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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

ESSAYS ON BOARD OF DIRECTOR COMPENSATION

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

Doctor of Philosophy

By

GYOUNGSIN PARK

Norman, Oklahoma

2002

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ESSAYS ON BOARD OF DIRECTOR COMPENSATION

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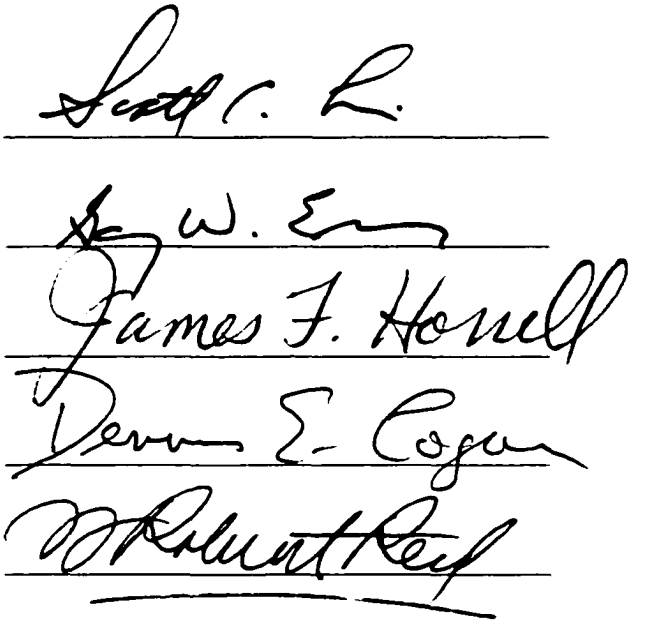

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ESSAYS ON BOARD OF DIRECTOR COMPENSATION

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ABSTRACT

This dissertation consists of three essays that explore topics on the board of directors of profit-making corporations. Special emphasis is given to the evolution and determinants of outside director compensation. Essay 1 presents a comprehensive review of the literature on boards. Essay 2 investigates the evolution of board compensation over the period 1979-2000. Overall, inflation-adjusted outside director compensation has increased on average 1.7% per year over the last 20 years. Manufacturing firms tend to provide larger compensation to outside directors than do financials or service related corporations. Cross-sectional dispersion in aggregate compensation is largely explained by industry sector (manufacturing, financial, non-financial service) and firm size. During the last 18 years the use of stock-based compensation plans for outside directors has dramatically increased. Stock-based compensation for outside directors takes the form of option grants and restricted stock grants and partial payment of basic annual compensation with stock. Smaller companies more frequently use option grants while larger firms more frequently use restricted stock grants. Recent changes in compensation practices are more consistent with the view that the normative goal of the board should be shareholder wealth creation than the alternative of shareholders' interest optimization.

Essay 3 examines whether the variation in compensation across firms can be explained by differences in investment opportunity sets. The results indicate that variation in outside director compensation among firms is consistent with the hypothesis that director compensation is designed to reduce agency costs. Firms with more growth opportunities pay more to their outside board members than do non-growth firms.

Growth firms also pay a larger proportion of compensation in the form of stock compared to non-growth firms.

ESSAYS ON BOARD OF DIRECTOR COMPENSATION

CHAPTER 1. INTRODUCTION

Enron started as a small natural gas company in 1985, but within two decades had become the world's largest energy trader. However, on December 2, 2001, the company filed for the largest Chapter 11 bankruptcy protection in U.S. history. Since then many have assigned significant responsibility for Enron's collapse to the company's board of directors.

The failure of corporate governance was at the heart of Enron's collapse. The role of Enron's board of directors was to oversee how profits were made, as its members are the ultimate arbiters of the company's ethics and integrity -The Christian Science Monitor[1] -

Members of a Senate Investigations Subcommittee announced this week they would be calling members of the Enron Board of Directors to testify --- "We will be trying to find out exactly what the Board Members knew about the accounting gimmicks, the off-the-books entities, the deceptive financial statements, and the hidden guarantees and buy backs," said Senator Carl Levin (D-MI) --- "For the first time, Congress will take a detailed look at why the primary guardians of Enron's shareholders were unable to protect them," said Senator Susan Collins (R-ME) in a statement, "I look forward to examining what role the Board members played in the activities leading to the corporation's downfall and what steps they should have taken to carry out their fiduciary responsibilities ---" -EVOTE.COM[2]-

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[1] See Christian Science Monitor, January 24, 2002 edition, Enron's board should have known better, W. Michael Hoffman and Dawn-Marie Driscoll (Web: http://www.csmonitor.com/2002/0124/p11s02-coop.html).

[2] See Evote.com news, April 04, 2002, Senate Hearing Will Focus On Enron Board (Web: http://www.evote.com/News/EV04042002F.html).

Consider the fate of the board of directors that presided over the fall of Enron Corp. Few in the history of American business have ever felt such outrage and infamy. Pilloried in the press, dragged before Congress, and hounded by Enron shareholders, the members of Enron's board may have tumbled as far and as fast as the laws of physics allow
- Business Week On Line[3] -

Fifteen months ago, Chief Executive magazine declared that the Enron Corp. board was one of the five best corporate boards of the year. Now the company's stunning collapse has become an enormous scandal. --- Thousands of investors have lost millions of dollars. Thousands of employees have lost their jobs and their retirement savings.--- We don't know the details of how Enron's directors allowed their management to hide the company's debt by pushing it off the Enron books into high-risk business partnerships. But we know this much: Either the board didn't know what was going on and should have, or the board knew and failed to stop it. Either way, the directors failed in carrying out their responsibilities to Enron's shareholders, employers, customers and community
- Center for Ethical Business Cultures[4] -

--- The Board put many controls in place, but the controls were not adequate, and they were not adequately implemented. -- did not exercise sufficient oversight, and did not respond --- - FindLaw[5] -

Why Enron's board failed to adequately oversee the company may in part be due to the incentives faced by the company's directors and especially the outside directors. The focus of this dissertation is on the incentives provided to outside directors through how they are compensated.

The board of directors is in principle the ultimate decision making body in the modern corporation. Numerous studies have focused on board member behavior and effectiveness. Hermalin and Weisbach (2000) summarize the principal questions that

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[3] See Business Week Online, February 12, 2002, Enron Directors: Unfit to Serve Anywhere? (Web: http://www.businessweek.com/bwdaily/dnflash/feb2002/nf20020212_1828.htm).

[4] See Center for Ethical Business Cultures news (CEBC IN THE NEWS), Enron Board's Role in Scandal Scrutinized, Published Sunday, January 20, 2002 in the Pioneer Press by Dave Beal (Web: http://www.cebcglobal.org/Overview/News/News_012002.htm)

[5] See FindLaw news (http://news.findlaw.com/hdocs/docs/enron/sicreport), Report of Investigation By the Special Investigative Committee of the Board of Directors of Enron Corp., February 02, 2002, William C. Powers, Jr., Chair, Raymond S. Troubh, Herbert S. Winokur, Jr.

have been addressed: 1) How do board characteristics such as composition or size relate to profitability? 2) How do board characteristics affect the observable actions of boards? 3) What factors affect the makeup of boards and how do they evolve overtime? John and Senbet (1998) offer a slight variation on these themes: How effective is the board in performing its monitoring function? Does the board contribute to shareholder wealth? Are the board and corporate control mechanisms substitutes? Does board composition matter? How does the board interact with management? Despite the volume of research on boards of directors, board member compensation has received little attention in the academic literature.

Until the emergence of the 'corporation form' of business, directors worked for their companies without any compensation. In fact, they were the major stockholders of their companies. However, the separation of ownership and control that developed in the 1930s and 1940s led to a class of directors and managers with decision control who received compensation as employees but who held only small financial interests in the companies that employed them.

Directors have become more liable for their decisions over time, and have been called on to make increasingly more difficult decisions. Along with these changes have come both increased compensation and more diversified pay packages. Increases in director compensation have attracted numerous critics from the media, politicians, regulators, social activists, investors, and shareholders (See Rick (1995), Linden and Lenzner (1995), Olson (1995), Shook (1995)). Although there have been discussions regarding how to set directors' compensation (See Salwen (1996), Levy (1996), Rutledge (1996), Zaleznik (1996), Wamberg (1997), Dyckhoff (1998), Hankins (2001)), Leighton

and Thain (1993) argue, "Directors' compensation is, paradoxically, one of the most obvious yet least examined elements of corporate governance."

The purpose of my dissertation is to increase our understanding of board compensation. The dissertation consists of three essays, the boards of directors in the modern corporation, the evolution of board compensation over time, and the variation of compensation across firms. Specifically, I examine and provide answers to questions such as how firms have paid their board members, how have pay practices changed, what are the recent trends in director compensation practices, and what determines how compensation varies across firms.

Essay I presents a review of the literature on boards. Essay 2 investigates the evolution of board compensation over the period 1979-2000. I examine yearly 'Corporate Directors' Compensation' data published by the *Conference Board.* Directors are paid retainers and fees for board and committee services and receive other benefits such as D&O liability insurance, retirement plans, deferred compensation and discounted company products or services. I provide evidence that, overall, outside director compensation has increased 1.7% per year after adjusting inflation over the last 20 years. Among three industry sectors (manufacturing, financial, and non-financial), the manufacturing sector has paid more compensation to directors than either the financial or non-financial services sector. Firm size and industry sector are the main determinants of cross-sectional variation in aggregate board compensation.

The most dramatic change in board compensation is the use of equity-based compensation. The compensation data examined show that only a small number of firms used stock compensation during the early 80s. However, today, a large number of firms

use equity-based compensation and many firms pay more than half of outside director total compensation in the form of stock or stock and option grants. The current practice of using stock-based compensation suggests that many companies support the view that maximizing shareholder wealth dominates the competing view of balancing the interests of multiple stakeholders.

The third essay examines whether the cross-sectional variation in outside director compensation at the firm level can be explained by factors related to firms' investment opportunity sets. The essay therefore extends the literature that has examined the relations between firm-specific investment opportunities and corporate policies (Smith and Watts (1992), Gaver and Gaver (1993, 1995), Skinner (1993), Baber *et al* (1996), Gul and Kealey (1999), and Hossain *et al* (2000)).

I hypothesize that firms with more growth opportunities will pay more board compensation than firms with less growth opportunities since monitoring managers in high growth firms is potentially more difficult than in non-growth firms. In addition, growth firms should use more equity-based compensation (thus, less fixed salary compensation) than non-growth firms to ensure that boards work in the shareholders' best interests. Further, growth firms should pay higher meeting fees than non-growth firms to increase the incentive to attend meetings and contribute.

Using four years of yearly board compensation data for the two hundred largest US corporations, I find evidence that the investment opportunity set explains, at least in part, the cross-sectional variation in board compensation among firms. Firms with more abundant investment opportunities pay more total compensation and use stock-based compensation more heavily than firms with fewer investment opportunities. These

findings are consistent with the hypothesis that board compensation is set in part to reduce agency costs.

The last chapter summarizes and discusses the essays' implications.

CHAPTER 2. ESSAY 1: BOARDS OF DIRECTORS IN THE MODERN CORPORATION

This chapter surveys the research on *boards of directors* that have appeared in the economics, finance and other business literatures. The survey covers a broader range of topics than two previous surveys on boards by Hermalin and Weisbach (2000) and John and Senbet (1998). Hermalin and Weisbach (2000) "omitted discussion of management and law literatures entirely" in their survey. I include studies in management and the law. In addition, I update John and Senbet's survey by including recent studies of corporate directors.

In the modern corporation, managers are the agents who theoretically work in the interest of shareholders. One view of directors is that they constitute another level of agent who monitors the managers. Since shareholders delegate their decision power to a board of directors, the board of directors becomes the ultimate decision-making body in a corporation. An opposing view, and one discussed more fully in Chapter 3, is the position that directors are not agents of the stockholders, but instead should make decisions with the intent of balancing the interests of all stakeholders who receive cash flows from the firm. The shareholder interest versus stakeholder interest views each have their own set of advocates (see the review and critique in Jensen (2001)).

The existing literature, mostly empirical, has addressed the following issues: What is the role of the board of directors (mainly recommendations from practitioners and researchers)? How well do boards perform their monitoring roles (such as in the

setting of CEO compensation)? How does board composition affect firm performance (board independence, board size, board diversification, board ownership)? What characteristics and structures of boards are the most effective? How have the characteristics or structures of boards evolved over time and why (board composition, diversification, policy changes, law)? How should board members be compensated? How do boards of small firms operate?

The discussion that follows focuses on three major topics which jointly span the questions examined in the extant literature: 1) The relationship between the board and firm performance, 2) The relationship between the board and the CEO, and 3) The board itself.

2.1 The Relation Between Boards And Firm Performance

In general, boards of directors advise, monitor, and evaluate managers; they do not involve themselves in implementing operating policies. How board characteristics such as board composition, size, diversification and board ownership affect the monitoring role of a board and firm performance has been examined intensively.

Not everyone regards the board as a body that works in the best interests of shareholders. While Fama (1980) and Fama and Jensen (1983) assert that a board of directors is a key internal corporate mechanism for shareholders (owners) to resolve agency problems due to separation of ownership and control, others (Demsetz (1983), Hart (1983)) argue that the board is irrelevant due to the nature of general market discipline or that the board favors managers' interests over shareholders interests (Jensen and Murphy (1990)).

2.1.1 Board Composition And Firm Performance

There are three types of directors: insiders, affiliated individuals, and outsiders. Previous studies (Baysinger and Butler (1985), Byrd and Hickman(1992), and Mishra and Nielsen (2000) among others) have defined these as follows: Inside directors are full -time management employees. They include the chief executive officer, president, or chief financial officer and can include division heads, corporate counsel, and any of a number of vice presidents. Affiliated directors are outside directors who have a close relationship with the firm or its CEO. Affiliated directors include former employees and those with family ties or business relationships with the firm. Outside or independent directors are those who do not have either of the above relationships with the company.

Whether a board's independence affects firm performance has been a topic of interest for more than forty years. Since one of the primary tasks of boards of directors is overseeing managers including the CEO, it may be easier for them to monitor effectively if they are more independent. Many observers believe board composition has a direct, significant impact on firm value and firm performance. They conclude boards should be comprised of outside directors who can make fair, or impartial decisions or judgments to maximize shareholders' wealth. This 'common sense' is adopted in the SEC requirement that board members who have (affiliated) relationships with the CEO or the firm must be identified in proxy materials (SEC Regulation 14A, Item 6(b), see Daily and Dalton, 1994)). In addition, major stock exchanges have guidelines regarding the service of independent directors on primary committees including the nominating, compensation,

and audit committees.[6] The American Law Institute Principles of Corporate Governance, the Business Roundtable, the National Association of Corporate Directors (NACD), and the Investor Responsibility Research Center (IRRC) also recommend board independence. However, existing studies have not yet shown clear evidence to support the notion that greater independence implies better company performance, or that optimal board composition can be deduced. The empirical results presented are mixed and largely dependent on sample and methodology.

2.1.11 Board Independence And Firm Performance

Several studies suggest a positive relation exists between the proportion of outside directors (as a measure of independence) and company value. Hermalin and Weisbach (1988) find that firms add outsider directors following poor performance. Rosenstein and Wyatt (1990) examine the market reaction to the announcements of outside board appointments and report positive excess stock returns. Kaplan and Minton (1994) find that Japanese corporations appoint outsiders to their boards of directors at times of poor stock performance and when firms record losses in earnings. Dennis and Sarin (1999) find higher market adjusted returns among those firms that increase the fraction of outsider directors. These studies support the idea that board independence increases shareholders' wealth.

[6] 'For example, in 1978 the New York Stock Exchange introduced a requirement that each listed firm have an audit committee, "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."' (Deli and Gillan (2000))

However, there are other studies that do not show a positive effect of independent directors on firm performance. Demsetz (1983) argues that the need for regulating board composition is not necessary since executive compensation contracts are sufficient to guide top management in serving the interests of shareholders. MacAvoy, Cantor, Dana, and Peck (1983) provide empirical results suggesting that firms with a majority of outside directors on the board do not perform better than those firms whose boards fail to meet the American Law Institute's proposed guidelines on board composition. These guidelines suggest increased outside representation. Fosberg (1989) provides evidence that the proportion of outside directors does not have any relationship to firm performance. The findings of the paper by Fosberg (using paired sample firms with high and low proportions of outside directors) show no significant relationship between the proportion of outside directors and firm performance variables including ROE, sales, number of employees, and selling, general and administrative expenses. Agrawal, Makhija and Mandelkar (1991) report no relationship between board composition and performance for a sample of 69 public utilities. They argue that inside and outside directors are equally bad (good) at representing the shareholders' interests. They discuss the advantages of having inside directors to reconcile their results with papers reporting opposite conclusions. Inside directors help CEOs maximize firm value by providing valuable advice and knowledge about the day-to-day operations of the company (Mace, 1986). Agrawal *et al* argue that other papers, which examine the influence of outside directors, focus too much on extraordinary events such as unusually bad performance or the adoption of poison pills, from which it is difficult to ascertain the value of the day-to-day monitoring by outside directors. Hermalin and Weisbach (1991) test the relationship

between the proportion of outside directors and Tobin's q as a performance measure and find no correlation. More recently, Bhagat and Black (1999) examine the relationship between board composition and Tobin's q and long-term stock market returns and also find no correlation.

Some studies even find a negative relation between board independence and firm performance. Agrawal and Knoeber (1996) find that firm performance is negatively related to the number of outsiders on the board. Subrahmanyam, Rangan, and Rosenstein (1997) find that abnormal returns are negatively related to the proportion of independent outside directors on the boards of bidding banks in takeover situations. In contrast, Westphal (1999) asserts that the close relationship between the CEO and the board of directors does not impair corporate governance, rather the 'social tie' enhances board effectiveness and firm performance "by unifying managers and directors into a single, cohesive team." [7]

2.1.12 Board Independence And Behavior In Extreme Situations

Several studies focus on the role of independent directors in emergency or extreme situations. Shivdasani (1993) finds that if board members have additional outside directorships, it decreases the probability of a takeover. Byrd and Hickman (1992) show that bidder firms with a majority of outside directors make better

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[7] Coffey and Wang (1998) investigate the effect of board composition on a firm's social performance (in terms of philanthropic behavior). The result of the study is contrary to the popular recommendations of increasing the number of outside board members to improve a firm's social performance. They find that as the number of inside directors increases, the firm's social performance increases.

acquisitions. Lee, Rosenstein, Rangan, and Davidson III (1992) find that when the entire firm is taken private, abnormal returns for sellers are substantially higher for firms dominated by independent outside directors than for firms that are not. Brickley *et al* (1994) also examine the role of outside directors and corporate governance. They add additional evidence that outsiders serve the interests of shareholders from their study of a sample of firms adopting poison pills. The average reaction of the stock market to announcements of poison pills (corporate anti-takeover measures) is positive when the board has a majority of outside directors. However, the reaction is negative when the board does not have a majority of outside directors. Cotter, Shivdasani, and Zenner (1997) examine the effect of board independence in tender offer situations. Cotter *et al* study 169 tender offers made between 1989 and 1992 and find "higher initial tender offer premium, bid premium revision and target shareholder gains when the board of the target company is independent." Recently, Hanson and Song (2000) examined the effectiveness of internal control mechanisms and how well the resolution of agency problems is accomplished, focusing on managerial stock ownership and the fraction of outside directors on the board when a firm decides to sell assets. Using a pair-wise sample of 326 firms from 1981 through 1995, they find that independent outside boards provide effective monitoring when a firm's divestiture gain is positive. These studies provide support for the hypothesis that independent outside directors contribute to wealth creation in major, firm-changing events.

However, the empirical findings from financial firms are mixed. While Brewer, Jackson, and Jagtiani (2000) find that board independence leads to increases in the wealth of shareholders of target banks, Subrahmanyam *et al* (1997) report a negative relation

between abnormal returns and the proportion of outside directors on the boards of bidding banks.

2.1.13 The Effect Of Board Independence On Financial Statement Fraud

Beasley (1996) examines the relationship between the composition of corporate boards and financial statement fraud. The study compares board composition between 75 fraud and 75 no-fraud firms with similar size, industry, exchange listing and time period. The study's results suggest that no-fraud firms have a significantly higher percentage of outside directors than fraudulent firms.

2.1.14 Inside Directors And Firm Performance

Fama and Jensen (1983) suggest that inside directors provide valuable information to boards about their firm's long-term investment decisions. Klein (1998) finds that while there is little relation between firm performance and overall board composition, the higher the percentage of inside directors on finance and investment committees the greater is a firm's accounting and stock market performance. In addition, she shows that firms who significantly increase inside director representation on these two committees experience significantly higher contemporaneous stock returns and return on investment than firms that decrease the percentage of inside directors on these committees. Thus, the findings suggest that inside directors increase firm performance by providing valuable information to boards.

The empirical studies regarding board independence and value or performance provide mixed results. The 'mixed' results may be due to measurement errors and

different research methods. Dalton and Daily (1998) discuss this matter. "There are a wide variety of measures on which studies have relied over the years and there is no consensus as to which is the appropriate indicator. Accounting measures may be subject to manipulation; may systematically undervalue assets; may create distortions due to depreciation policies, inventory valuation, and treatment of certain revenue and expenditure items; may differ in methods adopted for consolidation of accounts; may lack standardization in the handling of international accounting conventions; and could be difficult to interpret in the case of multi-industry firms. Market-based returns (there are many, but all are based on stock market performance of the firm's shares) have some advantages as they reflect risk-adjusted performance and they are not adversely affected by multi-industry or multinational contexts. According to some, however, there is a steep downside to the use of market-based performance indicators. It has been argued that these are often subject to forces beyond management's control."

To verify the 'mixed' results, Dalton and Daily (1998) conduct a 'meta-analysis'[8] of more than 40 years of data, for 159 studies, and over 40,000 companies. They find that whether studies have relied on accounting-based performance measures, or market-based, or both is of no consequence. Irrespective of these differences, a relationship

[8] Meta analysis is a statistical technique developed by Hunter and Schmidt (1990). It "allows researchers to correct for various statistical artifacts, and to aggregate results across studies to obtain an estimate of the true relation between two variables. The analysis procedures require that each correlation observed in a given study be weighted by the study's sample size; thus a mean weighted correlation across studies can be calculated. Then the researchers can calculate the standard deviation of the observed correlations to estimate the variability in the relationship between the variables of interest. The total variability across studies is comprised of the true variation in the population, variation due to sampling error, and variation due to other artifacts, such as reliability and range restriction. Recognition and control of these artifacts allow for a better estimate of the true variability around the population correlation." Correction for such artifacts is then performed. "With the corrected estimates of the standard deviation of the mean-corrected effect size, and the standard error for the mean effect size, credibility and confidence intervals can be calculated" (See Dalton, et al (1998)).

between board composition and financial performance cannot be demonstrated. Dalton and Daily argue that the monitoring role based on agency theory is incomplete. Agency theory says "managers, by virtue of their firm-specific knowledge and expertise, are believed to enjoy a distinct advantage over firm owners (shareholders), who are distant from the operational aspects of the firm. Accordingly, managers may be able to pursue actions that benefit themselves at the expense of equity-holding owners. This potential conflict of interest requires monitoring mechanisms designed to protect shareholders. According to many observers, this is the primary duty of the board." (see Dalton and Daily, 1998) Thus, only independent directors can offer honest, fair evaluation of the firm and its leadership and this, in turn, will result in improved corporate performance. However, Dalton and Daily (1998) posit that "while the issues raised above are legitimate concerns, they are more than just a bit one-sided. It is true that boards of directors properly have a monitoring/control role. However, this does not exhaust the potential contribution of an effective board. More importantly, its other roles - expertise/counsel and resource dependence - are often in direct conflict with that of monitoring/control. Yet these additional roles are fundamental to the effective board and its firm. The issue is not how many outside directors there are on the board - the challenge for an exceptional board is to find an effective balance of directors who, in concert, can dispatch these multiple roles." This viewpoint suggests that performance and board structure are jointly determined and that for any particular firm, the observed board is optimal, but that any particular structure may not be optimal for every firm. Indeed, board structure is determined in concert with all other characteristics of the firm and to change it arbitrarily would lead to a sub-optimal system.

To the critics of inside directors, Dalton and Daily assert that the inside directors can provide "high-quality, local knowledge otherwise largely unavailable to the board." Regarding affiliated directors, they argue that restricting directors because of their ties to the firm could be naive, and at odds with the board's resource dependence function. The resource dependence function is the directors' access to critical information and resources without which the firm would be far less successful. Board members of this type are facilitators, members of potent networks. They are the ones who make things happen.

Based on their findings, Dalton and Daily recommend that reasoned guidance for best practice may come from increased attention to the multiple, non-fungible roles of the contemporary board of directors as opposed to our fixation on its "outside" members. As they mentioned, "it is time to reexamine that popular wisdom."

Their recommendation agrees with an article that appeared in the practitioner literature in the early 90s: Vance (1990), *"Inside or Outside Directors: Is There Really a Difference?"* Vance concluded that "--- list the outside director's virtues or vices in superlatives and I'd say ditto for the insider. Whether insiders or outsiders, directors today certainly look much more alike than when I first began my career as a Monday morning boardroom quarterback."

Although several empirical studies do not show any relationship (and some even find a negative relation) between board independence and firm performance, the results need to be interpreted carefully. First, the definition of independence is a subjective one. Simply dividing the board into three groups, outside, inside, and gray, may not reflect the real independence of the board. Although outsiders do not have any job except as a director of the firm, a close relation with the CEO may exist. Their position as director

may in fact be dependent on the CEO. On the other hand, insiders can act as if they are independent of the CEO. If there are benefits from having insider directors such as information and expertise, and these benefits are larger than the cost of losing independence (or having more outsiders), it may be hard to find any positive relation between board independence and firm performance. Most importantly, if board structure is determined endogenously along with other characteristics of the firm, and if all firms are organized optimally, then it is possible that we will be unable to discover any relation between board structure and performance. But, this is only one explanation.

2.1.2 Board Size And Firm Performance

In general, a smaller board may have several advantages over a larger board including better communication, faster decision-making, and more effective cooperation among directors. In addition, directors may have less potential responsibility diffusion. Several studies examine the relation between board size and firm performance. In general, those empirical studies provide evidence that smaller boards perform better. Jensen (1993) and Lipton and Lorsch (1992) recommend a maximum of seven or eight board members. They argue that increasing size makes boards less effective due to coordination and process problems.

The empirical evidence about the relation between board size and firm performance is relatively sparse. Gales and Kesner (1994) examine a sample of 127 bankrupt firms along and an equal number of nonbankrupt firms. They find that Chapter 11 firms with smaller boards at the time of bankruptcy filing show a greater chance of surviving in the post-bankruptcy period. Lear and Yavitz (1995) evaluate the boards of

200 companies with more than $250 million in revenues using annual reports, proxy statements, directories and other published corporate data. They argue that 'better' firms have relatively small boards. They recommend keeping boards small –"more than a handful of members (four or five), but less than a crowd (15 or more)." Yermack (1996) examines the relationship between board size and firm value. Examining a sample of larger U.S. corporations, Yermack finds a negative relationship between board size and Tobin's q controlling for other determinants of q that have been documented in the literature. Huther (1997) studies a sample of rural electric cooperatives and finds that larger boards are significantly correlated with higher costs. Eisenberg, et al (1998) and Conyon and Peck (1998) provide similar evidence for non-US firms. Eisenberg, Sundgren and Wells use a sample of small and midsize Finnish firms. The study finds a negative relationship exists between board size and company profitability. Conyon and Peck use five European countries' data and report similar findings.

In summary, while the relation between board structure and performance is ambiguous, the relation between board size and performance or value is decidedly negative. Board size may be one manifestation of inefficiency if larger firms have larger boards and in general larger firms are less efficient, perhaps due to the span-of-control problem as suggested by Williamson (1985) and others.

2.1.3 Board Diversity And Firm Performance

Although it is too early to draw firm conclusions regarding the effect of board diversity, several recent surveys have shown a trend of board composition towards increasingly more diverse boards (See *Wanted: More Diverse Directors*, Business Week,

2001, April 30, 134). The Conference Board (1999) study of *Board Diversity in U.S. Corporation* and the report of Catalyst, a nonprofit organization that focuses on women in business, *1998 Catalyst Census of women Corporate Officers and Top Earners*, have shown the number of women board members has increased (Biggins (1999)). In 1994, 8.7% of directors among Fortune 500 companies were women. In 1998, the percentage increased to 11%. Corporate Board (2000) concludes that America's 500 largest companies are significantly more likely to have at least one female director than the next largest group, using the 1999 Catalyst Census of Women Board Directors of the Fortune 1000. Rodriguez (2000) however shows only 7% of boards' members of directors among top 100 publicly traded Silicon Valley firms are women. This may reflect the fact that there are not many female venture capitalists.

There are few studies that examine the relation between gender diversification (including top management, board of directors, and middle managers) and firm performance. Shrader, Charles, Blackburn, and Paul Iles (1997) find that while firms with a higher total percentage of women managers have higher accounting performance than firms with a lower percentage women managers, they do not find the relationship when they use only the percentages of top women managers and women board members. Moskal (1997) examines the performance skills of 915 male and female managers. The results show that women executives outperform men in both right-brain intuitive skills and left-brain logical skills. Siciliano (1996) uses data from 240 YMCA organizations to examine the relationship between board member diversity and organization performance. The study finds that diversity in board member characteristics improves performance. Hillman (1998) finds that firms with a higher ratio of women or minority board members

demonstrate better stock performance. He argues that more diverse compositions of boards may positively impact minority employee turnover, improve customer loyalty, and attract more institutional investors. *Corporate Board* (1999) reports a study conducted by Professor Theresa Welbourne, Cornell University which finds that among 535 IPO companies, the stocks of companies with more women on their top management teams performed better in both the short and long run than those with few or no women at the top.

Although there is not enough evidence yet to firmly establish a relationship between diversity and firm performance, the Conference Board suggests that working groups of corporate executives, investors, and directors consider board diversity as a value creation tool. The *Catalyst Report* finds that the top 10 most profitable Fortune companies have one or more women on their boards. Additional research is needed before we will have a full understanding of the effect board diversity has on performance and value.

2.1.4 Board Common Stock Ownership And Firm Performance

A central criticism of boards has traditionally been that board members have too limited a stake in the firms they oversee. To align directors' interests to that of shareholders, increasing directors' ownership in the firm has been recommended.

Many studies show that inside ownership is an important control mechanism. While some studies (Kesner (1987), Lee, Rosenstein, Rangan, and Davidson (1992), Kren and Kerr (1997) and Bhagat, Carey, and Elson (1999)) use directors' ownership to check the relationship between ownership and firm performance, most studies examine

the shareholdings of managers and directors together. Morck *et al* (1988) examine the relation between managerial ownership and firm performance in terms of Tobin's *q* and find a significant non-monotonic relation. They find the same results when the ownership measure is split between managers and outside directors. McConnell and Servaes (1990) use two different years of data, one for 1976 and the other for 1986 and find a positive relation between inside ownership and firm performance. Hanson and Song (2000) find that a higher level of managers and directors' ownership is related to the selling of assets that create negative synergies and to the best price negotiations for shareholders. Their results support the effectiveness of internal control mechanisms due to board's ownership of the firm.

Kesner (1987) examines the relationship between corporate director stock ownership and firm performance. Using 250 of the Fortune 500 companies, he reports that directors who have a personal stake in the performance of their firms take a more active role in decision-making and the firm shows better performance. Lee, Rosenstein, Rangan, and Davidson (1992) find that the level of share ownership by inside directors is significant in promoting shareholder wealth when the entire firm is taken private. Kerr and Kren (1997) find that high board ownership is positively linked with improved corporate performance. In addition, they report that shareholder interests are better served by increased board shareholdings than by regulating board composition. Using a sample of 4,874 directors in1993 for 449 U.S. companies, Bhagat, Carey, and Elson (1999) find that there is a significant correlation between the dollar values of stock owned by directors and heightened corporate performance. The authors offer two possible explanations for the results. Their first explanation is that higher dollar values of stock

owned by directors result in better monitoring of corporate management and, hence, improved results. However, their alternative explanation is that the correlation between the dollar value of stock owned by directors and improved firm performance could be the result of the directors' having access to inside information about the company and its prospects, and simply increasing their individual holdings to take advantage of the company's anticipated success. Bradbury and Mak (2000) find that the likelihood of a less restrictive takeover amendment increases when the firm has unaffiliated directors who are blockholders.

Dennis and Sarin (1999) examine how manager and director ownership and board structure evolves in individual firms. They use a random sample of 583 companies and examine board composition and equity ownership structure from 1983-1992. They find that 65% of their sample firms experienced one or more large changes in ownership or board structure. Prior poor stock performance is one of the key factors that cause changes in ownership of directors and officers and board composition. If a stock price is lower, there is an increase in ownership concentration. Higher stock price performance is related to subsequent decreases in ownership concentration. All the above studies suggest a positive and significant relation between ownership and firm performance.

On the other hand, some studies do not find any significant effect of manager and director ownership on firm performance. Morck *et al* (1988) find no relation when they use profit rates as an alternative performance measure instead of Tobin's q. Himmelberg, Hubbard, and Palia (1999) find no relation between changes in ownership and firm performance. After controlling for endogeniety of ownership however, they find a quadratic relation between ownership structure and firm performance.

Demsetz and Villaonga (2001) argue that many studies reporting a significant relation between ownership structure and firm performance ignore the endogeneity and multi-dimensional characteristics of a firm's ownership structure. Considering the endogeniety of ownership and the multi-dimensionality of ownership structure, they specify and estimate a simultaneous equation system for performance and ownership. The first equation has firm performance as the dependent variable and uses two dimensions of ownership, the fraction of shares owned by management (including top management, the CEO and board members) and the fraction of shares owned by the five largest shareholding interests. The second equation specifies the fraction of shares owned by management as the dependent variable and firm performance and other variables (see Demsetz and Lehn (1985)) as explanatory variables. The findings of their study provide no evidence to support the notion that variations across firms in observed ownership structures result in systematic variations in observed firm performance.

The actual relation between ownership and performance is by no means resolved. The endogeneity problem raises serious questions about whether the results of prior tests are reliable in a statistical sense.

2.1.5 Board Time Commitment And Firm Performance

Another criticism of boards is that directors do not spend enough time working on directorial duties for the company that employs them (Lipton and Lorsch (1992), Thain and Leighton (1992)). Conger, Finegold, and Lawler III (1998) argue that board-meeting time is an important factor in determining the effectiveness of a board. However, Jensen (1993) asserts that board meetings are not necessarily useful since CEOs almost always

set the agenda. Jensen argues that well-functioning boards do not need frequent meetings. Thus, he suggests that boards should be relatively inactive except when there are problems that by their nature demand board attention. Therefore, higher levels of activity such as frequent meetings can be interpreted as a firm's response to problems such as poor performance or the existence of conflicts. Vafeas (1999) conducts a direct test of the relationship between board meeting frequency and firm performance using 307 firms from the period 1990-1994. The results of Vafeas' study show that boards meet more often following poor performance supporting Jensen (1993)'s argument. Vafeas also finds that increasing board meeting activity improves firms' future operating performance, especially among firms that increase meeting frequency following poor performance.

Li and Ang (2000) have examined the quality and quantity of time spent by directors on their effectiveness. They propose two hypotheses: the attention hypothesis and the expertise hypothesis. The attention hypothesis argues that directors with few outside directorships are more dedicated to their role as a monitor and devote the required amount of time to supervision. If a director has multiple directorships, the director may not have enough time to collect and analyze information for effective monitoring of any firm. The chance of missing a meeting will increase with the increasing number of directorships. The expertise hypothesis suggests that directors holding more outside directorships because of their expertise offer a better quality of managerial oversight. Since the directors' expertise is needed only at special times, the amount of time spent on routine monitoring will not bear any relation to better firm performance. They examine the relation between performance under routine monitoring and special circumstance

monitoring using 1,195 directors from 121 firms that had become merger targets. The study shows that multiple directorships, defined as directors who hold more than one additional[9] directorship, do not have any relation with poor past performance or lower merger premiums. The results provide weak support for the expertise hypothesis. The merger premium shows a monotonically increasing pattern with the number of directorships held.

2.1.6 Board Leadership And Firm Performance

In many firms, the CEO is also the chairman of the board. Although some shareholders and regulators argue that separating the CEO and chairman of the board will reduce agency costs and improve firm performance, Brickley, Coles, and Jarrell (1997) provide evidence that the costs of separation are larger than the benefits for most large firms. They find that the effect of combined leadership on firm performance is positive. However, Pi and Timme (1993) find that banking firms with a separate leadership structure perform better than those with a combined leadership structure. On the other hand, Baliga, Moyer, and Rao (1996) find little evidence that leadership structure affects firm performance.

Although there is not enough evidence to draw any firm conclusion, McWilliams and Sen (1997) and Coles and Hesterly (2000) suggest that independent directors' monitoring is important under a combined leadership structure. The mixed empirical

[9] Li and Ang define the number of additional directorships as the number of outside directorships a director holds, excluding the one in the target company.

results suggest that further studies are needed to gain a better understanding of the relationship between board leadership structure and firm performance.

2.1.7 Board Compensation And Firm Performance

Many studies of managerial compensation (including CEOs) show a positive relationship between manager compensation and firm performance. Murphy (1985) reports a positive relation between share returns and managerial remuneration. Agrawal, Makhija and Mandelkar (1991) find a positive relation between the change in CEO compensation and stock performance. Sridharan (1996) reports that CEO compensation levels are related to sales growth.

Should directors also be paid based on firm performance? The issue is a subject of much debate. Numerous companies have adopted stock incentive based compensation plans for their directors arguing that such plans better align directors and shareholders (see Chapters 3 and 4). On the other hand, others have argued that incentive pay will jeopardize a board's focus, integrity and independence. A board may focus on short-term instead of long-term performance.

Few empirical studies have examined the relation between board compensation and firm performance. Hempel and Fay (1994) find that there is no significant evidence of a relation between board total compensation and firm performance (in terms of profit). Cordeiro, Veliyath, and Eramus (2000) find that director's total compensation does not have any relation with firm performance (in terms of stock return). However, Benito and Conyon (1999) find a positive relation between directors' cash compensation and firm performance (in terms of stockholder return) for a sample of UK companies.

2.2 The Relation Between The Board And Management

This section reviews studies examining the relationship between the board and management. Boards are involved in the CEO selection process and the setting of management compensation. Conversely, the CEO can influence the board selection process as well as board activities (Mace (1971) and Vancil (1987), Westphal (1998), Sridharan (1996), Newman and Mozes (1999) among others). In many cases, the board chair is also the CEO of the firm, or the CEO of another firm. Board members may be CEO candidates in their company or in other companies and current CEOs or former CEOs of other firms can be a major source of outside directors (Booth and Deli (1996), and Brickley, Coles, and Linck (1999)).

2.2.1 Board Independence And Managerial Compensation

Fama (1980) argues that outside directors are professional referees who insure the effectiveness of top management. Monitoring management including the CEO is one of the most important tasks directors have to fulfill, and one of the most effective monitoring tools a board has is setting managers' compensation. We should expect that CEOs will try to influence the board to optimize their compensation. Boyd (1994) relates the salaries of CEOs from 193 firms in 12 industry sectors to several measures of the degree of board control, such as CEO duality, ratio of insiders, board stock ownership, director compensation, number of directors representing ownership groups and finds that CEO compensation is inversely related to levels of board control.

What kinds of board characteristics are associated with more effective settings of managerial compensation and managerial monitoring? Mishra and Nielsen (2000) say

"because the board of directors is ultimately responsible for determining the compensation package for top executives, the effectiveness of executive compensation in reducing shareholder-manager agency problems can depend on the board composition and on the level of board independence". Westphal (1998) asserts, "Calls for board reform have sought specific changes in board structure to increase the board's ability to exercise control. Such changes include adding outside or non-employee directors to the board, allocating board leadership to someone other than the CEO, increasing diversity on the board, and selecting directors who lack ties to the CEO. Several of these changes, including increasing the number of outsiders and changes in board leadership structure, appear to have gained support among large companies in recent years. This view of CEO/board relationships suggests that structural board independence increases the board's overall power in dealing with the CEO."

Several studies support the idea that general board composition and board compensation committee composition affect CEO compensation. Sridharan (1996) finds that the proportion of insiders on the board affects the salary and bonus levels of chief executives. He concludes that a CEO's degree of influence over the corporate board (in terms of the proportion of insiders) affects CEO compensation. Newman and Mozes (1999) examine whether the inside directors on the compensation committee react differently than outside directors when setting CEO compensation. Their results suggest that the composition of the compensation committee influences CEO compensation practices. They find that firms with insider(s) on the compensation committee are more favorable toward CEOs when they set CEO compensation related to firm performance than firms without insider(s) on the committee. However, just limiting the inclusion of

inside directors and using only outsiders on the compensation committee may increase agency costs since those insiders may be the ones who can distinguish between the performance attributable to the CEO and performance attributable to factors beyond the CEO's control. Thus, Newman and Mozes recommend that governing bodies consider increased disclosure of compensation committee appointments as a more appropriate policy initiative than restrictions on compensation committee membership.

Contrary to the above-mentioned research, Business Week (1999) reports a recent study that does show different results[10]. In the study, a team of researchers led by Catherine M. Daily of Indiana University's Kelley School of Business looked at how the makeup of board compensation committees affected CEO pay at some 194 major U.S. companies from 1991 to 1994. Surprisingly, the study finds no evidence of any impact of committee composition on either CEO pay or changes in CEO pay--whether in the form of direct salary, bonuses, stock options, or other incentives. The results suggest that efforts to remove directors with personal or professional ties to companies may be misguided. Daily says that "CEO compensation may be excessive, but the presence of such directors isn't the cause." More recently, Evans and Evans (2001) examine the influence of non-executive director control and compensation on CEO remuneration using 178 firms among the top 500 Australian Stock Exchange listed companies. Their study does not find any relation between CEO pay and the proportion of outsider directors on the board, the existence of a nomination committee, and the board meeting requirement as specified by law. Angbazo and Narayanan (1997) also find no relation

[10] This article appears in the *Academy of Management Journal*, 41, 209-221, 1998.

between the degree of board independence and top management compensation using a sample of 97 commercial banks. Core *et* al (1999) have in fact report that CEO compensation is higher when there is a greater percentage of the board composed of outside directors.

Westphal (1998) concludes that "institutional investors, management consultants, and governance observers have all strongly advocated changes in board structure that increase the board's independence, including the structural changes examined here. These advocates of governance reform tend to assume that independent boards will better protect shareholder interests, without considering the potential for CEO behavior to blunt the effects of structural change. The findings of this study suggest that more attention might be devoted to reforming the processes of CEO/board interaction, rather than board structure."

2.2.2 Board Compensation And Managerial Compensation

The board (Compensation Committee) decides CEO compensation as well as its own compensation. Board compensation committees have been criticized by regulatory agencies, institutional shareholders and the general public for increasing executive compensation despite what often appears to be poor performance (Fuersich(1994)).[11]

A recent report by the compensation specialists Pearl Meyer & Partners states: "Corporate governance leaders initiated a cash to equity shift at the senior executive level

[11] Murphy (1999) provides a comprehensive review of executive compensation. The Omnibus Budget Reconciliation Act of 1993 includes a provision that eliminates the tax deduction for a publicly held company's CEO and its four highest compensated officers if their individual compensation levels exceed $1 million and are not based on company performance.

more than a decade ago, causing corporations to move a growing portion of management as well as employee remuneration into company stock to motivate and reward the creation of shareholders value. Once equity became firmly entrenched inside the corporation, governance activists turned their attention to outside Directors. Thus, began the initial stages of a similar movement at the Board level to directly align pay with stock performance and, thereby, with shareholder interests." (Pearl Meyer & Partners, 1999).

Several studies compare the relation between director's compensation and CEO compensation. Main and Johnston (1993) examine the relationship between outside director compensation and CEO pay level and find no correlation. Mangel and Singh (1993) relate CEO cash compensation to outside director's fixed compensation (retainers) and find no evidence of the relation between the two. On the other hand, the Evans and Evans study finds that CEO compensation levels are affected positively by outside directors' pay levels and negatively by outside directors' equity holdings. Milliron (2000) also reports a positive relation between director incentive alignment and incentive –intensity of CEO pay.

Hallock and Oyer (1999) study whether boards of directors concentrate on performance near compensation decision times rather than providing consistent incentives for the CEO throughout the fiscal year. If performance timing matters to a CEO's compensation decision, the CEO may have an incentive to manipulate the timing of sales to increase his/her compensation. Hallock and Oyer find that CEO compensation changes are more strongly related to a firm's fourth quarter sales growth than to sales growth of other quarters in a fiscal year.

2.2.3 CEO's As Board Members

Does a company benefit when its CEO holds directorships in other companies? Some companies prohibit their CEO's from holding outside directorships. Neff, Lear, and Pellet (1998) describe a recent trend in company policy regarding CEO board service towards allowing fewer outside directorships. For example, the Washington DC-based National Association of Corporate Directors (NACD) survey in 1997 showed that around half of the 1,105 CEOs of major U.S. companies don't hold any seats on outside company boards. In 1995, a third of CEO respondents did not participate in outside boards. Although firms urge their CEOs to hold fewer directorships, Neff, Lear, and Pellet assert, "CEOs' taking other firms' directorships does not necessarily impair a CEO's accountability to shareholders, or reduce the effectiveness of the management team." They mention several reasons why CEOs serve on other boards. First, it helps educate executives in line to become CEO's in the intricacies of how boards operate. Next, board service is an opportunity to learn policy making at another level. Third, outside board service provides the chance to learn about different corporate governance practices and their effectiveness. Fourth, board service allows CEOs to meet fellow business leaders in a neutral environment. In addition, CEOs can make contacts that help their own companies. Neff, Lear, and Pellet conclude that the bottom line is that a CEOs' main focus should be taking care of his own company. CEOs should make sure that they consult with their own boards before they agree to serve on other boards and that they will be able to meet their responsibilities as outside board members but also as CEO. The question is not how many directorships CEOs accept, but why they take the directorships and whether their actions are beneficial to their firms.

Hallock (1997) has recently studied interlocking boards of directors and executive compensation using 9,804 director positions in America's largest companies. About 8% of CEOs are reciprocally interlocked with another CEO -- the current CEO of firm A serves as a director of firm B and the current CEO of firm B serves as a director of firm A – and CEOs of interlocked firms earn significantly higher compensation than normal. More recently, Fich and White (2000) examine further aspects of reciprocal interlocking. Using firms from *Forbes* 500 largest U.S. companies, they find that reciprocal interlocking of CEO's happens less when a board has more meetings and is more active, or when a CEO has more of his total compensation paid in the form of stock options. Further, the phenomenon is less likely to happen when a board has more outside directors.

2.2.4 Board Ownership Structure

This section reviews research on how ownership structure affects the relationship between the directors and the CEO (and managers). Elson (1994) examines 158 firms with either the poorest or best ranking in terms of compensation among the annual Business Week survey of 500 of the nation's largest publicly traded corporations. He finds that directors who maintain large holdings in company stock are more likely to keep CEO/managers pay tied to performance. However, Angbazo and Narayanan (1997) report no relation between the ownership of directors and top management compensation using a sample of 97 commercial banks. Core *et al* (1999) also find no relation between the percentage ownership per independent director and CEO compensation.

Recently, Dennis and Sarin (1999) examine the determinants of directors' ownership changes. They find that changes in equity ownership of directors and officers are related to CEO turnover. Perry (1999) reports that outside directors' incentive compensation increases the likelihood of CEO turnover following poor performance. Bryan *et al* (2000) examine the relation between the level of outside directors stock option awards and managerial stock ownership and find a negative association.

Other studies focus on the relationship between CEO ownership and board structure. Weisbach (1988) reports that the CEO's share ownership is negatively related to the percentage of outside directors on the boards of directors. Jordan (1999) studies the relation between the firm's compensation committee and the level of managerial equity holdings. The findings of that study show that the compensation committee does not control the level of managerial equity holdings. Instead, managers themselves determine the level of their shareholdings using their private, firm-specific information. More recently, Newman (2000) found evidence that CEO ownership is positively related to the presence of insiders on the compensation committee. Ofek and Yermack (2000) examine how executives take actions after receiving stock compensation. One hypothesis is that the boards' goal for stock compensation to CEOs is to align CEOs' interests with those of shareholders. However, Ofek and Yermack find that executives rebalance their ownership following stock awards. Executives with low prior ownership keep the stock awarded as part of their compensation. However, those with high prior ownership sell the awarded shares.

2.2.5 Board Structure And CEO Turnover

Does board composition affect CEO selection and dismissal? Kesner and Dalton (1985) find there is no relation between the ratio of outside/inside directors and the choice of an outside/inside CEO. However, several studies provide evidence that the hiring and firing of a CEO affects board composition and vice versa. Hermalin and Weisbach (1988) find that firms tend to add inside directors when their CEO nears retirement. They show evidence that the new CEO is more likely to be one of those new insider directors. When firm performance is poor, the firm removes insiders and adds outsiders. Weisbach (1988) shows that outside-dominated boards are more sensitive to poor performance in replacing their CEOs than inside-dominated boards. As Fama and Jensen (1983) have suggested, the value of outside directors human capital is affected by the information revealed as a result of their decision-making. Thus, outside directors are more likely to replace a poor CEO. However, inside directors may not want to challenge the current CEO to whom their careers are tied.

Borokhovich, Parrino, and Trapani (1996) find that the incentives of outside directors differ from those of inside directors. They focus on the incentives of outside and inside directors when directors choose a new CEO. Borokhovich *et al* suggest outside directors will select the best candidate among insiders and outsiders for the new CEO position to increase their reputation. However, inside directors are more likely to choose inside candidates since the new inside CEO is less likely to make changes in policies and the CEO is someone with whom they already have a relationship. Using 969 CEO successions at 588 large public firms between 1970 and 1988, Borokhovich *et at* find evidence that there is a positive monotonic relation between the proportion of

outside directors and the likelihood that an outside director is appointed CEO. They find the positive monotonic relation for both voluntary and forced turnover.

Boeker (1992) finds that a CEO's power influences the board's decision regarding CEO dismissal. In a below average performing firm, the chance of CEO dismissal is reduced if the CEO has greater power (in terms of his/her ownership, more insiders on the board, and more insiders appointed by the CEO) than a firm in which the CEO has less power. Wade *et al* (1990) examine the social influence of CEOs. They find that CEOs who are able to appoint more outside directors to their boards are more likely to have "golden parachutes."

Recently, Dennis and Sarin (1999) find that large changes in board composition are strongly related to CEO turnover. The rate of CEO turnover among those companies with either large increases or decreases in the fraction of outside directors on the board is more than twice as that of firms with small changes in board structure.

Board compensation structure affects CEO turnover. From approximately 1,000 firms over 1992-1995, Perry (1999) finds that the percentage of firms with any type of incentive plan for directors increased from 48% to 70%. He shows that incentive compensation for directors by itself does not affect the boards' monitoring level. However, incentive compensation for outside directors does affect CEO turnover. CEOs of poor performing firms are more likely to be replaced in firms where independent directors receive incentive compensation. The evidence suggests that outside directors who receive incentive compensation monitor management more effectively. Some other studies that focus on board meeting frequency (Vafeas (1999)) and board size (Mikkelson and Partch (1997)) do not find any relationship between these factors and CEO turnover.

2.2.6 Board And CEO Evaluation

One responsibility of the board of directors is overseeing the performance of the CEO. Conger, Finegold, and Lawler III (1998) discuss the forces that have brought about a growing interest in CEO evaluation. One force is an increased awareness of the critical role a CEO plays. The CEO's leadership is critical to implementing strategy, creating successful corporate transformations, and so on. A second force is the rise in shareholder activism. A third force comes from the increasingly more sophisticated evaluation and performance management systems that have been adopted over the last decade. The authors interviewed and collected questionnaire data from CEOs and board members of Fortune 1000 companies, as well as, from outside experts with Korn/Ferry. The results of the 1996 Korn/Ferry's Organization's Annual Corporate Governance Survey indicate that roughly 70 percent of the U.S.'s largest companies have adopted a formal CEO evaluation policy. Young, Stedham, and Beekun (2000) examine the determinants of the adoption of a formal CEO evaluation process. Using a sample from the hospital industry, they find that the board's independence (defined as the presence of an independent board chairperson) is positively related to the adoption of a formal CEO performance evaluation process.

No study has yet examined the market reaction to the adoption of a formal CEO evaluation policy, or whether firms with such policies are valued more highly.

2.2.7 CEO Influence On Board Selection

Directors select, compensate, and evaluate the CEO. However, the CEO is also involved in the selection of board members. Shivdasani and Yermack (1999) examine

CEO involvement in the selection of new directors. Using *Fortune 500* firms in 1995, they find that a firm selects fewer outside directors when the CEO serves on the nominating committee, or there is no nominating committee in the firm. If the CEO is involved in the selection of directors, the capital market reaction to outside director appointment is lower. They conclude that when a powerful CEO is involved in the selection of directors, the board tends to place less pressure on the CEO.

2.3 The Board As A Unit

Thain and Leighton (1992) label the implicit rules of conduct of directors, the 'old' code and the 'new' code. The 'old' code is "the traditional behavior pattern that has been followed for decades by senior directors in many relatively successful and stable companies." The rules of the 'old' code require directors to play passive roles such as "display total loyalty to the chairman, support management at all times, do not take the job too seriously, take your perks and keep quiet, and do not rock the boat." However, recent economic conditions and market volatility (i.e., increased competition, more informed investors, increasing owners' demands, and rapidly changing business conditions) have required firms to reevaluate board responsibilities leading to a 'new' code (Thain and Leighton, page 82-85):

1. Function as a trustee and consultant.
2. Take the job seriously and do it well.
3. Do what is right.
4. Support those who are worthy.
5. Use the board routines and infrastructure.

6. Get the information you need.

7. Build good relationships in the board and its organization network.

8. Work on getting the culture right.

9. If necessary, rock the boat.

The previous two sections of this review suggest some though not complete support for the 'new' code. This section reviews studies that focus on the board itself. Compared to the studies of the relation between the board and its decisions and performance of one form or another, and board and CEO (& managers), studies focusing on board characteristics per se are relatively rare.

2.3.1 Functional Role

According to Hillman et al (2000), most research on corporate directors has focused on two functional roles: the agency role and the resource dependence role. While agency theory focuses on the monitoring and governance function of directors, the resource dependence approach focuses on directors' role of providing important resources through linkages to the external environment. There exist only a few studies based on the resource dependence role of the board of directors and most of them are found in the management literature. Hillman *et al* (2000) examine a sample of US airline firms undergoing deregulation and find that the change of board composition reflects the shift in resource needs as the environment changes. They find that board replacements during regulation are more likely insiders and specialists. During deregulation, firms prefer business experts and 'community' influential directors as board replacements.

Recently, Blair and Stout (2001) argued that directors are not (in their words) "..in any legal sense, anyone's 'agents'..(p. 27)" but that their duties are really those of autonomous fiduciaries. Robert Clark (1985), argues that under U.S. laws "directors are not agents of the corporation but are *sui generis*;[12] neither officers nor directors are agents of the stockholders; but both officers and directors are "fiduciaries" with respect to the corporation and its stockholders." (p. 56). Black (2001) summarizes the fiduciary duties of directors as: 1) duty of loyalty, 2) duty of care, 3) duty of disclosure and 4) duty of special care when the company is the target of a takeover.

Agrawal and Knoeber (2001) examine the political role of the board. They find that politically experienced directors are more prevalent in firms who make sales to government, while lawyers are more prevalent in firms where environmental regulation costs are higher. Additionally, using a sample of electric utility firms, they found that firms increased outside directors with political backgrounds when the role of politically experienced directors became more important.

The functional role of the board is not independent of the overall goal the board should pursue. I return to a discussion of the overall goal in Chapter 3.

2.3.2 Diversity Characteristics

Little research on board diversity exists. Kesner (1988) compares the characteristics of women and men directors. The study finds that female directors have more diversified backgrounds than male directors. Further, women directors are more

[12] Webster's Dictionary of Law (1996) defines the meaning of the phrase *sui generis* as: Constituing a class alone; unique or particular to itself.

likely to be from outside the company. Bilimoria and Piderit (1994) report that male directors sit on key committees such as the finance, executive, and compensation committees while female directors sit on "soft" board committees such as public affairs committees. Daily *et al* (1999) examine the presence of women on corporate boards using *Fortune 500* firms for two time periods, 1987 and 1996. They find that the number of female derectors increased from 270 to 602 for the time period studied. A survey by Spencer Stuart shows that 21% of new board members were women in 2000[13].

2.3.3 CEO Succession

Many firms select new CEOs from amongst current board members. Research indicates inside directors in large firms have a better chance at being named CEO than outside directors (Hermalin and Weisbach (1988) and Parrino (1997)). However, outside directors are more likely to be named CEO than inside directors in more homogeneous industries, or in poor performing firms (Parrino (1997)). Tsoulouhas, Knoeber, and Agrawal (2000) examine the disadvantage of outsiders or 'outsider handicap' on CEO contests -- the results show that outsiders are disadvantaged in CEO contests.

2.3.4 Board Member Protection

In general, firms protect boards from liability for their decisions with either insurance or an indemnification provision in the corporate charter. Cordtz and Reingold (1993) find that 80% of potential outside directors turn down director job offers according to Spencer Stuart Board Services, which recruits outside directors for major

[13] See Business Week, April 30, 2001, pp 134, Wanted: More Diverse Directors.

companies. Although potential directors say they do not have enough time to be a director, Cordtz and Reingold argue that the main reasons for refusal are public criticism of corporate governance and the fear of lawsuits. MacLeod (1995) reports that 36% of outside directors from private firms and 46% from publicly held firms' have been subjected to class-action lawsuits by investors according to a survey conducted by Louis Harris and Associates Inc.. The survey indicated that the existence of director's liability insurance is the main factor a director considers in making his/her decision to accept or reject a directorship.

The increasing legal threat against directors has resulted in higher D&O insurance premiums. Some firms have argued that elimination of directors' legal liability would help shareholders. In 1986, Delaware allowed stockholders of Delaware corporations to eliminate or limit the personal liability of directors for breach of fiduciary duty. Janjigian and Bolster (1990) compare the stock performance of Delaware and non-Delaware firms around the liability-eliminating amendments period. Contrary to the firms' argument, they do not find any significant difference in stock return performance for the period between the two groups. Brook and Rao (1994) also examine the effect of the adoption of a liability limitation provision using a sample of 182 manufacturing firms between 1986-1988. They find that the adoption did not affect the stock prices of those firms. However, the stock market did react positively to the adoption for poorly performing firms. They conclude that a liability limitation provision is more valuable to the outside director in financially troubled firms since the expected cost of a lawsuit is larger for the director in the financially distressed firm.

More recently, Chalmers *et al* (2000) investigate the use of directors' and officers' liability insurance (D&O) in IPO firms. If managers and directors sell overvalued IPO stocks, they will face an increased likelihood of lawsuit from stockholders. The increased likelihood of a lawsuit will result in an increase in the amount of D&O purchases to protect directors and officers. Chalmers *et al* find that there is a negative relation between the amount of D&O purchased and the 3-year post-IPO stock price performance of the firm. Core (2000) relates D&O premiums to the quality of a firm's governance structure. He finds that firms with a weaker governance structure pay higher D&O premiums. Further, the results show that D&O premiums are higher when a firm's board has fewer outside directors, and when the CEO of the company selects more outside directors.

2.3.5 The Market For Directors

Several studies present evidence that an active labor market for directors provides board discipline. Gilson (1990) shows that directors who resign following bankruptcy go on to hold fewer directorships. Kaplan and Reishus (1990) report that CEOs who cut dividends are less likely to receive directorships than other CEOs. More recently, Brickley, Linck, and Coles (1999) examine CEOs' performance and the number of post-retirement directorships they hold. The findings indicate that better performance in the final years of service affects a CEO's directorship opportunities after retirement.

Harford (2000) examines the effect of a takeover bid on target directors. He finds that only 10% of target outside directors are retained after merger. Pre-bid performance affects future directorship opportunities. The potential loss of directorship opportunities

may provide outside directors with incentives for resisting a bid. However, if directors in a poorly performing firm resist and terminate the bid, the market for directors will penalize them in the future.

Farrell and Whidbee (2000) examine whether the director labor market rewards outside directors for removing a poorly performing CEO. Using a sample of 66 forced CEO turnovers from 1982 –1992, they find that directors' decision to remove a poorly performing CEO increase the likelihood of losing the directorship. However, those directors who hold large equity stakes, are not closely aligned with the outgoing CEO, and make good decisions, are more likely to acquire additional directorships and less likely to lose their directorship on the forced-turnover board.

Cahen and Wilkinson (1999) find that political change increases a boards' value in the market. The proportion of outside directors in a sample of New Zealand companies increased by about 5% after the 1993 Companies Act. They suggest that the value of outside directors actually increases as a result of the political process. Pye (2000) reports similar results among UK large firms following Cadbury Code (1992) and Code of Practice (1997). However, Doble (1997) shows the effect of political change on board market is less among small to medium sized UK companies than large companies.

2.3.6 Compensation

The National Association of Corporate Directors suggests that director compensation should be determined by the board and disclosed completely to shareholders, aligned with shareholders' long-term interests, and used to motivate

directors' behavior. Directors should be adequately compensated for their time and effort. The guidelines are:

Corporate boards should

1. Establish a deliberative and objective process to determine compensation.

2. Set a substantial target for each director's stock ownership and a time period during which this target is to be met.

3. Define the desirable total value of all forms of director compensation.

4. Dismantle existing benefit programs and create no new ones.

5. Adopt a policy against hiring a director or a director's company to provide professional or financial services to the corporation.

6. Disclose fully in the proxy statement the philosophy and process used in determining director compensation and the value of all elements of compensation.

A good example of the views held by compensation professionals is Edelson (1998) who emphasizes the importance of compensation design for the board of directors arguing that a "financial interest" is a must. The California Public Employee's Retirement System, Calpers, principles of good governance call for a direct link between director and shareholder wealth. Calpers suggests that good governance will be characterized by a situation in which: "*Director compensation* is a combination of *cash and stock* in the company. The stock component is a significant portion of the total compensation." (Core Principle 6, California Public Employees' Retirement System, Corporate Governance Core Principles & Guidelines, 1998).[14]

[14] An alternative view first proposed by Fama (1980) is that if an active market exists for corporate directors, then the real forces of this 'labor market for directors' will keep directors in line. Our emphasis on compensation as a basis for director incentives conforms with a common view held by many regarding

Although there are no clear answers regarding how to pay directors and how much to pay, the general trend is towards reducing cash payments and increasing stock payments. The increase in stock-pay has been welcomed by firms, shareholders, and regulators under the assumption that the stock-pay will align the interests of shareholders and those of directors. *Corporate Board* (2000) reports that 49% of S&P 500 firms grant annual option awards, up from 32% in 1995, using a study by Russell Reynolds Associates. Just increasing the stock payment may not be beneficial to the shareholders. Smith (1988) asserts that most stock pay plans for directors are "self-serving dealings between management and the board" and recommends restricted stock grants. Ronald and Toppel (1998) find that many companies use deferred compensation plans to relate director compensation with the interests of their shareholders. I return to a more detailed analysis of this issue in Chapter 3.

Some research relates board pay to board leadership structure and the role of remuneration committees. From a sample of 213 large UK firms for the period 1988-1993, Conyon (1997) finds that separating the chairman and CEO roles has little effect on director pay, while the existence of remuneration committees is negatively related to the growth of top director pay. Benito and Conyon (1999) confirm the findings of Conyon (1997) regarding the relation between board pay and the board leadership structure. However, they do not show any significant relation between the adoption of remuneration and nomination committees on board and director's cash compensation. In Chapter 3, I

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managerial compensation (see Murphy (1999)). A further view proposed by Demsetz (1983) amongst others is that the discipline of real markets in which firms by and sell goods and services in fact makes outside directors superfluous. The observation that boards of directors have persisted and no particular effort has been made to abolish them would seem at one level to refute the dominance of this argument.

show that industry segment and company size are important determinants of aggregate board member compensation in the US. Chapter 4 provides evidence that at the firm level, board member compensation is significantly related to investment opportunities.

2.3.7 The Determinants Of Size

Little research on board size exists. Wu (2000) investigates the evolution of board size from 1991 to 1995. She finds that boards become smaller due to active institutional investors such as California Public Employees' Retirement System (CalPERS). Kole and Lehn (1999) examine the effect of deregulation on governance structure. From the US airline industry during a period of 22 years surrounding the Airline Deregulation Act of 1978, they find that board size decreased after the implementation of deregulation. Dennis and Sarin (1999) find that board size is positively related to the fraction of independent outsiders. Size is quite possibly related to agency issues, since the findings of Yermack (1996) show that firm value is inversely related to board size.

2.4 Summary

This chapter discusses the three major topics which jointly span the questions examined in the extant literature: 1) The relationship between the board and firm performance, 2) The relationship between the board and the CEO, and 3) The board itself.

Studies of the relationships between board composition and firm performance, or between board ownership and firm performance do not provide any clear conclusions. The mixed results may come from model specification and measurement errors. Barnhart and Rosenstein (1998) for instance find that relatively minor changes in their model have profound effects on their empirical analysis of board composition, managerial ownership, and firm performance. Barnhart, Marr, and Rosenstein (1994) suggest that 'findings of similar studies be interpreted with caution.' While the empirical evidence does show that larger boards are associated with lower firm value, it is hard to draw any clear conclusions on the relations between other characteristics of the board such as board leadership structure, board compensation, or frequency of board meetings, and either performance or value.

In general, firms want their CEOs to have fewer outside directorships in other companies. Changes of directors' ownership and board composition are related to CEO turnover. The compensation structure of the board affects CEO turnover. The incentives of outside directors differ from those of inside directors when directors choose a new CEO. CEO ownership structure affects board composition.

However, clear conclusions on the relation between CEO compensation and board composition, board ownership, and outside director compensation are not evident from the existing empirical literature.

The current research on the board as a unit shows firms change their board composition on an as needed basis. Firms operating in a more regulated industry, or doing business with government agencies have more politically experienced directors. Although the number of female directors has increased in recent years, male directors sit

on key committees. Outside directors are disadvantaged in CEO contests. Most firms purchase D&O insurance to protect their directors, however the protection does not improve company stock prices. An active labor market for directors appears to provide board discipline. The size of the average board has decreased over time.

CHAPTER 3. ESSAY 2: TIME SERIES ANALYSIS OF OUTSIDE DIRECTOR COMPENSATION

3.1 Introduction

Who controls the board of directors and the mechanisms of control, be they internal or external (Fama, 1980), have emerged as focal points in the study of corporate governance. Board size, independence and composition have attracted increasing interest in the academic literature as John and Senbet (1998) and Hermalin and Weisbach (2000) have documented. Interest in the subject is by no means confined to the finance and economics literature. Blair and Stout (2001), Bhagat and Black (1999) and Black (2001) represent excellent examples of related questions being asked by legal scholars. A key component in any discussion of board behavior must be the monetary incentives that directors face in their role as board members. General Motors is a good example of the variety of compensation/benefit elements offered to outside board members. Table 3.1 documents the manner in which GM's outside board members were compensated during 1999. GM's system has several notable features. First, there are a number of ways in which outside board members accumulate compensation: retainers, fees for meeting attendance as well as committee chair duties, stock awards as well as other benefits such as insurance and retirement plans. Second, the magnitude of potential total compensation was equal to $84,500. And third, the proportion of total compensation distributed in the form of stock or stock equivalents, was roughly 28% for GM outside directors. We show later that the fraction of U.S. corporations using stock and stock equivalents in the

compensation of outside directors went from almost 0 in 1983 to roughly 80% in the year 2000.

Despite the widespread interest in boards of directors, outside board member compensation has received little scrutiny in the academic literature. Fama (1980) suggests that an outside director's compensation can potentially be set efficiently in the labor market conditional on the director's performance as a professional referee. He however does not claim that the market for outside directors has in fact evolved to a state that makes this possible. The conclusion is that full ex post setting up through the labor market for inefficient activities by board members may not currently be possible. Fama does present conditions regarding how the labor market learns. He argues these conditions insure full ex post settling up for inefficient managerial and, by extension, director behavior. Holmstrom (1982), however argues that the system proposed by Fama as the mechanism by which the labor market learns about an individual's productivity does not imply that the manager/director faces full ex post setting up. Noe and Rebello (1997) present a theoretical analysis of the endogenous structure of the board and board member compensation. They argue that director reputation may not be sufficient to motivate board members to act in the interests of shareholders. However, within the context of their model, alignment of board member and shareholder interests may be achieved through the optimal design of board compensation. They also show that optimal board compensation programs may be a low cost substitute for managerial compensation plans.[15] An important dimension of Noe and Rebello's work is the

[15] Interestingly, two recent empirical studies of the share price reaction to the adoption of equity-based incentive plans for outside directors find little evidence of revaluation, although both suggest that the

normative goal that directors should seek to maximize shareholder wealth (payoffs), a point of recent debate that crosses over several literatures and one we will return to in the next section of this paper.

The role of the board has been a source of concern for decades especially among legal scholars - notable amongst early discussions of the topic is the classic treatise by Berle and Means (1932).[16] Some observers argue that the board plays an inherently critical role in the monitoring of management and in the provision of expertise (Fama, 1980; Fama and Jensen 1983). Others however contend that the board of directors is either irrelevant due to the nature of general market discipline (Demsetz, 1983; Hart 1983), or that board candidates nominated by management, once elected, are more likely to accede to managerial or political pressures rather than to focus on shareholder interests (Jensen and Murphy, 1990). Corporate managers typically support the view that the board plays a critical role in the functioning of the enterprise. Which view holds sway within any particular company will of course influence director compensation.

We begin with a brief discussion of the opinions held about the effectiveness of U.S. boards of directors. We also discuss the primary positions on the normative objective that boards should pursue. A discussion of the debate about board objectives is important because it will put into perspective recent developments in director compensation practices. We then turn to a review of the characteristics of outside director compensation and the evolution of director compensation over the last 20 years.

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reaction may be conditioned on firm specific characteristics (Linn and Martin, 1998; Gerety, Hoi and Robin, 2001).

[16] Bates (1940) presents an insightful discussion of the board and its function, many elements of which continue to be echoed today.

Following this review, we focus on the primary determinants of aggregate director compensation. We conclude with a commentary on outside director compensation practices and their implications for the effectiveness of boards. Our study represents a first step in gaining an empirical understanding of outside director compensation and the implications of the various systems of compensation currently in use.

3.2 Corporate Director Effectiveness: Positive Observations And Normative Objectives

The issue of board effectiveness can be interpreted in two different ways. First, how effective is the board relative to a predetermined goal (meaning whatever the actual goal happens to have been over some historic calendar period)? The second way to interpret effectiveness is relative to an optimal normative goal (not necessarily the goal that has actually been pursued). The usual discussions regarding board effectiveness at least implicitly tend to emphasize the latter perspective.

There are two widely held views on the objective that should be the normative standard for the corporation. One view holds that directors should focus on shareholder interests (read "wealth"). This view stems largely from the theoretical principal-agent construct and emphasizes that directors are the agents of the shareholders.[17] An alternative view that has strong advocates in the community of legal academics (for instance, Blair and Stout (2001)), but which also has roots in the academic management literature (Freeman 1984; Freeman & Evans, 1990; Donaldson & Preston, 1995; Luoma

[17] Numerous authors have written on this topic, examples include Mace (1971), Jensen and Meckling (1976), Fama and Jensen (1983), Weisbach (1988), Smith and Watts (1992), Daily and Dalton (1994), Shleifer and Vishny (1997), Perry (1999), Bryan, Hwang, Klein, and Lilien (2000) among others.

and Goodstein, 1999 among others), is that boards should optimize an objective that takes into account the interests of all stakeholders who receive payoffs in one form or another from the operation of the firm. Jensen (2001) points out that the two views are both potentially flawed.[18] As we all remember from our baptism into the faith ala Modigliani and Miller (1958), Miller and Modigliani (1961) and Fama and Miller (1972), have shown that 'firm' value maximization is the normative standard under perfect market conditions.[19] Stakeholder interest optimization does not inherently achieve this goal because it leaves vague how the potentially conflicting interests of stakeholders should be weighted. Shareholder wealth maximization also does not inherently guarantee firm value maximization particularly when the firm's debt is risky (see for instance Fama and Miller, Ch. 4, 1972).[20] Only under very restrictive conditions regarding markets and contracts would we expect the optimal compensation policy for directors under the three alternative goals, shareholder wealth maximization, stakeholder interest optimization and firm value maximization to be the same.[21]

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[18] Sternberg (1996) also presents a strong case for the view that stakeholder theory is misguided.

[19] Firm value maximization with complete markets and perfect competition also implies optimal aggregate resource allocation, and in general equilibrium, optimal aggregate welfare (Debreu, 1959; Arrow, 1964).

[20] Jensen (2001) suggests an operational solution he labels 'Enlightened Stakeholder Theory', implicitly providing that directors will optimize the multitude of contracts that define the firm.

[21] The shareholder interest view and the stakeholder interest views are in principle neither correct when one views the firm as a nexus of contracts where the terms and conditions are jointly optimized. Both are internally consistent however given an appropriate set of conditions. For instance, if labor markets were perfect so that all laborers earned a wage consistent with their correct expected marginal product, and if warranted, a premium for the exante risk of being exploited later, and if all debt-holders negotiated perfect "me-first" rules to protect their interests (Fama and Miller, 1972) or an implied premium for the exante risk that their wealth might be expropriated, then indeed maximizing shareholder wealth would be sensible. In contrast, if labor markets were imperfect and workers could easily be exploited, and if bondholders were unable to anticipate states of nature in which they would be exploited and the costs of such exploitation, then maximizing an objective reflecting the total value of all claims (equity, debt and labor), could be sensible from an aggregate efficiency point of view, even though the individual factions of the aforementioned troika would at times not view the board's decisions as optimal from a personal

Shareholder primacy has its roots in the economic theory of agency (Ross, 1973; Kreps, 1990). The economic theory of agency and its implications for designing incentives emphasizes the relation between compensation, wealth and performance.[22] This insight has not been lost on the community of practitioners. A good example of the views held by compensation professionals is Edelson (1998) who emphasizes the importance of compensation design for the board of directors arguing that a "financial interest" is a must. The California Public Employee's Retirement System, Calpers, principles of good governance call for a direct link between director and shareholder wealth. Calpers suggests that good governance will be characterized by a situation in which: "*Director compensation* is a combination of *cash and stock* in the company. The stock component is a significant portion of the total compensation." (Core Principle 6, California Public Employees' Retirement System, Corporate Governance Core Principles & Guidelines, 1998).[23] It is important to recognize however that this advice implicitly springs from the view that shareholder interests are primary. In contrast, basing director compensation primarily on an equity-based mechanism would not necessarily be

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perspective. Two interesting questions arise: 1) how should directors be compensated since it may "depend" upon the status of markets and or contracts that have been entered in to, and 2) if a market for director talent exists and operates, how in fact is the market wage for directors determined given that it "depends"? For an insightful analysis of the issue of compensation in the presence of risky debt see John and John (1993).

[22] The literature has a long history including Alchian and Demsetz (1972), Ross (1973) and Jensen and Meckling (1976) to the excellent compilations of many important results by Hart (1995), Kreps (1990) and the review article by Murphy (1999).

[23] An alternative view first proposed by Fama (1980) is that if an active market exists for corporate directors, then the real forces of this 'labor market will keep directors in line. Our emphasis on compensation as a basis for director incentives conforms with a common view held by many regarding managerial compensation (see Murphy (1999)). Demsetz (1983) amongst others has argued the discipline of real markets in which firms by and sell goods and services in fact makes outside directors superfluous. The observation that boards of directors have persisted and no particular effort has been made to abolish them would seem at one level to refute the dominance of this latter argument.

advocated by those who view the normative objective function to be optimized by directors as a weighted average of the interests of all stakeholders.[24]

Shareholders delegate decision monitoring and control authority to the board of directors. In fact most state laws grant this right. The board therefore represents a potential mechanism for solving managerial agency problems, but can also be an important factor in value creation (Fama and Jensen, 1983). The conclusion on whether boards are effective in terms of monitoring and 'managing the managers' is divided but no doubt is shaded by the underlying normative goal the observer believes directors should pursue. Jensen (1989, 1993) among others concludes that the state of internal corporate governance in U.S. corporations, including the functioning of boards, does not inspire the conclusion that these mechanisms have been effective. A 1978 report issued by the Business Roundtable (1978) still summarizes well the views held by many regarding the effectiveness of U.S. boards of directors:

1.Directors do not spend enough time ---participate passively and collect a fee.

2. Boards are hand picked by the CEO and --- they are rubber stamps.

3. Shareholders have no voice in the nomination of directors.

3. Directors are poorly informed --- poorly prepared for board discussions.

4. Boards are too homogeneous--- will not "rock the boat."[25]

The view that boards have traditionally been ineffective has led to a groundswell of institutional activism. The California Public Employees' Retirement System (Calpers)

[24] Recent work by Hall and Murphy (2002) and Muelbroek (2001) further suggests that over-weighting compensation plans with equity awards can lead to distortions in the level of diversification of the personal portfolios of individual directors. Such distortions can in turn drive the decisions made by directors away from the central normative goal.

has gone so far as to propose a list of *principles* they view as indicative of good internal corporate governance, many of which deal directly with the composition and compensation of the board. The empirical evidence on board effectiveness has generally been couched in terms of equity value maximization. The evidence is mixed as the surveys by John and Senbet (1998) and Hermalin and Weisbach (2000) document. Examinations of the implications of board independence for equity value and performance find no relation, but board size tends to be negatively related to value. The extent of board independence does however seem to matter for specific "crisis" type decisions.

In contrast, corporate managers, legal scholars and the courts tend to share the view that boards are effective, or at least that they operate within the domain required by law. For instance, Thomas J. Engibous, chairman, president and CEO of Texas Instruments, has asserted, "Much of the success that we've enjoyed over the past few years is the direct result of the bold decisions made by our board of directors in refocusing our business portfolio with numerous acquisitions and divestitures." (2000, p. 38). Some legal scholars (Easterbrook and Fischel, 1981; Blair and Stout, 2001 for instance) tend to come down on the positive side as well. If boards have historically pursued an objective consistent with stakeholder interest optimization, then an observer who assumed shareholder primacy as the preferred objective could on average interpret board behavior as inefficient. Conversely, such boards would be considered to have operated effectively relative to the stakeholder optimization view.

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[25] Interestingly, since 1978 the NYSE has required that an audit committee of the board be in place before listing will be approved. Furthermore, the majority of this committee's membership is generally made up of outside directors.

The historical attitude of the courts has likewise been to give directors the "benefit of the doubt" through the exercise and interpretation of the business judgment rule. Blair and Stout (2001) suggest that the *law* in fact has evolved to emphasize the view that directors should consider all stakeholders interest in their decision-making. Blair and Stout have indeed argued that directors are not (in their words) "..in any legal sense, anyone's 'agents'..(p. 27)" but that their duties are really those of autonomous fiduciaries. Directors in their view (and they argue in the "law's" view) owe allegiance to the firm, but not necessarily to the shareholders or to any single stakeholder group, and what's more, are motivated by a duty of "loyalty", much different from the economic motivation that springs from traditional principal-agent theory.[26] Black (2001) summarizes the fiduciary duties of directors as: 1) duty of loyalty, 2) duty of care, 3) duty of disclosure and 4) duty of special care when the company is the target of a takeover. Robert Clark (1985), argues that under U.S. laws "1) corporate officers like the president and treasurer are agents of the corporation itself; 2) the board of directors is the ultimate decision-making body of the corporation (and in a sense is the group most appropriately identified with "the corporation"); 3) directors are not agents of the corporation but are *sui generis*;[27] 4) neither officers nor directors are agents of the stockholders; but 5) both officers and directors are "fiduciaries" with respect to the corporation and its stockholders." (p. 56).

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[26] Forty-five states have adopted nonshareholder stakeholder statutes, generally referred to as stakeholder constituency statutes (Orts (1992), Springer (1999), Adams and Matheson (2000)).

[27] Webster's Dictionary of Law (1996) defines the meaning of the phrase *sui generis* as: Constituing a class alone; unique or particular to itself.

One would expect that such divergent views on the role of directors and whom they serve would be reflected in how directors are compensated. As we shall see in the next sections director compensation by no means strictly favors one view over another.

3.3 Director Compensation

The compensation of non-employee directors is beginning to receive increased scrutiny from corporate boards, shareholder watchdog groups and compensation specialists. The days when a $20 gold piece left at an outside director's place at the board table sufficed as compensation for duties fulfilled, are now long gone. With the passing of this romantic era in corporate culture has come an ever-increasing array of elements designed to compensate non-employee directors.[28]

Director compensation has historically been composed of a retainer for board membership and for being a committee chair, as well as fees for attendance of board and committee meetings. In recent years however, a number of corporations have adopted stock incentive compensation plans for outside directors. The general descriptions of these plans suggest that they are motivated by an interest in aligning the outside directors with the common stockholders. For instance an early adopter of equity-based compensation for outside directors was Squibb Corporation. The 1987 Proxy statement of Squibb Corporation states:

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[28] Compensation may not be the sole determinant in attracting and retaining outside board members. Other factors such as increased status, professional and social connections may also be important. In addition, the fact that many outside board members of U.S. corporations are either current or former CEOs with large personal wealths suggests that compensation for board service may not be economically significant for these individuals. However, if an outside board member holds several such board memberships (Brickley *et al*, 1999), the total compensation from these activities may be an attractive and important factor to the director regardless of his/her other income sources.

> This 1987 Stock Option Plan for Non-employee Directors (the "Plan") is
> intended to attract and retain the services of experienced and knowledgeable independent directors of Squibb Corporation (the "Corporation") for the benefit of the Corporation and its stockholders and to provide additional incentive for such directors to continue to work for the best interests of the Corporation and its stockholders. (p. B1).

The advent of stock compensation plans for outside directors therefore suggests that monitoring and litigation costs, as well as imperfections in the market for directors (due to that market not yet having reached "...a state of advanced evolution..."-Fama (1980 , p. 294)) are believed to inhibit the alignment of director and stockholder interests. But more to the point, equity-based compensation for directors suggest that some corporations, not surprisingly, have adopted the shareholder primacy view, at least at some level.

3.4 Director Compensation Data

Outside directors receive a base level of compensation (a fixed retainer), fees for meeting attendance, and additional compensation for committee service including chair duties. Additional benefits often include health and life insurance, retirement benefits, and special travel benefits. The most significant change in outside director compensation during the last 20 years has been the adoption of equity-based compensation systems. In 1983 stock-based compensation systems for outside directors existed at only a small number of U.S. corporations. By 2000 such plans had been widely adopted. Pearl Meyer & Partners (2000) report in a recent survey that 95 percent of the nation's top 200

companies included equity compensation for outside directors in 1999 compared to 66 percent in 1994. The board members of these firms received 18 percent of their compensation as stock in 1994 but that proportion jumped to 59 percent in 1999.

Our study examines both the cross-sectional as well as time series behavior of outside director compensation measured at the industry sector level. The data are based upon survey results first compiled by the Conference Board. The survey data span the period 1979 to 2000. Each year the Conference Board collects data from questionnaires mailed to members of the American Society of Corporate Secretaries. The respondents are U.S. corporations. On average, 836 companies per year responded to the survey during the period 1979 to 2000. The number of respondents varied between 590 and 1013. On average, 377 of the respondents operated in the manufacturing sector, 178 were financials and 281 were non-financial service and mineral extraction companies. The Conference Board reports summary statistics for the responding firms by industry and in total. Figure 3.1 presents a visual comparison of the survey respondents with firms in the S&P 500, by industry sector and company size. Figure 3.1 shows that responders operating in the manufacturing and nonfinancial sectors are spread fairly evenly across the different size groups while the S&P 500 companies are skewed towards larger sizes. However, financial sector firms are distributed across size groupings in a fashion similar to the S&P 500 firms. Table 3.2 reports the distribution of industries represented and the classification of each as manufacturing, financial and non-financial service. The respondents constitute a diverse cross-section of U. S. industry.

Outside directors are defined as individual board members who are not otherwise directly employed by the corporation. Median board size and board composition are

documented in Panel A of Table 3.3. Financials tend to have more directors overall but proportionately fewer outside directors. Panel B of Table 3.3 reports the frequency of various Board Governance Policies. Interestingly, only 25% of the respondents indicate that a formal process exists for the evaluation of the board, and only 11% indicate that such a process exists for individual board members.

3.5 Remuneration Of Outside Directors

Basic annual compensation includes the annual retainer for board service, payment for meeting attendance, and payment for committee service. *Basic annual compensation* is computed based upon the assumption that the typical director attends, and is paid for, every board meeting and every meeting of every committee on which he or she serves. Compensation is therefore the potential compensation for full participation. The amount is therefore an upper bound on actual basic compensation. We report median data in the tables and figures that follow.

The actual payment of *basic annual compensation* may include cash as well as payment in the form of stock, but grants of stock options and restricted stock are excluded. *Total annual compensation* in contrast, equals *basic annual compensation* plus the value of equity-based distributions not already included in that figure. The Conference Board values restricted and non-restricted stock grants at the current market price at distribution. The value of stock options granted is approximated as 30% of the current market value of the underlying stock. We readily admit that the restricted stock and option valuation heuristics are rough and so present these numbers only as a point of reference.

Table 3.4 presents nominal basic annual compensation by industry sector and year.[29] Manufacturing firms generally pay outside directors more than either financial or non-financial firms. In 1979, the median amount paid to outside directors by manufacturing companies was $11,500, financial companies paid $8,000, and non-financial companies paid $9,000. In 2000, the compensation amounts, unadjusted for inflation, were $37,200, $30,000, and $33,000 respectively. Two key facts are immediately apparent: 1) Basic annual compensation is greatest for manufacturing companies followed by non-financial and financials, in that order, and 2) The compound annual growth rate in nominal basic compensation is greatest for financial companies followed by non-financial and manufacturing.

Real basic annual compensation is computed by adjusting the nominal data in Table 3.4 for inflation as measured using annual CPI data for the United States.[30] Figure 3.2 presents a plot of the data. The manufacturing sector continues to dominate after inflation adjusting the data. The cumulative percentage changes in real basic annual compensation are shown in Figure 3.3. Real (inflation adjusted) compensation shows a positive change over the last two decades. Among the three sectors, the real basic annual compensation paid by financial companies has seen the most growth.[31]

Basic annual compensation does not include restricted stock grants and stock options. Therefore the data presented in Table 3.4 excludes these components. Total annual compensation will be larger if the value of stock grants and options are included.

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[29] The Conference Board issued the survey report on a bi-annual basis until 1983, therefore no data are reported for 1980 and 1982.

[30] Source: U.S. Bureau of Labor Statistics, http://stats.bls.gov/cpihome.htm.

[31] Table 3.A in the Appendix presents the data used to construct Figures 3.2 and 3.3.

A switch to greater emphasis on stock grants and stock options in part explains the low growth rates in basic annual compensation during the last five years. Manufacturing firms have historically paid the highest retainer even after adjusting for inflation (Figure 3.4). The retainer paid has tended to flatten out in recent years. Part of the reason lies in the increasing use of restricted stock and option awards. Figure 3.5 shows that the real value of per-meeting fees has decreased over the past 7-8 years.

3.6 Forms Of Compensation For Regular Board Service

Table 3.5 shows the distribution of payment methods for the surveyed companies. There are three primary payment methods: annual retainer plus meeting fees, retainer only, meeting fees only. In addition to these basic systems, U.S. corporations have moved toward the granting of restricted stock and stock options. We will return to a critique of the use of these grants in section 3.9. Roughly 80 percent of the surveyed firms pay a retainer plus meeting fees, 13 percent pay a retainer only and 6 percent pay only meeting fees. Retainers are generally paid annually and are not directly linked to attendance at board meetings or to service on committees or committee meeting attendance. A portion of the retainer is itself sometimes paid in the form of stock. Fees are paid for attendance at a scheduled board or committee meeting. On average, 79 percent of manufacturing firms use the retainer/fee structure. The corresponding proportions for financial firms and service firms are 80 percent and 83 percent.

The proportions of firms using the alternative systems have remained relatively stable although a slight shift has occurred in recent years. However, there has been a

slight downward drift in the fraction using the retainer plus fees system and a slight upward drift in the fraction using only a retainer.

3.7 Committee Activities And Compensation

Table 3.6 presents information on existing board committees for the surveyed companies. On average, 80 percent of the reporting companies have had between three and six committees for the last two decades. During the sample period, larger firms used more committees. Most of the sample companies have audit, compensation, and executive committees. Around half of the companies have a nominating committee. Only 6 percent of the respondents have a human resource committee.

The audit committee is the most structured committee of the modern board. (Ward, 1997) Directors on this committee audit the company's internal and external affairs. Although the idea of an audit committee was developed during the 1930s, adoption did not become widespread until after 1978 when the NYSE made it a requirement for listed firms. In 1987, the Treadway Commission sponsored by the AICPA, the American Accounting Association, and the Financial Executives Institute urged the SEC to require all public companies to implement an audit committee. Although the SEC did not accept the suggestion, most firms adopted the guidelines. Table 3.6 shows that 96 percent of the companies surveyed had an audit committee and that this fraction has been relatively stable for the last 14 years. Around 85 percent of the survey respondents have a compensation committee. About half of the firms have a nominating committee.

The bracketed numbers shown in Table 3.6 represent the percentage of the surveyed firms by year that compensated directors for committee duties. Roughly 80% of the companies surveyed pay for committee services. The fractions paying for service on the Audit, Compensation, Executive, Nominating, Finance, and Pension and Benefits Committees have remained relatively stable over time, but drifted downward following 1995, increasing again in the most recent year for which data were available. Table 3.7 presents the per-meeting fee for the four most common committees and the committee retainer payments by industry. On average, financial firms pay smaller per-meeting fees but larger retainers. Recently, nominal fees have tended to stabilize and have fallen in real terms (Figure 3.5). Around half of the respondent firms pay a bonus fee to committee chairs. Some firms pay an annual retainer to the committee chair. The proportion of basic annual compensation represented by committee service pay is 14 percent, 18 percent, and 14 percent on average for manufacturing, financial, and non-financial firms respectively.

3.8 Determinants Of Aggregate Basic Annual Compensation

3.8.1 Industry Sector Effects

Figure 3.2 suggests that basic annual compensation differs across the three industry sectors. We test the proposition that median inflation-adjusted basic annual compensation is equal across the three sectors using a dummy variable regression model. Dummy variables are specified for the manufacturing and non-financial sectors. The estimated coefficients on the dummy variables therefore reveal the differential in real basic annual compensation over what was on average paid by financials. The pooled

across industry and year model is estimated by OLS and the results are presented in column 1 of Table 3.8. The estimated coefficients for the manufacturing and nonfinancial dummies are both positive and significant, indicating that compensation within these sectors is significantly greater than what is paid by financials. Note also that the coefficient on the manufacturing dummy is larger than the non-financial dummy's coefficient. A test for the equality of the manufacturing and the non-financial dummies rejects the null hypothesis. We therefore conclude that manufacturing firms paid significantly more than non-financials, which paid significantly more than financials.

3.8.2 Compensation And Company Size

Larger companies tend to pay more to their CEO's than do smaller companies (Murphy, 1999). The compensation of board members also shows a similar pattern. Columns 2-4 of Table 3.8 present within industry sector coefficient estimates for dummy variable regression models in which the dependent variable is again median real basic annual compensation. Nine dummy variables are defined based upon size groupings, with eight included in the regression model.[32] The data at our disposal only allow us to

[32] Specifically, the dummy variables included in the regression models are defined in the following manner based upon size groupings:

Dummy Variable	Dummy-size 1	Dummy-size 2	Dummy-size 3	Dummy-size 4	Dummy-size 5	Dummy-size 6	Dummy-size 7	Dummy-size 8	Dummy-size 9
Manufacturing and Nonfinancial Sectors: Sales ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000
Financial Sector: Total Assets ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000

Note that Dummy-size 1 is excluded from the regressions because the models are estimated with an intercept.

define size groups in terms of sales for the manufacturing and non-financial services sectors. Size is defined based upon total assets for the financial sector. The relation between size and real basic annual compensation continues to hold for manufacturing and non-financial companies and is generally supported for financials.[33] However, the significance of the point estimates for the two smallest size dummy coefficients in the financials regression are not significantly different from zero. In sum, the results presented in Table 3.8 indicate that overall median inflation adjusted basic annual compensation differs across industry sector and firm size groups. The size effect tends to be monotonic. Smaller firms pay less, and compensation increases as we proceed from smaller to larger firms.

3.9 The Use Of Stock In The Compensation Of Outside Directors

A recent report by the compensation specialists Pearl Meyer & Partners states: "Corporate governance leaders initiated a cash to equity shift at the senior executive level more than a decade ago, causing corporations to move a growing portion of management as well as employee remuneration into company stock to motivate and reward the creation of shareholders value. Once equity became firmly entrenched inside the corporation, governance activists turned their attention to outside Directors. Thus, began the initial stages of a similar movement at the Board level to directly align pay with stock performance and, thereby, with shareholder interests." (Pearl Meyer & Partners, 1999.

[33] Although not reported, the retainer paid for regular board service is larger for larger firms, consistent with the earlier evidence reported on basic annual compensation.

The promotion of equity-based compensation has not been without controversy. A *Wall Street Journal* article entitled "While Outside Directors' Pay Increases, Independence From Managers May Fade" (*WSJ*, April 22, 1991) highlights the diversity of opinions on the matter. The article states for instance that "...officials believe stock options enable directors to think more like stockholders and to be rewarded for their performance....Bigger equity stakes also give outsiders a greater financial inducement to protect shareholder value by holding chief executives accountable.."(p. B1). There is little doubt however that this incentive structure may lead to effectively larger payoffs for non-employee directors than under traditional arrangements. The article goes on to state that "...critics fear the increased compensation could reduce director independence.....Besides the possible loss of independence, the appearance of self-dealing....as pay packages get richer concerns critics."(p. B1).

Three models are typically used for stock awards. Stock is sometimes distributed in lieu of cash in the payment of basic annual compensation. Independent of such stock payments, restricted stock awards and stock option awards are granted as extras. Typically, stock options give outside directors a right to purchase shares of company stock at a fixed price for a fixed period of time. The exercise price is usually set at 100 percent of the fair market value of the underlying stock at the date of the grant or distribution.[34] Restricted stock is awarded subject to restrictions on its sale or transfer for a fixed period, often until retirement or termination of service.

[34] Most companies set the exercise price of options granted to directors and executives at 100% of the prevailing stock price at the time options are granted. This is motivated by APB25 which requires firms to expense the difference between the exercise price and the current price when the exercise price is smaller.

In the 1991 Corporate Directors' Compensation report, the Conference Board suggests several reasons for the increasing use of stock compensation for outside directors (p. 27).

1. to attract directors who are capable of dealing with the increasingly complex business environment
2. to align the interests of directors and owners
3. to retain directors by tying stock ownership to continued board service
4. to allow directors to reduce current tax liability
5. to apply the pay-for-performance concept to directors' compensation

The data indicate that on average only 3 percent of the firms surveyed in 1983 used stock as part of the compensation package offered to outside board members (Table 3.9). However, as Figure 3.6 shows the use of stock has increased dramatically. On average, 81 percent of the firms surveyed in 2000 included stock in their compensation packages. Manufacturing firms have been the largest users of stock compensation. However, the difference between non-financial firms and manufacturing firms has narrowed in recent years. Only 65 percent of the respondents in the financial sector used stock during 2000. The use of stock compensation has been reasonably stable during the last several years, but fell in all sectors between 1999 and 2000.

Stock payment practices and amounts vary by industry and firm size. In general, larger firms pay more in the form of stock, including stock and option grants as well as stock as the method of paying for basic annual compensation. Table 3.10 compares the use of stock payment methods between smaller firms, less than 500 million in sales, and larger firms, over 10 billion in sales. In general, smaller firms use more stock options

than larger firms. This may be because stock options enable smaller companies to give directors the opportunity to participate in investment appreciation. Growth opportunities may be greater for smaller firms. However, restricted stock grants and the payment of basic compensation in stock follow an opposite pattern. Larger firms use more restricted stock and stock payment than smaller firms.

Annual option grants are the most common. Some firms use one-time grants, others vary from several times per year to once every five or six years. Annual grants are also the most popular method when distributing restricted stock.

3.10 Other Benefits

Over 80 percent of the surveyed firms provide additional benefits for their outside directors. In general, larger firms tend to offer more benefits. Table 3.11 presents the percentage of firms offering various benefits. The most frequent benefit is directors' and officers' liability insurance. Roughly 83% of the surveyed firms on average offered this benefit over the 18 year survey period. Directors' and officers' (D&O) insurance protects directors from any legal liability that they might incur if they are sued as directors. The next most frequent benefit is deferred board compensation. On average, 50 percent of the responding firms offered a deferred compensation plan. How much and what kind of compensation may be deferred varies. Some firms allow board members to defer all annual compensation.

Table 3.11 shows that benefits have declined over the past several years. The fraction of firms offering retirement plans dropped from 37 percent in 1995 to 7 percent

in 2000. The big drop between 1995 and 1997 was in response to a recommendation of a Blue Ribbon Commission of the National Association of Corporate Directors (1995) and to the pressure from institutional shareholders.

3.11 Summary And Observations

This paper examines the evolution of outside director compensation by U. S. corporations over the last two decades. In general, inflation-adjusted outside director compensation has increased over the last 20 years. On average, annual growth in real compensation has been 1.7% per year. Among industries, manufacturing firms have generally paid more, as have larger firms, but growth has been largest for financials.

Most firms tend to use an annual retainer plus meeting fees as the basis for computing basic annual compensation. Per meeting fees are the most common method of compensation for committee services. Fees have stabilized in recent years.

The inclusion of equity-based compensation in the total compensation of outside directors has increased dramatically over the last 20 years. A small minority of firms began to use stock payments during the early 80's. Today, the use of equity-based compensation for outside directors is a common practice, especially amongst large corporations. The increased use of stock grants and stock options in outside director compensation begins to bring the interest of these two groups into closer alignment. The benefits of such alignment remain to be confirmed. However, it is worth mentioning that despite the generally widespread belief that there are positive benefits to tying pay to performance, some academics have begun to question the benefits of stock based compensation, particularly for under-diversified individuals (Hall and Murphy, 2002;

Meulbroke, 2001). Another form of concern centers on the objective that boards should pursue. One view on this issue is that shareholder interests should be primary while an alternative view holds that boards should pursue an objective of balancing the potentially competing interests of multiple stakeholders. The implementation of equity based compensation for outside directors clearly suggests that the shareholder primacy model has been embraced by many U.S. corporations despite the fact that this may not necessarily translate into firm value maximization.

CHAPTER 4. ESSAY 3: BOARD OF DIRECTORS' COMPENSATION AND THE INVESTMENT OPPORTUNITY SET

4.1 Introduction

Separation of ownership and control in a corporation makes it difficult for shareholders to directly monitor and evaluate managers' activities[35]. A duty of the corporate board, in principle, is to monitor and discipline managers in a manner designed to enhance shareholder interest. Thus, a board has a fiduciary duty to oversee managers and monitor their decision-making[36]. The Enron case clearly demonstrates how directors can make things worse rather than better through biased or ineffective selection, monitoring, and evaluation of management.

Several authors have asserted that outside (nonemployee) directors play a critical role in the governance of the modern corporation (Fama (1980), Fama and Jensen (1983), Weisbach (1988), Rosenstein and Wyatt (1990), Byrd and Hickman (1992), Brickley, Coles, and Terry (1994), Cotter, Shivdasani, and Zenner (1997), Dennis and Sarin (1999), and Brewer, Jackson, and Jagtiani (2000)). However, many observers hold the view that directors lean more toward appeasing the CEO than the shareholders (Westphal (1988), Agrawal and Knoeber (1996), Core, Holthausen, and Larcker (1999), Hallock and Oyer (1999), and Ofek and Yermack (2000)). This view comes in part from the observation of

[35] The complications associated with the separation of ownership and control date at least from Berle and Means (1932). Fama and Jensen (1983) present a more recent discussion of the issue.

[36] The fiduciary duty of the board is a formal part of the law governing modern corporations (Black(2001)).

disparities across boards in how they effectively monitor and discipline management. This essay asserts that cross-sectional disparities in board behavior depend upon the incentives board members themselves face. The study investigates one important element of the incentive structure, how outside board members are compensated.

Cordeiro, Veliyath, and Eramus (2000) assert the importance of board compensation saying, "Similar to top executive compensation, outside director compensation is arguably one of the most important incentive mechanisms that shape and direct director behavior on behalf of the stockholders." However, how much to pay and the payment methods needed to attract competitive directors and keep them working efficiently are not easily established since there is no best policy or "one-fit-for-all" policy that can be applied to different firms. The Business Roundtable (1997) for instance mentions, "The form of such compensation will vary from corporation to corporation and may depend on the circumstances of the directors that the board may be seeking to attract and retain."

The amount of outside director compensation varies by firm. Among the 200 largest US companies, for example, in 1999, Fleming paid $41,875 and Oracle Corporation paid $760,445, more than eighteen times that of Fleming. The forms of payment also vary. In 1998, Apple distributed stock options valued at $217,802 to each outside member of its board. It did not pay any retainer, meeting fees, or committee chair fees. On the other hand, Alcoa paid only a cash retainer of $85,000. General Motor

Corporation paid $84,500 per outside director in stock and cash, and utilized retainers and meeting fees[37].

Recently, several studies have examined the relation between cross-sectional differences in corporate policies and variation in firms' investment opportunities (Smith and Watts (1992), Gaver and Gaver (1993, 1995), Baber, Janakiraman, and Kang (1996), Blackwell, Farrell, and Wunsch (1997)). However, to my knowledge, no study has yet examined the relationship between board compensation and the investment opportunity set. In this essay, I examine outside directors' compensation policies and provide empirical evidence on the cross-sectional relation between firms' investment opportunities and their compensation practices.

This paper is important for two reasons. First, this is the first paper that examines the relationship between the investment opportunity set and BOD compensation. Second, this paper uses recent data including those of 1999. There have been dramatic changes in the governance environment faced by corporate boards and compensation practices among firms during the past decade. There has been a remarkable increase in the use of stock-based compensation among firms. The risk and pressure for board members has increased because of the growing threat of legal action. Hiring a director has become much harder due to the increasing role and risks faced by boards. Cordeiro, Veliyath, and Eramus (2000) argue, "The 1990s have seen an increased role of investor activism (in terms of pressuring boards) and accompanying lawsuits against directors." The

[37] See the proxy statement of Apple (1999), page3, Fleming (1999), page 8, Oracle (1999), page3, Alcoa (1999), page 5 and General Motor (1999), page iii and iv.
Source: http://www.sec.gov/

amendment of SEC Rule of 16b-3 allows much more flexibility in board compensation practices. Thus, studies examining earlier data may not reflect these recent changes.

Using board compensation data for the period 1996-1999, I find evidence that the variation in board compensation among firms can be explained by variation across firms in their investment opportunity sets. The result is consistent with the hypothesis that board compensation policy is designed to reduce agency costs. Firms with more investment opportunities pay more and rely on stock-based compensation more often than firms with fewer investment opportunities. The findings are consistent with prior studies on CEO compensation that report positive cross-sectional associations between investment opportunities and the use of incentive-based executive compensation.

The reminder of the paper is organized as follows. Section 2 discusses the variables that have been used as proxies for the investment opportunity set in literature and presents the four proxies used in this study. In section 3, I propose four testable hypotheses. Section 4 describes the sample and the empirical methods employed in the analysis. Section 5 analyzes the relationship between the investment opportunity set and company compensation policy for outside board members. The final section summarizes the results and discusses their implications.

4.2 The Selection Of Proxies For The Investment Opportunity Set

A. Difficulties In Measuring The IOS

Myers (1977) describes a firm's current market value, V, as the combination of the market value of assets in place, V_A, and the market value of future growth

opportunities, V_G. While the value of assets in place does not depend on future investment decisions, the value of a firm's growth opportunities depends on future discretionary investments. Since growth opportunities can be thought of as future investment options, they are valuable to the firm. Myers (1977) predicts that the larger the proportion of firm value represented by growth options, the lower the assets in place, the lower the firm's leverage, and the higher its equity to value ratio.

Smith and Watts (1992) argue that although many factors determining firm policies vary over time, they do not vary across firms. For example, various contracting technologies such as sinking funds, dividend covenants, or executive stock options are open to all firms. In addition, all firms have access to individuals with different risk preferences or personal tax rates, and have access to all types of potential security holders, managers, or customers. Thus, contracting technologies, personal tax provisions, or risk preferences should not explain the cross-sectional variation in corporate policies. However, firm-specific investments use specialized physical and human capital. Therefore, these firm-specific investments result in variation in the investment opportunity set and offer the potential to explain cross-sectional policy variation.

Skinner (1993) suggests that the costs and benefits of monitoring and motivating managers depend on the nature of a firm's investment opportunities. Different firms have different investment opportunities, thus they may choose different corporate policies. Therefore, the structure of management compensation arrangements should vary across firms as a function of the investment opportunity set.

The main difficulty in using the investment opportunity set (IOS) as a potential determinant of corporate policy comes from the fact that it is unobservable. Several

proxies for investment opportunities have been suggested. Smith and Watts (1992), for example, use the ratio of book value of assets to firm value (A/V) as a proxy for the IOS in their examination of the relations between the IOS and corporate policies. They argue the higher is A/V, the higher the ratio of assets in place to firm value, and the lower the ratio of investment opportunities to firm value. They point out the possible errors in using A/V as a proxy. "Since book value (A) is historical cost less depreciation, it contains potentially significant measurement error for firms with long-lived assets." In addition, Gaver and Gaver (1993) suggest A/V involves measurement error for highly levered firms since firm value (V) is measured as the market value of equity plus the book value of debt.

Smith and Watts tested the explanatory power of several alternative IOS measures including the ratio of depreciation to firm value, the ratio of research and development to firm value, the variance of the rate of return on the firm, the earnings to price ratio, and the ratio of capital expenditures to firm value. Their results were not insensitive to the specification of the IOS variable. For example, when they substituted the earnings to price ratio (E/P) for A/V, they found no significant association between E/P and compensation, bonus, and stock option payment.

Gaver and Gaver (1993) discuss the drawbacks associated with IOS proxies. For example, the earnings to price ratio does not work if firms have negative earnings. The ratio of market value of equity to book value of equity and the ratio measure a firm's growth opportunities as the difference between the firm's value and existing assets, but "a disadvantage of these measures is that they rely on stock price, and the inverse

relationship between financial leverage and stock price makes them sensitive to the capital structure of the firm."

R&D spending to sales or to total assets can be used as an alternative measure of the investment opportunity set. Skinner (1993) argues "The higher the outlays for R&D, the greater the investment made by the firm in creating new products and potential barriers to entry." However, he mentions the problem with using R&D that "R&D is only one example of the vast array of discretionary expenditures available to support growth options and is not relevant for firms in certain industries."

Gaver and Gaver (1993) conclude, "The investment opportunity set is inherently unobservable and is likely to be imperfectly measured by any single empirical proxy." In response, they use factor analysis to construct an index for the investment opportunity set from several IOS proxie. Their method has been adopted in several studies including Gaver and Gaver (1995), Baber *et al* (1996), Jaggi and Gul (1999), and Hossain *et al* (2000). I also construct IOS indices using factor analysis in addition to examining the explanatory power of individual measures.

Baber *et al* (1996) compare their investment opportunity set proxies to those of Gaver and Gaver (1993) and find that their proxies are simpler and work better. I chose investment opportunity set proxies that can be easily interpreted and computed using readily available data. To maximize sample size and minimize sample bias, I prefer a relatively small set of investment opportunity set variables. Based on Baber *et al*'s (1996) results, I chose four price-based proxies including prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets

to book value of assets (MKTBKASS). Details on the construction of these measures are presented in section 4.4.

B. Reliability Of IOS Proxies

Recently, Kallapur and Trombley (1999) examined the association between investment opportunity set proxies and realized growth. They assume that investment opportunities lead to actual investment and therefore affect realized growth within a three to five-year period. They group the investment opportunity set proxies used in the literature into three categories: price-based proxies, investment-based proxies, and variance measures. Types of price-based proxies are market to book value of equity, book to market value of assets, Tobin's Q, the earnings to price ratio, ratio of property, plant, equipment to firm value, and ratio of depreciation to firm value. They argue "If growth prospects of the firm are at least partially impounded in stock prices, then growth firms will have higher market values relative to assets in place." Investment-based proxies are based on the idea that " a high level of investment activity is positively related to the investment opportunity set of the firm. R&D is itself an investment, and is also expected to create further investment opportunities for firms." The proxies in this second group are the ratio of R&D to assets, to sales, and to firm value, and the ratio of capital expenditures to value. Since real options become more valuable as the variability of the returns on the underlying asset increases, Kallapur and Trombley (1999) include the variance of returns and asset betas in the variance measurement group.

Kallapur and Trombley (1999) find that price-based proxies including market to book value of equity, book to market value of assets, Tobin's Q, the ratio of property,

plant, and equipment to firm value, and the ratio of depreciation to firm value are the most highly correlated with future growth. They argue the finding is important because the results suggest that simpler proxies perform just as well as the more difficult-to-calculate Tobin's Q.

Contrary to the common use of earnings to price ratios, Kallapur and Trombley argue the earnings to price ratio is not a good growth proxy. Among investment-based proxies, R&D spending is weakly and inconsistently correlated with realized growth while capital spending is correlated with future growth. The variance measurement group does not show any significant relation with realized growth.

4.3 Economic Hypotheses

Lewellen, Loderer and Martin (1987) present empirical evidence on whether firm differences in senior manager pay-package-design may in part be explained by attempts to solve manager-shareholder agency problems. They argue that if managerial performance is easy to measure, an acceptable compensation contract is just finding an optimal allocation of risk sharing between owners and managers. Such measurements are both difficult and expensive, however, the choice of the form in which executives are to be compensated becomes a potentially important issue for shareholders. Since compensation arrangements are diverse in practice, they hypothesize that the diversities are the answers to different aspects of owner-manager conflicts of interests.

Smith and Watts (1992) present empirical evidence of the diversity of CEO compensation between growth firms and non-growth firms. They find firms with more growth options are associated with higher executive compensation. They argue the

marginal product of investment decision makers is greater than that of supervisors and good decision makers are less numerous than good supervisors. Thus, the larger the proportion of a firm's value represented by growth options, the greater the decision-making manager's compensation.

Managers have private information about the value of their companies' future projects (Bizjak, Brickley, and Coles (1993)). In a growth firm, it is more difficult to observe managerial effort (Smith and Watts (1992)). Thus, the agency costs of shareholder-manager conflicts in a growth firm are higher due to the greater potential for managerial opportunism and the difficulty in observing the managers' actions. The difference in agency costs results in different compensation contracts between growth firms and non-growth firms. If managerial actions are less observable in growth firms, it will be harder for boards to monitor managers to ensure that they are working in the best interests of shareholders. In conclusion, Hypothesis 1 emerges.

H 1. Outside directors of growth firms will receive more compensation than boards of non-growth companies.

Equity based compensation, as part of the total compensation package for outside board members, has become common among many firms. If managers' actions are less observable for a firm that has more investment opportunities, then equity based incentive compensation for managers is more likely to be observed. Skinner (1993) argues that stock-based incentive plans are likely to be more prevalent in growth firms since these plans achieve the incentive-alignment benefits without incurring the measurement costs

associated with accounting based plans. Smith and Watts (1992) show that CEO's of growth firms are more likely to receive incentive compensation than those of non-growth firms. Clinch (1991) and Gaver and Gaver (1993) show the CEO compensation contracts of growth firms are more likely to include stock option plans than those of non-growth firms.

A recent survey by Pearl Meyer & Partners' on Director Compensation (1999) shows more than 98% of the largest U.S. industrial and service companies used some form of equity based outside director compensation during 1999. Overall, the evidence on whether outside directors enhance firm value is mixed (John and Senbet, 1998; Hermalin and Weisbach, 2000). Perry (1999) argues that having outside board members involves direct costs (compensation) and indirect costs of ownership and control, what he calls secondary agency costs. The costs arising from the separation of ownership and control are referred to herein as primary agency costs, and the costs from the agency relation between directors and shareholders are referred to herein as 'secondary agency costs', or 'cascading agency costs'. Since the CEO may influence board selection (Hermalin and Weisbach (1998)), the existence of outside directors does not guarantee the directors will work in the best interests of shareholders. The problem will be severe in firms with more growth opportunities (thus, more decision-making) than firms with fewer growth opportunities. Therefore, I expect incentive compensation contracts for outside directors will more likely be used by growth firms, ensuring that boards work in shareholders' best interests. The second hypothesis tested is

H 2. Growth firms pay a larger proportion of their boards' total compensation in stock compared to non-growth firms.

The second hypothesis leads naturally to the following corollary.

C1. Growth firms pay a smaller proportion of boards' total compensation in the form of a fixed salary as compared to those of non-growth firms.

In growth firms, more growth opportunities require more decision-making by boards. Choosing the best out of many alternative strategies and investment choices requires board preparation and careful evaluation. Thus, not only attendance of board meetings, but also the contribution of board members at committee meetings is very important. Therefore, growth firms will provide greater incentives for meeting attendance. This leads to the following hypothesis.

H 3. The boards of growth firms derive a larger proportion of their total compensation from board and committee meeting fees compared to those in non-growth firms.

4.4 Sample And Empirical Methods

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Each

year, some companies are added to the sample and others are dropped from the list[38]. The number of companies that remain in the sample for the entire four years is equal to 151, 33 remain for three years, 29 for two years and 29 for one. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Director compensation data are obtained from the annual proxy statements of the sample companies. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 company observations for the years 1996, 1997, 1998, and 1999, respectively.

4.4.1 Outside Director Compensation Data

Table 4.1 presents compensation statistics for the sample. The components of pay for outside directors include cash retainers, fees and equity-based awards including stock grants, stock options, restricted stock, and deferred stock. Sometimes retainers and fees are paid in stock.

A retainer is an annual amount which may be paid in installments during the year, is paid for regular board service, but is not directly linked to attendance at board meetings or to service on committees or committee meeting attendance. A portion of the retainer is sometimes paid in stock but is most often paid in cash. Fees are payments for attendance at scheduled board or committee meetings. The committee retainer is the payment to

[38] The list of firms was taken from an annual survey of compensation practices prepared by Pearl Meyer & Partners Co. to whom I am grateful for supplying me with these reports, the underlying data and permission to utilize the data in this study.

regular board members who serve on committees of the board. Not all board members serve on committees, and committee service is generally compensated separately. A separate retainer may be paid for committee service, as well as per-meeting fees. A retainer and/or fees are paid for serving as a committee chair. Incentive compensation is equity-based. Restricted stock is the grant of shares or units subject to restrictions on sale or transfer unless "earned out" over a stipulated period of employment. Stock options are a right to purchase employer stock at (usually) a fixed price for a fixed term. Deferred stock is any award made in stock, but not paid until termination or retirement. The payment at termination or retirement might be in a lump sum or might be spread over several annual installments. In addition, there are other types of awards such as stock appreciation rights and other benefits such as a pension, retirement plan, insurance, matching donation, charitable plan, and free or discounted company products or services.

Outside director compensation is calculated as follows:[39]

1. Each director serves on the board for the entire year and attends all board meetings.
2. Each board meets ten times per year.
3. Each director serves on two committees.
4. Each director serves as the chair of one committee.
5. Each committee meets five times per year.
6. There are no board or committee telephone meetings for which a director is compensated.

[39] The specification of outside director compensation is closest to the method employed by Pearl Meyer & Partners in their annual report on director compensation. One important exception is the valuation of option awards. A modified Black Scholes model is employed in this study, while Pearl Meyer & Partners approximate option value as one-third of grant value (1/3 x Number of options x Exercise price). Later I test the sensitivity of the results to the option valuation assumption.

7. There are no "actions taken by unanimous written consent" for which a director is compensated.

8. One-time equity grants are annualized over five years.

9. Stock options are valued based on the Black Scholes model adjusted for dividends.[40]

10. Estimated annual value of the stream of retirement payments is the average of the present values of the annuities to be purchased over the next ten years that would pay a

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[40]Pearl Meyer & Partners Co. uses stock option compensation valued as one-third of the grant value (number of share times option exercise prices). For this study, I use the value of stock option compensation based on the Black-Scholes (1973) option valuation formula modified to incorporate continuous dividend payments by Merton (1973), which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation."

$C_{BS} = Se^{-DT} N(d_1) - Xe^{-rT} N(d_2)$

$$d_1 = \frac{\ln(S / X) + (r - D + \frac{\sigma^2}{2})T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

where,

S is the fair market value of the underlying stock on the date of grant.
X is the exercise price on the option. Note that for all observations in the sample, S = X.
r is the riskfree interest rate.
T is the time to maturity.
σ^2 is the annualized variance of daily returns on the stock.
D is the annualized dividend yield on the stock.
$N(.)$ is the cumulative probability function of the standard normal distribution.

1. For a company in the sample, the number of stock option grants and other stock awards information for outside directors is obtained from the company's proxy statement. The actual numbers of stock options are underestimated since companies usually grant additional stock options to those newly elected directors.
2. Usually companies set the exercise price of stock grants as the market stock price on the grant date. Either from the proxy statement or CRSP, I collected the exercise prices of stock option grants.
3. Interest rates are collected from the 10-year Treasury bond rates at the FRB web site (http://www.federalreserve.gov/releases/h15/data.htm). I use business day rates to match the grant dates for different companies.
4. Generally the period of daily closing stock price to get a firm's stock volatility is the most recent 90 to 180days (See Jarrow and Rudd (1983), Hull (1998)) since the volatility of a specific stock changes over time and old data do not have strong predicting power. I use most recent 5-months daily closing stock prices from the grant date. Most of the sample firms have between 102 to 104 trading days over the most recent 5-months period.
5. The annualized dividend yield is obtained from the previous year dividend payments on the grant date.
6. Most of the sample firms have 10 years time to maturity for the option grants.

retirement benefit (assuming no adjustment for inflation) each year for ten years (assumed years of service) after retirement until death.

11. Restricted stock is valued at the prevailing market price of the stock at the time of the grant.

The sample firms paid on average $87,875, $106,193, $133,076 and $178,898 in nominal terms per outside director for the years 1996, 1997, 1998, and 1999, respectively. Over the sample period, boards received 27% per year increases, on average. Most of the pay-raise came from stock awards. The retainer payments including cash and stock increased from $34,031 in 1996 to $42,474 in 1999. However, most of the payment change came from stock retainer payments. The cash retainer payments were $28,022 in 1996 and $29,731 in 1999. The stock retainer payments were $6,010 in 1996 and $12,743 in 1999, a 212% increase over the period. The meeting fees have changed little. The average meeting fees were $24,807 in 1996 and $24,115 in 1999. Stock awards have increased dramatically over the four-year period, averaging 57% per year. The amounts of stock awards, $29,037 in 1996, increased to $112,309 in 1999. The amount of stock pay including stock awards and stock pay as part of retainers, $35,047 in 1996, increased to $125,052 in 1999.

Total compensation amounts vary across firms. In 1996, the total compensation of directors in the highest paying firm was ten times more than those of directors in the lowest paying firm. In 1999, the gap increased to 73 times. Almost every firm pays a retainer. However, some firms do not pay meeting fees. For example, 26 percent, or 46 firms, did not pay meeting fees in 1999. Among firms that paid meeting fees in 1999, the

amounts ranged from $500 to $5,000 per meeting. In 1996, 85 percent of the sample firms used stock pay. In 1999, 94 percent of the firms paid stock as part of the boards' compensation. Out of 176 firms in 1999, 60 firms used stock grants, 99 used stock options, 48 used restricted stock, 54 used deferred stock, and 69 used stock deferred to retirement. Among the firms using stock awards, 55 firms used only one type of stock award and the remaining 110 firms used two or more types of stock awards.

4.4.2 Investment Opportunity Set Variables And Measurement

I adopt and use four price-based proxies for the investment opportunity set based upon the results presented by Baber *et al* (1996)[41]. The first proxy is a measure of investment activity. Investment intensity (INVINT) is the ratio of the sum of capital expenditures, R&D expense, and acquisitions divided by depreciation expense. I include data for three years in an attempt to avoid aberrations.

1. INVINT $_t$ = the ratio of the sum of year *t-2* to *t* capital expenditure, R&D expenses, and acquisitions to the sum of year *t-2* to *t* depreciation expenses

$$= \frac{\sum_{i=t-2}^{t} \left[Capital\ Expenditure\ (\#30) + R\ \&\ D\ (\#46) + Acquisitions\ (\#129) \right]_i}{\sum_{i=t-2}^{t} Depreciation(\#14)}$$

[41] Barber et al (1996) start with 16 candidate variables as proxies for investment opportunities including various measures of market-to-book assets, market-to-book equity, Tobin's Q, E/P, R&D/assets, RSD/sales, net property, plant, and equipment/market value of assets, variance of return on total market value, investment/revenue, and the variability of earnings per share. Then, they test the predictive ability of these variables and factor scores based on subsets of these variables using eleven-year estimation period. Based on the test, they identify the most parsimonious set of variables (INVINT, MVAGR, MKTBKASS, R&D) yielding the factor scores that best predict investment intensity.

The numbers in parenthesis are COMPUSTAT data item numbers. The idea behind this measure is that if depreciation expenses approximate the investment required to sustain existing assets, INVINT that is greater than unity means that long-term investment exceeds the investment required to sustain existing assets. Baber *et al* (1996), however, point out the potential limitations of this measure. If a firm uses straight-line depreciation methods, current depreciation expenses computed using historical costs may underestimate the actual investment required to maintain existing assets. In addition, a stable firm, or even a contracting firm may have INVINT greater than unity if the firm uses R&D expenses that are not related to depreciation. Although there are limits to the use of INVINT to measure a firm's investment intensity, the problem may not be severe because most firms use accelerated depreciation methods.

The second IOS variable is the geometric mean annual growth rate of market value of assets (MVAGR).

2. $MVAGR_t$ (Geometric mean annual growth rate of market value of assets)

   = the squared root of the ratio of market value of assets at time *t* to the maximum year of the market value of assets for the time *t-3* to *t-1*.

$$= \left[\frac{Market\ Value\ of\ Assets\ (\#6 - \#60 + \#199 \times \#25)_t}{Market\ Value\ of\ Assets\ (\#6 - \#60 + \#199 \times \#25)_{t-n}} \right]^{\frac{1}{n}},$$

   where n = max(1,2,3), for which data is available. For example, if market values of assets at time t-1to t-3 are available, I use the market values of assets at time t-3 as a numerator to calculate MVAGR. If market values of assets at time t-1and t-2 are available, I use the t-2 value as a numerator to get MVAGR.

The third variable is the ratio of R&D expenditures to total assets (RD).

3. RD_t (R&D expenditure to total assets) = R&D expense $_t$ / Book value of total assets$_t$

$$= \frac{R\ \&\ D\ (\#46)_t}{Book\ Value\ of\ Assets\ (\#6)_t}$$

The ratio of market value of assets to book value of assets (MKTBKASS) is the last proxy used for the investment opportunity set.

4. MKTBKASS $_t$ = Market value of assets $_t$ / Book value of assets $_t$

$$= \frac{Market\ Value\ of\ Assets\ (\#6 - \#60 + \#199 \times \#25)_t}{Book\ Value\ of\ Assets\ (\#6)_t}$$

Market value of assets includes the book value of liabilities and preferred stock plus the market value of common stock.

Descriptive statistics for the investment opportunity set proxies are presented in Table 4.2. The number of observations differs across investment opportunity set variables and by year due to missing data. The actual calculations of these variables are based on year *t-1*[42]. All the investment opportunity set variables have increased over the sample period. For example, the 1996 sample has INVINT value of 2.5 and the 1999

[42] Barber *et al* (1996) use year t-1, rather than year t, data to compute IOS factor scores to mitigate spurious relations that can result from using contemporaneous data.

sample has 2.8 INVINT on average. MVAGR ranged from 1.13 (year 1996) to 1.24 (year 1999).

Table 4.3 presents correlations among the investment opportunity set variables. INVINT, MVAGR, RD, and MKTBKASS are all expected to be positively related to growth opportunities. Thus, all the four measures should be positively correlated with each other. The results support these predictions. All correlations among the four variables are positive and generally statistically significant in each sample year and for the pooled across years sample.

However, the results show that not all the correlations are tremendously 'large'. The largest correlation in 1999 is 0.52 between MKTBKASS and MVAGR, followed by 0.49 between MKTBKASS and RD. Gaver and Gaver (1993, 1995) explain that the low correlations amongst IOS proxies might be due to the fact that each variable has some unique limitation as a measure of the investment opportunity set. To address this issue, I compute an IOS index using standard common factor analysis (Gaver and Gaver (1993, 1995), Barber *et al* (1996), Gul and Jaggi (1999), Hossain *et al* (2000)). From the correlation table, I expect to observe one or two significant common factors.

A common factor is an unobservable, hypothetical variable that contributes to the variance of two or more observed variables. The basic factor analysis model can be expressed in the form:

$$z_j = a_{j1}F_1 + a_{j2}F_2 + \ldots\ldots + a_{jm}F_m + d_jU_j \qquad (j = 1,2,\ldots\ldots n).$$

where each of the n observed variables is described linearly in terms of m common factors and one unique factor and z_j is the value of the observed variable.[43] The common factors account for the correlations among the variables, while the unique factor accounts for the remaining variance of the variable.

Using common factor analysis, I can decompose each individual investment opportunity set measure (INVINT, MVAGR, RD, and MKTBKASS) into common factor(s) and a 'unique factor' that is unique to the specific measure and is not related to the true investment opportunity set unobservable.

Table 4.4 presents some of the factor analysis results for each year of the sample period. Panel A provides the starting communalities of the individual measures of the investment opportunity set. The jth communality is the portion of the variance of the jth variable contributed by the mth common factor. The first communality can be thought of as the squared multiple correlation of each measure with respect to the other investment opportunity set measures. Thus, total variance is communality plus specific variance. Each year, MKTBKASS has the highest prior communality value reflecting that the variance of MKTBKASS is contributed most by common factor(s).

Panel B of each yearly section lists the eigenvalues of the reduced correlation matrix for the four individual measures of the investment opportunity set. Harman (1967) and Cattrell (1966) suggest that the number of factors needed to approximate the original correlations among the individual measures is equal to the number of summed eigenvalues needed to exceeds the sum of the communalities. In the case of IOS, the first

[43] 'The essential purpose of 'factor analysis is to describe, if possible, the covariance relationships among many variables in terms of a few underlying, but unobservable, random quantities called *factor*' (Johnson and Wichern (1998)).

eigenvalue alone in each year exceeds the sum of the four communalities. Thus, each year, one common factor parsimoniously explains the inter-correlations among the individual measures. In addition, the Scree test (Cattrell, 1966)[44] for each year confirms the 'one meaningful factor' criteria (See Figure 4.1 to 4.5). The correlations between this single principal factor and the four underlying variables in each year are always positive and significant (see Panel C in Table 4.4). The consistently positive correlation results suggest that the common factor captures the underlying construct that is common to the four measures of the investment opportunity set. However, among the four investment opportunity set measures, MKTBKASS is the most strongly related to the common factor. For each year and for the pooled sample, factor scores[45] are calculated and used to divide the sample into growth firms and non-growth firms. Table 4.5 compares the characteristics of low factor -score firms (denoted as low-IOS firms) and high factor-score firms (denoted as high-IOS firms).

The average total assets and sales for low-IOS firms are higher than those of high-IOS firms for each year except 1999. This confirms the general expectation that high growth firms tend to be smaller. However, the t-test for mean equivalence generally does not reject the null of equality of means between the two groups. Although accounting based comparisons do not provide statistically significant results, the market-based comparison shows that a significant difference exists between the high and low-IOS

[44] The Scree test plots the eigenvalues associated with each component and looks for a "break" between the components with relatively large eigenvalues and those with small eigenvalues.

[45] Factor scores are the estimated values of the unobservable common factor. In SAS, the FACTOR procedure generates an output data set that contains factor-scoring coefficients. Factor scores are obtained by multiplying this dataset and the other dataset that contains raw data (the four investment opportunity set measures in this study). [See SAS/STAT User Guide Version 8, Vol. 3, 3063-3084.]

groups. The ratios of market-to-book-value of equity (Mktbkeq) for the high-IOS firms are much higher in every year compared to those for low-IOS firms. Overall, the ratio for high-IOS firms is more than twice that of low-IOS firms. Return on assets (ROA) values for high-IOS firms are also much higher compared to that of low-IOS firms in every year. In general, the market-based comparison measures support the general expectation.

4.5 Empirical Results

The propositions to be tested are:

H1. BOD of growth firms will ask for more compensation than boards of non-growth companies.

H2. Growth firms pay a larger proportion of their boards' total compensation in stock compared to non-growth firms.

C1. Growth firms pay a smaller proportion of boards' total compensation as fixed-form compared to those of non-growth firms.

H3. The boards of growth firms derive a larger proportion of their total compensation from board and committee meeting fees compared to those in non-growth firms.

4.5.1 Univariate Correlations

I construct the following compensation policy variables. Total compensation (Proposition 1) is the sum of retainers, meeting fees, chair/committee retainers, and total stock awards. The proportion of stock-based compensation (Proposition 2) is the relative size of the total stock award and stock retainer payments to total compensation. The fixed-form proportion (Corollary 1) is the relative size of the sum of the cash retainers

and meeting fees for committees and boards, fees for chair duties, and retainers for any committee or board membership to total compensation. Meeting fees consist of meeting fees for committees and boards. The relative size of this amount (Proposition 3) to total compensation is the meeting fees compensation ratio.

Table 4.6 presents correlations among the board compensation variables and the IOS factor scores. To reduce the high degree of skewness in the total compensation variable, I use a logarithmic transformation of total compensation.[46] The correlation results provide several observations. Every year, the correlation between the investment opportunity set factor score and total compensation is significant and positive. This suggests that growth firms pay more to their directors. The correlation coefficient values increase in later years. This finding supports proposition 1.

The positive and significant correlations between the stock-pay ratio and the investment opportunity set factor score provide evidence that growth firms rely more on stock compensation than non-growth firms (The coefficients are marginally significant in years 1996 and 1997. The *p*-values are 0.078 and 0.063 respectively). This finding provides support for proposition 2. Again, the strength of the relation increases in later years. The correlations between stock-awards compensation (the relative size of the total stock awards --total stock-based compensation minus stock pay in retainers--to total compensation) and the investment opportunity set score provide similar evidence.

The negative signs on the correlations between fixed-form compensation and the investment opportunity set factor score support corollary 1 that growth firms pay a smaller proportion of outside director total compensation as a fixed component compared

[46] Results based upon the untransformed data are discussed in section 4.5.3.

to non-growth firms. The correlation between the cash compensation in retainers (the relative size of the cash retainer --total fixed compensation minus board meeting fees and committee/chair fees and retainers--to total compensation) and the investment opportunity set score is not significant until 1998. However, 1999 and the pooled sample results show significant correlations in support of corollary 1.

I do not find any evidence favoring the last proposition from the correlation analysis. In fact, the results are contrary to expectation. The signs are all negative and statistically significant (1996 and 1997 correlations are not significant, though). One interpretation of the negative correlations may be the recent changes in the governance environment: shareholders are watching board activities more intensely and in some cases shareholders are even suing boards for the wrong decisions. If boards consider attending meetings as a must, the meeting fees may not provide any incentives. The growth firms may even reduce the proportion of total compensation paid as a meeting fee and increase other incentive oriented parts of compensation such as stock awards and/or stock retainer pay.

4.5.2 Multiple Regression Results

Table 4.7 presents regression results in which the board compensation variables are regressed on the investment opportunity set factor score and a control variable for firm size. The control variable for firm size is measured as the logarithm of total assets (LogAssets).[47] Ordinary least squares is used to estimate the parameters of the

[47] Total assets are measured as of the fiscal year-end prior to the sample year. The data are from COMPUSTAT and Moody's Manuals.

regression models for each year. Standard errors are computed to account for heteroskedasticity whenever the White test rejects the null of homoskedasticity at the 0.05 level.[48] The regression models in each year are listed below.

Model 1 regresses the logarithm of total compensation on the IOS score and the log of total assets.

Model 2 regresses the stock-pay ratio on the IOS score and the log of total assets.

Model 3 regresses the fixed ratio on the IOS score and the log of total assets.

Model 4 regresses the meeting fee ratio on the IOS score and the log of total assets.

The first column in Table 4.7 indicates the compensation variables by year. The second to fourth columns present estimates of the intercept and coefficients for the independent variables, and the fifth and sixth columns present adjusted R-squared values and associated F-statistics for each model. The coefficient on the IOS score is significantly positive in each year for model 1. The coefficient in year 1996 is 0.066 and increases to 0.127 in year 1999. The results provide evidence that boards of growth firms are paid more than their non-growth counterparts. This results support the hypothesis that boards of growth firms are paid more because the monitoring efforts and risk borne by directors of growth firms is higher than is required by directors of non-growth firms. The evidence is consistent with CEO compensation studies (Smith and Watts (1992), and Gaver and Gaver (1993, 1995)).

[48] See White, H, 1980, A heteroscedasticity consistent covariance matrix estimator and a direct test of heteroscedasticity, *Econometrica* 48, 817-838.

The coefficients on the IOS score are significantly positive for model 2 (The coefficients are marginally significant in year 1996 and 1997. The *p*-values are 0.070 and 0.051 respectively). The boards of growth firms derive a larger proportion of their pay from stock-based compensation. The fact that the coefficients on the IOS factor grow in later years suggests that the relation has intensified over time. The results support the second proposition, growth firms utilize more incentive-based compensation than non-growth firms. Since monitoring the activities of managers in growth firms is more difficult and involves greater risk for directors, incentive-based compensation is needed to induce boards to act in the owner's interest. The regressions of the stock-award ratio (the relative size of the total stock awards --total stock-based compensation minus stock pay in retainers--to total compensation) on the IOS score and the log of total assets also provide very similar results (see Table 4.7). The coefficient on the IOS score is significantly positive in each year and the coefficient values increase in later years.

The estimated coefficients on the IOS variable are significantly negative for model 3 (The coefficients are marginally significant in year 1996 and 1997. The *p*-values are 0.070 and 0.051 respectively). Thus, the results provide evidence in support of the corollary 1. As growth opportunities increase, boards derive a smaller proportion of their pay from a fixed salary.[49]

The last model does not support hypothesis 3. The signs of the IOS coefficient are negative in each year and statistically significant in later years. This suggests that the

[49] The regressions of the retainer-cash ratio (the relative size of the cash in retainers --total fixed-form compensation minus board meeting fees and committee/chair fees and retainers --to total compensation) on the IOS score and the log of total assets also provide very similar results (see Table 4.7). However, the coefficient of the IOS score is marginally significant in 1998 and significant in 1999 and the pooled sample.

proportion of meeting fees in total compensation is decreasing with increasing growth opportunities. The result may reflect the fact that boards are regularly attending meetings without any direct monetary incentives to do so. Further, since the emphasis on stock-based compensation has increased in high IOS firms, the relative size of meeting fees has decreased. The negative coefficient for the size variable indicates that smaller firms are more likely to rely on meeting fees than larger firms. In sum, the last model indicates that meeting fees are equivalent to a fixed compensation factor and behave like retainers. In general, the board compensation regression results support the first three propositions.

4.5.3 Alternative Analyses

Several alternative analyses confirm that the results presented in Tables 4.6 and 4.7 are robust. First, total sales is substituted as a control variable for size. The results are very similar to those presented in Tables 4.6 and 4.7. The regression results are provided in Appendix A, Table A4.1. The coefficient on the IOS score is significantly positive in each year for model 1. The coefficients on the IOS score are significantly positive for model 2 and significantly negative for model 3 in each year except in 1996. The coefficients on the IOS score are negative in each year and significant in later years for model 4.

Second, compensation levels are substituted as the dependent variables in the regressions. The results are provided in Appendix B, Tables B4.1 and B4.2. The results are similar to the previous findings except some of the signs of the coefficients on fixed level become positive in early years and pooled one. However, the coefficients are not

statistically significant in any sample year. The coefficient signs for meeting fee remain negative without showing any significance in any year except pooled one.

Third, year *t* instead of *t-1* financial data are used to construct all variables. Again, the results remain similar to those that use year t-1 data (see Appendix C, Tables C4.1 to C4.6). In Appendix D, total sales at t is substituted a control variable for size at t. Again, the results are largely insensitive to the substitution. In Appendix E, compensation levels are substituted as the dependent variables in the regressions. The results of these alternative tests are very similar to the results with *t-1* financial data (see Appendix D, Table D4.1 and Appendix E, Tables E4.1).

Compensation variables are also constructed based on Pearl Meyer & Partners Co. assumption that stock options can be valued as one-third of grant value (1/3 x number of shares x option exercise price). Appendix F uses the compensation variables and *t-1* financial data for IOS variables. Appendix G uses compensation levels. Appendix H uses year *t* financial data. Appendix I uses one of the IOS measures, INVINT as the ratio of capital expenditure to depreciation. All the results are very similar to those presented in Tables 4.1 to 4.7 (See Appendix F, Tables F4.1 to F4.7, Appendix G, Tables G4.1, Appendix H, Tables H4.1 to H4.8, and Appendix I, Table I4.1)

Finally, the IOS factor score variable was recalculated using different IOS variables and different sampling methods. Five investment opportunity proxies were utilized: market value to book value of assets (MKTBKASS), market value to book value of equity (MVEBVE), market value of assets to book value of property, plant, and equipment (MVAPPE), the earnings to price ratio (EP), and the change in firm assets (CASSET). The sample consists of the largest two hundred US companies over the

period 1996-1999. Each year, some companies are added to the sample and others are dropped from the list. If a company was among the largest 200 US firms at least once over the four-year period, it is included in the initial sample. If a company appeared more than once during the four-year period, I select the most recent year and collect information for that year. The revised selection process yielded 191 companies. The compensation variables are constructed using Pearl Meyer & Partners Co. data. Tables in Appendix J (see Appendix J, Tables J4.1 to J4.3) provide the primary results of the analysis using these 191 cases. Again, the results from these analyses are consistent with those presented in Tables 4.6 and 4.7. The correlation table and regression results show a positive and significant relation between the IOS factor score and total compensation, and factor score and stock awards. Retainers show a negative and significant relation with the IOS factor score. The results continue to support the first three propositions. However, meeting fees are negatively related to investment opportunities and the estimated coefficients are significantly different from zero.

In sum, all the alternative tests prove the robustness of the findings presented in Table 4.7.

4.6 Conclusion And Future Research

4.6.1 Conclusion

In this chapter, I examine the relation between outside director compensation and firm investment opportunities. Using a sample of publicly traded corporations from 1996 to 1999, I find that the variation of board compensation among firms can be explained by

investment opportunity sets. The main findings are that firms with more investment opportunities pay a higher level of compensation to their directors than firms with fewer investment opportunities. In addition to paying more total compensation, firms with abundant investment opportunities compensate directors more heavily with stock-based rather than with cash compensation.

The findings are consistent with prior CEO compensation studies that report positive cross-sectional associations between investment opportunities and the use of incentive-based compensations (Smith and Watts (1992), Gaver and Gaver (1993, 1995), Angbazo and Narayanan (1997) among others). This study is the first to examine the determinants of outside director compensation over a multi-year sample period. I find the positive relation between investment opportunities and the use of incentive-based compensations is getting stronger in later years. I conclude that payment practices for outside directors have shifted more toward incentive-based compensation, and in particular the use of equity-based compensation. This finding is consistent with the intention being to motivate directors to act in the interests of shareholders where the costs of monitoring is higher due to the higher manager-shareholder information asymmetry.

4.6.2 Future Research

A significant change in SEC Rule 16b-3 occurred in 1996 (proposed in 1994).

"New Rule 16b-3 exempts from short-swing profit recovery any acquisitions and dispositions of issuer equity securities (including those that occur upon the exercise or conversion of a derivative security, whether in- or out-of-the-money) between an officer or director and the issuer, subject to simplified conditions. A transaction with an employee benefit plan sponsored by the issuer will be treated the same as a transaction with the issuer. However, unlike the current rule, a transaction need not be pursuant to an employee benefit plan or any compensatory program to be exempt, nor need it

specifically have a compensatory element. A transaction will be exempt if it satisfies the appropriate conditions set forth among four alternative categories: Tax-Conditioned and Related Plans; Discretionary Transactions; Grants, Awards and Other Acquisitions from the Issuer; and Dispositions to the Issuer. New Rule 16b-3 eliminates many of the conditions of current Rule 16b-3, such as general written plan conditions, the prohibition against transfer of derivative securities, shareholder approval as a general condition for plan exemption, the six-month holding period as a general condition for the exemption of grant and award transactions, the disinterested administration or formula plan requirements regarding grant transactions, and the window period requirement for fund-switching transactions and stock appreciation right exercises.[50]"

Now, boards have more flexibility in determining the amount, mix, type of equity, and the timing of its grant and delivery. They can customize their own pay dependent on individual member's financial needs. Examining the effects of this public policy on compensation practices, on the market reaction of adoption, and on the adoptive firms' board performance will help us to further understand the determinants of outside director compensation.

[50] See SEC Release Nos. 34-37260; 35-26524; IC-21997; File No. S7-21-94, or SEC web: http://www.sec.gov/rules/final/37260a.txt

CHAPTER 5. DISSERTATION SUMMARY

This dissertation explores board of director compensation. In the modern corporation, the board of directors is in principle the ultimate decision making body. Although there have been numerous studies on boards of directors, board member compensation has received little attention in the academic literature.

The dissertation consists of three essays focusing on boards of directors in the modern corporation, the evolution of board compensation over time, and the variation of compensation across firms. The first essay (Chapter 2) presents a review of the literature on boards. Previous surveys have either omitted discussion of the academic management and legal literatures (Hermalin and Weisbach (2000)) or are dated (John and Senbet (1998)). The first essay (Chapter 2) includes a discussion of research on *boards of directors* that have appeared in the economics, finance, management and the law. In addition, the survey updates John and Senbet's survey by including recent studies on corporate directors. The discussion focuses on three major topics which jointly span the questions examined in the extant literature: 1) The relationship between the board and firm performance, 2) The relationship between the board and the CEO, and 3) The board itself. Although many studies have increased our understanding of boards of directors, there are still many unresolved issues, the most prominent being the relation between characteristics of the board and company performance or value.

The second essay (Chapter 3) examines the evolution of board compensation over the period 1979-2000. This essay provides answers to questions such as how firms have paid their board members, how have pay practices changed and what are the recent trends

in director compensation practices. Directors receive retainers and fees for board and committee services. In addition, they receive other benefits such as D&O liability insurance, retirement plans, deferred compensation and discounted company products or services. Using yearly 'Corporate Directors' Compensation' data published by the *Conference Board*, I provide evidence that, overall, outside director compensation has increased 1.7% per year after adjusting for inflation over the last 20 years. Among three industry sectors (manufacturing, financial, and non-financial services), the manufacturing sector has consistently paid more compensation to outside directors than either the financial or non-financial services sector. Firm size and industry sector are the main determinants of cross-sectional variation in aggregate board compensation.

One of the most prominent trends in director compensation practices is the use of equity-based compensation. The compensation data examined show that only 3 percent of firms used stock compensation in 1983. However, more than 80 percent used equity-based compensation in 2000 and many firms paid more than half of outside director total compensation in the form of stock or stock and option grants. The current practice of using stock-based compensation suggests that many companies support the view that maximizing shareholder wealth dominates the competing view of balancing the interests of multiple stakeholders.

In addition, many firms provide other benefits for their outside directors. On average, more than 80% of the surveyed firms have offered Directors' and Officers' insurance (D&O) over the last two decades to protect their directors. Some firms still provide retirement plans, but that benefit has declined in recent years.

The third essay (Chapter 4) examines how outside director compensation varies across firms. Several studies examined the relations between firm-specific investment opportunities and corporate policies. This essay is the first to examine whether the cross-sectional variation in outside director compensation at the firm level can be explained by factors related to firms' investment opportunity sets.

Using a sample of the two hundred largest US corporations from 1996 to 1999, I find evidence that the investment opportunity set explains, at least in part, the cross-sectional variation in board compensation among firms. Firms with more abundant investment opportunities pay a higher level of total compensation and use stock-based compensation more heavily than firms with fewer investment opportunities. These findings are consistent with the hypothesis that board compensation is set in part to reduce agency costs.

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Table 3.1 Outside Director Compensation at General Motors (1999)

General Motors Corporation (1999)[a]

Retainer		Meeting Fees and Committee/Chair Retaiers				
Cash	Stock	Board Fee	Committee Fee	Committee Retainer	Chair Fee	Chair Retainer
$26,000	$14,000	$1,000	$750	$6,000	$750	$11,000

Stock Awards	Total Compensation[b]	Other Benefits
$10,000	$84,500	NA

Table 3.1 (continued)
Outside Director Compensation at General Motors (1999)

[a] Data are from General Motors Proxy Statement (4/20/1999), and Pearl Meyer & Partners, Inc. 1999 *Director Compensation*. The following excerpt is taken directly from GM's 1999 Proxy Statement:

DIRECTOR COMPENSATION

Only non-employee directors receive payment for serving on the Board. Since Messrs. Smith, Pearce and Wagoner are employees of the Corporation, they do not receive director fees. Non-employee directors are not eligible to participate in the executive incentive program, Savings-Stock Purchase Program or any of the Retirement Programs for General Motors employees. Other than as described in this section, there are no separate benefit plans for directors. The fees paid to non-employee directors are as follows:

	Annual Retainer	Fee Per Meeting Attended	Stock Based Compensation
Board	$26,000	$ 1,000	$14,000 Restricted Stock Unit grant (a)
Committees (Excluding the Executive Committee)			
Chair	$11,000	$ 750	
Member	$ 6,000	$ 750	
Executive Committee	x	$ 750	
Special per diem (b)	x	$ 1,000	
Annual Stock Grant (c)			$10,000 Restricted Stock Unit grant OR A stock option grant

(a) Non-employee directors are required to defer $14,000 of their annual retainer in units of GM common stocks under the General Motors Deferred Compensation Plan for Non-Employee Directors. In addition, under this plan directors may also elect to defer all or a portion of their remaining compensation in cash or units of GM common stocks.

(b) Fee for special services and assignments requiring a director's attendance outside the scope of ordinary Board and Committee activities.

(c) For 1999, under the GM Non-Employee Director Long-Term Stock Incentive Plan, eligible non-employee directors elected to receive either a stock option for 910 shares of Common Stock and 140 shares of Class H Common Stock or Restricted Stock Units for $10,000 split 90% Common Stock and 10% Class H Common Stock.

Restricted Stock Units under both the Deferred Compensation and Stock Incentive Plans are credited with dividend equivalents in the form of additional stock units of the same class. Amounts deferred under either plan are generally not available until after the director retires from the Board at age 70. After the director leaves the Board, payment under both plans will be made in cash based on the number of stock units and the market price of the related GM common stocks at the time of payment.

[b] The total compensation calculation for GM non-employee directors is based upon the following list of assumptions. These assumptions follow those made by Pearl Meyer & Partners, Inc. in their publication *Director Compensation* as their general list of assumptions would apply to the GM case.

1. Each director serves on the board for the entire year and attends all board meetings.
2. The board meets ten times per year.
3. Each director serves on two committees.
4. Each director serves as the chair of one committee.
5. Each committee meets five times per year.
6. There are no board or committee telephone meetings for which a director is compensated.
7. There are no 'actions taken by unanimous written consent' for which a director is compensated.
8. Restricted stock is valued at the prevailing market price of the stock at the time of the grant.

Thus, Total Compensation = Board Retainer ($26,000 + $14,000) + Board Meeting Fees ($1000 x 10) + Committee Member Retainer ($6,000) + Committee Meeting Fees ($750 x 2 x 5) + Retainer for Committee Chair ($11,000) + Stock Award ($10,000) = $84,500.

Table 3.2 Primary Industries In Which Survey Respondents Operated, Over All Survey Years

Manufacturing Sector	Financial Sector	Non-financial Sector including Extraction
Aerospace, aircraft and parts	Banking holding company	Computer services, software
Biotechnical, pharmaceutical	Commercial banking	Construction (All)
Building materials	Savings institutions	Construction design, engineering
Computer hardware, office equipment	Health insurance-stock	Healthcare
Construction, construction engineering	Health insurance-mutual	Holding company
Consumer chemicals	Life insurance-stock	Hotels, restaurants, entertainment
Containers, packaging	Life insurance-mutual	Radio/TV broadcasting
Electric and electronic machinery	Investment company	Mining
Fabricated metal products	Diversified financial	Oil & gas transmission
Food, beverage, and tobacco	Property/casualty insurance-stock	Oil & gas extraction
Furniture and fixtures	Property/casualty insurance-mutual	Oil & gas field services
Industrial chemicals		Real estate
Industrial machinery		Public utility:
Instruments, controls, optical products		Electric only
Motor vehicles and parts		Electric & gas
Paper and allied products		Gas only
Petroleum and petroleum products		Telephone
Plastic, rubber, and leather		Water
Precision instruments		Retail trade
Primary metals, including steel		Transportation
Printing and publishing		Waste management
Stone, clay, glasses, and concrete		Wholesale trade
Textile, apparel, and fabric		
Transportation equipment		

Source: *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Table 3.3 Board Size, Outside Member Participation And Board Governance Policies

Panel A. Board Size

	96			97			98			99			2000		
Board Size (inside and outside)	Mftr	Fincl	Serv	Mftr	Fincl	Serv	Mftr	Fincl	Serv	Mftr	Fincl	Serv	Mftr	Fincl	Serv
Range	3-19	3-29	3-26	3-19	4-26	4-24	3-26	3-25	3-22	3-19	3-25	3-22	2-18	5-33	3-60
Median	10	12	10	10	12	10	10	12	10	10	12	10	9	12	10
Outside board members range	1-14	1-27	1-25	1-15	2-23	1-24	1-15	2-23	2-21	1-19	2-23	2-21	1-15	2-29	1-59
Median	8	10	8	8	10	7	8	10	8	8	10	8	8	9	8

Source: *Corporate Directors' Compensation*, The Conference Board (1996 to 2000). Data reproduced with permission of the Conference Board.

Panel B. Board Governance Policies

	95	96	97	98	99	2000
Total firms responded each year	759	590	650	614	718	754
Formal evaluation process in place for the board (%)	12	15	17	23	25	25
Formal evaluation for individual board, too (%)		8	6	9	11	11
Stock ownership guideline for outside directors (%)					19	21
Board compensation is linked to co's performance (%)			7	0 5	3	5
Limits number of other directorships to a board member (%)		1	2	2	3	2
Term limits for directors (%)		7	7	5	7	8
Mandatory retirement for directors (%)		64	59	61	55	56
Policy regarding continued tenure for retiring CEO (%)						
In favor of continued service		11	10	9	7	7
Against		11	13	14	13	11
No policy on the issue		75	75	73	77	68

Source: *Corporate Directors' Compensation*, The Conference Board (1995 to 2000)

Table 3.4 Basic Annual Compensation By Year For Three Industry Sectors ($000)

Industry	79	81	83	84	85	86	87	88	89	90
Manufacturing ('000)	11.5[1]	15	17	18.9	19	21	22	24	25.1	24.6
Change (%)		30.4[2]	13.3	11.2	0.5	10.5	4.8	9.1	4.6	-2.0
Firms	513	524	490	465	455	433	422	401	339	424
Financial ('000)	8	10.9	13.4	14.2	15	17.2	17	19.8	20.4	20.8
Change (%)		36.6	22.9	5.8	5.5	14.9	-1.2	16.5	3.0	2.0
Firms	164	186	181	189	202	205	221	231	212	211
Non- financial ('000)	9	12	14	16.1	17.2	18	18	17.6	20.6	21.6
Change (%)		33.3	16.7	15.2	6.7	4.7	0.0	-2.2	16.8	5.1
Firms	280	303	309	298	295	291	277	276	254	280

Industry	91	92	93	94	95	96	97	98	99	2000	g
Manufacturing ('000)	27.2	29.7	29	30.4	31	33.8	35	35	35.1	37.2	
Change (%)	10.6	9.2	-2.4	4.9	1.9	8.9	3.7	0.0	0.3	6.0	6.3
Firms	341	322	349	320	313	263	281	279	308	301	
Financial ('000)	23.4	24	24.6	28.1	32	30.2	30.4	31.8	31.4	30	
Change (%)	12.5	2.6	2.5	14.3	13.8	-5.6	0.7	4.6	-1.3	-4.5	7.3
Firms	222	185	208	178	160	122	126	101	123	134	
Non- financial ('000)	23.6	24.5	25.2	28.2	29	31.7	32	32	32	33	
Change (%)	9.4	3.6	2.9	11.9	2.8	9.3	0.9	0.0	0.0	3.1	7.0
Firms	294	317	329	285	286	205	243	234	287	268	

Source: *Corporate Directors' Compensation*, The Conference Board (1979 to 2000). Data reproduced with permission of the Conference Board.

1. Basic annual compensation includes the annual retainer for board service, per meeting fees, and pay for committee service. Compensation is defined based upon the assumption that the typical director attends, and is paid for, every board meeting and every meeting of every committee on which he or she serves. Compensation is therefore the potential compensation for full participation. Median values are reported. Payment of basic annual compensation may be in the form of cash or stock.
2. The report was issued on a bi-annual basis until 1983. Therefore the percent changes in compensation for 1981 and 1983 cover two years.

g: Compound annual growth rate.

Table 3.5 Fraction Of Firms Reporting Alternative Payment Methods For Regular Board Service By Industry Sector

The table presents the frequency of various compensation methods for regular board services among three industry sectors: manufacturing, financial, and non-financial. There are four types of payment forms used by the surveyed firms. They are retainer & per meeting fees, retainer only, meeting fees only.

Forms of compensation	79	81	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	AVG.
Manufacturing																					
(total # of companies)	535	537	489	466	454	431	422	401	334	424	344	310	338	318	308	243	281	279	308	310	**377**
Retainer & per-meeting fees (%)	76	81	78	81	81	80	81	80	85	82	83	83	80	81	81	77	75	71	64	71	**78.6**
Retainer only (%)	19	15	17	16	16	16	15	15	11	13	11	11	15	13	13	16	18	20	29	23	**16.1**
Per-meeting fees only (%)	5	4	5	3	3	4	4	5	4	5	6	6	5	5	4	5	4	5	5	4	**4.6**
Other[1] (%)														1	2	2	3	4	2	2	**2.3**
Financial																					
(total # of companies)	172	165	185	190	199	205	220	232	211	221	214	182	208	175	159	110	126	101	123	137	**177**
Retainer & per-meeting fees (%)	81	87	83	82	83	86	84	84	78	81	76	77	79	80	82	78	73	75	71	66	**79.3**
Retainer only (%)	8	6	7	10	7	6	8	5	11	10	11	14	9	11	11	12	18	14	18	20	**10.8**
Per-meeting fees only (%)	11	7	10	8	10	8	8	11	11	10	13	9	12	8	7	5	8	6	8	12	**9.1**
Other (%)														1	0	5	1	5	3	2	**2.4**
Non-financial																					
(total # of companies)	289	320	309	299	294	291	277	274	250	280	298	303	324	281	281	194	243	234	287	282	**281**
Retainer & per-meeting fees (%)	76	79	84	87	86	87	85	85	86	82	84	84	83	87	85	81	80	79	75	70	**82.3**
Retainer only (%)	15	14	12	10	9	10	12	10	10	13	11	13	11	7	10	14	12	13	16	19	**12.1**
Per-meeting fees only (%)	9	7	4	3	5	3	3	4	4	5	5	3	6	5	3	3	5	4	7	7	**4.8**
Other (%)														1	2	2	3	4	2	4	**2.6**

Source: *Corporate Directors' Compensation*, The Conference Board (1979 to 2000) Data reproduced with permission of the Conference Board.
[1]A clear definition is unavailable

Table 3.6 Fraction Of Firms Reporting The Existence Of Specific Committees (& Payment For Committees Services)

The table shows the percentage of surveyed firms that have each type of committee (& that compensate outside directors for services on each type of committee listed) by year

Committee	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	AVG.
Audit	97 (88)	97 (86)	97 (85)	97 (81)	96 (85)	97 (80)	98 (82)	98 (82)	84 (84)	98 (80)	96 (79)	97 (83)	97 (74)	96 (95)	**96 (83)**
Compensation	84 (86)	81 (84)	82 (83)	79 (79)	82 (85)	83 (77)	86 (80)	87 (80)	88 (82)	88 (79)	89 (78)	89 (81)	89 (73)	86 (92)	**85 (81)**
Executive	71 (76)	69 (76)	71 (76)	70 (73)	69 (87)	71 (71)	68 (72)	68 (73)	66 (75)	66 (72)	61 (71)	60 (71)	58 (67)	58 (88)	**66 (75)**
Nominating	48 (85)	47 (85)	49 (83)	47 (81)	45 (90)	47 (79)	48 (80)	50 (84)	49 (85)	50 (82)	48 (78)	49 (81)	44 (70)	46 (76)	**48 (81)**
Finance	26 (86)	25 (86)	27 (91)	26 (84)	27 (89)	25 (81)	26 (83)	26 (84)	34 (83)	30 (83)	30 (79)	27 (88)	24 (77)	27 (92)	**27 (85)**
Pension and benefit	20 (77)	18 (78)	18 (76)	16 (80)	17 (84)	15 (72)	14 (74)	13 (80)	15 (83)	14 (80)	13 (78)	12 (77)	9 (72)	12 (82)	**15 (78)**
Stock option	15 (50)	13 (55)	13 (54)	14 (65)	13 (83)	13 (51)	11 (52)	9 (49)	10 (51)	8 (56)	7 (54)	8 (51)	9 (50)	8 (73)	**11 (57)**
Public policy	10 (94)	10 (95)	11 (94)	8 (76)	10 (93)	9 (90)	9 (90)	10 (82)	10 (88)	11 (89)	9 (89)	10 (92)	7 (84)	5 (88)	**9 (89)**
Investment	8 (83)	8 (84)	8 (82)	8 (60)	10 (84)	7 (62)	7 (80)	7 (69)	7 (73)	7 (73)	5 (76)	5 (83)	7 (68)	7 (83)	**7 (76)**
Planning	6 (85)	6 (81)	7 (88)	5 (76)	4 (78)	4 (79)	6 (78)	5 (71)	5 (80)	6 (79)	5 (88)	5 (96)	5 (81)	5 (82)	**5 (82)**
Human resources	6 (75)	6 (86)	6 (90)	6 (82)	6 (88)	6 (83)	5 (89)	5 (95)	5 (98)	7 (80)	5 (86)	6 (83)	6 (80)	8 (82)	**6 (86)**
Contributions	4 (67)	3 (62)	3 (56)	2 (65)	2 (75)	3 (62)	3 (59)	2 (71)	2 (69)	2 (67)	2 (53)	2 (62)	2 (46)	2 (69)	**2 (63)**
Environment									5 (78)	5 (77)	4 (74)	5 (86)	5 (75)	4 (79)	**5 (78)**
Science & technology									3 (90)	2 (89)	1 (78)	2 (73)	1 (88)	2 (83)	**2 (84)**
Ethics									3 (85)	2 (70)	1 (33)	1 (75)	1 (63)	2 (75)	**2 (67)**
Corporate governance									7 (92)	9 (81)	13 (77)	15 (83)	16 (81)	22 (86)	**14 (83)**
Corporate responsibility													4 (96)	3 (64)	**4 (96)**

Source: *Corporate Directors' Compensation*, The Conference Board (1987 to 2000) Data reproduced with permission of the Conference Board.

Table 3.7 Median Committee Fees And Committee Retainer Payments For The Four Most Frequently Reported Committees From 1979 To 2000 By Industry Sector[1]

Panel A. Committee Fees

	79	81	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	Avg.
Manufacturing																					
Audit	400	500	500	500	525	600	650	700	750	750	750	800	850	1000	1000	1000	1000	1000	1000	1000	865
Compensation	400	300	500	500	500	600	650	700	750	750	750	800	850	1000	1000	1000	1000	1000	1000	1000	865
Executive	400	500	500	500	600	650	700	700	750	750	800	925	900	1000	1000	1000	1000	1000	1000	1000	887
Nominating	500	500	500	500	600	600	700	700	750	750	825	900	850	1000	1000	1000	1000	1000	1000	1000	883
Financial																					
Audit	250	300	400	400	475	500	500	500	500	600	625	700	700	750	900	800	750	800	775	750	685
Compensation	300	300	400	400	400	500	500	500	500	600	700	740	750	750	1000	875	750	800	750	750	709
Executive	250	300	400	500	500	500	500	500	500	600	700	625	750	800	1000	900	750	1000	775	775	723
Nominating	300	300	400	500	500	500	500	500	500	613	725	750	850	1000	1000	975	1000	800	1000	1000	786
Non-financial																					
Audit	300	400	500	500	500	500	500	600	600	700	750	750	750	800	900	900	1000	1000	1000	1000	788
Compensation	300	400	500	500	500	500	500	600	600	700	750	750	750	800	850	850	1000	1000	1000	1000	781
Executive	300	400	500	500	500	500	550	600	750	750	750	750	750	800	1000	900	1000	1000	1000	1000	815
Nominating	300	400	500	500	500	500	500	600	650	700	750	750	750	1000	1000	900	1000	1000	1000	1000	815

Table 3.7 (continued). Median Committee Fees And Committee Retainer Payments For The Four Most Frequently Reported Committees From 1979 To 2000 By Industry Sector[1]

Panel B. Retainers

	79	81	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	Avg.
Manufacturing																					
Audit	2000	2000	2000	2000	2500	2500	2500	2500	2500	3000	2500	3000	3000	3000	3000	3000	3500	3000	3000	3000	2885
Compensation	1500	2000	2000	2000	2000	2500	2500	2450	2500	3000	2500	3000	3000	2750	3000	3000	3500	3000	3250	3000	2881
Executive	2500	3000	3000	2000	3000	2750	2750	2750	2500	3000	2500	3000	3000	3000	3000	3000	3000	3000	3500	3000	2923
Nominating	1500	2000	2000	2000	2000	2500	2000	2000	2500	2500	2500	2500	2500	2500	3000	3000	3450	3000	5000	3000	2804
Financial																					
Audit	2000	2250	2000	2000	2000	2500	2500	3000	3000	3100	4000	3000	4000	3250	3600	3000	3750	3800	3500	5000	3346
Compensation	2000	1500	2000	2500	2225	2500	3000	3000	3000	4000	4000	4000	4000	4000	3875	3000	3750	3000	3500	3000	3548
Executive	2000	2450	2000	2500	3250	2500	2500	2500	3000	3000	4000	4000	4000	5000	3750	3000	3000	3500	2400	5000	3358
Nominating	2000	2000	1000	1750	2500	2250	1500	3000	3000	3000	3000	3000	3000	4000	3500	4000	4000	5750	4250	7500	3462
Non-financial																					
Audit	3500	2725	2625	2450	3000	1750	2400	2400	3000	3000	3000	3000	2750	2750	2750	3000	2500	3000	3000	3000	2812
Compensation	3500	2250	2450	2450	2575	1600	2000	2000	3000	3000	3000	2750	2750	2750	2750	3000	2000	2875	2875	2875	2673
Executive	3250	3000	3750	2500	2700	2000	4000	2500	3000	3000	3000	3000	2500	2875	2725	3000	2500	2750	2875	2875	2902
Nominating	3100	2000	1800	1100	1950	1000	2700	3325	3150	2750	2500	3000	2500	2500	3000	3000	2500	2000	2750	2250	2744

Source: *Corporate Directors' Compensation*, The Conference Board (1979 to 2000). Data reproduced with permission of the Conference Board.

[1]Data are not adjusted for inflation

Table 3.8 Coefficient Estimates Of A Model Explaining Outside Director Basic Annual Compensation As A Linear Function Of Industry Sector Membership And Company Size

Dependent variables are compensation level (Regression 1 and 4), compensation level in manufacturing industry (Regression 2), in financial industry (Regression 3), and in non-financial industry (Regression 4). Dummy variables used as independent variables include industry dummies (Regression 1), and size dummies (Regression model 2 to 4).[a] *t*-statistics are reported in parantheses.

	Dependent Variables: Compensation Level			
	Industry Sector	Manufacturing Sector	Financial Sector	Non-financial Sector
	(1)	(2)	(3)	(4)
Intercept	8,728.9* (20.91)	5,593.8* (35.04)	5,741.8* (14.47)	5,935.3* (22.16)
Dummy-manufacturing	4,620.4* (8.35)			
Dummy-non-financial	3,429.1* (6.20)			
Dummy-size 2		2,339.2* (10.36)	78.1 (0.13)	2,771.0* (7.32)
Dummy-size 3		4,271.5* (18.92)	437.3 (0.74)	3,196.4* (8.44)
Dummy-size 4		6,510.2* (28.83)	1,666.4** (3.13)	4,873.1* (12.87)
Dummy-size 5		9,199.5* (40.74)	2,869.1* (4.94)	7,084.6* (18.70)
Dummy-size 6		11,036.0* (48.88)	3,343.0* (5.76)	9,293.9* (24.54)
Dummy-size 7		13,104.0* (56.49)	6,085.0* (10.48)	10,661.0* (27.40)
Dummy-size 8		17,049.0* (73.49)	10,021.0* (17.25)	13,026.0* (33.47)
Adjusted R^2	14.17	98.23	80.06	92.16
F	36.42*	1230.08*	68.12*	261.24*

*,** denotes p-value for test of the null hypothesis that the coefficient is equal to zero is < 0.0001, <0.005.

Notes continue on the following page.

Table 3.8 (continued) Coefficient Estimates Of A Model Explaining Outside Director Basic Annual Compensation As A Linear Function Of Industry Sector Membership And Company Size

[4] Size dummies are defined in the following manner:

Dummy Variable	Dummy-size 1	Dummy-size 2	Dummy-size 3	Dummy-size 4	Dummy-size 5	Dummy-size 6	Dummy-size 7	Dummy-size 8	Dummy-size 9
Manufacturing and Non-financial Sectors: Sales ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000
Financial Sector: Total Assets ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000

Table 3.9 Fraction Of Firms Responding That Used Some Form Of Stock Payment By Industry Sector And Year

Total use of stock pay[1] (%)	**83**	**88**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing				46	55	66	68	78	81	86	90	91	88
Financial				28	42	51	52	57	58	73	75	66	65
Non-financial				32	34	44	60	72	78	86	90	92	82
Average	**3**	**17**	**33**	**37**	**45**	**55.4**	**62**	**71**	**75**	**84**	**88**	**87**	**81**
Stock pay in basic compen.[2] (%)	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing			11	10	13	17	23	26	24	28	37	38	40
Financial			4	7	9	14	17	17	19	26	26	23	33
Non-financial			5	7	9	13	16	15	28	27	36	37	42
Average			**8**	**8**	**11**	**15**	**19**	**20**	**24**	**27**	**35**	**35**	**40**
Stock option grants (%)	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing			29	33	36	48	48	49	53	58	60	65	75
Financial			12	21	24	29	39	38	38	44	48	43	72
Non-financial			11	22	32	36	40	44	46	53	53	65	73
Average			**22**	**26**	**32**	**39**	**43**	**45**	**48**	**54**	**55**	**61**	**74**
Restricted stock grants (%)	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing			12	11	16	23	23	14	18	17	21	20	20
Financial			4	4	5	13	16	7	13	13	11	6	14
Non-financial			5	7	7	14	20	14	16	14	17	16	15
Average			**8**	**8**	**10**	**17**	**20**	**13**	**16**	**15**	**18**	**16**	**17**
Annual grants[3] (%)	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing										19	18	28	13
Financial										16	16	15	9
Non-financial										17	18	24	14
Average									**17**	**18**	**18**	**24**	**13**
One time grant[4] (%)	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
Manufacturing										8	11	15	12
Financial										14	11	10	9
Non-financial										10	14	14	14
Average										**10**	**12**	**14**	**12**

Source: *Corporate Directors' Compensation*, The Conference Board (1988 to 2000). Data reproduced with permission of the Conference Board.

[1] Total use of stock pay represents the incidence of any form of stock compensation to nonemployee directors.
[2] Stock pay in basic compensation represents the percentage of firms that pay in stock at least a portion of basic compensation (retainer and fees).
[3] Information on annual and one-time grants of stock is available only for 1997, 1998, 1999, and 2000. Annual grants are not part of the basic compensation.
[4] One-time grants of stock to the board can be made at the time of election.

Table 3.10 Fraction Of Firms Using Different Stock-Based Compensation Methods By Firm Size and By Year

	Stock Option Grants						Restricted Stock Grants						Partial Payment of Basic Annual Compensation in Stock					
Industry and size	**91**	**92**	**93**	**94**	**95**	**96**[2]	**91**	**92**	**93**	**94**	**95**	**96**	**91**	**92**	**93**	**94**	**95**	**96**
Manufacturing																		
Under 500 M		44[1]	61	68	59	68		6	20	18	5	5		7	8	15	13	14
10 bil. Over		30	33	19	29	38		30	30	42	26	41		30	30	42	48	41
Financial																		
Under 500 M		24	33	33	41	19		2	5	13	4	14		2	10	8	7	10
10 bil. Over		15	21	31	33	35		10	18	24	9	15		21	29	22	24	20
Non-financial																		
Under 500 M			49	49	60	54			14	15	8	10			9	12	12	22
10 bil. Over			22	21	36	40			17	37	23	26			17	26	14	23
Average																		
Under 500 M	32	41	52	55	58	56	7	6	15	16	6	8	5	6	9	12	12	17
10 bil. Over	13	22	25	26	33	37	11	19	21	31	17	25	23	25	27	29	29	26

Source: *Corporate Directors' Compensation*, The Conference Board (1991 to 1996). Data reproduced with permission of the Conference Board.

[1] In 1992, the Conference Board divided surveyed firms into two groups: manufacturing & non-financial and financial firms
[2] In 1996, the largest size reported for financial and non-financial firms is '5 billion and over', not '10 billion and over'

Table 3.11 Percentage Of Firms Offering Additional Benefits To Outside Directors By Year

Insurance	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	Avg.
Directors' and officers' liability	85	85	88	84	81	81	78	79	81	85	87	87	86	81	83	81	82	**82.6**
Travel accident	40	40	40	39	38	36	36	35	34	35	34	32	36	32	33	27	25	**34.4**
Life	15	16	17	15	15	16	16	15	16	15	15	16	15	13	13	11	11	**14.7**
Accidental death & dismemberment	16	18	16	16	17	16	17	16	16	17	16	15	16	15	14	12	12	**15.6**
Medical and hospitalization	7	7	9	8	8	10	9	8	8	10	8	7	8	8	8	6	6	**8.2**
Other										2	4	5	6	5	5	3	3	**4.1**
Other benefits																		
Differed board compensation	51	53	56	56	51	54	49	46	47	46	47	50	53	51	51	46	47	**49.8**
Matching donation	32	35	35	33	32	27	31	31	35	35	36	33	33	31	31	25	26	**31.8**
Retirement or pension plan	11	15	18	21	28	31	33	32	36	36	36	37	30	19	12	10	7	**27.8**
Free or discounted company products	10	12	10	9	9	10	10	8	11	10	9	10	10	8	9	8	8	**9.3**
Charitable giving plan										5	7	8	7	7	7	5	5	**6.4**
Pay to honorary directors							7	9	7	8	7	5	7	6	5	5	3	**6.3**
Other		4	8	10	15	17												**13.3**

Source. *Corporate Directors' Compensation*, The Conference Board (1984 to 2000). Data reproduced with permission of the Conference Board.

Appendix

Table 3.A Inflation Adjusted Basic Annual Compensation: Levels and Annual Percentage Changes

Panel A. Inflation Adjusted Basic Annual Cash Compensation By Year And Industry Sector ($ 000)

	79	81	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	g
Manufacturing	11.5	11.9	11.5	12.4	11.9	12.7	13.1	13.8	13.8	12.9	13.6	14.2	13.5	13.7	13.6	14.5	14.6	14.3	14.1	14.6	13.3
Financial	8.0	8.6	9.1	9.3	9.4	10.4	10.1	11.3	11.2	10.9	11.7	11.5	11.4	12.7	14.1	12.9	12.7	13.0	12.6	11.8	11.1
Non-financial	9.0	9.5	9.4	10.5	10.8	10.9	10.7	10.1	11.3	11.3	11.8	11.7	11.7	12.7	12.7	13.6	13.3	13.1	12.9	12.9	11.5
Average	10.2	10.6	10.4	11.2	11.0	11.6	11.6	12.0	12.3	12.0	12.5	12.6	12.3	13.1	13.4	13.8	13.7	13.6	13.4	13.4	12.2

Panel B. The Annual Percentage Change In Inflation Adjusted Basic Annual Compensation

	81	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	g
Manufacturing	3.07	-3.25	7.72	-3.61	6.68	2.81	5.30	0.46	-6.48	4.90	4.79	-5.20	1.86	-0.69	6.22	0.68	-1.67	-1.29	3.19	1.27
Financial	7.91	4.90	2.49	1.12	10.86	-3.01	12.43	-1.03	-2.71	6.74	-1.57	-0.48	11.00	10.89	-7.93	-2.27	2.86	-2.81	-6.98	2.12
Non-financial	5.36	-0.40	11.60	2.27	1.01	-1.86	-5.62	12.16	0.30	3.84	-0.54	-0.14	8.65	0.23	6.64	-1.99	-1.67	-1.57	0.41	1.93
Average	4.64	-0.85	7.90	-0.78	5.83	0.01	3.80	3.76	-3.54	5.01	1.31	-2.21	6.41	2.10	3.44	-0.89	-0.92	-1.67	0.19	1.68

Source of nominal data on basic annual compensation: *Corporate Directors' Compensation*, The Conference Board (1984 to 2000). Source of inflation index: U.S. Bureau of Labor Statistics, http://stats.bls.gov/cpihome.htm

g. Compound annual growth rate.

Table 4.1

Descriptive Statistics For Compensation Variables

This table presents the descriptive statistics for compensation variables. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." Due to the availability of financial information and stock option information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively.

Variable	1996	1997	1998	1999	Pooled
Retainer[1] ($)					
Mean	34,031	36,269	38,622	42,474	37,972
Median	30,000	32,000	35,000	38,000	35,000
Largest	85,000	85,000	136,392	132,526	136,392
Smallest	8,000	0	0	0	0
Firms	160	164	169	176	669
Meeting fees[2] ($)					
Mean	24,807	23,487	24,364	24,115	24,189
Median	26,000	25,000	26,000	25,000	25,600
Largest	54,000	54,000	100,000	174,691	174,691
Smallest	0	0	0	0	0
Firms	160	164	169	176	669
Stock-awards[3] ($)					
Mean	21,670	31,760	47,533	63,647	41,697
Median	14,457	26,365	35,050	44,917	28,396
Largest	194,792	189,000	381,000	419,250	419,250
Smallest	0	0	0	0	0
Firms	160	164	169	176	669
Total compensation[4] ($)					
Mean	87,875	106,193	133,076	178,898	127,730
Median	79,625	86,709	103,948	117,106	95,559
Largest	397,827	665,306	1,290,564	3,067,532	3,067,532
Smallest	38,000	38,000	45,000	41,875	38,000
Firms	160	164	169	176	669

[1]Equals the dollar value of any cash and stock payments used solely as payment of the retainer.
[2]Meeting fees include fees paid for board meetings, committee meetings, committee retainer, chair retainer and chair services.
[3]Stock awards include stock grant, stock options, restricted stock, deferred stock, stock deferred to retirement, but do not include stock payments for retainers, meeting fees, or chair fees.
[4]Total compensation is the sume of the retainer, meeting fees, chair fees, and stock awards.

Table 4.2

Descriptive Statistics For Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999)[1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

Variable	1996	1997	1998	1999	Pooled
INVINT[2]					
Mean	2.500	2.742	2.872	2.826	2.739
Median	2.084	2.331	2.489	2.447	2.333
Firms	144	149	153	158	604
MVAGR[3]					
Mean	1.129	1.178	1.224	1.241	1.195
Median	1.102	1.111	1.180	1.088	1.125
Firms	155	161	169	176	661
MKTBKASS[4]					
Mean	1.796	1.891	2.210	2.595	2.134
Median	1.486	1.546	1.657	1.611	1.577
Firms	158	164	169	176	667
R&D[5]					
Mean	0.019	0.020	0.023	0.022	0.021
Median	0.000	0.000	0.000	0.000	0.000
Firms	159	164	169	176	668

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. Barber *et al* (1996) use year *t-1*, rather than year *t*, data to compute an IOS factor score to mitigate spurious relations that can result from using contemporaneous data.
[2]The ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses.
[3]Year *t-3* to *t-1* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditures to book value of assets.

Table 4.3

Simple Correlations Amongst The Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

1996	INVINT[2]	MVAGR[3]	MKTBKASS[4]	RD[5]
INVINT	1.000			
MVAGR	0.418***	1.000		
No. of firms	141			
MKTBKASS	0.301***	0.422***	1.000	
No. of firms	144	155		
RD	0.477***	0.279***	0.385***	1.000
No. of firms	144	155	158	
1997	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.093	1.000		
No. of firms	146			
MKTBKASS	0.180*	0.226***	1.000	
No. of firms	149	161		
RD	0.317***	0.037	0.425***	1.000
No. of firms	149	161	164	
1998	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.382***	1.000		
No. of firms	153			
MKTBKASS	0.278**	0.441***	1.000	
No. of firms	153	169		
RD	0.378***	0.091	0.426***	1.000
No. of firms	153	169	169	

1999	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.227** 1.000			
No. of firms	158			
MKTBKASS	0.351***	0.517***	1.000	
No. of firms	158	176		
RD	0.481***	0.082	0.492***	1.000
No. of firms	158	176	176	

Pooled (1996 to 1999)	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.235***	1.000		
No. of firms	598			
MKTBKASS	0.272***	0.426***	1.000	
No. of firms	604	661		
RD	0.406***	0.095*	0.427***	1.000
No. of firms	604	661	667	

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. Barber *et al* (1996) use year *t-1*, rather than year *t*, data to compute an IOS factor score to mitigate spurious relations that can result from using contemporaneous data.

[2]The ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses.

[3]Year *t-3* to *t-1* geometric mean growth of market value of assets.

[4]The ratio of the market value of equity plus book value of debt to book value of assets.

[5]The ratio of R&D expenditure to book value of assets.

Table 4.4

Selected Statistics Related To A Common Factor Analysis Of Four Measures Of The Investment Opportunity Set (IOS) [1] For The Sample Firms

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively.

1996	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities[2] of four IOS measures				
	0.3059	0.3328	0.3090	0.2920
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.5321	0.0765	-0.1113	-0.2576
C. Correlations between the common factor and four IOS measures				
	0.7427	0.7635	0.7404	0.7341
1997	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.1065	0.0595	0.2082	0.2283
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	0.8478	0.0943	-0.0526	-0.2871
C. Correlations between the common factor and four IOS measures				
	0.6133	0.3732	0.7526	0.7631
1998	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2612	0.3365	0.3644	0.2774
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.3415	0.2035	0.0228	-0.3283
C. Correlations between the common factor and four IOS measures				
	0.7107	0.7031	0.7815	0.6448

1999	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2624	0.3930	0.5166	0.3822
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.5472	0.3768	-0.0888	-0.2810
C. Correlations between the common factor and four IOS measures				
	0.6933	0.6525	0.8498	0.7141

Pooled	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2017	0.2453	0.3467	0.2778
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.2401	0.2115	-0.0730	-0.3071
C. Correlations between the common factor and four IOS measures				
	0.6728	0.6293	0.7927	0.6963

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. INVINT is the ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses. MVAGR is the year *t-3* to *t-1* geometric mean growth of market value of assets. MKTBKASS is the ratio of the market value of equity plus book value of debt to book value of assets. RD is the ratio of R&D expenditure to book value of assets.

[2] Communalities are equivalent to the squared multiple correlations obtained from regressing each of the investment opportunity set measures on the other three measures.

Table 4.5

Comparison Of The Low-IOS And High-IOS Firms For The Sample Firms

This table presents the mean values and *t*-values associated with tests of the null hypothesis that the two-sample means are equal[1] for 1996 to 1999[2]. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 141, 146, 153, and 158 for the years 1996, 1997, 1998, and 1999, respectively. For each year and for the pooled sample, factor scores[3] are calculated and used to divide the sample into growth firms and non-growth firms.

Variable	1996	1997	1998	1999	Pooled
Assets ($M)					
Low IOS	26,713	25,249	32,847	25,850	27,308
High IOS	13,329	22,787	24,091	35,883	25,342
t-stat	[2.35]*	[0.35]	[0.97]	[-0.89]	[0.45]
Sales ($M)					
Low IOS	18,306	18,911	21,575	17,528	18,830
High IOS	13,656	17,088	17,538	21,474	18,283
t-stat	[1.54]	[0.50]	[1.09]	[-1.11]	[0.30]
Mktbkeq[4] ($M)					
Low IOS	2.218	2.996	3.290	3.251	2.764
High IOS	4.619	4.745	5.914	8.631	6.234
t-stat	[-4.30]**	[-2.64]**	[-3.00]**	[-3.45]**	[-6.74]**
ROA					
Low IOS	0.042	0.044	0.048	0.041	0.044
High IOS	0.079	0.074	0.072	0.080	0.076
t-stat	[-4.99]**	[-3.84]**	[-2.48]*	[-3.84]**	[-7.01]**

**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The t-test of two-sample equal means for the higher (than median factor score) and lower investment opportunity set firms is based on the assumption of unequal variances.
[2]The financial variables used year *t-1* financial data for the sample firms.
[3]To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).
[4]The ratio of market value of equity to book value of equity.

Table 4.6

Simple Correlations Among Board Compensation Variables And The IOS Factor Score

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
1996							
Log total Compen.	1.000						
Stock-pay Ratio	0.711***	1.000					
Stock-award Ratio	0.819***	0.836***	1.000				
Fixed Ratio	-0.711***	-1.000***	-0.836***	1.000			
Retn-cash Ratio	-0.506***	-0.733***	-0.549***	0.733***	1.000		
Meet-only Ratio	-0.474***	-0.575***	-0.525***	0.575***	-0.055	1.000	
Factor Score	0.370***	0.149[7]	0.178*	-0.149[8]	-0.070	-0.135	1.000
1997							
Log total Compen.	1.000						
Stock-pay Ratio	0.738***	1.000					
Stock-award Ratio	0.834***	0.770***	1.000				
Fixed Ratio	-0.738***	-1.000***	-0.827***	1.000			
Retn-cash Ratio	-0.502***	-0.727***	-0.527***	0.727***	1.000		
Meet-only Ratio	-0.503***	-0.598***	-0.568***	0.598***	-0.060	1.000	
Factor Score	0.311***	0.154[9]	0.124	-0.154[10]	-0.087	-0.119	1.000
1998							
Log total Compen.	1.000						
Stock-pay Ratio	0.756***	1.000					

Stock-award Ratio	0.775***	0.835***	1.000				
Fixed Ratio	-0.756***	-1.000***	-0.835***	1.000			
Retn-cash Ratio	-0.583***	-0.771***	-0.601***	0.771***	1.000		
Meet-only Ratio	-0.455***	-0.602***	-0.537***	0.602***	0.012	1.000	
Factor Score	0.350***	0.235**	0.207**	-0.235***	-0.148[11]	-0.179*	1.000

1999	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
Log total Compen.	1.000						
Stock-pay Ratio	0.718***	1.000					
Stock-award Ratio	0.769***	0.790***	1.000				
Fixed Ratio	-0.718***	-1.000***	-0.790***	1.000			
Retn-cash Ratio	-0.545***	-0.789***	-0.592***	0.789***	1.000		
Meet-only Ratio	-0.491***	-0.629***	-0.539***	0.629***	0.055	1.000	
Factor Score	0.439***	0.322***	0.347***	-0.322***	-0.167*	-0.297***	1.000

Pooled (1996 to 1999)							
Log total Compen.	1.000						
Stock-pay Ratio	0.752***	1.000					
Stock-award Ratio	0.802***	0.831***	1.000				
Fixed Ratio	-0.752***	-1.000***	-0.831***	1.000			
Retn-cash Ratio	-0.563***	-0.771***	-0.594***	0.771***	1.000		
Meet-only Ratio	-0.501***	-0.630***	-0.567***	0.630***	0.044	1.000	
Factor Score	0.403***	0.269***	0.264***	-0.269***	-0.158***	-0.226***	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[5]The retainer cash amount divide by total compensation.
[6]The sum of board and committee meeting fees divide by total compensation.
[7,8]P-value is 0.078.
[9,10]P-value is 0.063.
[11]P-value is 0.068.

Table 4.7

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 141[1] firms (1996), 146[2] firms (1997), 153[3] firms (1998), 158[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.498*** [36.62]	0.066*** [5.08]	0.101*** [3.37]	0.19	17.54***
Stock-pay Ratio[7]	0.167 [0.90]	0.036[12] [1.83]	0.040 [0.89]	0.014	1.97
Stock-award Ratio[8]	0.165 [0.95]	0.040* [2.16]	0.023 [0.55]	0.020	2.42[15]
Fixed Ratio[9]	0.833*** [4.52]	-0.036[13] [-1.83]	-0.040 [-0.88]	0.014	1.97
Retainer-cash Ratio[10]	0.386** [2.74]	-0.012 [-0.84]	-0.007 [-0.21]	-0.009	0.36
Meet-only Ratio[11]	0.616*** [5.12]	-0.023[14] [-1.84]	-0.088** [-3.03]	0.066	5.95**
1997					
Log total Compen.	4.690*** [47.82]	0.064*** [3.39]	0.068** [2.93]	0.119	10.78***
Stock-pay Ratio	0.270[16] [1.80]	0.038[17] [1.97]	0.034 [0.93]	0.016	2.18
Stock-award Ratio	0.205 [1.31]	0.032* [1.58]	0.028 [0.73]	0.005	1.39
Fixed Ratio	0.730*** [4.88]	-0.038[18] [-1.97]	-0.034 [-0.97]	0.016	2.18[22]
Retainer-cash Ratio	0.383*** [3.36]	-0.016 [-1.10]	-0.014 [-0.51]	-0.004	0.68
Meet-only Ratio	0.437*** [4.47]	-0.022[19] [-1.73]	-0.054* [-2.25]	0.034	3.59*

1998

Log total Compen.	4.947*** [34.70]	0.080*** [4.64]	0.027 [0.77]	0.114	10.80***
Stock-pay Ratio	0.507** [3.26]	0.055** [2.94]	-0.003 [-0.09]	0.043	4.39*
Stock-award Ratio	0.537** [3.05]	0.053* [2.51]	-0.034 [-0.81]	0.034	3.69*
Fixed Ratio	0.493** [3.17]	-0.055** [-2.94]	0.003 [0.09]	0.061	4.39*
Retainer-cash Ratio	0.274* [2.38]	-0.025[20] [-1.82]	0.001 [0.04]	0.013	1.68
Meet-only Ratio	0.346** [3.64]	-0.028** [-2.41]	-0.039[21] [-1.71]	0.038	4.00*
1999	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
Log total Compen	4.886*** [25.76]	0.127*** [8.02]	0.059 [1.35]	0.191	19.55***
Stock-pay Ratio	0.380* [2.22]	0.080*** [4.29]	0.042 [1.02]	0.098	9.56***
Stock-award Ratio	0.371[22] [1.75]	0.098*** [6.26]	0.017 [0.34]	0.110	10.70***
Fixed Ratio	0.620*** [3.48]	-0.080*** [-6.02]	-0.042 [-1.00]	0.098	9.56***
Retainer-cash Ratio	0.136 [1.04]	-0.030* [-2.08]	0.027 [0.87]	0.020	2.61[23]
Meet-only Ratio	0.550*** [5.71]	-0.044*** [-4.20]	-0.093*** [-4.05]	0.165	16.47***
Pooled					
Log total Compen.	4.695*** [62.36]	0.100*** [10.46]	0.079*** [4.44]	0.185	68.56***
Stock-pay Ratio	0.267** [3.14]	0.069*** [7.46]	0.044* [2.18]	0.076	25.69***
Stock-award Ratio	0.261** [2.82]	0.071*** [6.60]	0.023 [1.05]	0.072	22.96***
Fixed Ratio	0.733*** [8.60]	-0.069*** [-7.46]	-0.044* [-2.18]	0.076	25.70***
Retainer-cash Ratio	0.331*** [4.41]	-0.029*** [-4.15]	-0.008 [-0.42]	0.022	7.70***
Meet-only Ratio	0.505*** [7.97]	-0.037*** [-7.67]	-0.073*** [-4.85]	0.101	34.50***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]19 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]18 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]16 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]18 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.
[5]71 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.

[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12, 13]P-value is 0.070.
[14]P-value is 0.068.
[15]P-value is 0.093.
[16]P-value is 0.073.
[17,18]P-value is 0.051.
[19]P-value is 0.086.
[20]P-value is 0.058.
[21]P-value is 0.090.
[22]P-value is 0.082.
[23]P-value is 0.077.

Appendix A - Alternative Test One- Total Sales

Table A4.1

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (**the logarithm of total sales**). The full sample consists of 141[1] firms (1996), 146[2] firms (1997), 153[3] firms (1998), 158[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogSales	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.626*** [25.83]	0.065*** [4.81]	0.069 [1.58]	0.140	12.42***
Stock-pay Ratio[7]	0.380 [1.45]	0.034[12] [1.76]	-0.013 [-0.20]	0.008	1.58
Stock-award Ratio[8]	0.363 [1.48]	0.039* [2.10]	-0.025 [-0.42]	0.019	2.36[15]
Fixed Ratio[9]	0.619* [2.37]	-0.034[13] [-1.76]	0.013 [0.84]	0.008	1.59
Retainer-cash Ratio[10]	0.216 [1.08]	-0.012 [-0.78]	0.034 [0.71]	-0.006	0.59
Meet-only Ratio[11]	0.497** [2.90]	-0.022[14] [-1.69]	-0.058 [-1.39]	0.018	2.26
1997					
Log total Compen.	4.607*** [29.56]	0.066*** [4.33]	0.088* [2.31]	0.117	10.63***
Stock-pay Ratio	0.156 [0.79]	0.040* [2.07]	0.061 [1.27]	0.021	2.57[17]
Stock-award Ratio	0.126 [0.67]	0.033 [1.64]	0.047 [0.93]	0.008	1.56
Fixed Ratio	0.844*** [4.25]	-0.040* [-2.07]	-0.062 [-1.28]	0.021	2.57[18]
Retainer-cash Ratio	0.450** [2.97]	-0.017 [-1.17]	-0.031 [-0.83]	-0.002	0.89
Meet-only Ratio	0.419** [3.18]	-0.022[16] [-1.69]	-0.050 [-1.53]	0.016	2.20

1998					
Log total Compen.	4.847*** [24.07]	0.080*** [4.65]	0.051 [1.05]	0.117	11.08***
Stock-pay Ratio	0.351 [1.60]	0.056** [3.00]	0.034 [0.65]	0.045	4.61*
Stock-award Ratio	0.478[19] [1.92]	0.054* [2.56]	-0.020 [-0.33]	0.031	3.41*
Fixed Ratio	0.649** [2.96]	-0.056** [-3.01]	-0.034 [-0.65]	0.045	4.61*
Retainer-cash Ratio	0.325* [2.00]	-0.026[20] [-1.85]	-0.011 [-0.29]	0.009	1.72
Meet-only Ratio	0.380** [2.82]	-0.027* [-2.35]	-0.047 [-1.45]	0.033	3.58*
1999	Intercept	IOS score	LogSales	Adj. R sqr.	F-score
Log total Compen	4.721*** [15.61]	0.126*** [6.09]	0.099 [1.36]	0.192	19.63***
Stock-pay Ratio	0.278 [1.01]	0.079*** [4.23]	0.066 [1.01]	0.098	9.55***
Stock-award Ratio	0.340 [0.96]	0.098*** [6.25]	0.025 [0.28]	0.110	10.69***
Fixed Ratio	0.722** [2.63]	-0.079*** [-4.23]	-0.066 [-1.01]	0.098	9.55***
Retainer-cash Ratio	0.047 [0.22]	-0.030* [-2.13]	0.048 [0.97]	0.021	2.70*
Meet-only Ratio	0.720*** [5.01]	-0.042*** [-5.77]	-0.134*** [-3.94]	0.147	14.51***
Pooled					
Log total Compen.	4.573*** [44.49]	0.100*** [10.48]	0.108*** [4.30]	0.183	67.78***
Stock-pay Ratio	0.154 [1.28]	0.069*** [7.01]	0.072* [2.46]	0.079	26.44***
Stock-award Ratio	0.196 [1.56]	0.071*** [6.65]	0.039 [1.28]	0.069	23.22***
Fixed Ratio	0.846*** [8.00]	-0.069*** [-7.56]	-0.072** [-2.80]	0.079	26.45***
Retainer-cash Ratio	0.354*** [3.41]	-0.029*** [-4.19]	-0.013 [-0.52]	0.022	7.76***
Meet-only Ratio	0.531*** [5.45]	-0.037*** [-7.66]	-0.079*** [-3.37]	0.079	26.57***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]19 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]18 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]16 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]18 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.

[5]71 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12, 13]P-value is 0.082.
[14, 16]P-value is 0.094.
[15]P-value is 0.098.
[17, 18]P-value is 0.080.
[19]P-value is 0.057.
[20]P-value is 0.067.

Appendix B-Alternative Test Two- Compensation Levels

Table B4.1

Simple Correlations Among Board Compensation Variables (Log Of Levels) And The IOS Factor Score

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." Due to the availability of financial information and stock option information, the final sample includes 141, 146, 153, and 158 for the years 1996, 1997, 1998, and 1999, respectively. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable		Log total[1] Compen.	Log Stock-pay[2]	Log Stock-award[3]	Log Fixed[4]	Log Retn-cash[5]	Log Meet-only[6]	Factor Score
1996	Factor Score	0.370***	0.251**	0.209*	0.089	0.010	-0.090	1.000
1997	Factor Score	0.311***	0.268 **	0.326***	-0.019	-0.003	-0.178	1.000
1998	Factor Score	0.350***	0.293***	0.377***	-0.033	-0.003	-0.084	1.000
1999	Factor Score	0.439***	0.412***	0.487***	-0.054	0.073	-0.114	1.000
Pooled								
Log total Compen.		1.000						
Log Stock-pay		0.905***	1.000					
Log Stock-award		0.886***	0.926***	1.000				
Log Fixed		0.044	-0.208***	-0.151***	1.000			
Log Retn-cash		0.102*	0.005	0.085[7]	0.568***	1.000		
Log Meet-only		-0.056	-0.218***	-0.257***	0.506***	0.072	1.000	
Factor Score		0.403***	0.348***	0.393***	-0.006	0.035	-0.119**	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]Log of the sum of stock retainer payments and stock award amount.
[3]Log of total stock award amount.
[4]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[5]Log of the retainer cash amount.
[6]Log of the sum of board and committee meeting fees.
[7]P-value is 0.066

Table B4.2

Coefficients For Board Compensation (Log Of Levels) Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 141[1] firms (1996), 146[2] firms (1997), 153[3] firms (1998), 158[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. Rsqr.	F-score
1996					
Log Total Compen.[6]	4.498*** [36.63]	0.066*** [5.08]	0.101*** [3.37]	0.191	17.54***
Log Stock Pay[7]	4.404*** [13.67]	0.093** [2.81]	0.013 [0.17]	0.047	3.95*
Log Stock Award[8]	4.289*** [11.55]	0.085* [2.23]	0.027 [0.30]	0.027	2.48[12]
Log Fixed[9]	4.395*** [35.96]	0.016 [1.23]	0.074* [2.48]	0.037	3.65*
Log Retainer-Cash[10]	3.985*** [32.10]	0.004 [0.33]	0.110*** [3.61]	0.076	6.53**
Log Meet-only[11]	4.186*** [37.16]	-0.011 [-0.95]	0.040 [1.44]	0.009	1.53
1997					
Log Total Compen.	4.691*** [47.82]	0.064*** [3.39]	0.068** [2.93]	0.119	10.78***
Log Stock Pay	4.462*** [18.77]	0.099*** [3.21]	0.032 [0.56]	0.060	5.16**
Log Stock Award	4.326*** [15.46]	0.128*** [3.73]	0.060 [0.89]	0.096	7.03**
Log Fixed	4.518*** [43.85]	0.006 [0.44]	0.042[14] [1.68]	0.006	1.43
Log Retainer-Cash	4.195*** [36.63]	0.003 [0.22]	0.059* [2.12]	0.018	2.25
Log Meet-only	4.276*** [42.25]	-0.022[13] [-1.92]	0.019 [0.77]	0.020	2.16
1998					
Log total Compen.	4.947*** [34.71]	0.080*** [4.64]	0.027 [0.77]	0.114	10.80***
Log Stock Pay	4.830*** [18.99]	0.110*** [3.59]	-0.021 [-0.34]	0.074	6.75**

Log Stock Award	4.481*** [15.21]	0.166*** [4.65]	0.053 [0.75]	0.132	10.82***
Log Fixed	4.524*** [47.24]	-0.003 [-0.23]	0.044[15] [1.89]	0.012	1.87
Log Retainer-Cash	4.149*** [33.51]	0.002 [0.13]	0.071* [2.39]	0.025	2.85[16]
Log Meet-only	4.443*** [37.83]	-0.012 [-0.94]	-0.019 [-0.66]	-0.006	0.63
1999	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
Log total Compen	4.886*** [25.76]	0.127*** [8.02]	0.059 [1.35]	0.191	19.55***
Log Stock Pay	4.812*** [16.39]	0.170*** [5.47]	0.017 [0.25]	0.159	14.96***
Log Stock Award	4.608*** [13.32]	0.224*** [6.42]	0.056 [0.67]	0.228	20.61***
Log Fixed	4.533*** [40.03]	-0.008 [-0.61]	0.042 [1.56]	0.006	1.44
Log Retainer-Cash	4.039*** [30.03]	0.015 [1.03]	0.102** [3.17]	0.057	5.44**
Log Meet-only	4.316*** [30.48]	-0.020 [-1.21]	0.013 [0.37]	-0.003	0.81
Pooled					
Log total Compen.	4.695*** [62.36]	0.100*** [10.46]	0.079*** [4.44]	0.185	68.56***
Log Stock Pay	4.516*** [29.39]	0.144*** [8.57]	0.040 [1.09]	0.120	38.28***
Log Stock Award	4.310*** [25.72]	0.178*** [9.62]	0.080* [1.98]	0.158	46.55***
Log Fixed	4.498*** [84.37]	0.001 [0.15]	0.049*** [3.81]	0.021	7.27***
Log Retainer-Cash	4.098*** [52.63]	0.009 [0.92]	0.084*** [4.53]	0.052	16.48***
Log Meet-only	4.300*** [72.60]	-0.017** [-2.08]	0.014 [1.02]	0.012	3.87*

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]19 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]18 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]16 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]18 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.
[5]71 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]Log of the sum of stock retainer payments and stock award amount.
[8]Log of total stock award amount.
[9]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[10]Log of the retainer cash amount.
[11]Log of the sum of board and committee meeting fees.
[12]P-value is 0.089.
[13]P-value is 0.058.
[14]P-value is 0.096.
[15]P-value is 0.060.
[16]P-value is 0.061.

Table C4.1

Descriptive Statistics For Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999)[1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

Variable	1996	1997	1998	1999	Pooled
INVINT[2]					
Mean	2.612	2.734	2.896	2.804	2.763
Median	2.240	2.333	2.481	2.402	2.349
Firms	146	150	152	156	604
MVAGR[3]					
Mean	1.155	1.200	1.226	1.082	1.166
Median	1.099	1.161	1.075	1.008	1.088
Firms	158	164	168	168	658
MKTBKASS[4]					
Mean	1.907	1.676	2.500	2.407	2.249
Median	1.545	1.676	1.600	1.510	1.609
Firms	159	164	168	168	659
R&D[5]					
Mean	0.020	0.020	0.022	0.019	0.021
Median	0.000	0.000	0.000	0.000	0.000
Firms	159	164	168	172	663

[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms.
[2]The ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses.
[3]Year *t-2* to *t* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditures to book value of assets.

Table C4.2

Simple Correlations Amongst The Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

1996	INVINT[2]	MVAGR[3]	MKTBKASS[4]	RD[5]
INVINT	1.000			
MVAGR	0.107	1.000		
No. of firms	144			
MKTBKASS	0.206*	0.260***	1.000	
No. of firms	145	158		
RD	0.348***	0.061***	0.423***	1.000
No. of firms	145	158	159	
1997	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.358	1.000		
No. of firms	150			
MKTBKASS	0.265**	0.392***	1.000	
No. of firms	150	164		
RD	0.390***	0.090	0.404***	1.000
No. of firms	150	164	164	
1998	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.223***	1.000		
No. of firms	151			
MKTBKASS	0.309***	0.464***	1.000	
No. of firms	151	168		
RD	0.438***	0.070	0.460***	1.000

No. of firms	151	168	168	

1999	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.129**	1.000		
No. of firms	149			
MKTBKASS	0.423***	0.373***	1.000	
No. of firms	149	168		
RD	0.533***	0.234**	0.579***	1.000
No. of firms	153	168	168	

Pooled (1996 to 1999)	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.185***	1.000		
No. of firms	594			
MKTBKASS	0.306***	0.374***	1.000	
No. of firms	595	658		
RD	0.422***	0.108**	0.454***	1.000
No. of firms	599	658	659	

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms.
[2]The ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses.
[3]Year *t-2* to *t* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditure to book value of assets.

Table C4.3

Selected Statistics Related To A Common Factor Analysis Of Four Measures Of The Investment Opportunity Set (IOS) [1] For The Sample Firms

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively.

1996	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities[2] of four IOS measures				
	0.1307	0.0746	0.2179	0.2377
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	0.9127	0.1084	-0.0755	-0.2846
C. Correlations between the common factor and four IOS measures				
	0.6394	0.4190	0.7510	0.7562

1997	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2571	0.2548	0.2831	0.2640
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.2140	0.1734	0.0020	-0.3304
C. Correlations between the common factor and four IOS measures				
	0.7264	0.6509	0.7465	0.6631

1998	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2270	0.3000	0.4193	0.3276
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.3582	0.2975	-0.0795	-0.3026
C. Correlations between the common factor and four IOS measures				
	0.6839	0.6234	0.8208	0.7035

1999	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.3084	0.1397	0.4039	0.4305
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.5378	0.1285	-0.1745	-0.2093
C. Correlations between the common factor and four IOS measures				
	0.7336	0.5052	0.8279	0.8342

Pooled	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2052	0.1665	0.3166	0.2912
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.2094	0.1624	-0.1077	-0.2846
C. Correlations between the common factor and four IOS measures				
	0.6908	0.5489	0.7902	0.7383

[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms. INVINT is the ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses. MVAGR is the year *t-2* to *t* geometric mean growth of market value of assets. MKTBKASS is the ratio of the market value of equity plus book value of debt to book value of assets. RD is the ratio of R&D expenditure to book value of assets.

[2] Communalities are equivalent to the squared multiple correlations obtained from regressing each of the investment opportunity set measures on the other three measures.

Table C4.4

Comparison Of The Low-IOS And High-IOS Firms For The Sample Firms

This table presents the mean values and *t*-values associated with tests of the null hypothesis that the two-sample means are equal[1] for 1996 to 1999[2]. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information and stock option compensation information, the final sample includes 144, 150, 151, and 149 for the years 1996, 1997, 1998, and 1999, respectively. For each year and for the pooled sample, factor scores[3] are calculated and used to divide the sample into growth firms and non-growth firms.

Variable	1996	1997	1998	1999	Pooled
Assets ($M)					
Low IOS	26,713	25,249	32,847	25,850	27,308
High IOS	13,329	22,787	24,091	35,883	25,342
t-stat	[2.35]*	[0.35]	[0.97]	[-0.89]	[0.45]
Sales ($M)					
Low IOS	18,306	18,911	21,575	17,528	18,830
High IOS	13,656	17,088	17,538	21,474	18,283
t-stat	[1.54]	[0.50]	[1.09]	[-1.11]	[0.30]
Mktbkeq[4] ($M)					
Low IOS	2.218	2.996	3.290	3.251	2.764
High IOS	4.619	4.745	5.914	8.631	6.234
t-stat	[-4.30]**	[-2.64]**	[-3.00]**	[-3.45]**	[-6.74]**
ROA					
Low IOS	0.042	0.044	0.048	0.041	0.044
High IOS	0.079	0.074	0.072	0.080	0.076
t-stat	[-4.99]**	[-3.84]**	[-2.48]*	[-3.84]**	[-7.01]**

**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The t-test of two-sample equal means for the higher (than median factor score) and lower investment opportunity set firms is based on the assumption of unequal variances.
[2]The financial variables used year *t* financial data for the sample firms.
[3]To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).
[4]The ratio of market value of equity to book value of equity.

Table C4.5

Simple Correlations Among Board Compensation Variables And The IOS Factor Score

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." Due to the availability of financial information and stock option information, the final sample includes 160, 164, 169, and 176 for the years 1996, 1997, 1998, and 1999, respectively. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
1996							
Log total Compen.	1.000						
Stock-pay Ratio	0.685•••	1.000					
Stock-award Ratio	0.804•••	0.797•••	1.000				
Fixed Ratio	-0.685•••	-1.000•••	-0.797•••	1.000			
Retn-cash Ratio	-0.466•••	-0.720•••	-0.479•••	0.720•••	1.000		
Meet-only Ratio	-0.470•••	-0.556•••	-0.519•••	0.556•••	-0.091	1.000	
Factor Score	0.363•••	0.201••	0.180•	-0.201•	-0.099	-0.192•	1.000
1997							
Log total Compen.	1.000						
Stock-pay Ratio	0.735•••	1.000					
Stock-award Ratio	0.838•••	0.815•••	1.000				
Fixed Ratio	-0.735•••	-1.000•••	-0.815•••	1.000			
Retn-cash Ratio	-0.507•••	-0.730•••	-0.523•••	0.730•••	1.000		
Meet-only Ratio	-0.498•••	-0.607•••	-0.562•••	0.607•••	-0.042	1.000	
Factor Score	0.257•••	0.156[7]	0.104	-0.156[8]	-0.010	-0.103	1.000

1998							
Log total Compen.	1.000						
Stock-pay Ratio	0.749***	1.000					
Stock-award Ratio	0.772***	0.830***	1.000				
Fixed Ratio	-0.749***	-1.000***	-0.830***	1.000			
Retn-cash Ratio	-0.575***	-0.768***	-0.594***	0.768***	1.000		
Meet-only Ratio	-0.467***	-0.616***	-0.551***	0.616***	0.029	1.000	
Factor Score	0.320***	0.244**	0.218**	-0.244***	-0.105	-0.249**	1.000

1999	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
Log total Compen.	1.000						
Stock-pay Ratio	0.728***	1.000					
Stock-award Ratio	0.768***	0.820***	1.000				
Fixed Ratio	-0.728***	-1.000***	-0.820***	1.000			
Retn-cash Ratio	-0.545***	-0.780***	-0.626***	0.780***	1.000		
Meet-only Ratio	-0.498***	-0.625***	-0.540***	0.625***	0.038	1.000	
Factor Score	0.374***	0.251***	0.243***	-0.251***	-0.110	-0.246**	1.000

Pooled (1996 to 1999)							
Log total Compen.	1.000						
Stock-pay Ratio	0.748***	1.000					
Stock-award Ratio	0.803***	0.830***	1.000				
Fixed Ratio	-0.748***	-1.000***	-0.830***	1.000			
Retn-cash Ratio	-0.552***	-0.764***	-0.586***	0.764***	1.000		
Meet-only Ratio	-0.511***	-0.627***	-0.568***	0.627***	0.034	1.000	
Factor Score	0.325***	0.223***	0.200***	-0.223***	-0.110**	-0.212***	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[5]The retainer cash amount divide by total compensation.
[6]The sum of board and committee meeting fees divide by total compensation.
[7],[8]P-value is 0.056.

Table C4.6

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 144[1] firms (1996), 150[2] firms (1997), 151[3] firms (1998), 149[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.554*** [46.04]	0.067*** [5.27]	0.087*** [3.58]	0.193	18.09***
Stock-pay Ratio[7]	0.169 [1.13]	0.049* [2.56]	0.039 [1.06]	0.034	3.55*
Stock-award Ratio[8]	1.080 [0.76]	0.042* [2.30]	0.035 [1.02]	0.026	2.90*
Fixed Ratio[9]	0.831*** [5.54]	-0.049* [-2.57]	-0.039 [-1.06]	0.035	3.55*
Retainer-cash Ratio[10]	0.468*** [4.01]	-0.019 [-1.31]	-0.027 [-0.95]	0.002	1.16
Meet-only Ratio[11]	0.473*** [4.83]	-0.033* [-2.64]	-0.053* [-2.20]	0.056	5.22**
1997					
Log total Compen.	4.740*** [37.37]	0.054*** [3.38]	0.056[14] [1.84]	0.075	7.01***
Stock-pay Ratio	0.300* [1.98]	0.038[12] [1.97]	0.027 [0.75]	0.015	2.12
Stock-award Ratio	0.244 [1.53]	0.026 [1.30]	0.019 [0.49]	-0.001	0.93
Fixed Ratio	0.690*** [4.62]	-0.038[13] [-1.97]	-0.027 [-0.75]	0.015	2.13
Retainer-cash Ratio	0.389*** [3.40]	-0.018 [-1.26]	-0.016 [-0.58]	-0.001	0.91
Meet-only Ratio	0.413*** [4.19]	-0.018 [-1.41]	-0.048* [-2.01]	0.024	2.83[15]

1998					
Log total Compen.	4.939*** [33.07]	0.072*** [4.13]	0.028 [0.78]	0.094	8.80***
Stock-pay Ratio	0.492** [3.06]	0.058** [3.07]	-0.000 [-0.00]	0.047	4.70*
Stock-award Ratio	0.511** [2.82]	0.057** [2.71]	-0.028 [-0.66]	0.037	3.91*
Fixed Ratio	0.508** [3.15]	-0.058** [-3.07]	0.000 [0.00]	0.047	4.70*
Retainer-cash Ratio	0.260* [2.17]	-0.018 [-1.28]	0.005 [0.16]	-0.002	0.83
Meet-only Ratio	0.362*** [3.74]	-0.036** [-3.19]	-0.042[16] [-1.83]	0.070	6.68**
1999	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
Log total Compen	4.798*** [24.45]	0.107*** [4.93]	0.079[17] [1.70]	0.145	13.58***
Stock-pay Ratio	0.380* [2.16]	0.061** [3.15]	0.041 [0.98]	0.057	5.43*
Stock-award Ratio	0.320 [1.55]	0.069** [3.04]	0.028 [0.58]	0.049	4.77**
Fixed Ratio	0.620*** [3.52]	-0.061** [-3.15]	-0.041 [-0.98]	0.057	5.43**
Retainer-cash Ratio	0.114 [0.83]	-0.020 [-1.34]	0.033 [1.01]	0.006	1.41
Meet-only Ratio	0.555*** [5.70]	-0.035** [-3.24]	-0.094*** [-4.08]	0.145	13.54***
Pooled					
Log total Compen.	4.681*** [68.54]	0.080*** [7.21]	0.081*** [5.03]	0.132	45.93***
Stock-pay Ratio	0.259** [3.22]	0.057*** [5.88]	0.046* [2.39]	0.055	18.22***
Stock-award Ratio	0.227** [2.60]	0.054*** [4.51]	0.030 [1.45]	0.040	13.42***
Fixed Ratio	0.741*** [9.24]	-0.057*** [-5.89]	-0.046* [-2.39]	0.055	18.23***
Retainer-cash Ratio	0.353*** [4.95]	-0.020** [-2.81]	-0.012 [-0.72]	0.010	3.93*
Meet-only Ratio	0.475*** [7.57]	-0.034*** [-7.24]	-0.065*** [-4.42]	0.089	29.82***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]16 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]14 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]18 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]27 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.

[5]75 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12, 13]P-value is 0.051.
[14]P-value is 0.068.
[15]P-value is 0.062.
[16]P-value is 0.069.
[17]P-value is 0.092.

Table D4.1

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (**the logarithm of total sales**). The full sample consists of 144[1] firms (1996), 150[2] firms (1997), 151[3] firms (1998), 149[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogSales	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.559*** [35.10]	0.066*** [5.12]	0.085** [2.68]	0.162	14.85***
Stock-pay Ratio[7]	0.185 [0.96]	0.049* [2.53]	0.035 [0.74]	0.030	3.24*
Stock-award Ratio[8]	0.101 [0.55]	0.042* [2.29]	0.037 [0.83]	0.024	2.72[12]
Fixed Ratio[9]	0.815*** [4.21]	-0.049* [-2.53]	-0.035 [-0.74]	0.031	3.25*
Retainer-cash Ratio[10]	0.480** [3.18]	-0.020 [-1.31]	-0.030 [-0.81]	0.001	1.04
Meet-only Ratio[11]	0.359** [2.80]	-0.031* [-2.43]	-0.024 [-0.78]	0.028	3.02[13]
1997					
Log total Compen.	4.623*** [27.22]	0.054*** [3.39]	0.084* [2.06]	0.080	7.47***
Stock-pay Ratio	0.138 [0.68]	0.038* [2.01]	0.067 [1.37]	0.024	2.79[14]
Stock-award Ratio	0.115 [0.54]	0.027 [1.33]	0.050 [0.97]	0.004	1.28
Fixed Ratio	0.862*** [4.26]	-0.038* [-2.01]	-0.067 [-1.37]	0.024	2.80[15]
Retainer-cash Ratio	0.488** [3.19]	-0.019 [-1.29]	-0.040 [-1.08]	0.005	1.33
Meet-only Ratio	0.407** [3.05]	-0.017 [-1.35]	-0.046 [-1.44]	0.011	1.83

1998					
Log total Compen.	4.806*** [23.44]	0.071*** [4.08]	0.060 [1.22]	0.100	9.29***
Stock-pay Ratio	0.311 [1.40]	0.057** [3.04]	0.043 [0.82]	0.051	5.06**
Stock-award Ratio	0.364 [1.46]	0.058* [2.71]	0.007 [0.12]	0.035	3.69*
Fixed Ratio	0.690** [3.12]	-0.057** [-3.04]	-0.044 [-0.82]	0.051	5.06*
Retainer-cash Ratio	0.309[16] [1.87]	-0.018 [-1.27]	-0.007 [-0.18]	-0.002	0.83
Meet-only Ratio	0.396** [2.96]	-0.035** [-3.09]	-0.050 [-1.58]	0.065	6.22*
1999	**Intercept**	**IOS score**	**LogSales**	**Adj. R sqr.**	**F-score**
Log total Compen	4.618*** [15.34]	0.105*** [4.84]	0.121[17] [1.70]	0.145	13.59***
Stock-pay Ratio	0.315 [1.16]	0.060** [3.10]	0.056 [0.88]	0.055	5.33**
Stock-award Ratio	0.230 [0.73]	0.068** [3.08]	0.050 [0.66]	0.049	4.83**
Fixed Ratio	0.685* [2.53]	-0.060** [-3.10]	-0.056 [-0.88]	0.055	5.33**
Retainer-cash Ratio	0.042 [0.20]	-0.021 [-1.39]	0.050 [1.00]	0.005	1.40
Meet-only Ratio	0.650*** [4.81]	-0.033*** [-4.55]	-0.116*** [-3.66]	0.111	10.23***
Pooled					
Log total Compen.	4.547*** [49.05]	0.079*** [7.15]	0.113*** [4.96]	0.133	46.45***
Stock-pay Ratio	0.125 [1.34]	0.057*** [5.89]	0.078*** [3.47]	0.060	19.79***
Stock-award Ratio	0.101 [0.89]	0.053*** [4.52]	0.061* [2.22]	0.044	14.67***
Fixed Ratio	0.876*** [9.45]	-0.057*** [-5.89]	-0.078*** [-3.48]	0.060	19.80***
Retainer-cash Ratio	0.412*** [4.56]	-0.020** [-2.82]	-0.026 [-1.23]	0.012	4.46***
Meet-only Ratio	0.472*** [5.11]	-0.033*** [-7.15]	-0.064** [-2.92]	0.066	22.01***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]16 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]14 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]18 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]27 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.

[5]75 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12]P-value is 0.090.
[13]P-value is 0.052.
[14]P-value is 0.065.
[15]P-value is 0.064.
[16]P-value is 0.063.
[17]P-value is 0.091.

Appendix E - Alternative Test Five -Year *t* Financial Data (Compensation Levels)

Table E4.1

Coefficients For Board Compensation (Log Of Levels) Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 144[1] firms (1996), 150[2] firms (1997), 151[3] firms (1998), 149[4] firms (1999), and 598[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Pearl Meyer & Partners Co. uses stock option compensation value as one-third of the grant value (number of share times option exercise prices). For the stock option compensation part, I calculated the value based on the Black-Scholes valuation model which is consistent with the requirements of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation." To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log Total Compen.[6]	4.554*** [46.04]	0.067*** [5.27]	0.087*** [3.58]	0.193	18.08***
Log Stock Pay[7]	4.270*** [16.90]	0.097** [3.02]	0.043 [0.71]	0.055	4.57*
Log Stock Award[8]	4.211*** [13.43]	0.090* [2.41]	0.044 [0.58]	0.034	2.91[15]
Log Fixed[9]	4.496*** [43.33]	0.005 [0.37]	0.049[13] [1.93]	0.012	1.86
Log Retainer-Cash[10]	4.228*** [39.67]	0.002 [0.13]	0.051[14] [1.95]	0.013	1.91
Log Meet-only[11]	4.219*** [42.15]	-0.021[12] [-1.87]	0.031 [1.27]	0.026	2.62[16]
1997					
Log Total Compen	4.740*** [37.37]	0.054*** [3.38]	0.056[17] [1.84]	0.075	7.00***
Log Stock Pay	4.532*** [18.46]	0.097** [3.11]	0.018 [0.30]	0.054	4.84**
Log Stock Award	4.374*** [15.07]	0.129*** [3.62]	0.052 [0.74]	0.089	6.63**
Log Fixed	4.519*** [43.73]	-0.004 [-0.27]	0.042[18] [1.67]	0.006	1.47
Log Retainer-Cash	4.237*** [36.58]	-0.008 [-0.57]	0.050[19] [1.79]	0.012	1.84
Log Meet-only	4.286*** [42.63]	-0.023* [-2.08]	0.017 [0.68]	0.025	2.47[20]
1998					
Log total Compen.	4.939*** [33.07]	0.072*** [4.13]	0.028 [0.78]	0.094	8.80***
Log Stock Pay	4.816*** [18.31]	0.110*** [3.62]	-0.018 [-0.28]	0.074	6.64**
Log Stock	4.517***	0.166***	0.044	0.141	11.38***

Award	[14.82]	[4.75]	[0.60]		
Log Fixed	4.559***	-0.013	0.034	0.009	1.66
	[45.99]	[-1.08]	[1.45]		
Log Retainer-Cash	4.158***	0.006	0.068*	0.022	2.59[21]
	[32.37]	[0.42]	[2.23]		
Log Meet-only	4.446***	-0.019	-0.019	-0.006	1.33
	[37.97]	[-1.45]	[-0.68]		
1999	Intercept	IOS score	LogAsset	Adj. Rsqr.	F-score
Log total Compen	4.798***	0.107***	0.079[23]	0.145	13.58***
	[24.45]	[4.93]	[1.70]		
Log Stock Pay	4.705***	0.139***	0.040	0.103	9.05***
	[15.30]	[4.22]	[0.56]		
Log Stock Award	4.452***	0.190***	0.090	0.166	13.39***
	[11.96]	[5.08]	[1.03]		
Log Fixed	4.520***	-0.010	0.043	0.022	1.70
	[40.77]	[-0.78]	[1.66]		
Log Retainer-Cash	3.990***	0.009	0.112**	0.062	5.53**
	[27.55]	[0.57]	[3.28]		
Log Meet-only	4.375***	-0.027[22]	-0.001	0.012	1.65
	[32.22]	[-1.82]	[-0.04]		
Pooled					
Log total Compen.	4.681***	0.080***	0.081***	0.132	45.93***
	[68.54]	[7.21]	[5.03]		
Log Stock Pay	4.460***	0.119***	0.052	0.083	25.65***
	[31.49]	[7.08]	[1.53]		
Log Stock Award	4.270***	0.155***	0.088*	0.123	34.65***
	[25.44]	[8.17]	[2.20]		
Log Fixed	4.524***	-0.006	0.042***	0.019	6.54***
	[88.18]	[-1.05]	[3.41]		
Log Retainer-Cash	4.156***	0.004	0.069***	0.036	11.42***
	[53.92]	[0.39]	[3.81]		
Log Meet-only	4.315***	-0.024**	0.011	0.028	7.64***
	[80.48]	[-2.86]	[0.84]		

***: Denotes P-value < 0.001. **: Denotes P-value < 0.01. *: Denotes P-value < 0.05.

[1]16 observations are omitted from original 160 sample firms due to missing values to conduct factor analysis.
[2]14 observations are omitted from original 164 sample firms due to missing values to conduct factor analysis.
[3]18 observations are omitted from original 169 sample firms due to missing values to conduct factor analysis.
[4]27 observations are omitted from original 176 sample firms due to missing values to conduct factor analysis.
[5]75 observations are omitted from original 669 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]Log of the sum of stock retainer payments and stock award amount.
[8]Log of total stock award amount.
[9]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[10]Log of the retainer cash amount.
[11]*Log of the sum of board and committee meeting fees.*
[12]P-value is 0.063.
[13]P-value is 0.056.
[14]P-value is 0.053.
[15]P-value is 0.052.
[16]P-value is 0.077.
[17]P-value is 0.068.
[18]P-value is 0.097.
[19]P-value is 0.075.
[20]P-value is 0.089.
[21]P-value is 0.079.
[22]P-value is 0.072.
[23]P-value is 0.092.

Table F4.1

Descriptive Statistics For Compensation Variables

This table presents the descriptive statistics for compensation variables. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively.

Variable	1996	1997	1998	1999	Pooled
Retainer[1] ($)					
Mean	33,747	35,930	38,443	42,104	37,644
Median	30,000	32,000	35,000	36,000	34,750
Largest	85,000	85,000	136,392	132,526	136,392
Smallest	8,000	0	0	0	0
Firms	178	167	185	171	736
Meeting fees[2] ($)					
Mean	24,590	23,389	24,639	24,669	24,328
Median	25,937	25,000	26,000	25,250	25,550
Largest	54,000	54,000	100,000	174,691	174,691
Smallest	0	0	0	0	0
Firms	178	181	185	192	736
Stock-awards[3] ($)					
Mean	23,919	34,650	48,839	66,229	43,886
Median	16,208	26,063	36,625	46,071	29,500
Largest	233,345	236,625	381,000	419,250	419,250
Smallest	0	0	0	0	0
Firms	177	181	185	192	735
Total compensation[4] ($)					
Mean	82,122	93,971	111,922	133,003	105,800
Median	77,313	85,000	100,050	110,135	90,825
Largest	315,347	276,625	409,500	464,785	464,785
Smallest	38,000	38,000	45,000	41,875	41,875
Firms	178	181	185	192	736

[1]Equals the dollar value of any cash and stock payments used solely as payment of the retainer.
[2]Meeting fees include fees paid for board meetings, committee meetings, committee retainer, chair retainer and chair services.
[3]Stock awards include stock grant, stock options, restricted stock, deferred stock, stock deferred to retirement, but do not include stock payments for retainers, meeting fees, or chair fees.
[4]Total compensation is the sume of the retainer, meeting fees, chair fees, and stock awards.

Table F4.2

Descriptive Statistics For Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

Variable	1996	1997	1998	1999	Pooled
INVINT[2]					
Mean	2.511	2.759	2.908	2.813	2.750
Median	2.089	2.333	2.477	2.463	2.335
Firms	162	166	168	173	669
MVAGR[3]					
Mean	1.135	1.188	1.232	1.254	1.204
Median	1.115	1.111	1.180	1.098	1.127
Firms	172	177	185	192	726
MKTBKASS[4]					
Mean	1.771	1.886	2.160	2.537	2.099
Median	1.484	1.536	1.664	1.600	1.576
Firms	175	180	185	192	732
R&D[5]					
Mean	0.019	0.020	0.022	0.021	0.021
Median	0.000	0.000	0.000	0.000	0.000
Firms	177	181	185	192	735

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. Barber *et al* (1996) use year *t-1*, rather than year *t*, data to compute an IOS factor score to mitigate spurious relations that can result from using contemporaneous data.
[2]The ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses.
[3]Year *t-3* to *t-1* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditures to book value of assets.

Table F4.3

Simple Correlations Amongst The Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

1996	INVINT[2]	MVAGR[3]	MKTBKASS[4]	RD[5]
INVINT	1.000			
MVAGR	0.331***	1.000		
No. of firms	158			
MKTBKASS	0.299***	0.381***	1.000	
No. of firms	161	172		
RD	0.408***	0.231***	0.361***	1.000
No. of firms	162	172	175	
1997	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.103	1.000		
No. of firms	162			
MKTBKASS	0.184*	0.281***	1.000	
No. of firms	165	177		
RD	0.297***	0.058	0.391***	1.000
No. of firms	166	177	180	
1998	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.322***	1.000		
No. of firms	168			
MKTBKASS	0.228**	0.401***	1.000	
No. of firms	168	185		

RD	0.309***	0.064	0.414***	1.000
No. of firms	168	185	185	

1999	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.209**	1.000		
No. of firms	173			
MKTBKASS	0.338***	0.442***	1.000	
No. of firms	173	192		
RD	0.454***	0.025	0.469***	1.000
No. of firms	173	192	192	

Pooled (1996 to 1999)	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.206***	1.000		
No. of firms	661			
MKTBKASS	0.253***	0.393***	1.000	
No. of firms	667	726		
RD	0.361***	0.066[6]	0.407***	1.000
No. of firms	669	726	732	

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. Barber *et al* (1996) use year *t-1*, rather than year *t*, data to compute an IOS factor score to mitigate spurious relations that can result from using contemporaneous data.

[2]The ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses.

[3]Year *t-3* to *t-1* geometric mean growth of market value of assets.

[4]The ratio of the market value of equity plus book value of debt to book value of assets.

[5]The ratio of R&D expenditure to book value of assets.

[6]P-value is 0.075.

Table F4.4

Selected Statistics Related To A Common Factor Analysis Of Four Measures Of The Investment Opportunity Set (IOS) [1] For The Sample Firms

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively.

1996	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities[2] of four IOS measures				
	0.2288	0.2441	0.2702	0.2295
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.3123	0.0336	-0.1364	-0.2368
C. Correlations between the common factor and four IOS measures				
	0.7106	0.7137	0.7456	0.7057

1997	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.0968	0.0856	0.2073	0.1938
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	0.8323	0.1106	-0.0766	-0.2828
C. Correlations between the common factor and four IOS measures				
	0.5964	0.4658	0.7583	0.7197

1998	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.1833	0.2897	0.3411	0.2343
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.1871	0.1729	0.0179	-0.3296

C. Correlations between the common factor and four IOS measures

0.6522	0.6901	0.7851	0.6283

1999	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2451	0.2935	0.4274	0.3557
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.3641	0.3416	-0.0803	-0.3037
C. Correlations between the common factor and four IOS measures				
	0.7089	0.5736	0.8266	0.7095

Pooled	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.1633	0.2074	0.3113	0.2412
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.1142	0.1906	-0.0748	-0.3068
C. Correlations between the common factor and four IOS measures				
	0.6522	0.6019	0.7888	0.6793

[1]The investment opportunity set variables are constructed using year *t-1* financial data for the sample firms. INVINT is the ratio of the sum of year *t-3* to *t-1* capital expenditure, R&D expense, and acquisitions to the sum of year *t-3* to *t-1* depreciation expenses. MVAGR is the year *t-3* to *t-1* geometric mean growth of market value of assets. MKTBKASS is the ratio of the market value of equity plus book value of debt to book value of assets. RD is the ratio of R&D expenditure to book value of assets.

[2] Communalities are equivalent to the squared multiple correlations obtained from regressing each of the investment opportunity set measures on the other three measures.

Table F4.5

Comparison Of The Low-IOS And High-IOS Firms For The Sample Firms

This table presents the mean values and *t*-values associated with tests of the null hypothesis that the two-sample means are equal[1] for 1996 to 1999[2]. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. For each year and for the pooled sample, factor scores[3] are calculated and used to divide the sample into growth firms and non-growth firms.

Variable	1996	1997	1998	1999	Pooled
Assets ($M)					
Low IOS	31,587	24,431	31,918	26,003	27,132
High IOS	15,217	23,152	23,935	35,894	26,096
t-stat	[2.38]*	[0.19]	[0.95]	[-0.94]	[0.25]
Sales ($M)					
Low IOS	19,061	18,450	20,664	17,702	18,446
High IOS	14,438	16,952	17,689	20,654	18,019
t-stat	[1.40]	[0.45]	[0.88]	[-0.89]	[0.26]
Mktbkeq[4] ($M)					
Low IOS	2.194	2.962	3.218	3.618	2.762
High IOS	4.495	4.742	5.802	8.304	6.136
t-stat	[-4.61]**	[-2.90]**	[-3.25]**	[-3.11]**	[-6.98]**
ROA					
Low IOS	0.041	0.045	0.047	0.041	0.045
High IOS	0.077	0.073	0.069	0.074	0.072
t-stat	[-5.32]**	[-3.75]**	[-2.48]*	[-3.51]**	[-6.56]**

**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The t-test of two-sample equal means for the higher (than median factor score) and lower investment opportunity set firms is based on the assumption of unequal variances.
[2]The financial variables used year *t-1* financial data for the sample firms.
[3]To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).
[4]The ratio of market value of equity to book value of equity.

Table F4.6

Simple Correlations Among Board Compensation Variables And The IOS Factor Score

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
1996							
Log total Compen.	1.000						
Stock-pay Ratio	0.637***	1.000					
Stock-award Ratio	0.750***	0.773***	1.000				
Fixed Ratio	-0.637***	-1.000***	-0.773***	1.000			
Retn-cash Ratio	-0.446***	-0.687***	-0.429***	0.687***	1.000		
Meet-only Ratio	-0.396***	-0.509***	-0.483***	0.509***	-0.159*	1.000	
Factor Score	0.294***	0.145[7]	0.182*	-0.145[8]	-0.062	-0.111	1.000
1997							
Log total Compen.	1.000						
Stock-pay Ratio	0.626***	1.000					
Stock-award Ratio	0.738***	0.770***	1.000				
Fixed Ratio	-0.626***	-1.000***	-0.770***	1.000			
Retn-cash Ratio	-0.441***	-0.711***	-0.462***	0.711***	1.000		
Meet-only Ratio	-0.378***	-0.529***	-0.493***	0.529***	-0.134[9]	1.000	
Factor Score	0.323***	0.190*	0.178*	-0.190*	-0.107	-0.106	1.000
1998							
Log total Compen.	1.000						
Stock-pay Ratio	0.632***	1.000					
Stock-award Ratio	0.648***	0.781***	1.000				

Fixed Ratio	-0.632***	-1.000***	-0.781***	1.000			
Retn-cash Ratio	-0.489***	-0.736***	-0.528***	0.736***	1.000		
Meet-only Ratio	-0.350***	-0.556***	-0.479***	0.556***	-0.070*	1.000	
Factor Score	0.326***	0.265***	0.225**	-0.265***	-0.152*	-0.171*	1.000

1999	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
Log total Compen.	1.000						
Stock-pay Ratio	0.667***	1.000					
Stock-award Ratio	0.710***	0.748***	1.000				
Fixed Ratio	-0.667***	-1.000***	-0.748***	1.000			
Retn-cash Ratio	-0.500***	-0.757***	-0.549***	0.757***	1.000		
Meet-only Ratio	-0.452***	-0.599***	-0.485***	0.599***	-0.159*	1.000	
Factor Score	0.467***	0.315***	0.342***	-0.315***	-0.143[10]	-0.292***	1.000

Pooled (1996 to 1999)							
Log total Compen.	1.000						
Stock-pay Ratio	0.682***	1.000					
Stock-award Ratio	0.729***	0.783***	1.000				
Fixed Ratio	-0.682***	-1.000***	-0.783***	1.000			
Retn-cash Ratio	-0.507***	-0.740***	-0.525***	0.740***	1.000		
Meet-only Ratio	-0.431***	-0.575***	-0.508***	0.575***	-0.038	1.000	
Factor Score	0.401***	0.289***	0.285*	-0.289***	-0.161***	-0.218***	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[5]The retainer cash amount divide by total compensation.
[6]The sum of board and committee meeting fees divide by total compensation.
[7,8,9]P-value is 0.07.
[10]P-value is 0.06.

Table F4.7

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 158[1] firms (1996), 162[2] firms (1997), 168[3] firms (1998), 173[4] firms (1999), and 661[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999 The company publishes yearly data for compensation of board for US largest 200 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS) *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.77*** [60.96]	0.042*** [3.77]	0.029 [1.54]	0.089	8.62***
Stock-pay Ratio[7]	0.346** [2.84]	0.032[12] [1.83]	-0.008 [-0.29]	0.009	1.70
Stock-award Ratio[8]	0.143 [1.28]	0.036* [2.26]	0.025 [0.92]	0.026	3.10*
Fixed Ratio[9]	0.654*** [5.37]	-0.032[13] [-1.83]	0.008 [0.29]	0.009	1.70
Retainer-cash Ratio[10]	0.346*** [3.62]	-0.011 [-0.78]	0.005 [0.23]	-0.009	0.32
Meet-only Ratio[11]	0.285*** [3.37]	-0.016 [-1.37]	-0.007 [-0.34]	0.0003	1.02
1997					
Log total Compen.	4.601*** [48.91]	0.060*** [5.00]	0.084*** [3.65]	0.163	16.66***
Stock-pay Ratio	0.208 [1.59]	0.044** [2.65]	0.046 [1.43]	0.036	4.04*
Stock-award Ratio	0.171 [1.26]	0.042* [2.42]	0.033 [1.00]	0.026	3.12*
Fixed Ratio	0.792*** [6.05]	-0.044** [-2.65]	-0.046 [-1.43]	0.364	4.04*
Retainer-cash Ratio	0.444*** [4.12]	-0.021 [-1.51]	-0.026 [-1.01]	0.005	1.44
Meet-only Ratio	0.435*** [4.86]	-0.020[14] [-1.74]	-0.054* [-2.46]	0.036	3.97*
1998					
Log total Compen.	4.780*** [44.11]	0.060*** [3.70]	0.057* [2.20]	0.102	10.51***
Stock-pay Ratio	0.404** [2.81]	0.058*** [3.65]	0.017 [0.50]	0.061	6.37**
Stock-award Ratio	0.499** [3.31]	0.054** [2.82]	-0.031 [-0.85]	0.043	4.76**

Fixed Ratio	0.596*** [4.15]	-0.058*** [-3.65]	-0.017 [-0.50]	0.061	6.37**
Retainer-cash Ratio	0.350** [3.26]	-0.026* [-2.03]	-0.015 [-0.58]	0.013	2.14
Meet-only Ratio	0.368*** [4.12]	-0.026* [-2.43]	-0.044* [-2.04]	0.042	4.64*
1999	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
Log total Compen	4.672*** [34.11]	0.101*** [8.16]	0.098** [3.02]	0.254	30.33***
Stock-pay Ratio	0.260 [1.62]	0.074*** [6.20]	0.065[15] [1.72]	0.106	11.13***
Stock-award Ratio	0.336[16] [1.81]	0.090*** [6.12]	0.019 [0.42]	0.108	11.37***
Fixed Ratio	0.740*** [4.61]	-0.074*** [-6.20]	-0.065[17] [-1.72]	0.106	11.13***
Retainer-cash Ratio	0.228[18] [1.93]	-0.025[19] [-1.88]	0.007 [0.26]	0.009	1.81
Meet-only Ratio	0.552*** [6.26]	-0.042*** [-4.32]	-0.093*** [-4.41]	0.170	18.6***
Pooled					
Log total Compen.	4.683*** [82.28]	0.079*** [10.90]	0.073*** [5.37]	0.198	82.39***
Stock-pay Ratio	0.278*** [3.94]	0.069*** [8.67]	0.037* [2.18]	0.087	32.55***
Stock-award Ratio	0.247*** [3.46]	0.070*** [7.52]	0.022 [1.26]	0.081	29.9***
Fixed Ratio	0.722*** [10.22]	-0.069*** [-8.67]	-0.037* [-2.18]	0.087	32.55***
Retainer-cash Ratio	0.362*** [5.78]	-0.029*** [-4.64]	-0.012 [-0.83]	0.024	9.18***
Meet-only Ratio	0.409*** [8.00]	-0.034*** [-7.59]	-0.050*** [-4.08]	0.075	27.75***

*** denotes P-value < 0.001, ** denotes P-value < 0.01, and * denotes P-value < 0.05.
[1]20 observations are omitted from original 178 sample firms due to missing values to conduct factor analysis.
[2]19 observations are omitted from original 181 sample firms due to missing values to conduct factor analysis.
[3]17 observations are omitted from original 185 sample firms due to missing values to conduct factor analysis.
[4]19 observations are omitted from original 192 sample firms due to missing values to conduct factor analysis.
[5]76 observations are omitted from original 737 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12, 15]P-value is 0.069.
[14]P-value is 0.084.
[15,17]P-value is 0.087.
[16]P-value is 0.072.
[18]P-value is 0.055.
[19]P-value is 0.062.

Appendix G - Alternative Test Seven (PM & Co. Compensation Data - Compensation Levels)

Table G4.1

Coefficients For Board Compensation (Log Of Levels) Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 158[1] firms (1996), 162[2] firms (1997), 168[3] firms (1998), 173[4] firms (1999), and 661[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). I change dependent variables (retainers, meeting fees, and stock awards) from proportion of total compensation to log of levels of compensation. *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr	F-score
1996					
Log Total Compen.[6]	4.77*** [60.96]	0.042*** [3.77]	0.029 [1.54]	0.089	8.62***
Log Stock Pay[7]	4.554*** [22.20]	0.071* [2.47]	-0.036 [-0.73]	0.117	3.27*
Log Stock Award[8]	4.145*** [17.74]	0.069* [2.05]	0.046 [0.82]	0.023	2.48[12]
Log Fixed[9]	4.810*** [80.72]	0.003 [0.36]	0.026[13] [1.82]	0.010	1.75
Log Retainer-Cash[10]	4.435*** [46.14]	-0.002 [-0.14]	0.021 [0.92]	-0.007	0.42
Log Meet-only[11]	4.215*** [58.60]	-0.008 [-0.75]	0.031[14] [1.76]	0.011	1.71
1997					
Log Total Compen.	4.601*** [48.91]	0.060*** [5.00]	0.084*** [3.65]	0.163	16.66***
Log Stock Pay	4.249*** [20.96]	0.103*** [3.95]	0.073 [1.49]	0.089	8.15***
Log Stock Award	4.103*** [17.21]	0.131*** [4.49]	0.099[15] [1.71]	0.129	10.57***
Log Fixed	4.678*** [66.91]	0.008 [0.91]	0.061*** [3.58]	0.064	6.48**
Log Retainer-Cash	4.231*** [39.27]	0.006 [0.40]	0.050[16] [1.91]	0.011	1.83
Log Meet-only	4.300*** [43.84]	-0.012 [-1.07]	0.010 [0.41]	-0.005	0.68
1998					
Log total Compen.	4.780*** [44.11]	0.060*** [3.70]	0.057* [2.20]	0.102	10.51***
Log Stock Pay	4.491*** [21.72]	0.100*** [4.04]	0.046 [0.93]	0.084	8.31***

Log Stock Award	4.261*** [17.85]	0.154*** [5.33]	0.088 [1.53]	0.158	14.44***
Log Fixed	4.688*** [61.57]	0.004 [0.43]	0.064*** [3.48]	0.058	6.07**
Log Retainer-Cash	4.197*** [36.15]	0.004 [0.31]	0.059* [2.10]	0.015	2.22
Log Meet-only	4.496*** [41.52]	-0.006 [-0.52]	-0.032 [-1.22]	-0.002	0.85
1999	**Intercept**	**IOS score**	**LogAsset**	**Adj. R sqr.**	**F-score**
Log total Compen	4.672*** [34.11]	0.101*** [8.16]	0.098** [3.02]	0.254	30.33***
Log Stock Pay	4.369*** [17.44]	0.148*** [7.34]	0.104[17] [1.76]	0.187	19.74***
Log Stock Award	4.265*** [15.93]	0.197*** [7.12]	0.114[18] [1.78]	0.256	26.34***
Log Fixed	4.559*** [50.02]	0.001 [0.14]	0.098*** [4.48]	0.096	10.05***
Log Retainer-Cash	4.114*** [32.83]	0.016 [1.17]	0.083** [2.78]	0.042	4.47***
Log Meet-only	4.368*** [33.85]	-0.005 [-0.34]	-0.0004 [-0.01]	-0.015	0.06
Pooled					
Log total Compen.	4.683*** [82.28]	0.079*** [10.90]	0.073*** [5.37]	0.198	82.39***
Log Stock Pay	4.373*** [39.13]	0.131*** [9.52]	0.060* [2.22]	0.130	46.48***
Log Stock Award	4.161*** [32.62]	0.164*** [10.63]	0.097** [3.15]	0.175	58.93***
Log Fixed	4.692*** [100.84]	0.005 [0.70]	0.060*** [5.44]	0.064	23.32***
Log Retainer-Cash	4.230*** [77.55]	0.008 [1.22]	0.051*** [3.91]	0.022	8.19***
Log Meet-only	4.318*** [87.79]	-0.009 [-1.36]	0.009 [0.71]	0.001	1.16

***: Denotes P-value < 0.001. **: Denotes P-value < 0.01. *: Denotes P-value < 0.05.

[1]20 observations are omitted from original 178 sample firms due to missing values to conduct factor analysis.
[2]19 observations are omitted from original 181 sample firms due to missing values to conduct factor analysis.
[3]17 observations are omitted from original 185 sample firms due to missing values to conduct factor analysis.
[4]19 observations are omitted from original 192 sample firms due to missing values to conduct factor analysis.
[5]76 observations are omitted from original 737 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]Log of the sum of stock retainer payments and stock award amount.
[8]Log of total stock award amount.
[9]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[10]Log of the retainer cash amount.
[11]Log of the sum of board and committee meeting fees.
[12]P-value is 0.088.
[13]P-value is 0.071.
[14]P-value is 0.081
[15]P-value is 0.089
[16]P-value is 0.058.
[17]P-value is 0.056.
[18]P-value is 0.077

Table H4.1

Descriptive statistics for four measures of the investment opportunity set for the sample firms (1996 to 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

Variable	1996	1997	1998	1999	Pooled
INVINT[2]					
Mean	2.567	2.728	2.864	2.771	2.734
Median	2.225	2.331	2.496	2.407	2.340
Firms	164	167	167	171	669
MVAGR[3]					
Mean	1.151	1.206	1.218	1.093	1.167
Median	1.102	1.158	1.075	1.012	1.089
Firms	175	180	183	184	722
MKTBKASS[4]					
Mean	1.878	2.168	2.444	2.370	2.218
Median	1.520	1.680	1.569	1.515	1.606
Firms	176	180	183	184	723
R&D[5]					
Mean	0.019	0.022	0.021	0.018	0.020
Median	0.000	0.000	0.000	0.000	0.000
Firms	177	181	183	188	729

[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms.
[2]The ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses.
[3]Year *t-2* to *t* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditure to book value of assets.

Table H4.2

Simple Correlations Amongst The Four Measures Of The Investment Opportunity Set For The Sample Firms (1996 To 1999) [1]

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. The number of observations differs across investment opportunity set variables due to missing data.

1996	INVINT[2]	MVAGR[3]	MKTBKASS[4]	RD[5]
INVINT	1.000			
MVAGR	0.0984	1.000		
No. of firms	161			
MKTBKASS	0.2229**	0.2625***	1.000	
No. of firms	162	175		
RD	0.3382***	0.0559	0.4039***	1.000
No. of firms	163	175	176	
1997	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.3671***	1.000		
No. of firms	166			
MKTBKASS	0.2836***	0.4675***	1.000	
No. of firms	166	180		
RD	0.3741***	0.084	0.3719***	1.000
No. of firms	167	180	180	
1998	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.211**	1.000		
No. of firms	165			
MKTBKASS	0.3004***	0.464***	1.000	
No. of firms	165	183		
RD	0.4197***	0.0459	0.4382***	1.000

No. of firms	165	183	183	
1999	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.096	1.000		
No. of firms	164			
MKTBKASS	0.410***	0.365***	1.000	
No. of firms	164	184		
RD	0.514***	0.188*	0.558***	1.000
No. of firms	168	184	184	
Pooled (1996-1999)	INVINT	MVAGR	MKTBKASS	RD
INVINT	1.000			
MVAGR	0.178***	1.000		
No. of firms	656			
MKTBKASS	0.304***	0.388***	1.000	
No. of firms	657	722		
RD	0.406***	0.090*	0.432***	1.000
No. of firms	663	722	723	

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms.
[2]The ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses.
[3]Year *t-2* to *t* geometric mean growth of market value of assets.
[4]The ratio of the market value of equity plus book value of debt to book value of assets.
[5]The ratio of R&D expenditure to book value of assets.

Table H4.3

Selected Statistics Related To A Common Factor Analysis Of Four Measures Of The Investment Opportunity Set (IOS)[1] For The Sample Firms

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively.

1996	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities[2] of four IOS measures				
	0.1273	0.0740	0.2110	0.2178
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	0.8924	0.1095	-0.0980	-0.2737
C. Correlations between the common factor and four IOS measures				
	0.6457	0.4171	0.7543	0.7423
1997	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2119	0.3061	0.4155	0.3102
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.3105	0.3202	-0.0813	-0.3056
C. Correlations between the common factor and four IOS measures				
	0.7952	0.6284	0.6268	0.4963
1998	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2534	0.3141	0.3252	0.2401
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.2653	0.2078	-0.0141	-0.3262
C. Correlations between the common factor and four IOS measures				
	0.6756	0.6205	0.8225	0.6822

1999	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.2915	0.1330	0.3926	0.4025
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.4580	0.1599	-0.1759	-0.2225
C. Correlations between the common factor and four IOS measures				
	0.7284	0.4662	0.8270	0.8233
Pooled	INVINT	MVAGR	MKTBKASS	RD
A. Estimated prior communalities of four IOS measures				
	0.1944	0.1776	0.3165	0.2697
B. Eigenvalues of the reduced correlation matrix of four IOS measures				
	1.1750	0.1851	-0.1154	-0.2866
C. Correlations between the common factor and four IOS measures				
	0.6854	0.5532	0.7938	0.7175

[1]The investment opportunity set variables are constructed using year *t* financial data for the sample firms. INVINT is the ratio of the sum of year *t-2* to *t* capital expenditure, R&D expense, and acquisitions to the sum of year *t-2* to *t* depreciation expenses. MVAGR is the year *t-2* to *t* geometric mean growth of market value of assets. MKTBKASS is the ratio of the market value of equity plus book value of debt to book value of assets. RD is the ratio of R&D expenditure to book value of assets.

[2] Communalities are equivalent to the squared multiple correlations obtained from regressing each of the investment opportunity set measures on the other two measures.

Table H4.4

Comparison Of The Low-IOS And High-IOS Firms For The Sample Firms

This table presents the mean values and *t*-values associated with tests of the null hypothesis that the two-sample means are equal[1] for 1996 to 1999[2]. The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. For each year and for the pooled sample, factor scores[3] are calculated and used to divide the sample into growth firms and non-growth firms.

Variable	1996	1997	1998	1999	Pooled
Assets ($M)					
Low IOS	28,508	47,909	26,121	40,768	30,966
High IOS	22,935	26,912	37,978	31,647	29,889
t-stat	[0.72]	[0.71]	[-1.07]	[0.74]	[0.21]
Sales ($M)					
Low IOS	18,015	20,419	18,285	20,039	18,854
High IOS	17,224	17,382	22,306	23,427	20,584
t-stat	[0.24]	[0.61]	[-1.15]	[-0.87]	[-0.97]
Mktbkeq[4] ($M)					
Low IOS	2.995	4.225	3.762	2.158	2.896
High IOS	4.865	4.549	8.073	8.066	6.771
t-stat	[-2.93]**	[-4.30]**	[-2.76]**	[-4.69]**	[-6.97]**
ROA					
Low IOS	0.042	0.051	0.040	0.036	0.041
High IOS	0.075	0.064	0.072	0.077	0.073
t-stat	[-4.56]**	[-2.65]**	[-3.40]**	[-5.33]**	[-7.58]**

**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]The *t*-test of two-sample equal means for the higher (than median factor score) and lower investment opportunity set firms is based on the assumption of unequal variances.
[2]The financial variables used year *t* financial data for the sample firms.
[3]To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).
[4]The ratio of market value of equity to book value of equity.

Table H4.5

Simple Correlations Among Board Compensation Variables And The IOS Factor Score

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
1996							
Log total Compen.	1.000						
Stock-pay Ratio	0.637***	1.000					
Stock-award Ratio	0.750***	0.773***	1.000				
Fixed Ratio	-0.637***	-1.000***	-0.773***	1.000			
Retn-cash Ratio	-0.446***	-0.687***	-0.429***	0.687***	1.000		
Meet-only Ratio	-0.396***	-0.509***	-0.483***	0.509***	-0.159*	1.000	
Factor Score	0.285***	0.204**	0.182*	-0.204***	-0.084	-0.179*	1.000
1997							
Log total Compen.	1.000						
Stock-pay Ratio	0.626***	1.000					
Stock-award Ratio	0.738***	0.770***	1.000				
Fixed Ratio	-0.626***	-1.000***	-0.770***	1.000			
Retn-cash Ratio	-0.441***	-0.711***	-0.462***	0.711***	1.000		
Meet-only Ratio	-0.378***	-0.529***	-0.493***	0.529***	-0.134	1.000	
Factor Score	0.287***	0.200**	0.160*	-0.200**	-0.212	-0.099	1.000
1998							
Log total Compen.	1.000						

Stock-pay Ratio	0.632***	1.000					
Stock-award Ratio	0.648***	0.781***	1.000				
Fixed Ratio	-0.632***	-1.000***	-0.781***	1.000			
Retn-cash Ratio	-0.489***	-0.736***	-0.528***	0.736***	1.000		
Meet-only Ratio	-0.350***	-0.556***	-0.479***	0.556***	-0.070*	1.000	
Factor Score	0.295***	0.256***	0.242**	-0.256***	-0.099	-0.228**	1.000
1999							
Log total Compen.	1.000						
Stock-pay Ratio	0.667***	1.000					
Stock-award Ratio	0.710***	0.748***	1.000				
Fixed Ratio	-0.667***	-1.000***	-0.748***	1.000			
Retn-cash Ratio	-0.500***	-0.757***	-0.549***	0.757***	1.000		
Meet-only Ratio	-0.452***	-0.599***	-0.485***	0.599***	-0.159*	1.000	
Factor Score	0.422***	0.243***	0.240***	-0.243***	-0.087	-0.246**	1.000
Pooled (1996 to 1999)							
Log total Compen.	1.000						
Stock-pay Ratio	0.682***	1.000					
Stock-award Ratio	0.729***	0.783***	1.000				
Fixed Ratio	-0.682***	-1.000***	-0.783***	1.000			
Retn-cash Ratio	-0.507***	-0.740***	-0.525***	0.740***	1.000		
Meet-only Ratio	-0.431***	-0.575***	-0.508***	0.575***	-0.038	1.000	
Factor Score	0.326***	0.234***	0.218***	-0.234***	-0.105**	-0.203***	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[3]Retainer cash divided by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[4]The retainer cash amount divide by total compensation.
[5]The sum of board and committee meeting fees divide by total compensation.
[5]P-value is 0.07

Table H4.6

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 161[1] firms (1996), 166[2] firms (1997), 165[3] firms (1998), 164[4] firms (1999), and 656[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.728*** [59.48]	0.040*** [3.77]	0.039* [2.03]	0.093	9.22***
Stock-pay Ratio[7]	0.322* [2.59]	0.044** [2.61]	-0.003 [-0.09]	0.029	3.42*
Stock-award Ratio[8]	0.086 [0.74]	0.036* [2.31]	0.037 [1.35]	0.032	3.66*
Fixed Ratio[9]	0.678*** [5.44]	-0.044** [-2.61]	0.003 [0.09]	0.029	3.42*
Retainer-cash Ratio[10]	0.355*** [3.56]	-0.014 [-1.06]	0.003 [0.14]	-0.005	0.57
Meet-only Ratio[11]	0.303*** [3.51]	-0.027* [-2.27]	-0.011 [-0.54]	0.022	2.76[12]
1997					
Log total Compen.	4.614*** [48.30]	0.051*** [4.25]	0.080*** [3.46]	0.135	13.83***
Stock-pay Ratio	0.242[13] [1.82]	0.045** [2.71]	0.038 [1.18]	0.036	4.13*
Stock-award Ratio	0.215 [1.48]	0.037[14] [1.67]	0.023 [0.66]	0.016	2.37[15]
Fixed Ratio	0.758*** [5.70]	-0.045** [-2.71]	-0.038 [-1.18]	0.036	4.13*
Retainer-cash Ratio	0.447*** [4.14]	-0.022 [-1.65]	-0.028 [-1.06]	0.009	1.78
Meet-only Ratio	0.412*** [4.55]	-0.017 [-1.49]	-0.048* [-2.21]	0.027	3.28*
1998					
Log total Compen.	4.789*** [42.83]	0.052*** [4.00]	0.054* [2.01]	0.098	9.92***
Stock-pay Ratio	0.418** [2.91]	0.056*** [4.24]	0.013 [0.38]	0.055	5.78**
Stock-award Ratio	0.482** [3.22]	0.059** [3.18]	-0.027 [-0.78]	0.055	5.77**

Fixed Ratio	0.582*** [4.05]	-0.056*** [-4.24]	-0.013 [-0.38]	0.055	5.78**
Retainer-cash Ratio	0.326** [2.92]	-0.017 [-1.27]	-0.009 [-0.33]	0.002	0.86
Meet-only Ratio	0.379*** [4.14]	-0.033** [-3.05]	-0.046 [-2.10]	0.066	6.77**
1999					
Log total Compen	4.628*** [34.03]	0.089*** [6.45]	0.106*** [3.35]	0.226	24.78***
Stock-pay Ratio	0.273[16] [1.68]	0.056*** [4.13]	0.061 [1.64]	0.063	3.10*
Stock-award Ratio	0.310[17] [1.71]	0.063** [3.14]	0.024 [0.55]	0.048	6.50**
Fixed Ratio	0.727*** [4.48]	-0.056*** [-4.13]	-0.061 [-1.64]	0.063	3.10*
Retainer-cash Ratio	0.203 [1.64]	-0.015 [-1.10]	0.013 [0.46]	-0.004	0.72
Meet-only Ratio	0.560*** [6.32]	-0.034*** [-3.47]	-0.094*** [-4.51]	0.155	16.00***
Pooled					
Log total Compen.	4.660*** [79.84]	0.062*** [7.68]	0.077*** [5.55]	0.147	57.61***
Stock-pay Ratio	0.278*** [3.88]	0.055*** [6.54]	0.036* [2.14]	0.058	21.21***
Stock-award Ratio	0.230*** [3.17]	0.053*** [5.14]	0.025 [1.54]	0.047	17.29***
Fixed Ratio	0.722*** [9.93]	-0.055*** [-6.21]	-0.036* [-2.09]	0.058	21.21***
Retainer-cash Ratio	0.358*** [5.76]	-0.019** [-2.84]	-0.011 [-0.75]	0.009	3.98*
Meet-only Ratio	0.417*** [7.85]	-0.030*** [-7.14]	-0.005*** [-4.08]	0.070	25.51***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]17 observations are omitted from original 178 sample firms due to missing values to conduct factor analysis.
[2]15 observations are omitted from original 181 sample firms due to missing values to conduct factor analysis.
[3]20 observations are omitted from original 185 sample firms due to missing values to conduct factor analysis.
[4]28 observations are omitted from original 192 sample firms due to missing values to conduct factor analysis.
[5]81 observations are omitted from original 737 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12]P-value is 0.066.
[13]P-value is 0.070.
[14]P-value is 0.097.
[15]P-value is 0.096.
[16]P-value is 0.094.
[17]P-value is 0.089.

Table H4.7

Simple Correlations Among Board Compensation Variables (Log Of Levels) And The IOS Factor Score For Pooled Sample (1996 To 1999)

The sample of companies examined and their board compensation practices consists of the two hundred largest US corporations over the period 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. Due to the availability of financial information, the final sample includes 736 companies (178, 181, 185, and 192 for the years 1996, 1997, 1998, and 1999, respectively). To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

Variable	Log total[1] Compen.	Log Stock-pay[2]	Log Stock-award[3]	Log Fixed[4]	Log Retn-cash[5]	Log Meet-only[6]	Factor Score
Log total Compen.	1.000						
Log Stock-pay	0.862***	1.000					
Log Stock-award	0.848***	0.898***	1.000				
Log Fixed	0.269***	0.011	-0.018	1.000			
Log Retn-cash	0.140***	-0.012	0.094*	0.722***	1.000		
Log Meet-only	0.149***	-0.445	-0.075	0.401***	0.051	1.000	
Factor Score	0.326***	0.295***	0.352***	0.001	0.022	-0.084[7]	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]Log of the sum of stock retainer payments and stock award amount.
[3]Log of total stock award amount.
[4]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[5]Log of the retainer cash amount.
[6]Log of the sum of board and committee meeting fees.
[7]P-value is 0.057.

Table H4.8

Coefficients For Board Compensation Variables (Log Of Levels) Regressed On The Investment Opportunity Set Factor Score, And Firm Size For Pooled Sample (1996 To 1999)

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 656[1] firms among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). I change dependent variables (retainers, meeting fees, and stock awards) from proportion of total compensation to level of compensation. *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
Log Total Compen.[2]	4.660*** [79.84]	0.062*** [7.68]	0.077*** [5.55]	0.147	57.61***
Log Stock Pay[3]	4.350*** [37.47]	0.107*** [7.65]	0.064* [2.30]	0.092	31.44***
Log Stock Award[4]	4.142*** [31.08]	0.140*** [8.88]	0.099** [3.13]	0.136	43.44***
Log Fixed[5]	4.692*** [124.96]	0.001 [0.16]	0.060*** [6.66]	0.014	22.20***
Log Retainer-Cash[6]	4.235*** [75.21]	0.004 [0.60]	0.050*** [3.70]	0.029	6.99***
Log Meet-only[7]	4.325*** [88.31]	-0.012[8] [-1.92]	0.007 [0.58]	0.017	1.98

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]81 observations are omitted from original 737 sample firms due to missing values to conduct factor analysis.
[2]Log of total compensation.
[3]Log of the sum of stock retainer payments and stock award amount.
[4]Log of total stock award amount.
[5]Log of the sum of retainer cash and meeting fee/committee fee and retainer amount.
[6]Log of the retainer cash amount.
[7]Log of the sum of board and committee meeting fees.
[8]P-value is 0.056.

Appendix I - Alternative Test Nine (Use the INVINT variable as the ratio of Capital Expenditure to Depreciation)

Table I4.1

Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of outside board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 160[1] firms (1996), 164[2] firms (1997), 169[3] firms (1998), 176[4] firms (1999), and 669[5] firms (pooled one) among Pearl Meyer & Partners' US largest 200 companies for 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS). *t*-statistics are in brackets.

Variable	Intercept	IOS score	LogAsset	Adj. R sqr.	F-score
1996					
Log total Compen.[6]	4.503*** [36.90]	0.068*** [5.26]	0.100*** [3.35]	0.200	18.55***
Stock-pay Ratio[7]	0.171 [0.93]	0.034[12] [1.73]	0.039 [0.86]	0.011	1.79
Stock-award Ratio[8]	0.167 [0.96]	0.044* [2.38]	0.023 [0.54]	0.027	2.93[13]
Fixed Ratio[9]	0.829*** [4.49]	-0.034[14] [-1.73]	-0.039 [-0.86]	0.011	1.79
Retainer-cash Ratio[10]	0.383** [2.72]	-0.009 [-0.62]	-0.007 [-0.19]	-0.012	0.20
Meet-only Ratio[11]	0.614*** [5.19]	-0.023[15] [-1.83]	-0.087** [-3.01]	0.066	5.29**
1997					
Log total Compen.	4.592*** [37.98]	0.070*** [4.46]	0.092** [3.12]	0.128	11.65***
Stock-pay Ratio	0.231 [1.48]	0.033 [1.63]	0.044 [1.15]	0.008	1.57
Stock-award Ratio	0.164 [1.01]	0.031 [1.48]	0.038 [0.96]	0.003	1.23
Fixed Ratio	0.769*** [4.93]	-0.033 [-1.63]	-0.044 [-1.15]	0.008	1.57
Retainer-cash Ratio	0.386** [3.25]	-0.008 [-0.55]	-0.015 [-0.52]	-0.011	0.22
Meet-only Ratio	0.469*** [4.61]	-0.023[16] [-1.74]	-0.061* [-2.47]	0.035	3.60*
1998					
Log total Compen.	4.934*** [34.10]	0.073*** [4.19]	0.030 [0.85]	0.094	8.84***
Stock-pay Ratio	0.509** [3.22]	0.040* [2.10]	-0.004 [-0.10]	0.017	2.27**
Stock-award Ratio	0.535** [3.01]	0.042[17] [1.97]	-0.034 [-0.79]	0.019	2.48[18]

Fixed Ratio	0.492** [3.11]	-0.040* [-2.10]	0.004 [0.10]	0.017	2.27
Retainer-cash Ratio	0.268* [2.30]	-0.013 [-0.90]	0.003 [0.09]	-0.008	0.43
Meet-only Ratio	0.348*** [3.63]	-0.023* [-1.99]	-0.040[19] [-1.72]	0.027	3.07*
1999					
Log total Compen	4.819*** [25.60]	0.131*** [6.36]	0.076 [1.68]	0.202	20.82***
Stock-pay Ratio	0.336[20] [1.97]	0.085*** [4.53]	0.052 [1.28]	0.109	10.64***
Stock-award Ratio	0.319 [1.64]	0.101*** [4.76]	0.030 [0.64]	0.117	11.37***
Fixed Ratio	0.664*** [3.89]	-0.085*** [-4.53]	-0.052 [-1.28]	0.109	10.63***
Retainer-cash Ratio	0.151 [1.16]	-0.030* [-2.12]	0.023 [0.74]	0.021	2.69[21]
Meet-only Ratio	0.574*** [5.97]	-0.046*** [-4.42]	-0.099*** [-4.31]	0.173	17.46***
Pooled					
Log total Compen.	4.642*** [60.75]	0.102*** [9.94]	0.092*** [5.08]	0.190	70.80***
Stock-pay Ratio	0.235** [2.74]	0.067*** [6.90]	0.052* [2.55]	0.070	23.49***
Stock-award Ratio	0.023* [2.40]	0.071*** [6.41]	0.032 [1.42]	0.068	22.92***
Fixed Ratio	0.765*** [8.91]	-0.067*** [-6.80]	-0.052* [-2.55]	0.070	23.49***
Retainer-cash Ratio	0.340*** [4.50]	-0.024** [-3.21]	-0.010 [-0.54]	0.014	5.36**
Meet-only Ratio	0.524*** [8.39]	-0.040*** [-7.62]	-0.078*** [-5.25]	0.101	34.55***

***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]18 observations are omitted from original 178 sample firms due to missing values to conduct factor analysis.
[2]17 observations are omitted from original 181 sample firms due to missing values to conduct factor analysis.
[3]16 observations are omitted from original 185 sample firms due to missing values to conduct factor analysis.
[4]16 observations are omitted from original 192 sample firms due to missing values to conduct factor analysis.
[5]68 observations are omitted from original 737 sample firms due to missing values to conduct factor analysis.
[6]Log of total compensation.
[7]The sum of stock retainer payments and stock award amount divide by total compensation.
[8]The stock award amount divide by total compensation.
[9]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[10]The retainer cash amount divide by total compensation.
[11]The sum of board and committee meeting fees divide by total compensation.
[12,14,18]P-value is 0.087.
[13]P-value is 0.057.
[15]P-value is 0.070.
[16]P-value is 0.085.
[17,20]P-value is 0.051.
[19]P-value is 0.088.
[21]P-value is 0.071.

Table J4.1

Descriptive Statistics For Five Measures Of Investment Opportunity Set For The 191 Sample Firms

The sample consists of the largest two hundred US companies over the period of 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Each year, some companies are added to the sample and others are dropped from the list. If a company was among the largest 200 US firms at least once over the four-year period, it is included in the initial sample. If a company appeared more than once during the four-year period, I select the most recent year and collect information for that year. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. The revised selection process yielded the final sample of 191 companies. The IOS factor score variable was recalculated using five investment opportunity proxies: market value to book value of assets (MKTBKASS), market value to book value of equity (MVEBVE), market value of assets to book value of property, plant, and equipment (MVAPPE), the earnings to price ratio (EP), and the change in firm assets (CASSET). The number of observations differs across investment opportunity set variables due to missing data.

	MVABVA[1]	MVEBVE[2]	MVAPPE[3]	EP[4]	CASSET[5]
No. of firms	191	189	191	186	190
Mean	2.515	5.692	23.270	0.057	0.758
[Median]	1.733	3.204	7.521	0.040	0.474
Minimum	0.882	0.631	1.189	0	-0.781
Maximum	19.152	80.323	421.86	0.274	12.727

[1] The ratio of market value to book value of assets.
[2] The ratio of market value to book value of equity
[3] The ratio of market value of assets to book value of property, plant, and equipment
[4] Earnings to price ratio (calculated only for firms with positive earnings).
[5] The change of total asset between year *t* and year *t-4*.

Table J4.2

Simple Correlations Among Board Compensation Variables And The IOS Factor Score

The sample consists of the largest two hundred US companies over the period of 1996-1999. Pearl Meyer & Partners Co. publishes yearly board compensation data for the largest 200 US companies. Each year, some companies are added to the sample and others are dropped from the list. If a company was among the largest 200 US firms at least once over the four-year period, it is included in the initial sample. If a company appeared more than once during the four-year period, I select the most recent year and collect information for that year. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. The revised selection process yielded the final sample of 191 companies. To determine factor scores, common factor analysis is applied to the following IOS measures: market value to book value of assets (MKTBKASS), market value to book value of equity (MVEBVE), market value of assets to book value of property, plant, and equipment (MVAPPE), the earnings to price ratio (EP), and the change in firm assets (CASSET).

Variable	Log total[1] Compen.	Stock-pay[2] Ratio	Stock-award[3] Ratio	Fixed[4] Ratio	Retn-cash[5] Ratio	Meet-only[6] Ratio	Factor Score
Log total Compen.	1.000						
Stock-pay Ratio	0.670***	1.000					
Stock-award Ratio	0.708***	0.752***	1.000				
Fixed Ratio	-0.670***	-1.000***	-0.752***	1.000			
Retn-cash Ratio	-0.480***	-0.739***	-0.519***	0.739***	1.000		
Meet-only Ratio	-0.453***	-0.628***	-0.508***	0.628***	-0.014	1.000	
Factor Score	0.490***	0.364***	0.330***	-0.364***	-0.189*	-0.287***	1.000

Test of the null hypothesis that the simple correlation is equal to zero:
***: Denotes P-value < 0.001.
**: Denotes P-value < 0.01.
*: Denotes P-value < 0.05.
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[4]Retainer cash divided by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[5]The retainer cash amount divide by total compensation.
[6]The sum of board and committee meeting fees divide by total compensation.

Table J4.3

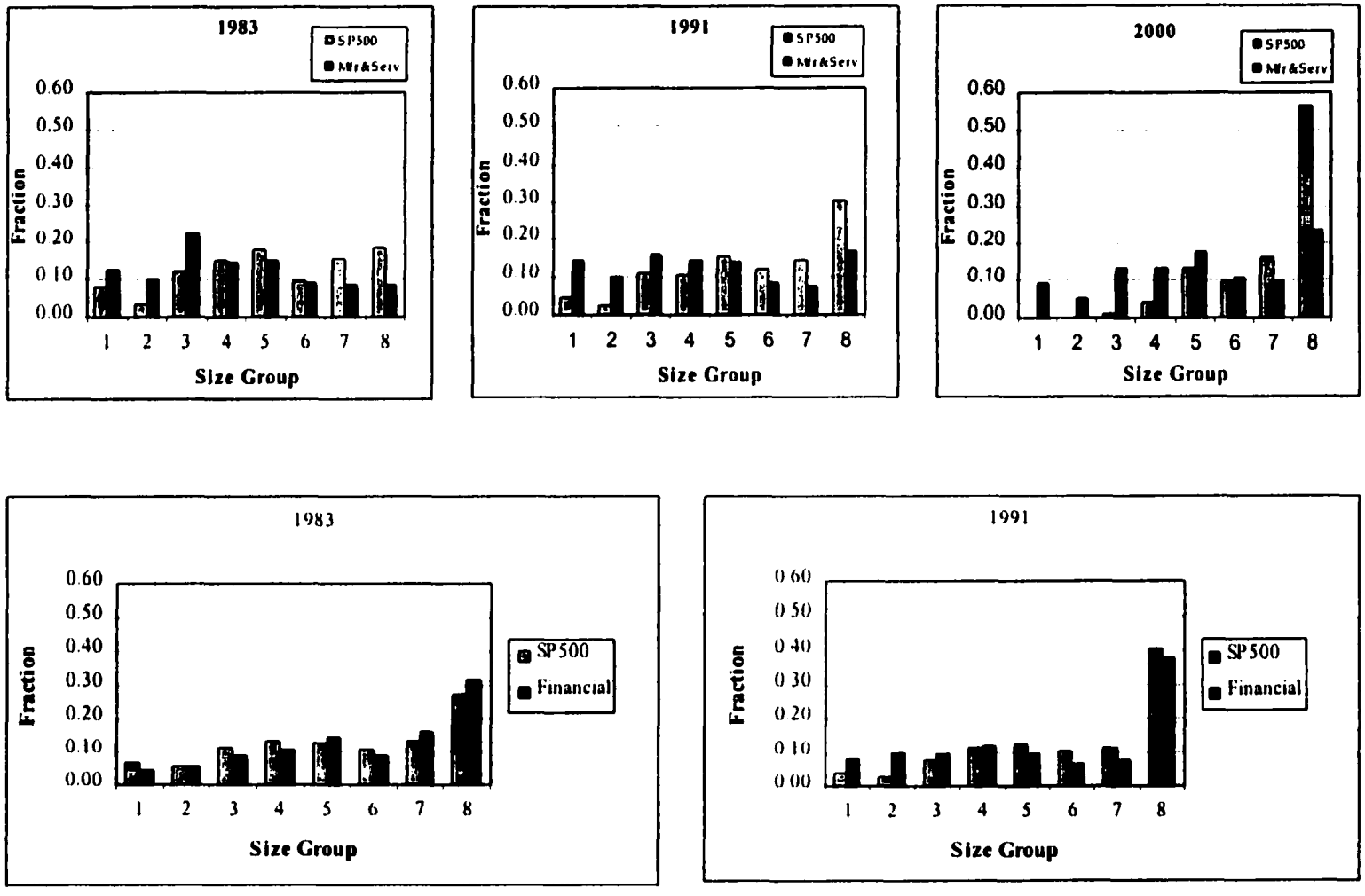
Coefficients For Board Compensation Variables Regressed On The Investment Opportunity Set Factor Score, And Firm Size

This table presents the results of regressing variables that represent the structure of board of directors compensation contracts on the investment opportunity set factor score and control variables for firm size (the logarithm of total assets). The full sample consists of 191 firms among Pearl Meyer & Partners' US largest 200 companies for the period of 1996 to 1999. The company publishes yearly data for compensation of board for US largest 200 companies. Each year, some companies are added to the sample and others are dropped from the list. If a company was among the largest 200 US firms at least once over the four-year period, it is included in the initial sample. If a company appeared more than once during the four-year period, I select the most recent year and collect information for that year. Financial statement information is collected from the COMPUSTAT annual primary, secondary, tertiary, merger annual, and full-coverage data files. In addition, some data are collected from COMPUSTAT Research Insight, Moody's Manuals, and the CRSP stock price file. To determine factor scores, common factor analysis is applied to the following IOS measures: market value to book value of assets (MKTBKASS), market value to book value of equity (MVEBVE), market value of assets to book value of property, plant, and equipment (MVAPPE), the earnings to price ratio (EP), and the change in firm assets (CASSET). *t*-statistics are in brackets.

Variable	No. of Observation.	Intercept	IOS score	Logasset	Adj. R^2	F-score
Log total Compen.[1]	191	4.574*** [40.07]	0.099*** [7.60]	0.114*** [4.18]	0.299	39.92***
Stock-pay Ratio[2]	191	0.253 [1.57]	0.086*** [6.88]	0.058 [1.52]	0.135	15.26***
Stock-award Ratio[3]	191	0.286 [1.73]	0.087*** [4.64]	0.024 [0.61]	0.101	11.18***
Fixed Ratio[4]	191	0.747*** [4.62]	-0.086*** [-6.88]	-0.058 [-1.52]	0.135	15.26***
Retn-cash Ratio[5]	191	0.234* [2.06]	-0.034* [-2.60]	0.010 [0.38]	0.020	2.83
Meet-only Ratio[6]	191	0.574*** [6.31]	-0.041*** [-3.92]	-0.094*** [-4.33]	0.160	18.29***

***: Denotes P-value < 0.001
**: Denotes P-value < 0.01
*: Denotes P-value < 0.05
[1]Log of total compensation.
[2]The sum of stock retainer payments and stock award amount divide by total compensation.
[3]The stock award amount divide by total compensation.
[4]The sum of retainer cash and meeting fee/committee fee and retainer amount divide by total compensation.
[5]The retainer cash amount divide by total compensation.
[6]The sum of board and committee meeting fees divide by total compensation.

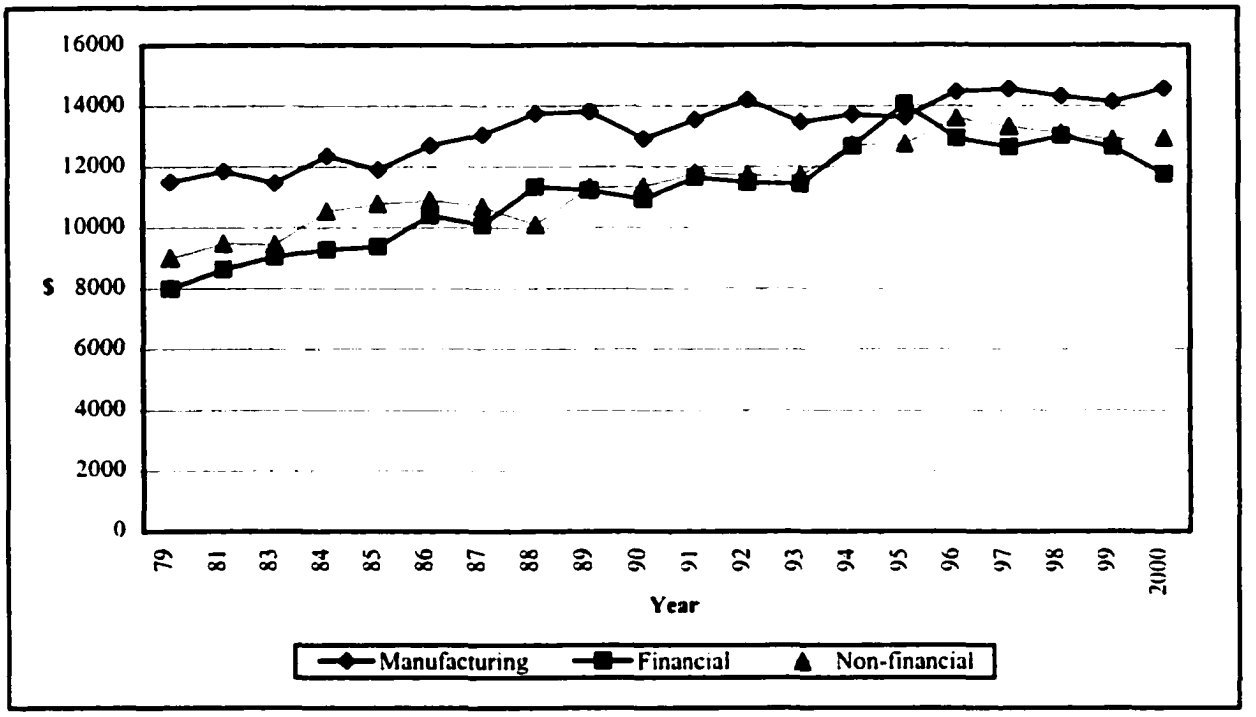
Figure 3.1 Size Comparisons: Surveyed U.S. Corporations and S&P 500 Corporations



Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 1999). The data at our disposal only allow us to define size groups in terms of sales for the manufacturing and non-financial services sectors. Size is defined based upon total assets for the financial sector. The size groups are defined in the following manner.

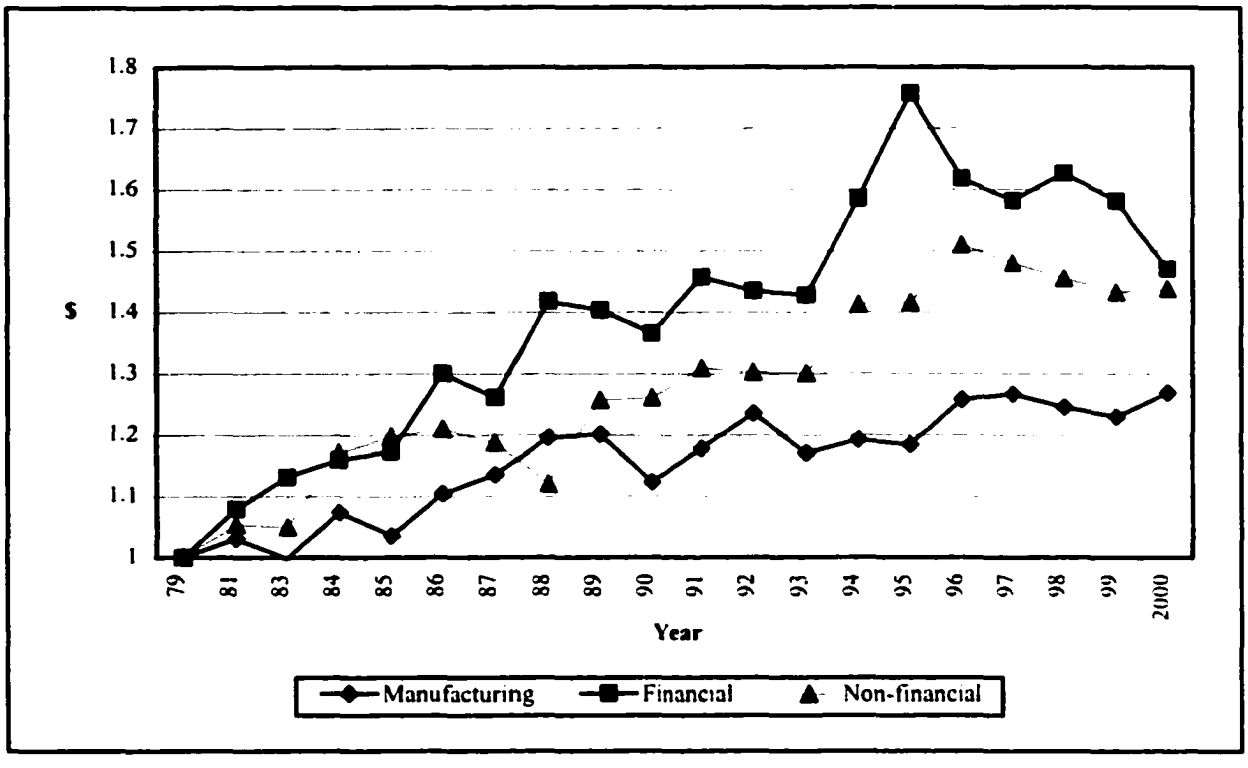
Dummy Variable	Dummy-size 1	Dummy-size 2	Dummy-size 3	Dummy-size 4	Dummy-size 5	Dummy-size 6	Dummy-size 7	Dummy-size 8	Dummy-size 9
Manufacturing and Non-financial Sectors: Sales ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000
Financial Sector: Total Assets ($millions)	<100	100-199	200-499	500-999	1,000-1,999	2,000-2,999	3,000-4,999	5,000-9,999	≥10,000

Figure 3.2 Inflation Adjusted Basic Annual Compensation By Year Excluding Restricted Stock And Option Grants



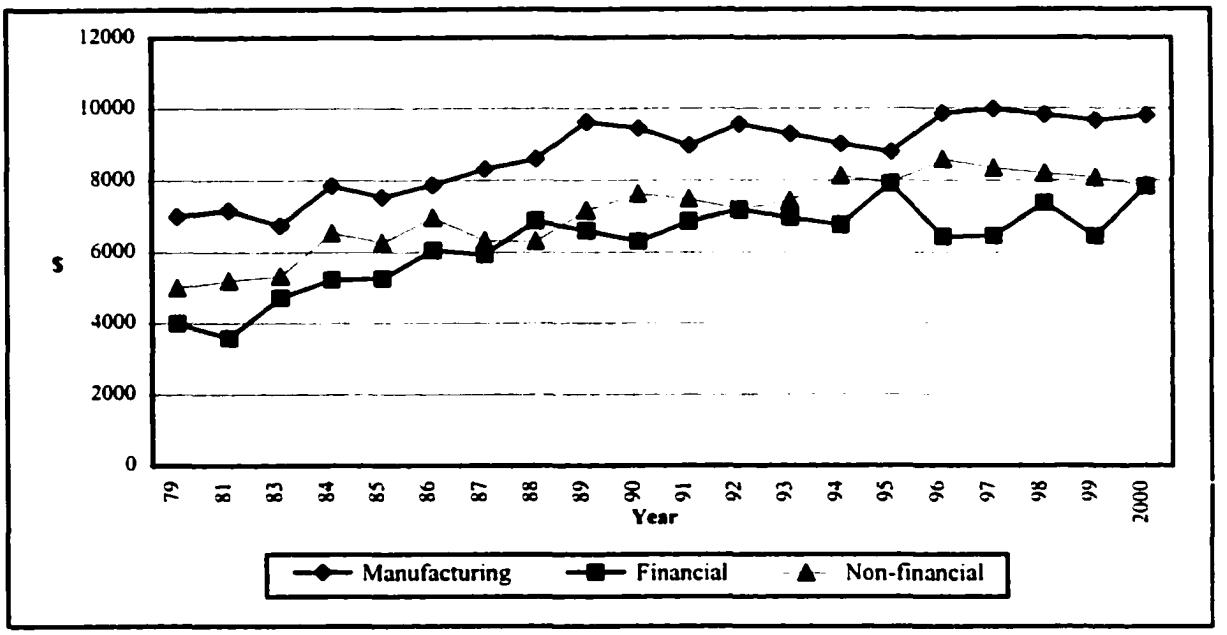
Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Figure 3.3 Cumulative Percentage Change In Inflation-Adjusted Basic Annual Compensation



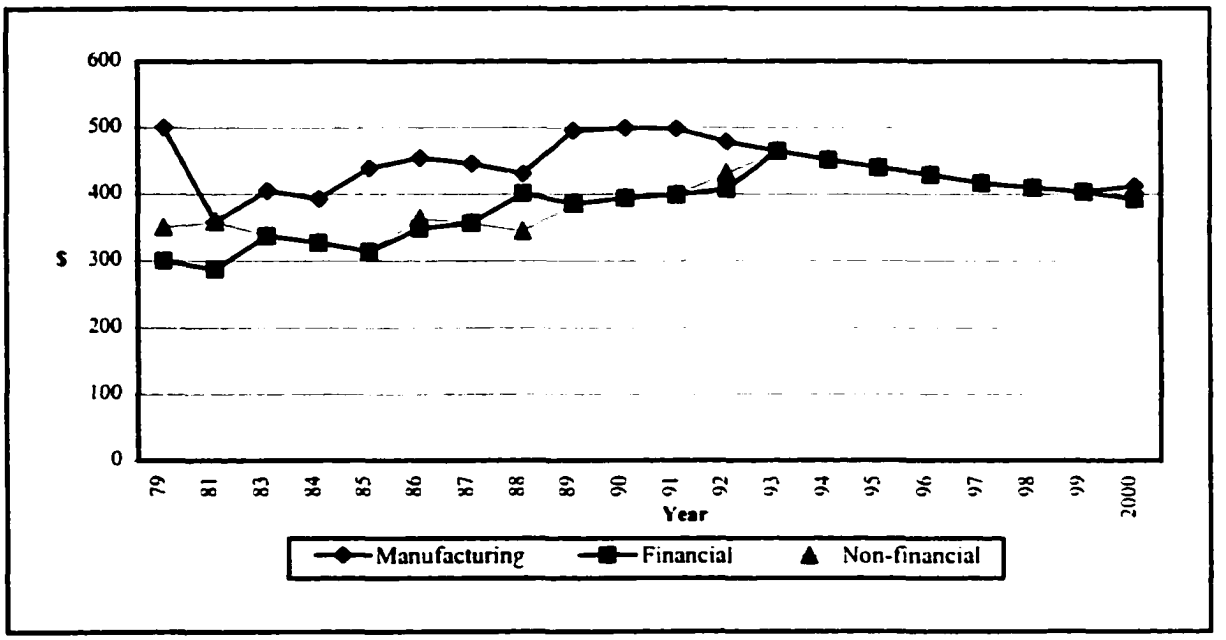
Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Figure 3.4 Retainers Paid For Regular Board Services For Companies Paying Retainers And Fees, Inflation Adjusted



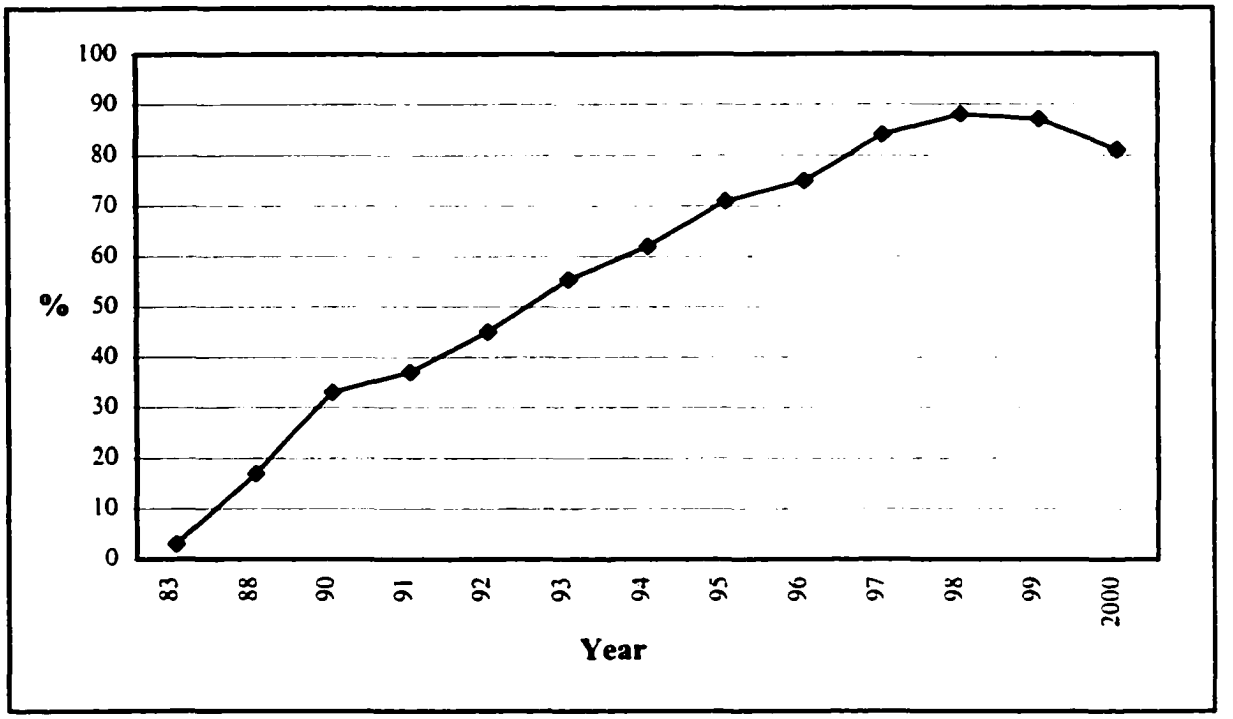
Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Figure 3.5 Fee Levels Paid For Regular Board Meetings By Industry, Inflation Adjusted



Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Figure 3.6 Fraction Of Respondents Using Stock-Based Compensation



Source: Data derived from *Corporate Directors' Compensation*, The Conference Board (1979 to 2000).

Figure 4.1

Scree plot of the eigenvalues of the correlation matrix computed from four measures reflecting the investment opportunity sets of the sample companies for the year 1996. The variables used to compute the correlation matrix include prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

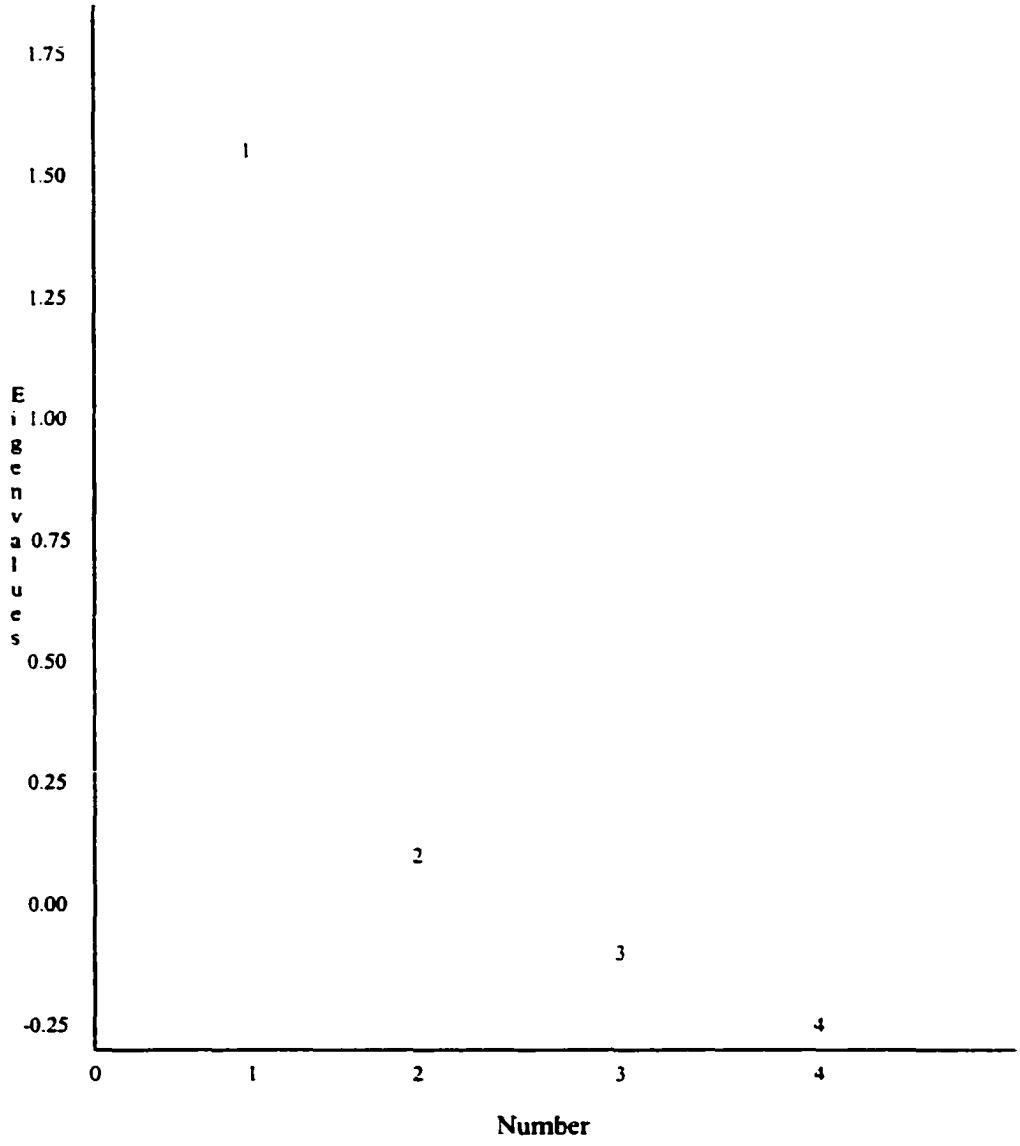


Figure 4.2

Scree plot of the eigenvalues of the correlation matrix computed from four measures reflecting the investment opportunity sets of the sample companies for the year 1997. The variables used to compute the correlation matrix include prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

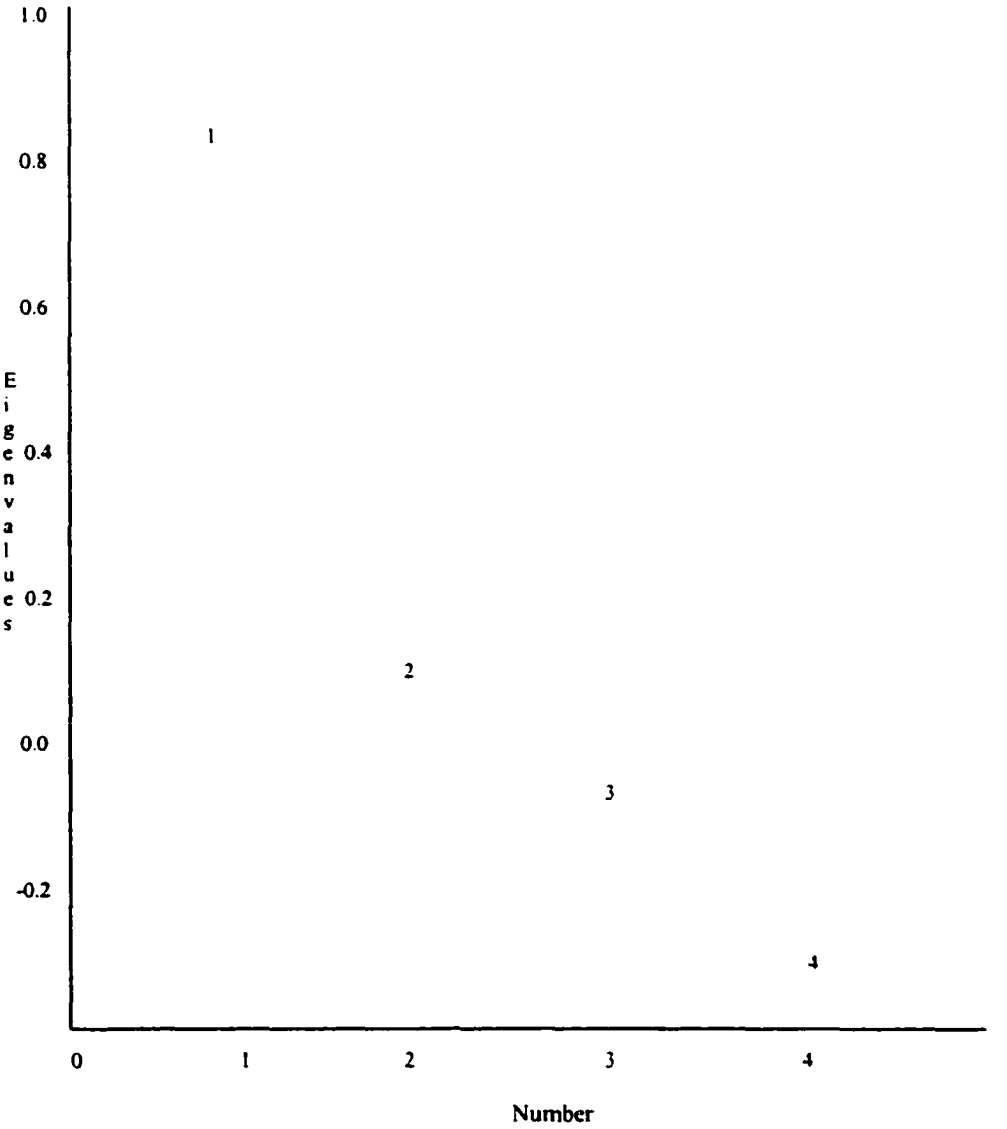


Figure 4.3

Scree plot of the eigenvalues of the correlation matrix computed from four measures reflecting the investment opportunity sets of the sample companies for the year 1998. The variables used to compute the correlation matrix include prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

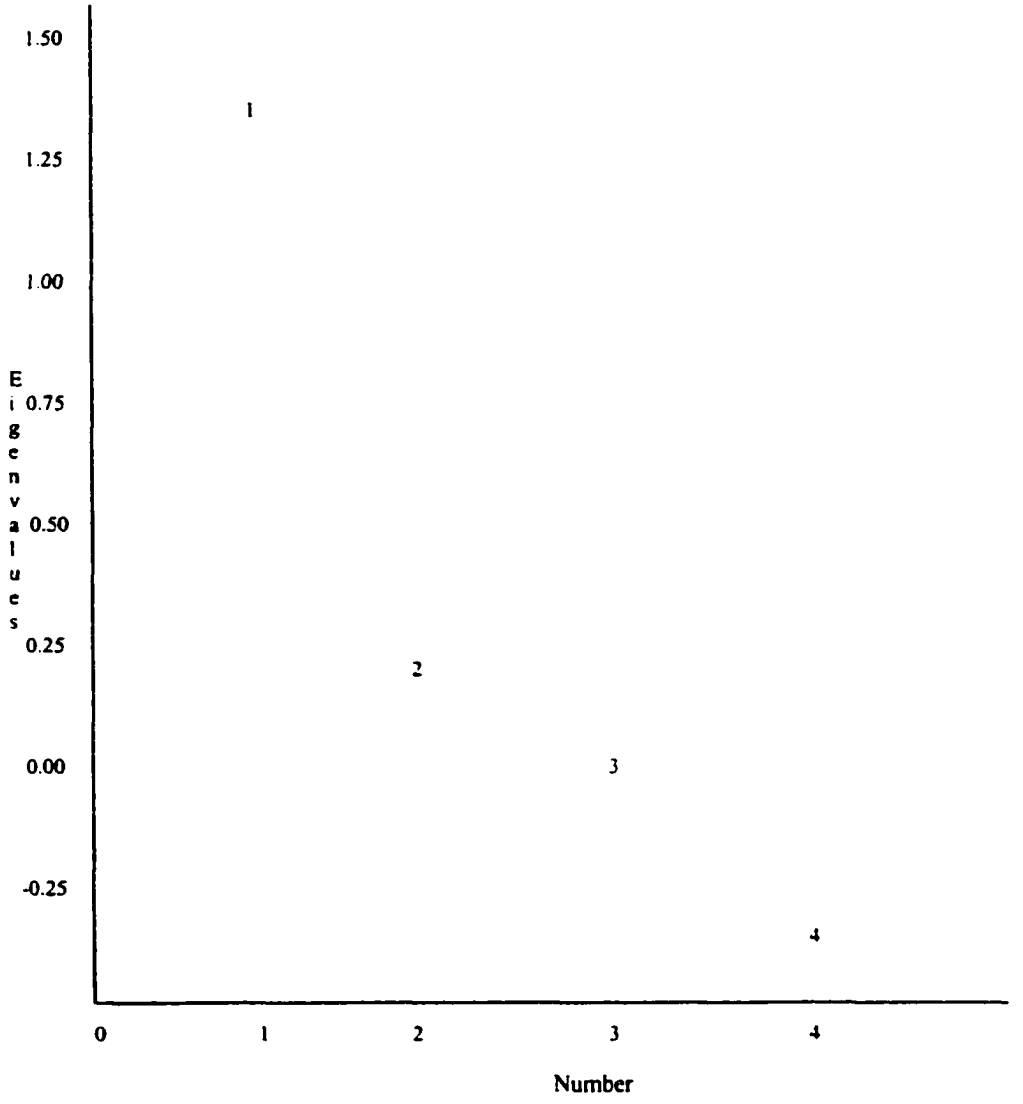


Figure 4.4

Scree plot of the eigenvalues of the correlation matrix computed from four measures reflecting the investment opportunity sets of the sample companies for the year 1999. The variables used to compute the correlation matrix include prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

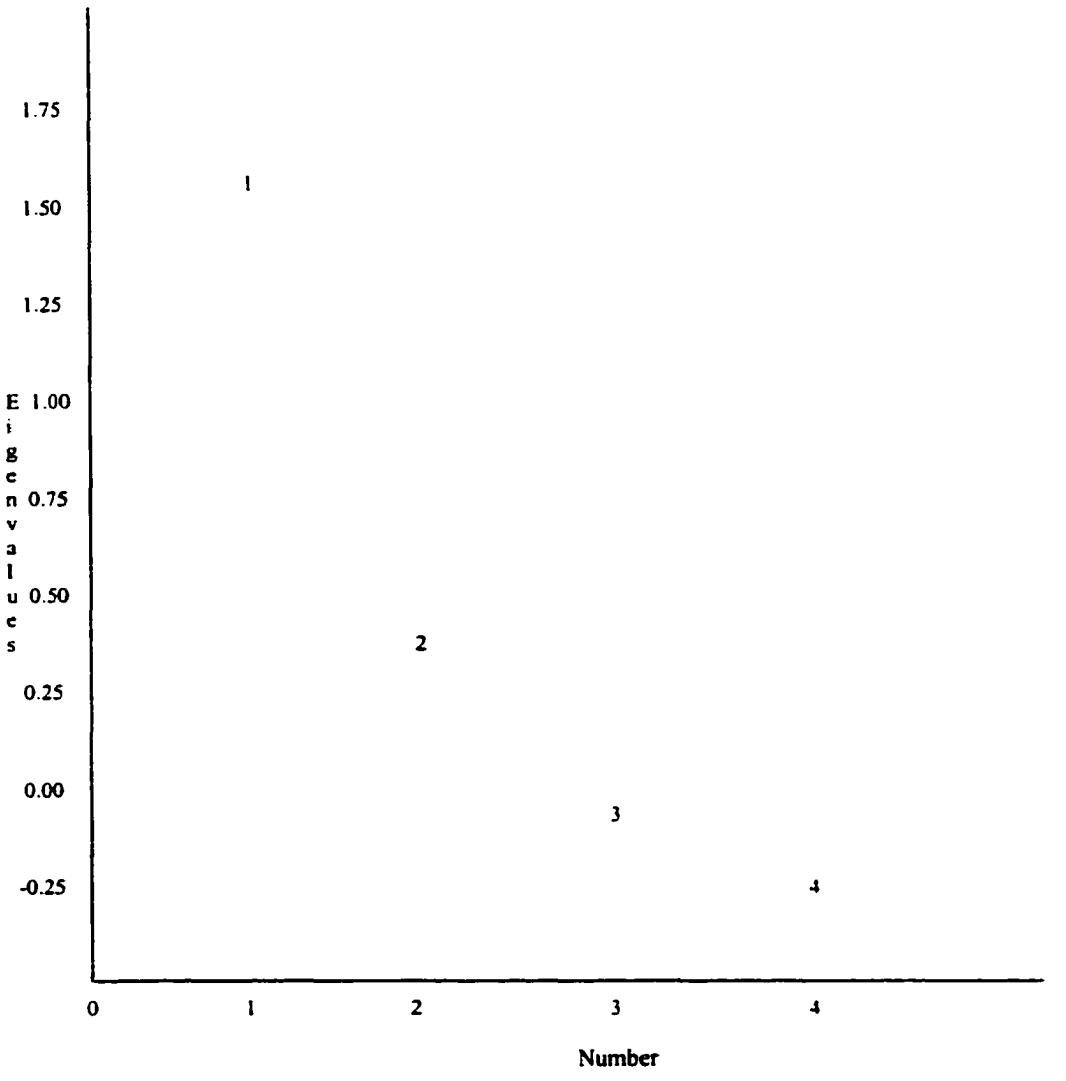


Figure 4.5

Scree plot of the eigenvalues of the correlation matrix computed from four measures reflecting the investment opportunity sets of the sample companies for the year 1996-1999. The variables used to compute the correlation matrix include prior investment intensity (INVINT), the geometric mean annual growth rate of market value of assets (MVAGR), the ratio of R&D expenditures to total assets (RD), and the ratio of market value of assets to book value of assets (MKTBKASS).

