 different probit models that correct for bias created by the use of a one-to-one match in a choice-based sample. They find that for the probit model inferences about the statistical significance of the slope coefficients are relatively insensitive to the correction procedure and that the major variation occurs in the constant term. Palepu (1986) finds that all the parameters in a logit acquisition prediction model are unaffected except for the constant term.

Rasp's (1991) study for classification as a small sample. Furthermore, Stone and Rasp (1991 p. 184) conclude that logit rather than OLS will continue to be the preferable method when sample sizes are not "large enough".

4.2 Logit Regression Model - Outside Directors

This section describes the logit regression model that examines the hypotheses using a definition of outside directors that is consistent with the national stock exchanges. Outside directors represent all directors who are not current employees of the firm.⁴

The statistical methodology underlying the empirical test is a logit regression in which the dependent variable (FRAUD) is dichotomous, having a value of one when a firm is alleged to have experienced a management fraud and a value of zero otherwise. As disclosed in Table 2 of Chapter 3, fraud and no-fraud firms appear to have univariate differences in board of director characteristics consistent with many of the hypotheses. While these differences appear to exist, the logit multiple regression model offers advantages over the comparison of univariate descriptives because it controls for differences in fraud and no-fraud firms that may be associated with both management fraud and board of director composition as discussed in Section 3.4 of Chapter 3. The following logit cross-sectional regression tests the hypotheses about the board of directors

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⁴ Some corporate governance studies use a more restrictive definition of an outside director. See Section 4.3 for a similar analysis in this study.

(hypotheses 1-8) while controlling for certain variables across fraud and no-fraud firms:

$FRAUD_{i} = \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} + \beta_{3} OWNBOARD_{i} + \beta_{4} MGTBOARD_{i} + \beta_{5} BOSS_{i} + \beta_{6} CEOTENURE_{i} + \beta_{7} OUTTENURE_{i} + \beta_{8} ACTIVEAC_{i} + \beta_{9} GROWTH_{i} + \beta_{10} TROUBLE_{i} + \beta_{11} AGEPUB_{i} + \beta_{12} BLOCKHLD_{i} + \beta_{13} BDSIZE_{i} + \varepsilon_{i}$

where

i	firm 1 through 150.
FRAUD	a dummy variable with a value of 1 when a firm is alleged to have experienced management fraud; a value of 0 otherwise.
β₀	the constant term.
E	the residual.

The variables corresponding to β_1 through β_{12} are described in the following paragraphs. They are divided into two categories: variables of interest and control variables.

4.1.1 Variables of Interest. There are eight variables included in the model that directly correspond to the eight hypotheses discussed in Chapter 2. Figure 6 reconciles the eight hypotheses with the eight variables of interest described in this section. The data for each of these eight variables of interest was obtained from the firm's proxy statement filed with SEC.

Hypothesis 1 predicts that the percentage of outside members on the board of directors will be lower for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable **%OUTBOARD** represents the percentage of the board members who are outside (e.g., non-employee) board of directors. The coefficient for this variable, β_1 , is expected to be negatively related to the occurrence of management fraud.

Coefficient	Variable Name	Predicted Sign	Related Hypothesis
\$ 1	%OUTBOARD	-	H1: % of outside members on board lower for fraud firms ¹
β₂	QUALBOARD	-	H2: Quality of outside members on board lower for fraud firms ¹
β ₃	OWNBOARD	-	H3: Ownership in firm by outside directors is lower for fraud firms ¹
β₄	MGTBOARD	-	H4: Ownership in firm by management serving on board lower for fraud firms ¹
ß₅	BOSS	+	H5: Chairperson is also CEO or President more often for fraud firms ¹
$m{eta}_{6}$	CEOTENURE	+	H6: CEO's tenure on board is longer for fraud firms ¹
β	OUTTENURE	-	H7: Average outside director tenure on board is shorter for fraud firms ¹
β _ε	ACTIVEAC	-	 H8: % of firms with active audit committees is lower for fraud firms¹

¹ Relative to no-fraud firms.

Figure 6 Linkage of Model Variables with Eight Hypotheses About Board of Director Characteristics Hypothesis 2 predicts that the reputational quality of outside members on the board will be lower for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable QUALBOARD is a proxy for the reputational "quality" of outside members. As discussed in Chapter 2, the measure of "quality" is the mean number of additional directorships held by outside directors. Proxy statements disclose for each member of the board of directors all directorships in other firms. The coefficient for this variable, β_2 , is expected to be negatively related to the occurrence of management fraud.

Hypothesis 3 predicts that the cumulative percentage ownership in the firm held by outside directors is lower for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable **OWNBOARD** represents the cumulative percentage of outstanding common stock shares held by outside board of director members. Proxy statements disclose each director's ownership in the firm. The coefficient for this variable, β_3 , is expected to be negatively related to the occurrence of management fraud.

Hypothesis 4 predicts that the cumulative percentage ownership in the firm held by management serving on the board of directors is lower for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable MGTBOARD represents the cumulative percentage of ownership in the firm held by insiders (i.e., managers) who serve on the board. The coefficient for this variable, β_4 , is expected to be negatively related to the occurrence of management fraud.

Hypothesis 5 predicts that the chairperson of the board of directors holds managerial positions more often for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable BOSS is a dummy variable with a value of one if the chairperson of the board holds the managerial positions of CEO or president and a value of 0 otherwise. The coefficient for this variable, β_5 , is expected to be positively related to the occurrence of management fraud.

Hypothesis 6 predicts that the CEO's tenure on the board of directors is longer for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. Proxy statements disclose the number of years a director has served on the board. The variable **CEOTENURE** represents the number of years that the CEO has served as a director. The coefficient for this variable, β_6 , is expected to be positively related to the occurrence of management fraud.

Hypothesis 7 predicts that the outside directors' average tenure on the board of directors is shorter for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable OUTTENURE represents the mean number of years that outside directors have served on the board as directors. The coefficient for this variable, β_7 is expected to be negatively related to the occurrence of management fraud.

Finally, Hypothesis 8 predicts that the extent to which the board of directors has an active audit committee will be lower for firms experiencing management fraud relative to firms allegedly not experiencing management fraud. The variable ACTIVEAC is a dummy variable with a value of 1 if there is an active audit committee and a value of 0 otherwise. An active audit committee represents an audit committee that meets at least once during the fiscal year. Proxy statements disclose the number of audit committee meetings held each year. The coefficient on this variable, β_3 , is expected to be negative. 4.1.2 Control Variables. As explained in Section 3.4 of Chapter 3, four variables are included in the logit regression model to control for non-board of director characteristics that may be associated with both the likelihood of management fraud and board of director composition. These four control variables include the effects of firm growth, financial health, length of time the stock has traded publicly on a national exchange, and the extent of monitoring by large holders of stock. Similarly, the size of the board is also included as a control variable, as discussed in Section 2.5.

Figure 7 summarizes the definitions of the variables included in the model.

4.3 Logit Regression Model - Independent Directors.

The above model is based on the definition of an outside director that includes all non-employee directors, consistent with the requirements of the national stock exchanges. A number of corporate governance researchers note that the traditional distinction between inside and outside directors may fail to account for the realized and potential conflicts of interests between outside directors and the corporations they serve [Mace (1986), Patton and Baker (1987), Hermalin and Weisbach (1988) (1991), Lee, Rosenstein, Rangen, and Davidson (1992), Shivdasani (1993), Vicknair, Hickman, and Carnes (1993)]. These researchers commonly refer to the pervasiveness of "grey" directors who are a potential source of violations of board independence because of their other affiliations with management. While they are not current employees of the firm and thus considered as outside directors, grey directors' independence may be impaired by being relatives of management, consultants and suppliers of the firm, outside attorneys who perform legal work for the firm, retired executives of the firm, and investment bankers [Gilson (1992), Shivdasani (1993)].

$FRAUD_{i} = \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} + \beta_{3} OWNBOARD_{i} + \beta_{4} MGTBOARD_{i} + \beta_{5} BOSS_{i} + \beta_{6} CEOTENURE_{i} + \beta_{7} OUTTENURE_{i} + \beta_{8} ACTIVEAC_{i} + \beta_{9} BLOCKHLD_{i} + \beta_{10} GROWTH_{i} + \beta_{11} TROUBLE_{i} + \beta_{12} AGEPUB_{i} + \beta_{13} BDSIZE_{i} + \varepsilon_{i}$

Variables	Definitions		
Dependent Variable:			
FRAUD	1 when a firm is alleged to have experienced management fraud; 0 otherwise.		
Independent Variables of Interest:			
%OUTBOARD	% of board members who are not employees of the firm.		
QUALBOARD	average number of additional directorships on other firm boards held by outside directors.		
OWNBOARD	cumulative percentage of outstanding common stock shares held by outside directors.		
MGTBOARD	cumulative percentage of outstanding common stock shares held by management serving on the board of directors.		
BOSS	1 when the chairperson of the board of directors holds managerial positions of CEO or president; 0 otherwise.		
CEOTENURE	number of years that the CEO has served on the board as a director.		
OUTTENURE	average number of years that outside directors have served on the board.		
ACTIVEAC	1 if the board has an audit committee that met at least once during the year prior to the year of the management fraud; 0 otherwise.		
Control Variables:			
GROWTH	average % change in total assets for two years ending before the year of the management fraud.		
TROUBLE	1 when the firm has reported at least three annual net losses in the six- year period preceding the first year of the management fraud.		
AGEPUB	number of years the firm's stock has traded on a national stock exchange.		
BLOCKHLD	cumulative % of outstanding common stock shares held by blockholders holding at least 5% of such shares and who are not affiliated with management.		
BDSIZE	number of members of the board of directors.		

Figure 7 Summary of Logit Model Variable Definitions While the NYSE requires audit committee members of exchange-listed firms to be independent of management, the NYSE leaves discretion for selecting independent directors to the firms' boards of directors. The requirements are broadly written, requiring only that the audit committee be "comprised solely of directors independent of management and free from any relationship that, in the opinion of its board of directors, would interfere with the exercise of independent judgment as a committee member." Vicknair, Hickman, and Carnes (1993) find that 74% of NYSE firms have at least one grey director on the audit committee.

Because fraud and no-fraud firms are likely to have grey directors on their boards, this study includes an additional logit regression model that analyzes whether board of director composition differs between fraud and no-fraud firms when a more restrictive definition of an outside director is used. Outside directors can be divided into two categories: grey directors and independent directors. Consistent with earlier corporate governance research, this study defines grey directors as those directors who are relatives of management, consultants and suppliers of the firm, outside attorneys who perform legal work for the firm, retired executives of the firm, and investment bankers.^{5 6} Any affiliations with the firm such as these are disclosed for all outside directors in the

⁵ Because of the conflict-of-interest problems inherent in having investment bankers on the board, investment bankers are always designated as grey directors [Hermalin and Weisbach (1988) p. 591, Lee, Rosenstein, Rangan, and Davidson (1992) p. 62].

⁶ In this study, former employees are included as grey directors consistent with other previous corporate governance research (i.e., Shivdasani (1993)). However, some of the previous corporate governance research (i.e., Hermalin and Weisbach (1988), (1991)) include former employees as inside directors. For robustness, tests are also performed that reclassify former employees as insiders. See Chapter 5.

proxy statement filed with the SEC. Independent directors represent those outside directors who have no other relationship with the firm outside their role as directors. Hereafter, all outside directors who have no such ties other than their role as director are referred to as independent directors.

Table 4 compares univariate board of director characteristics between fraud and no-fraud firms for the two subsets of outside directors: grey directors and independent directors. Because the combination of grey directors and independent directors comprises outside directors, the addition of the descriptives for board composition and ownership disclosed in Table 4 for grey and independent directors agrees with the disclosures for outside directors in Table 2 of Chapter $2.^7$

The data in Table 4 suggests that fraud and no-fraud firms do not differ significantly in grey director characteristics. It appears that no-fraud firms do not differ significantly in the percentage of grey directors serving on the board with both groups of firms having on average 22% (median 20%) of the board composed of grey directors. Additionally, the number of directorships on other firm boards and ownership in the firm held by grey directors do not differ significantly across fraud and no-fraud firms. The only difference in grey director characteristics between fraud and no-fraud firms is their tenure on the board of directors. Grey directors for no-fraud firms appear to have significantly (.01 level) longer average and median tenures on the board relative to grey directors for fraud firms.

⁷ Because the disclosures in Table 4 for quality and tenure represent averages, the sum of the descriptives for grey and independent directors appropriately do not equal the disclosures for outside directors in Table 2.

Table 4 Descriptive Characteristics of Two Subsets of Outside Directors: Grey Directors and Independent Directors

	mean [median] (standard deviation)			
Variable	Variable Name	Fraud Firms (n=75)	No-Fraud Firms (n=75)	
Board Composition:				
% Grey directors	%GREYBOARD	22.5 [20.0] (20.4)	21.8 [20.0] (18.1)	
% Independent directors	%INDBORD	27.9 [33.3] (21.7)	42.9*** [50.0]*** (21.1)	
Quality of Board:				
Average # of other directorships held by grey directors	QUALGYBD	.704 [.000] (1.152)	.492 [.000] (.942)	
Average # of other directorships held by independent directors	QUALINBD	.956 [.500] (1.410)	1.015 [1.000]* (.936)	
Ownership Held by Board:				
Cumulative % shares held by grey directors	OWNGYBD	2.55 [.11] (5.08)	5.67** [.40] (12.3)	
Cumulative % shares held by independent directors	OWNINBD	2.88 [.10] (7.3)	6.33** [1.70]*** (10.7)	
Tenure on Board				
Average board tenure for grey directors (in years)	GRYTENURE	3.657 [1.000] (5.291)	6.244*** [4.000]*** (7.616)	
Average board tenure for independent directors (in years)	INDTENURE	3.065 [2.000] (4.149)	5.538*** [5.000]*** (4.493)	

* [**], (***) Significantly different across firm type at less than the .10 [.05] (.01) level (one-sided when in direction predicted, two-sided otherwise) based on paired t-tests for means and Wilcoxon matched-pair sign-rank test for medians.

NOTE: This table contains descriptive data for the two subsets of outside directors: grey and independent directors. Similar descriptive information for outside directors is presented in Table 3 of Chapter 3.

The univariate descriptive statistics presented in Table 4 suggest that fraud and no-fraud firms do differ in characteristics of independent directors. For no-fraud firms, the mean (median) percentage of independent directors on the board is 42.9% (50%) whereas for fraud firms the mean (median) percentage of independent directors is 27.9% (33.3%). This difference in mean (median) percentage of independent directors is significant at the .01 (.01) level. While the number of directorships in other firms held by independent directors does not appear to differ across fraud and no-fraud firms, the data in Table 4 suggests that no-fraud firms have independent directors who own significantly more common stock in the firm and have longer tenures on the board than independent directors of fraud firms. Independent directors of no-fraud firms hold on average (median) 6.33% (1.7%) of outstanding common shares, which is significantly higher at the .05 (.01) level than independent directors of fraud firms who hold on average 2.88% (.1%) of the outstanding common shares of fraud firms. Finally, independent directors of no-fraud firms have mean (median) tenures on the board that are significantly longer at the .01 (.01) level than the tenures of independent directors of fraud firms.

In order to empirically examine whether there are significant differences in independent and grey director characteristics across fraud and no-fraud firms, the following logit regression analysis is performed.

 $FRAUD_{i} = \beta_{0} + \beta_{1} \% INDBOARD_{i} + \beta_{2} \% GRYBOARD_{i} + \beta_{3} QLINDBD_{i} + \beta_{4} QLGRYBD_{i} + \beta_{5} ONINDBD_{i} + \beta_{6} ONGRYBD_{i} + \beta_{7} MGTBOARD_{i} + \beta_{8} BOSS_{i} + \beta_{9} CEOTENURE_{i} + \beta_{10} INDTENURE_{i} + \beta_{11} GRYTENURE_{i} + \beta_{12} ACTIVEAC_{i} + \beta_{13} GROWTH_{i} + \beta_{14} TROUBLE_{i} + \beta_{15} AGEPUB_{i} + \beta_{16} BLOCKHLD_{i} + \beta_{17} BDSIZE_{i} + \varepsilon_{i}$

This logit model is similar to the logit model described in Section 4.2 except the model replaces outside directors with the two subsets of independent and grey directors. Thus, all variables are the same except that %OUTBOARD, QUALBOARD, OWNBOARD, and OUTTENURE are replaced with the following variables:

- %INDBOARDpercentage of the board members who are independent board members those
non-management directors with no ties to the firm outside their role as director.%GRYBOARDpercentage of the board members who are grey directors. Grey directors
represent all non-management directors who are related to management,
consultants/suppliers to the firm, outside attorneys who perform legal work for
the firm, retired executives of the firm, and investment bankers.QLINDBDmean number of additional outside directorships held by independent directors.QLGRYBDmean number of additional outside directorships held by grey directors.
- ONINDBD cumulative percentage of outstanding common stock shares held by independent directors.
- ONGRYBD cumulative percentage of outstanding common stock shares held by grey directors.
- INDTENURE mean number of years that independent directors have served on the board as directors.

GRYTENURE mean number of years that grey directors have served on the board as directors.

Refer to Figure 7 for all other variable definitions.

4.4 Piecewise Regression - Non-Linear Effects of Firm Ownership

This section describes a piecewise logit regression model that explores whether or not the effect of firm ownership is non-linear in relation to the occurrence of management fraud. The previous two logit regression models described in Sections 4.2 and 4.3 examine whether firm ownership held by outside and management directors are linearly related to the occurrence of management fraud, as predicted by Hypotheses 3 and 4, respectively. Empirical research, particularly Morck, Shleifer, and Vishny (1988) and Hermalin and Weisbach (1991), suggests that the relation between firm ownership and firm performance may be non-linear.

The idea that stock ownership can reduce the underlying agency problem comes directly out of agency theory: the more stock one owns, the stronger his/her motivation to work to raise the value of the firm's stock. Therefore, there will be less demand for alternative anti-agency measures for firms in which management and outside directors own a large fraction of stock. Recall that such theory is used to motivate the linear relation between firm ownership and the occurrence of management fraud in Hypotheses 3 and 4 of Chapter 2. That theory is examined using the logit regression models described in Sections 4.2 and 4.3 of this chapter.

It has been argued, however, that agency problems need not be monotonically decreasing in stock ownership. Large ownership, particularly by management, insulates management from other forces that reduce agency costs such as the discipline of the board [Demsetz (1983)]. In addition, large management ownership is often a characteristic of family-controlled firms, which are notorious for putting the interests of the family above the interests of shareholders [Hermalin and Weisbach (1991)]. Morck, Shleifer, and Vishny (1988) suggest that when a manager owns only a small stake, market disciplines, such as the managerial labor market, the product market, and the market for corporate control may still force that manager towards firm value maximization. In contrast, a manager who controls a substantial fraction of the firm's equity may have enough voting power or influence to guarantee employment with the firm at an attractive salary. With effective control, the manager may indulge his/her preference for non-value-maximizing behavior.

To explore whether the relation between firm ownership held by outside and management directors is non-linear in relation to the occurrence of management fraud, this study includes a piecewise logit regression model that is consistent with the piecewise model in Morck et al. (1988). Specifically, the piecewise model is similar to the logit model described in Section 4.2 (see Figure 7) except for two changes in the slope coefficients for the extent of firm ownership held by outside and management directors. That is, all variables in the piecewise logit model are the same as the logit model in Section 4.2 except that the variables representing firm ownership held by outside directors, OUTBOARD, and firm ownership held by management on the board, MGTBOARD, are replaced with the following variables:

OUTBOARD is replaced with -

ONOUTLO	= % ownership in the firm if outside director ownership $<5\%$
	= 5% if outside director firm ownership \geq 5%;

- ONOUTMID = 0% if outside director firm ownership <5%, = % outside director firm ownership minus 5% if 5% < firm ownership <25%,
 - = 20% if outside director firm ownership $\geq 25\%$;
- ONOUTHI = 0% if outside director firm ownership <25%, = outside director firm ownership minus 25% if firm ownership $\geq 25\%$.

MGTBOARD is replaced with -

ONMGTLO	= % ownership in the firm if management director ownership $<5\%$, = 5% if management director firm ownership $\geq 5\%$;
ONMGTMID	 = 0% if management director firm ownership <5%, = % management director ownership minus 5% if 5% < firm ownership <25%, = 20% if management director firm ownership >25%;
ONMGTHI	= 0% if management director firm ownership $<25\%$,

= management director firm ownership minus 25% if firm ownership $\geq 25\%$.

For example, when management director ownership is equal to 35%, ONMGTLO would equal 5%, ONMGTMID would equal 20%, and ONMGTHI would equal 10% (the sum of ONMGTLO, ONMGTMID, and ONMGTHI sum to 35%).

The piecewise logit model allows for ownership slopes to change at 5% and 25%. As noted by Morck et al. (1988), the theoretical justification for these particular numbers is not strong. Morck et al. (1988) note that the use of 5% is consistent with the use by Herman (1981) as a focal stake beyond which ownership is no longer negligible and by the SEC as a point of mandatory public disclosure of ownership in proxy statements. They go on to note that the breakpoint at 25% is in part motivated by Weston (1979) who suggests that 20-30% as the ownership range beyond which a hostile bid for the firm cannot succeed. This study uses these same cutoff levels.

The piecewise logit regression model is summarized below:

 $FRAUD_{i} = \\ \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} \\ + \beta_{3} ONOUTHI_{i} + \beta_{4} ONOUTMID_{i} + \beta_{5} ONOUTLO_{i} \\ + \beta_{6} ONMGTHI_{i} + \beta_{7} ONMGTMID_{i} + \beta_{8} ONMGTLO_{i} \\ + \beta_{9} BOSS_{i} + \beta_{10} CEOTENURE_{i} + \beta_{11} OUTTENURE_{i} + \beta_{12} ACTIVEAC_{i} \\ + \beta_{13} GROWTH_{i} + \beta_{14} TROUBLE_{i} + \beta_{15} AGEPUB_{i} \\ + \beta_{16} BLOCKHLD_{i} + \beta_{17} BDSIZE_{i} + \epsilon_{i}$

See Figure 7 for definitions of all variables except for the ownership variables defined in this section.

Performing this piecewise logit analysis using the three levels of ownership described previously is appropriate if there are firms with cumulative ownership held by

Table 5Cell Sizes for Low, Moderate, & High Outside and Management Ownership Levels,75 Fraud and 75 No-Fraud Firms

	Fraud Firms (n=75)	No-Fraud Firms (n=75)
Outside Directors:		
Number of firms whose ownership by outside directors is high: $\geq 25\%$	n=2	n=14
Number of firms whose ownership by outside directors is moderate $\geq 5\%$ but $< 25\%$	n=22	n=23
Number of firms whose ownership by outside directors is low $< 5\%$	n=51	n=38
Management Directors:		
Number of firms whose ownership by outside directors is high $\geq 25\%$	n=40	n=30
Number of firms whose ownership by outside directors is moderate $\geq 5\%$ but $< 25\%$	n=23	n=26
Number of firms whose ownership by outside directors is low $<5\%$	n=12	n=19

outside and management directors that exceed the two cutoff points of $\geq 5\%$ and $\geq 25\%$. Table 5 contains the number of firms in the low, moderate, and high levels of ownership for fraud and no-fraud firms. As shown in Table 5, only two fraud and fourteen nofraud firms have outside directors who cumulatively own $\geq 25\%$ of the outstanding common shares of the firm. Twenty-three of the no-fraud firms and twenty-two of the fraud firms have outside directors with cumulative ownership greater than or equal to 5% and <25%. Forty fraud firms and thirty no-fraud firms have management directors who cumulatively own $\geq 25\%$ of the outstanding common shares of the firm. Twenty-six nofraud firms and twenty-three fraud firms have managers who cumulatively own between $\geq 5\%$ and <25% of outstanding common shares of the firm. Due to the few number of firms with outside director cumulative ownership exceeding $\geq 25\%$, results from an additional analysis combining ONOUTHI and ONOUTMID are presented in Chapter 5. No other levels are combined since cell sizes appear to be sufficiently large.

4.5 Summary

This chapter describes three regression models that examine the eight hypotheses developed in Chapter 2. All three models involve logit multiple regression where the dependent variable is dichotomous with a value of 1 when the firm is alleged to have experienced management fraud and zero otherwise. The first logit model examines the hypotheses using a definition of outside directors that is consistent with the definition used by the national stock exchanges. The second logit model examines the hypotheses using a more restrictive definition of an outside director that only includes outside directors who have no ties to the firm other than through their role as director. The third model includes a piecewise logit regression model that explores whether a recent empirical finding holds for the study of management fraud. Specifically, this empirical finding suggests that the relation between firm ownership held by outside and management directors is not linearly related to firm performance, which implies that the relation between firm ownership and the occurrence of management fraud may also be non-linear. Results for all three models are presented in Chapter 5.

CHAPTER 5 - EMPIRICAL RESULTS

This chapter contains the empirical results from the examination of eight hypotheses described in Chapter 2 about the relation of board of director composition and management fraud using the sample described in Chapter 3. Empirical results are presented for each of the three logit cross-sectional regression models described in Chapter 4.

Section 5.1 summarizes the empirical results from the logit regression model described in Section 4.2 of Chapter 4 that uses a definition of outside director that is consistent with the definition allowed by the national stock exchanges. Section 5.2 summarizes the empirical results from the logit model described in Section 4.3 of Chapter 4 that uses a more restrictive definition of outside directors. That definition considers those outside directors who have no non-director affiliations with the firm. Section 5.3 summarizes the empirical results from the piecewise logit model described in Section 4.4 of Chapter 4 that analyzes whether the relation between firm ownership and management fraud is non-linear. Section 5.4 includes an additional robustness test. Section 5.5 summarizes the findings of this study.

5.1 Logit Regression Results - Outside Directors

This section contains the empirical analysis of the logit regression model described in section 4.2 of Chapter 4 that examines the eight hypotheses about the relation of board of director composition and management fraud using a definition of outside director that is consistent with the definition used by the national stock exchanges. That definition treats all directors who are not currently employed by the

firm as an outside director and treats all current employees as inside (e.g., management) directors.

Table 6 contains the logit cross-sectional regression results. The logit model for the 75 fraud and 75 no-fraud firms has a pseudo R^2 of .27 and the chi-square test of the model's fit of 47.152 (13 degrees of freedom), which is significant at the .0001 level.¹ While the primary interest of this study is whether the individual coefficients for the board of director composition variables are significantly different from zero in the direction predicted by the hypotheses, the pseudo R^2 and chi-square results are reported here to provide an assessment of the overall fit of the model.

Based on the chi-square test, the null hypothesis that the coefficients are simultaneously equal to zero is rejected. However, Stone and Rasp (1991) note that the logit chi-square statistic is anticonservatively biased when compared to ordinary least squares regression (OLS), particularly for small sample sizes of 50-100. To examine whether this bias affects the conclusions about the fit of the model in this study, an OLS regression was performed (but not separately reported in a table). The F-statistic of the OLS model is significant at the .0001 level with an adjusted R^2 of .25. Additionally, there are no differences in the significance levels of the individual coefficients between the logit and OLS models. Based on the comparison of logit and OLS results, any anticonservative bias that may be present does not affect the conclusions about the

¹ The pseudo R^2 statistic is analogous to the R^2 statistic in the case of a linear multiple regression model and provides an indication of the logit model's explanatory power. The pseudo R^2 is equal to one minus the ratio of the log likelihood at convergence for the logit model (unconstrained) to the log likelihood with only the constant term in the model (constrained) [Palepu (1986), Dopuch et al. (1987)].

Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β ₀	INTERCEPT	none	2.305	1.285	1.79*
β ₁	%OUTBOARD	-	-4.645	1.505	-3.09***
β2	QUALBOARD	-	.855	.280	3.05***
β3	OWNBOARD	-	-4.285	2.149	-1.99**
β ₄	MGTBOARD	-	907	1.435	63
β5	BOSS	+	.012	.524	.02
β ₆	CEOTENURE	+	.020	.035	.57
β ₇	OUTTENURE	-	149	.071	-2.10**
β ₈	ACTIVEAC	-	-1.336	.505	-2.65***
β9	GROWTH	+	.013	.133	.10
β ₁₀	TROUBLE	+	.511	.536	.95
β ₁₁	AGEPUB	-	025	.044	57
β ₁₂	BLOCKHLD	-	-2.173	1.938	-1.12
β ₁₃	BDSIZE	none	.219	.096	2.28**
Psuedo R ²	.27				
Chi-Square Test of Model's Fit 47.152 (p=.0001) (13 degrees of freedom)					

Table 6Outside Director Logit Regression Results,75 Fraud Firms Matched With 75 No-Fraud Firms¹

*, [**], (***) Statistically significant at less than the .10 [.05], (.01) level, based on one-sided tests when in direction predicted, two-sided otherwise.

The following logit regression was estimated. See variable definitions in Figure 7:

1

 $FRAUD_{i} = \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} + \beta_{3} OWNBOARD_{i} + \beta_{4} MGTBOARD_{i} + \beta_{5} BOSS_{i} + \beta_{6} CEOTENURE_{i} + \beta_{7} OUTTENURE_{i} + \beta_{8} ACTIVEAC_{i} + \beta_{9} GROWTH_{i} + \beta_{10} TROUBLE_{i} + \beta_{11} AGEPUB_{i} + \beta_{12} BLOCKHLD_{i} + \beta_{13} BDSIZE_{i} + \epsilon_{i}$

model's fit or conclusions about the significance levels of individual parameters, which are discussed next.

The first hypothesis predicts the following:

H1: The proportion of outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

The results in Table 6 are consistent with the expectation in hypothesis 1. The coefficient for %OUTBOARD, which represents the percentage of outside members on the board of directors, is negative and statistically significant at the p < .01 level.² Thus, boards of directors of no-fraud firms are significantly more likely to have a higher concentration of outside (non-management) directors than fraud firms. This suggests that boards of directors with higher percentages of outside directors are more effective in preventing management fraud than other boards of directors with smaller percentages of outside directors. The data supports the economic theory argument that outside directors are important monitors of management.

The second hypothesis predicts the following:

H2: The quality of outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

The results in Table 6 are not consistent with hypothesis 2. The coefficient for QUALBOARD, which represents the number of additional directorships held by outside directors, is unexpectedly positive and significant at the .01 level. This surprising result suggests that outside members on the board of directors of fraud firms are of significantly higher quality than outside directors of no-fraud firms, which is not the expected relation.

² Throughout this chapter, the significance levels for individual coefficients are based on one-sided tests when in the direction predicted, two-sided otherwise.

An alternative explanation for these results may be that the proxy used to measure outside director quality is inappropriate. Recall that the number of additional directorships in other firms held by outside directors serves as the proxy for outside director quality. The results show that outside directors of fraud firms have significantly more directorships in other firms than outside directors of no-fraud firms. It is possible that the number of other directorships does not proxy for outside director quality, and instead, proxies for other outside director characteristics. Perhaps, the number of directorships reflects the extent that outside directors are distracted from their monitoring responsibilities. The increased responsibilities associated with more directorships held by outside directors of fraud firms may increase distractions. This increased level of distraction for outside directors of fraud firms may decrease their ability to effectively monitor management for the prevention of management fraud.

This alternative explanation is particularly plausible given the characteristics of the sample of firms examined in this study relative to empirical studies, such as Shivdasani (1993), that employ a similar proxy for outside director quality. As noted in Chapter 3, most of the firms included in this study (124 out of 150 firms) are NASDAQ firms. In contrast, Shivdasani's (1993) sample consists of much larger firms. His sample contains hostile takeover and matched non-takeover firms with an average market value of equity of \$1,161 million, which is much larger than the average market value of equity for firms in this study of \$126 million. It is possible that the heavy concentration of small NASDAQ firms in this study affects the measure of quality used. Possibly, the other directorships held by outside directors in this study are with lesserknown, small firms. As a result, the additional directorships held by outside directors in this study may not be as highly sought-after directorships as other directorship opportunities in widely-known, large firms such as AMEX or NYSE firms. Small, lesser-known firms may require outside directors to spend more time with day-to-day monitoring than large, widely known firms. Thus, as the number of additional directorships increases for outside directors of small firms, time available for outside directors to monitor management of each firm goes down. Additionally, small firms may not be able to attract high quality directors. As those directors accept more directorships in other firms, their ability to effectively monitor management of each firm deteriorates.

The third hypothesis predicts the following:

H3: The extent of firm ownership by outside members on the board of directors is lower for firms experiencing management fraud compared to control firms.

The results in Table 6 are consistent with hypothesis 3. The coefficient for OWNBOARD, which represents the cumulative percentage of outstanding common stock shares held by outside directors, is negative and significant at the p=.023 level suggesting that outside directors who serve on the board of directors of no-fraud firms are significantly more likely to own higher levels of the firm's common stock than outside directors who serve on the boards of directors of fraud firms. This suggests that as outside directors' ownership in the firm increases the incentive for outside directors to monitor management for the prevention of management fraud increases.

In contrast, the results in Table 6 are not consistent with hypothesis 4, which predicts the following:

H4: The extent of ownership in the firm held by managers who serve on the board of directors is lower for firms experiencing management fraud compared to control firms.

The coefficient for MGTBOARD, which represents the cumulative percentage ownership in the firm held by managers who serve on the board, is negative as predicted but not statistically different from zero. These results suggest that ownership in the firm held by managers who serve on the board of directors has no effect on the board of director's prevention of management fraud.

One reason for the lack of significance of the MGTBOARD coefficient may be that the effects of ownership in the firm held by managers serving on the board of directors differ depending on the type of management fraud committed. As noted in Chapter 4, the predicted negative relation between the extent of ownership in the firm may not hold for fraudulent financial reporting occurrences if management believes the benefits of artificially inflating firm value by fraudulently reporting financial information exceed the penalties of detection. In that case, the relation between ownership held by management serving on the board of directors and the occurrence of fraudulent financial reporting would be positive. Given that 67 of 75 fraud firms in this study represent fraudulent financial reporting occurrences, a separate analysis of the fraudulent financial reporting firms and their related matched no-fraud firms may provide further insights about the relation of management ownership in the firm and the occurrence of fraudulent financial reporting.

Table 7 contains the logit regression results for the 67 fraudulent financial reporting firms and the 67 matched no-fraud firms. The results are consistent with the full sample results reported in Table 6. The significance levels of all individual coefficients are the same except that the coefficient for the cumulative percentage of shares held by outside directors, OWNBOARD, is significant at the p=.053 level as
Table 7 **Outside Director Logit Regression Results,** 67 Fraudulent Financial Reporting Firms Matched With 67 No-Fraud Firms¹

Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β ₀	INTERCEPT	none	2.800	1.447	1.94**
β ₁	%OUTBOARD	-	-5.396	1.709	-3.16***
β2	QUALBOARD	-	1.062	.323	3.29***
β3	OWNBOARD	-	-4.036	2.497	-1.62*
β ₄	MGTBOARD	-	457	1.615	28
β ₅	BOSS	+	275	.594	46
β ₆	CEOTENURE	+	.004	.040	.10
β ₇	OUTTENURE	-	140	.076	-1.84**
β ₈	ACTIVEAC	-	-1.705	.594	-2.87***
β9	GROWTH	+	.004	.146	.03
β ₁₀	TROUBLE	+	.735	.605	1.21
β ₁₁	AGEPUB	-	033	.048	69
β ₁₂	BLOCKHLD	-	-2.584	2.189	-1.18
β ₁₃	BDSIZE	none	.201	.102	1.97**
Psuedo R ²	.32				
Chi-Square Test of Model's Fit	49.358 (p=.0001) (13 degre	ees of freedom)		

*, [**], (***) Statistically significant at less than the .10 [.05], (.01) level, based on one-sided tests when in direction predicted, two-sided otherwise.

The following logit regression was estimated. See variable definitions in Figure 7:

 $FRAUD_i =$ $\beta_0 + \beta_1 \% OUTBOARD_i + \beta_2 QUALBOARD_i + \beta_3 OWNBOARD_i$ $+\beta_4 MGTBOARD_i + \beta_5 BOSS_i + \beta_6 CEOTENURE_i + \beta_7 OUTTENURE_i + \beta_8 ACTIVEAC_i$ $+\beta_{9}GROWTH_{i}+\beta_{10}TROUBLE_{i}+\beta_{11}AGEPUB_{i}+\beta_{12}BLOCKHLD_{i}+\beta_{13}BDSIZE_{i}+\epsilon_{i}$

1

compared to a significance level of p=.023 for the full sample in Table 6. Again, the coefficient for MGTBOARD is negative and not statistically significant.

Based on the results for the full sample reported in Table 6 and for the subset of fraudulent financial reporting occurrences and the related matched no-fraud firms, it is difficult to make any conclusions about the relation between the extent of ownership in the firm held by managers serving on the board of directors and the occurrence of management fraud. Whether this lack of an association if due to limitations of the empirical tests or limitations of the theory is unknown. It may be the case that the agency theory argument, which suggests that increases in firm ownership reduce agency costs, does not apply to the agency problem of management fraud. Section 5.3 includes results of a piecewise logit regression model that examines whether the relation between firm ownership and management fraud is non-linear.

The fifth hypothesis predicts the following:

H5: The chairperson of the board of directors holds managerial positions more often for firms experiencing management fraud compared to control firms.

The results reported in Table 6 are not consistent with hypotheses five. The coefficient for BOSS, which has a value of 1 when the chairperson is also the CEO or president and a value of 0 otherwise, is not statistically significant. This suggests that chairpersons of fraud firms are not more likely to hold a managerial position in the firm more often than chairpersons of no-fraud firms. Therefore, fraud firms are not more likely to have chairpersons with greater power through holding managerial positions in the firm than chairpersons of no-fraud firms.

The sixth hypothesis predicts the following:

H6: The CEO's tenure on the board of directors is longer for firms experiencing management fraud compared to control firms.

The coefficient for CEOTENURE, which represents the number of years the CEO has served as a director, is not significantly different from zero. This suggests that CEO tenure is not different between fraud and no-fraud firms. Therefore, the lack of differences in CEO tenure between fraud and no-fraud firms suggests that CEOs of fraud firms are not more established members of the board of directors than CEOs of no-fraud firms.

The seventh hypothesis predicts the following:

H7: The average outside director's tenure on the board of directors is shorter for firms experiencing management fraud compared to no-fraud firms.

The coefficient for OUTTENURE, which represents the average number of years that outside directors have served on the board, is statistically significant at the .05 level. This shorter average tenure of outside directors of fraud firms suggests that managers of fraud firms are able to exert power over more recently appointed, shorter-tenured outside directors to override outside director monitoring. The lack of seniority of outside directors of fraud firms apparently affects his/her ability to scrutinize top management.

The combined results for hypotheses five, six, and seven suggest that managers may be able to override outside director monitoring when the tenure of outside directors is short. Whether the CEO or president serves as chairperson of the board of directors or has a long tenure on the board of directors does not appear to enable management to override outside director monitoring. However, management may be able to intimidate the outside director who is new to the board of directors because newer members on the board of directors may be more susceptible to group pressures to conform. The outside director's lack of seniority apparently affects his/her ability to scrutinize top management for purposes of preventing management fraud.

The eighth hypothesis predicts the following:

H8: The extent to which the board of directors has an active audit committee is lower for firms experiencing management fraud compared to control firms.

The results in Table 6 are consistent with hypothesis eight. The coefficient for ACTIVEAC, which has a value of 1 if there is an audit committee that met at least once during the year prior to the year of the management fraud and a value of 0 otherwise, is statistically significant in the direction predicted at the .01 level. This finding suggests that an active audit committee can serve as a deterrent for management fraud.

Of the five control variables, BDSIZE is the only statistically significant variable. Fraud firms are significantly (p < .05) more likely to have a larger board of directors than no-fraud firms. All other control variables, GROWTH, TROUBLE, AGEPUB, and BLOCKHLD are not significant. These findings suggest that fraud and no-fraud firms do not differ in the extent of growth in assets, financial health, length of time the firm's stock has traded publicly on one of the national stock exchanges, and levels of blockholder ownership. Recall that these four control variables are included in the model because they were identified from the review of management fraud and corporate governance research as possibly being associated with both management fraud and board of director composition. The concern during the model development stage was that the exclusion of these four control variables may create a correlated omitted variables bias that would potentially affect conclusions reached about the hypotheses examined in this study. However, based on results (not separately reported in a table) from a logit regression model that excludes these four control variables, it appears that the exclusion of these variables does not create a correlated omitted variables bias. The significance levels of the variables of interest, as well as the tests of the overall fit of the model, for the logit regression model that excludes these control variables are the same as those reported in Table 6. Therefore, their inclusion or exclusion in the model does not impact the conclusions about the hypotheses examined.

The logit models underlying the results presented in Tables 6 and 7 include a control variable for firm growth, GROWTH, which represents the average two-year growth in total assets. As discussed in Chapter 3, fraud and no-fraud firms differ significantly on an univariate basis in average two-year growth in net sales. To show that the results are robust across two different measures of firm growth, Table 8 includes the results of a separate logit analysis that substitutes average two-year net sales growth for average two-year total asset growth. A comparison of the results in Table 6 and Table 8 shows that there are no differences in the significance levels for any of the coefficients in the two models except that the control variable BLOCKHLD is marginally significant at the p < .10 level when growth in net sales is used. This comparison indicates that the results are robust across both measures of firm growth.

Table 9 contains the Pearson correlation coefficients for the independent variables in the logit model. These coefficients are presented to examine whether multicollinearity is present in the model. Highly correlated independent variables would suggest the presence of multicollinearity. The primary undesirable consequence of multicollinearity

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Table 8Logit Regression Results - Using Growth in Net Sales75 Fraud Firms Matched With 75 No-Fraud Firms1

Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β ₀	INTERCEPT	none	2.175	1.274	1.71*
β ₁	%OUTBOARD	-	-4.681	1.499	-3.12***
β ₂	QUALBOARD	•	.872	.280	3.11***
β3	OWNBOARD	•	-3.885	2.116	-1.84**
β4	MGTBOARD	-	819	1.438	.57
β _s	BOSS	+	.054	.526	.10
β	CEOTENURE	+	.019	.036	.53
βη	OUTTENURE	-	146	.071	-2.06**
β _t	ACTIVEAC	•	-1.305	.507	-2.57***
β,	GROWTH	+	.073	.087	.84
β ₁₀	TROUBLE	+	.388	.539	.72
β ₁₁	AGEPUB	•	024	.043	56
β ₁₂	BLOCKHLD	•	-2.722	2.048	-1.33*
β ₁₃	BDSIZE	none	.221	.096	2.30**
Psuedo R ²	.27				
Chi-Square Test of Model's Fit	47.879 (p=.0001) (13 degre	ees of freedom)		

*, [**], (***) Statistically significant at less than the .10 [.05], (.01) level, based on one-sided tests when in direction predicted, two-sided otherwise.

1

The following logit regression is the same as the logit model in Table 6 except that GROWTH in the model presented below represents the average two-year growth in net sales rather than the average two-year growth in assets. See definition for all other variables in Figure 7:

 $FRAUD_{i} = \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} + \beta_{3} OWNBOARD_{i}$ $+ \beta_{4} MGTBOARD_{i} + \beta_{5} BOSS_{i} + \beta_{6} CEOTENURE_{i} + \beta_{7} OUTTENURE_{i} + \beta_{8} ACTIVEAC_{i}$ $+ \beta_{9} GROWTH_{i} + \beta_{10} TROUBLE_{i} + \beta_{11} AGEPUB_{i} + \beta_{12} BLOCKHLD_{i} + \beta_{13} BDSIZE_{i} + \varepsilon_{i}$
 Table 9

 Pearson Correlation Matrix of Independent Variables

<u>Variablee</u>	gour Board	QUAL POARD	OWN BOARD	MGT BOARD	BOSS	CBO TENURE	OUT TENURE	ACTIVE AC	HLMOND	TROUBLE	AGE	BLOCK	BDSIZE
% OUTBOARD	1.00												
QUALBOARD	.36***	1.00											
OWNBOARD	.37***	• 1 4•	1.00										
MOTBOARD	S7000	38	31.	1.00									
BOSS	13	8	23	8	1.00								
CEOTENURE	8	60	8	.12	II.	1.00							
OUTTENURE	.26***		.19**	•••16'-	19	.55***	1.00						
ACTIVEAC	.42***	.39***	6.	••••0*'-	16**	.13	.26***	1.00					
GROWTH	8 .	8 .	••41'-	.15•	8	12	••••lZ'-	60	1.00				
TROUBLE	8	8 9	8	8	.12	•••04	****	•••16''	.30***	1.00			
AGEPUB		8 .	.10	36***	10	.37***	***65.	.27***	•••€€`•		1.00		
BLOCKHLD	.16**	.20***	Ş	20***	13	22	50	.13	01	.12	. 80	1.00	
BDSIZE	***0*	.28***	.26***	36***	•11•	•••1	.36***	.48	. 8		36	8	1.00

Pearson correlation coefficient statistically different from zero at the .10 [.05], (.01) level. *, [**], (***) is that the variances of the correlated variables is quite large which in turns decreases the precision of the parameter estimates. As a result, the power of the t-tests of significance for purposes of examining hypotheses about the individual parameters is reduced [Kennedy (1989)].

The Pearson correlation coefficients among the independent variables do not suggest the presence of multicollinearity. Out of the seventy-eight Pearson correlation coefficients presented in Table 9, the highest coefficient is .59 (AGEPUB and OUTTENURE). Most of the coefficients are well below .40. According to Kennedy (1989), a high correlation of .80 or .90 generally suggests the presence of multicollinearity.

Review of plots of regression diagnostics, which include the Pearson residuals and the deviance residuals, suggest that five of the sample firms may be outlier observations.³ A logit regression analysis that excludes these five firms and their related matched firms was performed, and the results are consistent with (and even slightly stronger than) the results of the full sample reported in Table 6. Thus, these five observations do not affect the results of this study, and therefore they are not excluded from the remaining analysis in this study.

Figure 8 summarizes the tests of the eight hypotheses. This figure shows that the data presented in this section are consistent with four of the eight hypotheses. The data supports economic theory suggesting that outside directors serve to monitor management because the percentage of outsiders who serve on the board, their ownership and tenure

³ Pearson residuals and deviance residuals are useful in identifying observations that are not well explained by the model.

in the firm are found to be significantly related to the occurrence of management fraud in a manner predicted by economic theory. Additionally, the data suggest that the presence of an active audit committee of the board of directors reduces the occurrence of management fraud as predicted by economic theory.

	Hypotheses	Predicted Relation With Occurrence of Management Fraud	Data Consistent With Hypotheses?
Represe	entation of Outside Directors		
H1:	% of Outside Members on Board	Inverse	Ycs
Quality	of Outside Directors		
H2:	Quality of Outside Members on Board	Inverse	No
Owners	hip Stakes In Firm:		
H3:	Held By Outside Directors on Board	Inverse	Ycs
H4:	Held By Management on Board	Inverse	No
Manage	ment Power:		
H5:	Chairperson is also CEO or President	Direct	No
H6:	CEO's Tenure on Board	Direct	No
H7:	Average Outside Director Tenure on Board	Inverse	Yes
Audit C	ommittees:		
H8:	% of Firms with Active Audit Committees	Inverse	Ycs

Figure 8 Summary of Hypotheses Testing

5.2 Logit Regression Results - Independent Directors

The logit regression results discussed in the previous section use a definition of an outside director that includes all non-employee directors. This section contains the results of the logit regression model described in Section 4.3 of Chapter 4 that considers a more restrictive definition of outside director. Outside directors can be divided into two subsets: independent directors and grey directors. An independent director is an outside director who has no other affiliation with the firm other than the affiliation from being a member of the board of directors. Grey directors are outside directors who have some non-board affiliation with the firm. Consistent with earlier corporate governance research, this study defines grey directors as those outside directors who have affiliations with the firm because they are relatives of management, consultant/suppliers of the firm, outside attorneys who perform legal work for the firm, retired executives of the firm, or investment bankers.

Section 5.1 shows that no-fraud firms have significantly higher percentages of outside members on the board of directors compared to fraud firms. Perhaps, this difference may be due to higher concentrations of grey directors on boards of directors of no-fraud firms compared to fraud firms, and there may be no differences in percentages of independent members on boards of directors of fraud and no-fraud firms. This section of Chapter 5 focuses on whether there are differences in boards of directors of fraud and no-fraud firms when a more restrictive definition of outside director - independent director - is used. This section includes results of a logit regression model that is identical to the logit model underlying the results reported in Table 6 except that outside directors are divided into two subsets: independent and grey directors.

Table 10 contains the empirical results of the logit cross-sectional regression model that examines differences in characteristics of independent and grey directors between fraud and no-fraud firms. The results show that not only do no-fraud firms have higher percentages of grey directors on the board of directors compared to fraud firms, they also have higher percentages of independent directors. The coefficients for

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Table 10Independent Director Logit Regression Results,75 Fraud Firms Matched With 75 No-Fraud Firms¹

Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β.	INTERCEPT	BODE	2.174	1.373	1.58
β ₁	%INDBOARD	-	-6.315	1.775	-3.56***
₿₂	%GRYBOARD	-	-3.740	1.712	-2.18**
ß,	QLINDBD	-	.534	.242	2.21**
ß.,	QLGRYBD	-	.387	.215	1.80*
β _s	ONINDBD	-	-1.784	2.846	63
ße	ONGRYBD	-	-7.120	3.354	-2.12**
β,	MGTBOARD	-	751	1.463	51
ß	BOSS	+	.557	.569	.98
в,	CEOTENURE	+	010	.038	24
β ₁₀	INDTENURE	-	099	.057	-1.74**
\$ 11	GRYTENURE	•	010	.050	20
β ₁₂	ACTIVEAC	-	-1.103	.516	-2.14**
β ₁₃	GROWTH	+	.002	.145	.01
β ₁₄	TROUBLE	+	.336	.569	.59
β ₁₅	AGEPUB	•	046	.044	-1.05
β ₁₆	BLOCKHLD	-	-1.823	1.963	94
β ₁₇	BDSIZE	DODE	.254	.112	2.27**
Psuedo R ²	.29				
Chi-Square Test of	Model's Fit 49.418 (p	=.0001) (17 degree	s of freedom)		

•, [••], (•••)

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Statistically significant at less than the .10 [.05], (.01) level, based on one-sided tests when in direction predicted, two-sided otherwise.

The following logit regression was estimated. See variable definitions in Chapter 4:

$$FRAUD_{i} = \beta_{0} + \beta_{1} \% INDBOARD_{i} + \beta_{2} \% GRYBOARD_{i} + \beta_{3} QLINDBD_{i} + \beta_{4} QLGRYBD_{i} + \beta_{5} ONINDBD_{i} + \beta_{6} ONGRYBD_{i} + \beta_{7} MGTBOARD_{i} + \beta_{8} BOSS_{i} + \beta_{9} CEOTENURE_{i} + \beta_{10} INDTENURE_{i} + \beta_{11} GRYTENURE_{i} + \beta_{12} ACTIVEAC_{i} + \beta_{13} GROWTH_{i} + \beta_{14} TROUBLE_{i} + \beta_{15} AGEPUB_{i} + \beta_{16} BLOCKHLD_{i} + \beta_{17} BDSIZE_{i} + \varepsilon_{i}$$

%GRYBOARD and %INDBOARD, which represent the percentages of grey and independent members on the board of directors, respectively, show that no-fraud firms have significantly more grey and independent directors at the p < .05 and p < .01 levels, respectively, than fraud firms. These results suggest that all outside directors, whether classified as independent or grey directors, play an important role in scrutinizing the actions of management, particularly for the prevention of management fraud. Using the more restrictive subset of outside directors - independent directors - does not affect the conclusions reached in the previous section about differences in outside director representation on boards of directors of fraud and no-fraud firms.

While the representation of both independent and grey directors is significantly greater for no-fraud firms compared to fraud firms, the results in Table 10 show that only the level of ownership held by grey directors (represented by ONGRYBD), and not the ownership held by independent directors (represented by ONINDBD), is significantly different between fraud and no-fraud firms. The results for ONGRYBD suggest that increasing ownership held by grey directors increases grey directors' incentives to overcome potential conflicts of interest arising from other non-board affiliations in order to effectively prevent management fraud. The results for ONINDBD suggest that independence from management that results from having no affiliations with the firm provides sufficient incentive for independent directors to effectively monitor management fraud. Apparently, no additional incentives are derived from increases in firm ownership held by independent directors.

The results in Table 10 show that, like the tenure of outside directors, the tenure of independent directors (represented by INDTENURE) is statistically longer for no-fraud

firms relative to fraud firms. The coefficient for INDTENURE, which represents the average tenure of independent directors on the board, is negative and statistically significant at the .05 level. Grey director tenure does not appear to differ across fraud and no-fraud firms.

Like the results in Table 6 for outside directors, both grey and independent directors of fraud firms appear to have significantly more directorships in other firms than grey and independent directors of no-fraud firms. The coefficients for QLGRYBD and QLINDBD, which represent the number of additional directorships held by grey and independent directors, respectively, are unexpectedly positive and significant at the .05 and .10 levels, respectively.

The results reported in Table 10 are also consistent with the results reported in Table 6 regarding other board of director characteristics. The data in Table 10 suggests that there are no differences in characteristics of management personnel who serve on the board of directors of fraud and no-fraud firms. Neither the level of firm ownership held by management (MGTBOARD), extent of managerial positions held by the chairperson (BOSS), nor the extent of CEO tenure (CEOTENURE) differ significantly between fraud and no-fraud firms. Further, the data continues to highlight the importance of an active audit committee for the prevention of management fraud as exhibited by the statistically significant (.05 level) negative coefficient for ACTIVEAC.

To summarize, the results in Table 10 show that boards of directors of no-fraud firms have significantly higher percentages of independent and grey directors than fraud firms. These results suggest that how one defines outside directors does not affect the conclusions reached about differences in percentages of outside directors serving on boards of directors of fraud and no-fraud firms that are reported in Table 6. Use of the more restrictive definition of outside directors - independent directors - only appears to affect conclusions about differences in firm ownership held by outside directors of fraud and no-fraud firms, given that there appears to be no difference in ownership held by independent directors across fraud and no-fraud firms. All other conclusions based on the results reported in Table 6 continue when the more restrictive definition of outside directors - is used.

5.3 Piecewise Logit Regression Analysis of Firm Ownership Levels

Recall that while the results reported in Section 5.1 suggest that the levels of firm ownership held by outside directors are significantly higher (p < .05) for no-fraud firms compared to fraud firms, there appears to be no significant difference in the extent of ownership held by managers who serve on the board of directors between fraud and nofraud firms. As suggested in Section 5.1, perhaps the relation of firm ownership and management fraud is nonlinear. A piecewise logit regression analysis provides a method for examining whether such relation is non-linear.

This section summarizes the results of the piecewise logit regression model described in Section 4.4 of Chapter 4. As noted in that section, the piecewise logit regression model is similar to the logit model underlying the results reported in Table 6 except that the ownership levels held by outside directors and management are each subdivided into three levels of low, moderate, and high. Three levels of ownership are examined for both outside and management directors to determine whether the relation

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is linear for both types of holders of a firm's stocks. This approach is also consistent

with Morck et al., (1988).

Firm ownership held by outside directors. OUTBOARD, is replaced with -

ONOUTLO	= % ownership in the firm if outside director ownership $<5\%$, = 5% if outside director firm ownership $\geq 5\%$;
ONOUTMID	 = 0% if outside director firm ownership < 5%, = % outside director firm ownership minus 5% if 5% < firm ownership < 25%, = 20% if outside director firm ownership > 25%;
ONOUTHI	= 0% if outside director firm ownership <25%, = outside director firm ownership minus 25% if firm ownership \geq 25%.
Firm ownership	p held by managers who serve on the board, MGTBOARD, is replaced with -
ONMGTLO	= % ownership in the firm if management director ownership $<5\%$, = 5% if management director firm ownership $\geq 5\%$;
ONMGTMID	 = 0% if management director firm ownership <5%, = % management director ownership minus 5% if 5% < firm ownership <25%, = 20% if management director firm ownership >25%;
ONMGTHI	= 0% if management director firm ownership <25%, = management director firm ownership minus 25% if firm ownership $\geq 25\%$.

Table 11 contains the piecewise logit regression results. Results of the nonownership hypotheses (hypotheses 1, 2, 5, 6, 7, and 8) are consistent with the results reported in Table 6 and summarized in Figure 8. The results related to the hypotheses for the relations between firm ownership held by outside and management directors and the occurrence of management fraud (hypotheses 3 and 4, respectively) differ from the results reported in Table 6.

The data in Table 6 suggests that outside directors of no-fraud firms hold significantly greater levels (at the .023 level) of firm ownership than outside directors of no-fraud firms. When outside director firm ownership is subdivided into low, moderate,

Table 11

	· · · · · · · · · · · · · · · · · · ·				
Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β,	INTERCEPT	none	1.493	1.683	.89
β ₁	%OUTBOARD	-	-5.007	1.565	-3.20***
₿₂	QUALBOARD	-	.831	.286	2.91***
ß	ONOUTHI	-	-4.462	6.860	65
β	ONOUTMID	-	-5.244	4.601	-1.14
ß,	ONOUTLO	-	.757	12.430	.07
ß	ONMOTHI	-	1.255	2.321	.54
ß,	ONMGTMID	-	-6.562	4.093	-1.60*
β _e	ONMGTLO	-	26.631	25.259	1.05
β,	BOSS	+	.002	.573	.00
β ₁₀	CEOTENURE	+	.013	.038	.34
β ₁₁	OUTTENURE	•	144	.073	-1.97++
β ₁₂	ACTIVEAC	-	-1.402	.513	-2.73***
β ₁₃	GROWTH	+	011	.137	.08
β ₁₄	TROUBLE	+	.730	.564	1.29*
\$ 13	AGEPUB	-	022	.046	.48
β ₁₆	BLOCKHLD	•	-2.273	1.947	-1.17
β ₁₇	BDSIZE	•	.251	.103	2.44**
Psuedo R ²	.28				
Chi-Square Test of	Model's Fit 48.731 (p	=.0001) 17 degrees	of freedom		

Piecewise Logit Regression Results for Analysis of Ownership Levels, 75 Fraud Firms Matched With 75 No-Fraud Firms¹

•, [••], (•••) Statistically significant at less than the .10 level, based on one-sided tests when in direction predicted, two-sided otherwise.

¹ The following piecewise logit regression model was estimated. See variable definitions in Chapter 4:

 $FRAUD_{i} = \beta_{0} + \beta_{1} \% OUTBOARD_{i} + \beta_{2} QUALBOARD_{i} + \beta_{3} ONOUTHI_{i} + \beta_{4} ONOUTMID_{i} + \beta_{5} ONOUTLO_{i} + \beta_{6} ONMGTHI_{i} + \beta_{7} ONMGTMID_{i} + \beta_{8} ONMGTLO_{i} + \beta_{9} BOSS_{i} + \beta_{10} CEOTENURE_{i} + \beta_{11} OUTTENURE_{i} + \beta_{12} ACTIVEAC_{i} + \beta_{13} GROWTH_{i} + \beta_{14} TROUBLE_{i} + \beta_{15} AGEPUB_{i} + \beta_{16} BLOCKHLD_{i} + \beta_{17} BDSIZE_{i} + \varepsilon_{i}$

and high levels of firm ownership, there appears to be no relation between outside director ownership and the occurrence of management fraud. Recall, however, that Table 5 of Chapter 4 shows that few outside directors hold high levels of common stock in the firm. Specifically, only two fraud firms and fourteen no-fraud firms have outside directors who own greater than or equal to 25% of the common stock shares of the firm. These small cell sizes for high levels of stock ownership held by outside directors suggest that the moderate and high categories of firm ownership held by outside directors should be combined. The results of a piecewise regression analysis that combines ONOUTMID and ONOUTHI (not separately reported in a table) show that the coefficient for the combined variable is significantly negative at the p < .05 level, which is consistent with the results reported in Table 6 and hypothesis 3. Whether or not the high and moderate levels are combined, the coefficient for low levels of firm ownership held by outside directors (ONOUTLO) is not significantly different from zero. These results suggest that within low levels of firm ownership (less than 5%), increases in firm ownership held by outside directors is not related to occurrences of management fraud. However, once firm ownership held by outside directors is greater than or equal to 5%, increases in levels of firm ownership are negatively related to occurrences of management fraud, consistent with the predicted relation in hypothesis 3.

The results reported in Table 11 suggest that the relation between firm ownership held by management and the occurrence of management fraud may not be linear. The coefficients for both low and high levels of ownership held by managers who serve on the board of directors are not significantly different from zero, suggesting that increases in firm ownership within these levels do not reduce occurrences of management fraud. Interestingly, the coefficient for moderate levels of management ownership in the firm, ONMGTMID, is significant at the p=.055 level in the direction predicted by hypothesis 4. The results in Table 11 suggest that when firm ownership held by managers increases within moderate levels, 5% to 25%, the occurrence of management fraud decreases. These results suggest that the agency theory prediction of a linear relation between firm ownership and the agency problem of management fraud may not be accurate. Instead, it appears that the agency theory prediction that increases in firm ownership held by management decreases the agency problem of management fraud only applies within moderate levels of firm ownership held by managers who serve on the board.

5.4 Another Robustness Test

This section summarizes results from an additional logit model designed to examine the robustness of the results reported in Table 6 of Section 5.1. This additional logit model examines whether the process of matching fraud and no-fraud firms based on firm size, industry, and national stock exchange has any effect on the results reported in Table 6. The only difference between this additional logit model and the logit model underlying the results reported in Table 6 is that logit model described in this section includes three additional control variables.

The first additional variable, LSIZE, explicitly controls for the effects of firm size in the logit model. LSIZE represents the natural logarithm of the market value of common equity (total assets if market value data is not available).

The second additional variable, INDUSTRY, controls for the closeness of the industry match between fraud and no-fraud firms. INDUSTRY is a dummy variable with a value of 1 if fraud and no-fraud firms match at the three or four digit SIC industry

code levels and a value of 0 otherwise. Recall from Table 1 of Chapter 3, that twentyfour of the fraud firms could only be matched with no-fraud firms using two digit SIC codes. Perhaps, matching firms at the two-digit SIC code level does not fully control for industry differences between fraud and no-fraud firms. Inclusion of INDUSTRY controls for any differences in industry type between pairs of fraud and no-fraud firms.

The third additional variable, EXCHANGE, controls for the type of national stock exchange where the common shares of the firm are traded. The NASDAQ exchange firms may have different characteristics from AMEX or NYSE firms that are not addressed by other control variables. EXCHANGE is a dummy variable with a value of 1 if the firm's common stock shares trade on the NASDAQ exchange and a value of 0 otherwise.

Table 12 contains the empirical results of this additional logit model. The data in Table 12 indicates that the results reported in Table 6 appear to be robust. The results are consistent with the results in Table 6 with no differences in significance levels for any of the variables of interest that relate to the hypotheses examined. And, none of the additional control variables are significantly different from zero.

5.5 Summary

The empirical results reported in this chapter indicate that there are significant differences in board of director composition between fraud and no-fraud firms in a manner predicted by economic theory. Fraud firms have significantly fewer percentages of outside directors on the board of directors compared to no-fraud firms. Additional analysis shows that how outside directors are defined does not affect the conclusions reached about differences in percentages of outside directors serving on boards of

Table 12

	Logit Regression	Controlling	For Size,	Industry,	and	Stock	Exchange,
75	Fraud Firms Match	ed With 75	No-Fraud	l Firms ¹			

Coefficients	Independent Variable	Predicted Relation	Estimated Coefficients	Standard Errors	T-Statistics
β ₀	INTERCEPT	none	2.183	1.796	1.22
β ₁	%OUTBOARD	-	-4.749	1.550	-3.06***
β ₂	QUALBOARD	-	.829	.293	2.83***
β3	OWNBOARD	•	-3.665	2.157	-1.70**
β ₄	MGTBOARD	-	516	1.482	35
β ₅	BOSS	+	060	.531	11
β ₆	CEOTENURE	+	.012	.037	.32
β7	OUTTENURE	-	143	.072	-1.99**
β ₈	ACTIVEAC	-	-1.580	.540	-2.93***
β9	GROWTH	+	039	.142	.27
β ₁₀	TROUBLE	+	.771	.556	1.39*
β ₁₁	AGEPUB	-	027	.046	59
β ₁₂	BLOCKHLD	-	-2.489	2.056	-1.21
β ₁₃	BDSIZE	none	.170	.105	1.62
β14	LSIZE	none	.074	.060	1.23
β ₁₅	INDUSTRY	none	560	.727	.77
β ₁₆	EXCHANGE	none	084	.451	.19
Psuedo R ²	.28				
Chi-Square Test of Model's Fit	49.151 (p=.0001)	(16 degree	es of freedom)		

*, [**], (***) Statistically significant at less than the .10 [.05], (.01) level, based on one-sided tests when in direction predicted, two-sided otherwise.

The logit regression model underlying the results in this table is the same as the logit model underlying the results in Table 6 except for the addition of these three variables:

- LSIZE represents the natural logarithm of the market value of common equity (total assets if market value information is not available).
- INDUSTRY represents a dummy variable with the value of 1 if fraud and no-fraud firms match at the three or four digit SIC code level, otherwise the value is zero.
- EXCHANGE represents a dummy variable with the value of 1 if the firm's common stock shares trade on the NASDAQ exchange, otherwise the value is zero.

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directors of fraud and no-fraud firms, given that fraud firms have significantly fewer independent and grey directors compared to no-fraud firms. Together these findings suggest that outside directors, whether classified as independent or grey directors, perform an important monitoring function for the prevention of management fraud.

Surprisingly, the outside directors of fraud firms hold more directorships in other firms than outside directors of no-fraud firms. It is possible that this surprising result suggests that these additional directorships serve to distract outside directors from their monitoring responsibilities at each firm where they serve as director.

The data reported in this chapter indicates that the extent of firm ownership held by outside directors is associated with firms experiencing management fraud. Outside directors who own more of the firm's outstanding common shares are more likely to be associated with firms not experiencing management fraud, particularly as their ownership exceeds 5%. Additional analysis indicates that this relation holds for the subset of outside directors who have non-board affiliations with the firm - grey directors. However, there does not appear to be a relation between firm ownership held by independent directors and the occurrence of management fraud. These results suggest that increasing ownership held by grey directors increases grey directors' incentives to overcome potential conflicts of interest arising from non-board affiliations in order to effectively prevent management fraud. They also suggest that an independent director's lack of any non-board affiliation with the firm provides sufficient incentives to monitor management and there is no significant change in that incentive as independent directors own more of the firm. The piecewise logit regression analysis indicates that the predicted inverse relation between firm ownership and management fraud may only apply within moderate levels of firm ownership, 5% to 25%. Within that range, increases in firm ownership held by management decreases the likelihood of management fraud; however, outside that range there appears to be no relation of firm ownership held by management and the occurrence of management fraud. It is possible that incentives to reduce agency costs that come from management's ownership in the firm are strongest within moderate levels of ownership and that at low and high levels of ownership other offsetting incentives are present.

Chairpersons of fraud firms are just as likely to hold managerial positions of CEO or president as chairpersons of no-fraud firms, and CEO tenure on the board of directors does not differ between fraud and no-fraud firms. But, the average tenure of outside members on the board of directors is significantly longer for no-fraud firms compared to fraud firms. This suggests that managers serving on the boards of directors of fraud firms are able to exert power over recently appointed, shorter-tenured outside directors. The lack of seniority of outside directors of fraud firms apparently affects his/her ability to scrutinize top management. The results are consistent when the tenure of independent directors is examined; however, there is no difference in tenure of grey directors between fraud and no-fraud firms.

Finally, consistent with the beliefs of many corporate governance reform critics, such as the National Commission on Fraudulent Financial Reporting and the AICPA Public Oversight Board, the empirical results suggest that an active audit committee can play an important role in the prevention of management fraud. The results reported in this chapter indicate that no-fraud firms are more likely to have an active audit committee than fraud firms, suggesting that the audit committee can be an important management fraud deterrent.

CHAPTER 6 - SUMMARY, CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

This study is an empirical examination of the relation between board of director composition and the occurrence of management fraud. Economic theory of the firm suggests that unique board of director composition may help to reduce the occurrence of management fraud. This study exploits variations in board of director composition to examine this theory. Empirical results confirm the predicted relation.

This chapter summarizes the primary research findings and contributions of this study, which empirically tests economic theory suggesting that there is a relation between board of director composition and the occurrence of management fraud. This chapter also describes limitations of the study and includes suggestions for future research.

Section 6.1 contains a summary of the hypotheses and empirical findings. Section 6.2 highlights how this study contributes to research on management fraud and corporate governance. Section 6.3 contains a discussion of limitations of this study, and Section 6.4 includes suggestions for future research.

6.1 Summary of Research Findings

This study empirically examines whether there is a relation between board of director composition and the occurrence of management fraud. By exploiting variations in board of director composition, this study examines economic theory of the firm that suggests unique board of director composition may help reduce management fraud. This study builds upon economic theory to test eight hypotheses.

The empirical results confirm the predicted relation between board of director composition and the occurrence of management fraud. These results suggest that certain

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characteristics of the board of directors increase the effectiveness of the board as a monitor of management for the prevention of management fraud. Figure 9 summarizes the results of this study, which are described further in this section.

6.1.1 Representation of Outside Directors. This study finds that no-fraud firms are significantly more likely to have higher percentages of outside members on the board of directors compared to fraud firms. Economic theory suggests that the composition of individuals who serve on the board of directors is an important factor in creating a board of directors that is effective in monitoring management for the prevention of management fraud. That theory notes that the viability of the board of directors as a monitor of management is enhanced by the inclusion of outside directors. Results from this study support that economic theory prediction.

Additional analysis shows that the results are not sensitive to how outside directors are defined. As discussed in this study, outside directors can be divided into two subsets: independent and grey directors. Independent directors are outside directors who have no affiliation with the firm other than the affiliation from being a member of the board of directors. Grey directors are outside directors who have some non-board of director affiliation with the firm. The results indicate that no-fraud firms have significantly more independent and grey directors, whether classified as independent or grey directors, serve to monitor management for the prevention of management fraud.

	Empirical Findings	Related	Hypothesis
Repres	entation of Outside Directors		
•	Representation of outside directors is higher for no-fraud firms than fraud firms.	H1:	No-fraud firms have higher percentages of outside directors than fraud firms.
Charac	teristics of Outside Directors		
	Ownership in the firm held by outside directors of no-fraud firms is higher than outside director ownership of fraud firms.	H3:	Outside directors hold higher ownership stakes in no-fraud firms than outside directors of fraud firms.
	Average tenure of outside directors of no-fraud firms is longer than outside director tenure of fraud firms.	H7:	Outside directors of no-fraud firms have longer average tenures than outside directors of fraud firms.
	Number of additional directorships in other firms held by outside directors of no- fraud firms is lower than outside directors of fraud firms.	H2:	Outside directors of no-fraud firms are of higher quality than outside directors of fraud firms.
Charac	teristics of Management Directors		
•	The extent of management ownership in the firm does not differ between fraud and no-fraud firms except that increases in ownership within moderate ranges of ownership (5% to 25%) are more likely to be associated with no-fraud firms.	H4:	Management directors hold higher ownership stakes in no- fraud firms than management directors of fraud firms.
	Chairpersons are of fraud firms are not more likely to hold managerial positions of CEO or president than chairpersons of no-fraud firms.	H5:	Chairpersons of no-fraud firms are less likely to hold managerial positions of CEO or president than chairpersons of fraud firms.
	CEO tenure does not differ between fraud and no-fraud firms.	H6:	CEO tenure on the board of directors of no-fraud firms is shorter than CEO tenure of fraud firms.
Other (Characteristics of the Board of Directors		
	Active audit committees are more likely for no-fraud firms than fraud firms.	H8:	Active audit committees are more likely for no-fraud firms than fraud firms.
	Boards are smaller for no-fraud firms than fraud firms.		No Related Hypothesis

Figure 9 Summary of Empirical Findings 6.1.2 Differences in Outside Director Characteristics. The characteristics of outside directors who serve on boards of directors of fraud firms differ significantly from characteristics of outside directors who serve on boards of directors of no-fraud firms. Outside directors of no-fraud firms have significantly higher ownership levels in the firm, longer tenures on the board of directors, and fewer outside directorships in other firms. These findings are discussed further in the following paragraphs.

Agency theory suggests that a high stake in a company's outstanding equity should provide individual directors with a strong incentive to promote firm activities that increase a firm's value because this increases the value of the director's own investment. Thus, agency theory suggests that as the extent of ownership in the firm held by outside directors increases, the occurrence of management fraud should decrease.

The results of this study are consistent with this prediction given that outside directors of no-fraud firms have significantly higher ownership stakes in the firm than outside directors of fraud firms. Additional analysis based on a piecewise logit regression model indicates that as outside director ownership in the firm increases, particularly above 5%, the likelihood of management fraud decreases. This finding suggests that holding a personal financial stake in the firm encourages outside directors to spend the time and effort necessary to effectively monitor management for the prevention of management fraud.

Interestingly, the relation between firm ownership and the occurrence of management fraud holds for grey directors but does not hold for independent directors. Perhaps, the incentives from owning shares in the firm helps grey directors overcome potential conflicts of interests with management to effectively prevent the occurrence of

management fraud. However, for independent directors, the separation from management through the lack of any non-board affiliation enables them to effectively monitor management for the prevention of management fraud, and no significant incentives are derived from increasing independent director ownership in the firm.

Outside directors of no-fraud firms have significantly longer average tenures on the board of directors of those firms. This empirical finding suggests that managers of fraud firms may be able to override outside director monitoring in order to commit management fraud when outside directors have recently joined the board of directors. When outside director tenure is short, managers may be able to take advantage of outside directors' lack of seniority to avoid monitoring by those directors. Results also suggest that the average tenure on the board of directors for independent directors of no-fraud firms is longer than the average tenure of independent directors of fraud firms. However, there appears to be no significant difference in average tenure of grey directors of fraud and no-fraud firms.

Surprisingly, the empirical results are not consistent with the prediction that nofraud firms have higher quality outside directors than fraud firms. Boards with similar percentages of outside directors may vary in their effectiveness as a monitor of management depending on whether outside directors have an incentive to maintain reputations as quality directors. Fama (1980) argues that the external market for directors provides an incentive by rewarding high quality directors with additional directorships and punishing low quality directors with fewer directorship opportunities. Using the number of additional directorships held by outside directors as a proxy for outside director quality, the finding that outside directors of fraud firms have significantly higher numbers of additional directorships than outside directors of no-fraud firms suggests that fraud firms have higher quality outside directors compared to outside directors of no-fraud firms. This finding is opposite of the expected relation.

An explanation of this unexpected result may be that the proxy used to measure outside director quality is inappropriate, particularly given the heavy concentration of small firms in this study. Outside directors of small firms are likely to serve as outside directors of other similar-sized firms. Such firms may require outside directors to spend more time with the day-to-day monitoring than the time required to serve on larger, more widely-known firm boards. Also, small firms may have difficulty attracting high quality directors. If this is the case, as the number of additional directorships increases, the quality of monitoring by outside directors at the individual firm level deteriorates.

6.1.3 Differences in Management Director Characteristics. The results of this study suggest that managers who serve on the board of directors of fraud and no-fraud firms differ in the level of ownership in the firm only when they hold moderate levels of outstanding common shares of the firm - between 5% and 25% of the outstanding shares. This findings suggests that increases in firm ownership for managers serving on the board of directors within the range of 5% to 25% decreases the likelihood of management fraud. That finding is consistent with agency theory, which predicts that stock ownership by management in the firm decreases agency costs. However, the relation between increases in ownership held by management directors and the occurrence of management fraud is limited to moderate levels of ownership given that ownership levels held by management directors do not appear to differ between fraud and no-fraud firms when managers own small percentages (less than 5%) or large percentages (greater

than 25%). Apparently, at both low and high levels of firm ownership, there are other incentives for management that offset incentives to prevent management fraud derived from firm ownership. The overall results suggests that the relation between ownership held by management directors and the occurrence of management fraud may not be linear.

The results also suggest that chairpersons of the board of directors of fraud firms are not more likely to hold managerial positions of CEO or president than chairpersons of no-fraud firms. Given that eighty-five percent of fraud firms and seventy-three percent of no-fraud firms have chairpersons who hold one of these two managerial positions, it appears that this lack of separation of board of director and management positions is not that uncommon in most firms. Additionally, the results indicate that the average tenure of CEOs on the board of directors does not differ significantly across fraud and no-fraud firms.

6.1.4 Differences in Other Characteristics. This study documents the importance of an active audit committee for the prevention of management fraud. The findings highlight that boards of directors of no-fraud firms are significantly more likely than boards of fraud firms to have an audit committee that meets at least once during the year. This result is consistent with the view of many corporate governance reform proponents who believe that the audit committee can be an effective deterrent of management fraud. These proponents believe audit committees with oversight responsibility for the financial reporting process are critical for effective governance by the board of directors for the prevention of management fraud.

Additionally, while this study does not include any hypotheses predicting a relation between board of director size and the occurrence of management fraud, the results of this study indicate that fraud and no-fraud firms differ in board size. Fraud firms are significantly more likely to have a larger board of directors than no-fraud firms. This finding is consistent with the view that larger boards of directors are not able to function effectively as a controlling body leaving management relatively free [Chaganti, Mahajan, and Sharma (1985)].

In summary, this study documents that there is a relation between board of director composition and the occurrence of management fraud. It highlights that the composition, ownership, and tenure of members of the board of directors, particularly outside directors, as well as the presence of an active audit committee are important factors that affect the board of directors' ability to prevent management fraud.

6.2 Contributions to Management Fraud and Corporate Governance Research

This study contributes to existing research because little is known about the relation between board of director composition and management fraud. Prior research has not empirically tested economic theory suggesting that there is a relation between board of director composition and the occurrence of management fraud. By providing initial empirical results of this economic theory prediction, this study expands knowledge about the effectiveness of the board of directors as a corporate governance mechanism designed to prevent agency problems such as management fraud.

This study contributes to research on management fraud by highlighting how characteristics of boards of directors differ between fraud and no-fraud firms. While prior management fraud research identifies numerous red flag indicators of firms likely to experience management fraud, none of those indicators address unique characteristics of boards of directors of firms experiencing management fraud. Many of the red flag indicators imply that the board of directors of fraud firms may be ineffective monitors of management by consistently noting the significance of "weak internal control environments" for many of the firms experiencing management fraud. By providing a more focused analysis of the internal control environment, particularly the board of directors, this study provides empirical support about differences in one aspect of the internal control environment - the board of directors - between fraud and no-fraud firms.

Recall that the purpose of this study is to test economic theory about the monitoring role of the board of directors in a setting of management fraud. While the purpose of this study is not to develop a predictive model of management fraud, this study contributes to the development of future management fraud predictive models by providing evidence of a relation between board of director composition and the occurrence of management fraud. Such evidence suggests the importance of including board of director composition in future predictive models.

This study also contributes to the corporate governance literature. Previous research on corporate governance considers the relation of board of director composition with either some aspect of firm performance or some type of acute agency problem. No prior study has empirically examined the relation of board of director composition with the agency problem of management fraud.

Many of the empirical findings from this study provide additional support for a couple of the corporate governance reform proposals suggested by groups such as the National Commission on Fraudulent Financial Reporting and the AICPA's Public Oversight Board. In addition, these findings are relevant to standards-setters such as the Auditing Standards Board, which is responsible for developing auditing professional standards. Current standards set certain management fraud detection responsibilities for auditors and provide guidance to increase audit effectiveness in the form of red flag predictive indicators for consideration by auditors. Given that current standards are silent as to board of director characteristics that may be associated with occurrences of management fraud, empirical findings in this study may provide further insights for consideration by the Auditing Standards Board when making future modifications to existing authoritative standards.

6.3 Limitations

There are limitations that may reduce the generalizability of the results of this study. These limitations relate to the uniqueness of the type of management fraud examined in this study, biases of the sources used to identify fraud firms, potential misclassifications of fraud firms as no-fraud firms, potential correlated omitted variables bias, and alternative explanations for the documented relation of board of director composition and management fraud. These limitations are discussed next.

First, conclusions of this study are limited to two types of management fraud misappropriation of firm assets and fraudulent financial reporting. These types of management fraud were examined in this study because they are directly related to the financial statement reporting activities of publicly traded firms. There are other types of fraudulent activities such as customer fraud, employee fraud, anti-trust violations, illegal mergers, tax evasion, and defense contract violations. The findings of this study may not be generalizable to other fraudulent activities. Second, the results are limited to cases of management fraud for publicly traded firms investigated as part of an enforcement action by the SEC staff or reported in The <u>Wall Street Journal</u>. To the extent that both the SEC and <u>The Wall Street Journal</u>'s selection of management fraud cases is not representative of the population of management fraud occurrences, the ability to generalize the results of this study is limited.

Third, while procedures have been performed to minimize the potential misclassification of fraud firms as no-fraud firms, such misclassification may have occurred. Recall, however, that such misclassification biases against findings consistent with the hypotheses. More importantly, it is assumed that the likelihood of management fraud in a random sample is small.

Fourth, while this study attempted to control for endogenous differences in characteristics of fraud and no-fraud firms, there may be certain unidentified variables that may be associated with both management fraud and board of director composition. The exclusion of such characteristics, if any, may create a correlated omitted variables bias that potentially affects conclusions about the tests of the hypotheses.

Finally, there is an alternative explanation to the economic theory prediction about the relation between board of director composition and the occurrence of management fraud. As summarized in this study, economic theory argues that shareholders delegate responsibility to the board of directors for the oversight of management for purposes of minimizing agency problems like management fraud. This theory argues that the board of directors is an important monitor of management with ultimate control over activities within the firm. Critics of this theory argue that the board of directors is not an effective monitor of management because the board of directors is generally controlled by top management. They argue that the CEO often selects individuals for service on the board. Consistent with this alternative view of the board, some may argue that the observed empirical relation between board of director composition and the occurrence of management fraud is not evidence that certain characteristics of the board of directors serve to decrease the likelihood of management fraud. Instead, it is possible that managers who control the selection of individuals to serve on the board of directors use board of director composition to signal information about the quality of top management to investors. Perhaps, high quality managers signal information about their quality by creating boards of directors with unique characteristics, such as higher percentages of outside directors and active audit committees, to distinguish them from other firms controlled by lower quality managers. Unfortunately, the research design of this study cannot distinguish the economic theory prediction from this alternative view.

6.4 Suggestions for Future Research

This study finds that there is a relation between board of director composition and the occurrence of management fraud. While prior management fraud research notes that fraud firms often have weak internal control environments, none of these studies examine differences in board of director composition. This study is particularly relevant to management fraud researchers who are attempting to development management fraud predictive models. As future predictive models are developed, this study suggests that researchers consider the inclusion of board of director composition in those predictive models. As noted in the prior section, this study does not examine the relation between board of director composition and the occurrence of other fraudulent activities. Future research on board of director composition may be able to provide additional insights about board effectiveness for the prevention of other illegal activities.

This study focuses on board of director composition that firms have in place in the fiscal year prior to the occurrence of management fraud. One extension of this research would be to examine how board of director composition evolved over a period of time leading up to the occurrence of management fraud. Additionally, research on changes in board of director composition subsequent to the announcement of management fraud may provide further evidence of how shareholders modify board of director composition in response to evidence of failed board governance. Examining board of director characteristics in periods subsequent to management fraud may also provide additional evidence about the existence of an external market for corporate directors. Future research may be able to determine whether the external market punishes directors of firms experiencing management fraud by offering fewer directorships in other firms in periods subsequent to the discovery of management fraud. Finally, according to Kalbers and Fogarty (1993), research on audit committee effectiveness is limited. Perhaps, future research about differences in audit committee characteristics between fraud and no-fraud firms may provide additional insights about the effectiveness of audit committees in fulfilling their responsibilities for financial reporting activities.
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