

Back Door Links Between Directors and Executive Compensation

David F. Larcker^a
Scott A. Richardson^a
Andrew J. Seary^b
İrem Tuna^a

^aThe Wharton School, University of Pennsylvania,
Philadelphia, PA 19104-6365 United States.

^bSchool of Communication, Simon Fraser University,
Burnaby B.C. V5A 1S6 Canada.

Draft: February 22, 2005

We would like to thank David Chun and Roger Boissonnas of Equilar Inc. for their considerable help on this research project.

Back Door Links Between Directors and Executive Compensation

Abstract

This paper examines whether links between inside and outside directors have an impact on CEO compensation. Using a comprehensive sample of 22,074 directors for 3,114 firms, we develop a measure of the “back door” distance between each pair of directors on a company’s board. Specifically, using the entire network of directors and firms, we compute the minimum number of other company boards that are required to establish a connection between each pair of directors (*ignoring* the obvious link that occurs when directors are on the same board). The back door distance provides a measure for the existence and strength of a communication channel between board members that can be used to influence decisions by the board of directors. We document that CEOs at firms where there is a relatively short back door distance between inside and outside directors or between the CEO and the members of the compensation committee earn substantially *higher* levels of total compensation (after controlling for standard economic determinants and other personal characteristics of the CEO and the structure for board of directors). This statistical association is consistent with recent claims that the monitoring ability of the board is hampered by “cozy” and possibly difficult to observe relationships between directors.

Back Door Links Between Directors and Executive Compensation

1. Introduction

The role of corporate governance in monitoring and controlling corporate management has been the subject of considerable research in accounting, economics, and finance (e.g., see Shleifer and Vishny, 1997, Bhagat and Black, 2002, and Bushman and Smith, 2001, for general reviews). Examples of these types of studies are Morck, Shleifer, and Vishny (1988), Byrd and Hickman (1992), Brickley, Coles and Terry (1994), Yermack (1996), Core, Holthausen, and Larcker (1999), Klein (2002), and Gompers, Ishii, and Metrick (2003). The general research question in this literature is whether selected dimension of corporate governance influences the decisions made by executives and the economic performance of the firm.

Since the purpose of the board of directors is to explicitly monitor management behavior for a dispersed group of individual shareholders, the structure of the board has been the focus of many theoretical and empirical studies (e.g., Hermalin and Weisbach, 1998 and Rosenstein and Wyatt, 1990). One dimension of board structure that is especially important is the “independence” of individual board members. It is commonly alleged that personal relationships between directors reduce the independence of board members and this has an impact on the choices made by the board of directors (e.g., the compensation paid to the CEO). Corporate governance rating services and activist shareholders often mention this aspect of director interlocks in their discussions of questionable corporate governance. For example, the AFL-CIO Executive Paywatch profiles the CEO-compensation committee relationships that they view as suspicious. The Corporate Library and Governance Metrics International include measures of

director interlocks when developing their rating of firm governance practices. Finally, the former chairman of the SEC, Arthur Levitt, in a recent *Wall Street Journal* editorial noted that the “cozy” relationships between the CEO and interlocked directors need to cease, especially for the compensation committee (Levitt, 2004). Levitt went as far to say that there should be no interlocking relationships.

Despite the conventional wisdom that suggests the existence of interlocks erodes the ability of the board to serve as an independent monitor of top management, there is relatively little evidence on this idea. For example, Hallock (1997), Core, Holthausen, and Larcker (1999) and Fich and White (2003) provide mixed evidence on whether director interlocks have a statistical association with the level of CEO compensation. However, these studies use a very narrow definition of links between directors (i.e., reciprocal interlocks) and restrict their analysis to small samples (i.e., less than 500 firms). Thus, the substantive impact of relationships between directors and CEO compensation is an unresolved question.

The purpose of our study is to assess the association between director linkages and CEO compensation using a comprehensive sample of 22,074 directors for 3,114 firms. Moreover, we apply social network analysis to this large sample to develop a new measure for links between directors which we refer to as the “back door” distance. This measure is the minimum number of other company boards that are required to establish a connection between each pair of directors (*ignoring* the obvious link that occurs when directors are on the same board). The back door distance provides a measure for the existence and strength of a communication channel between board members that can be used to influence decisions by the board of directors. Prior research only considers links

similar to the situation where an outside director on firm A is interlocked if an inside officer of firm A serves on the board of that outside director's primary company. In contrast, we explicitly measure the potentially important "friend of a friend" links that occur through various relationships in our large network of directors.

We find a statistically negative relation between various measures of the minimum distance from inside directors to outside directors (and from the CEO to members of the compensation committee) and CEO compensation. This result is robust to the inclusion of standard economic determinants of compensation, CEO characteristics, and board of director characteristics. These results are consistent with the agency cost explanation discussed in the popular and business press that CEOs are able to extract economic rent using the information and influence channels that exist when they are linked to outsider directors or members of the compensation committee.

The remainder of the paper is divided into four sections. Section 2 provides a review of the prior literature on director interlocks and develops our research hypotheses. Section 3 describes our sample, measurement choices, and methodological approach. Our results are presented in Section 4. Finally, the conclusions of our study are summarized in Section 5.

2. Background

2.1 Literature Review

There is a substantial literature examining structural relationships within social networks. This field, social network analysis, has its roots in sociology, social psychology and anthropology (e.g., Moreno, 1934) with the development of graph theory and sociograms to capture the relationships between members of a network. More

recently, mathematical techniques have been developed to quantify various aspects of the components of these networks (see Scott, 2000, chapter 2 for an excellent summary).

Social network analysis assumes that agents in a network are interconnected or exhibit some degree of dependence. Moreover, the links between agents are the channels by which information is communicated and this exchange of information produces an environment that provides “opportunities for or constraints on individual actions (Wasserman and Faust, 1994, p. 4). Studies based in this network perspective are very broad and cover a wide range of topics including the diffusion and adoption of innovation (Coleman, Katz and Menzel, 1957), coalition formation (Kapferer, 1969), group problem solving (Bavelas, 1950), elite decision making (e.g., Laumann, Marsden, and Galaskiewicz, 1977) and information diffusion in labor markets (Granovetter, 1974). The types of networks examined in these papers include social communities, powerful families and political and economic systems (e.g., Padgett and Ansell’s 1993 examination of business interests and marriage patterns in Florentine families in the 1400’s, and Galaskiewicz’s 1985 work on CEOs and social club networks).

The techniques developed in social network analysis can be applied to any setting where there are relations between agents in the network and there is reason to believe that these links impact the decision making of the agents in the network. In our empirical analysis, we focus on the corporate network (i.e., the network that exists between corporate directors). Specifically, we identify and measure the existence and strength of relational ties between directors and assess the economic significance of these relations on CEO compensation.

Our analysis is most closely related to prior social network analysis examining corporate interlocks (i.e., where board members exhibit some type of structural dependence). The extensive literature examining board interlocks can be traced back to the 1960s. For example, Levine (1972) documents the interlocked directorates between the boards of major banks and the boards of major industrials using a sample of 14 banks and 70 industrial firms using data from 1965. Dooley (1969) also documents the role of bankers in interlocks and the advantage gained by the industrial company because capital can be obtained at favorable rates when a banker is on the board. Interestingly, the majority of the director network research tends to only document the nature of the network interrelationships. For example, how particular interlocks are created (Pfeffer and Salancik, 1978), how they are maintained (Palmer, Friedland and Singh, 1986), how dense and/or central the network is (Davis, Yoo and Baker, 2003) have been studied. However, very little work has been done documenting economic consequences of the network. Indeed, Mizruchi (1992) notes that the evidence examining whether interlocking affects corporate behavior is “fragmented and contradictory”. The notable exceptions to this summary statement include work that documents the impact of the social network on firms’ decisions to adopt poison pills (Davis, 1991), firms’ decisions to switch stock exchanges (Rao, Davis and Ward 2000) and firms’ decisions to make political contributions (Mizruchi, 1992).

Some prior work has examined characteristics of the director network (i.e., board interlocks) and CEO compensation. Since CEO compensation is an observable decision that is made on a regular basis, this decision seems to be a natural place to assess the impact of links between directors on monitoring behavior. Hallock (1997) examined how

the reciprocal interlocks for employee and non-employee directors of 602 firms in 1992 affected CEO pay. After controlling for standard economic determinants of CEO compensation, he finds only weak evidence that his narrow definition of director interlocks affect CEO compensation. More recently, Fich and White (2003) examine the impact of the number of mutual director interlocks on CEO compensation for a sample of 366 large industrial firms (the sample is based on the Fortune 500 firms used by Yermack, 1996). They define two boards to be “mutually interlocked” if they share at least two directors. They find some evidence that compensation, after controlling for standard economic determinants, is positively related to the number of mutual director interlocks that exist on the board. Finally, Core, Holthausen and Larcker (1999) find no association between direct outsider interlocks (i.e., an outside director on firm A is interlocked if an inside officer of firm A serves on the board of that outside director’s primary company) and executive compensation using a sample of 205 firms from 1982-1984.

Collectively, prior research has found only weak evidence of an association between director interlocks and CEO compensation. However, this research is limited by small sample sizes and very strict definitions of director interlocks. Small sample sizes cause a large part of the corporate network to be ignored when measuring links between directors, and therefore many potential linkages are ignored in these analyses.¹

Restricting the focus to reciprocal interlocks (Hallock, 1997) will ignore many “friend of

¹ Fich and White (2003) limit their analyses to large, industrial firms. This sample systematically excludes financial institutions and utilities which prior work has shown to be a central part of the corporate director network (Levine, 1972 and Dooley 1969). Even excluding a small number of firms will greatly limit the ability of the network analysis to recover linkages between firms. With our comprehensive sample of 3,114 firms including all industries and both small and large firms we are far less likely to be missing linkages within the network. Indeed, we find that the largest cluster in our network is 1,685 firms (i.e., firms that are interconnected through their directors) suggesting that prior studies looking at samples of 366 firms (e.g., Fich and White 2003) are missing large sections of the network.

a friend” relations in the data (Mizruchi, 1992).² In this paper we re-examine the effect of director links on CEO compensation for a large sample of firms using a more comprehensive measure for the linkages between directors that captures not only reciprocal interlocks but all possible connections between directors within the network of directors. Our measurement goal is to develop an estimate for the existence and strength of the natural channels through which information and influence is disseminated between directors.

2.2 Research Hypotheses

While there has been a substantial literature on social network analysis, especially the corporate director network, the summary above highlights that very little work has documented economic consequences of these relations. The aim in our paper is to study the linkages in the director network and examine whether these linkages affect CEO compensation. Our specific focus is on the links that exist between directors that occur because they serve on multiple boards. As discussed more fully in Section 3, we use the entire network of directors and firms to compute the minimum number of other company boards that are required to establish a connection between each pair of directors (*ignoring* the obvious link that occurs when directors are on the same board).³ We term the resulting measure as the “back door” distance. This provides a measure for the existence and strength of a communication channel between board members that can be used to influence decisions by the board of directors.

² ExecuComp also has a very narrow definition of interlocks. It defines an interlock as existing if the officer is involved in a relationship requiring disclosure in the "Compensation Committee Interlocks and Insider Participation" section of the proxy. This will capture only very specific linkages between directors.

³ This type of computation is related to the “degree of separation” measures that are commonly discussed in popular press features. For example, Stanley Milgram’s famous six degrees of separation among individuals is an example of this type of research (Milgram, 1967).

Despite the rhetoric by the financial pundits and activist governance organizations, it is not theoretically obvious that such an association will be evident in the data and, if such an association does exist, whether it will have a positive or negative impact on the firm. We may observe no relation between the “back door” linkages and CEO compensation because it is possible that the observed linkages in the corporate director network are nothing more than a neutral permutation of the parameters of the network. For example, there are a limited number of people who can serve as directors and each firm requires a certain number of directors on the board. Indeed, some prior work has suggested that random assignments of directors to boards yield very similar representations of the observed data (e.g., Newman, Strogatz and Watts, 2001 and Conyon and Muldoon, 2004). Under this scenario the linkages between directors are not necessarily indicative of monitoring problems, but rather a manifestation of how natural constraints impact the observed network structure.

If the “back door” linkages are not neutral mutations and do impact board decision making and CEO compensation, it is not clear whether close links between directors will lead to lower or higher levels of pay. Under the agency cost or entrenchment view, the “back door” linkage reflects the idea of friendly relations between directors that will impede their ability to make decisions in the best interests of the firm. Favorable compensation decisions will be made to obtain favorable decisions in return (or to avoid awkward personal interactions). Under this view, “back door” links reflect compromised independence and objectivity of the director which will manifest as higher levels of CEO compensation. These linked directors will be sympathetic to the CEO in setting pay levels (e.g., Fich and White, 2003).

Corporate governance rating services and activist shareholders often mention this aspect of director interlocks in their discussions of questionable corporate governance. For example, the AFL-CIO Executive Paywatch profiles the CEO-compensation committee relationships that they view as suspicious for large companies such as Safeway, Apple Computers and Cisco Systems. Similarly, ratings agencies such as The Corporate Library and Governance Metrics International include measures of director interlocks when rating firm governance practices. Some conventional wisdom suggests that the existence of these interlocks erodes the ability of the board to serve as a monitor of top management. Indeed, the former chairman of the SEC, Arthur Levitt, in a recent Wall Street Journal editorial noted that the “cozy” relationships between the CEO and interlocked directors need to cease, especially for the compensation committee (Levitt, 2004). Levitt went as far to say that there should be no interlocking relationships. If this agency cost explanation is descriptive in our sample, we would expect CEO compensation to increase when there are close links between insider and outside board members. This result would provide support for the conjectures of rating agencies and regulators that focus on these types of director links.

Finally, CEO compensation may exhibit an association with the extent of director links because these links reflect strategic alliances between powerful individuals and firms. These alliances can be a potentially valuable intangible asset for a company. In particular, these alliances make the firm inherently less risky because of the strength of the business relation created by the director associations (Schoorman, Bazerman and Atkin, 1981). Burt (1983) shows that director interlocks are associated with the extent to which one industry exercises market constraint over another, so the presence of the

interlock suggests an attempt of the firm to establish alliances to mitigate risk and uncertainty by expanding the boundary of the firm. Indeed, some of the earlier work examining relations between banks and financial companies found that industrial firms with links to banks were able to attract lower cost of capital (Dooley, 1969 and Mizruchi and Stearns, 1988). If the links between directors are a measure of firm risk, we would expect close links to result in lower CEO compensation because the required risk premium will be lower. However, it is also possible that the existence of strategic alliances is a measure of CEO quality. Thus, close links between directors can be desirable for shareholders and this would suggest that close links should increase CEO compensation. Furthermore, the type of director who is a central member of these networks has an economic incentive to maintain his or her personal reputation. This would suggest additional monitoring benefit from these “back door” linkages that would counteract the “co-opting” of these directors to CEO interests.

3. Methodological Approach

3.1 Sample

Our primary sample is developed from extensive board and compensation data collected from proxy statements by Equilar Inc. for companies with fiscal year ends ranging from June, 2002 to May, 2003 (or Compustat data year 2002). The board of director data consists of 22,074 individuals that are directors for 3,114 individual companies. Our sample spans many sectors of the economy and has a distribution of firms that is very similar to the composition of the complete Compustat file (see Table 1). Our sample represents approximately 85 percent of the market capitalization of the

Russell 3000 as of the end of 2002 (and this index accounts for about 98 percent of the total market capitalization of the U.S. equity markets).

Panel A of table 2 reports descriptive statistics for various board characteristics. The size of the board of directors ranges from a minimum of three to a maximum of 31 with the mean (median) board size of 8.6 (8) directors. The mean fraction of independent outsider (affiliated) directors on the board is 62 (17) percent.⁴ A relatively small fraction of the board is over the age of 70 (10 percent of independent outsider directors and 8 percent of affiliated directors) with very few boards having appointed a lead director or an outside director that can call meetings of all outside directors in executive session (6 percent). The majority of independent outside directors have been appointed during the insider directors' tenure (69 percent) and only a small portion of the sample (11 percent) have an outsider serving as chairperson of the board. For the directors in our network, each director is affiliated with at least one company and up to ten different 10 companies. The mean director is affiliated with 1.22 companies and 18,197 (or 82.4 percent) of the directors are affiliated with only a single company (untabulated).

3.2 Measurement Issues

Relations Between Directors

The construct of interest is the link between directors on a given board. Standard measures of these board relations have focused on interlocks. For example, ExecuComp defines an officer to be interlocked if the officer (i) serves on the board committee that makes his compensation decisions, or (ii) serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the

⁴ We use the definition of affiliated (or “grey”) directors developed by Equilar (which is a combination of SEC, NYSE, and NASD guidelines). Any outside directors that were mentioned in the “certain transactions” section of the proxy statement or a former executive was classified as affiliated.

compensation committee of the indicated officer's company, or (iii) serves on the compensation committee of another company that has an executive officer serving on the board (and possibly compensation committee) of the indicated officer's company. This especially narrow definition for links between directors misses substantial relations between directors that are more than one step removed from each another.

Figure 1 illustrates the basic measurement approach that we use to compute links between directors. The left side of Figure 1 captures the standard reciprocal interlock – directors 1 and 2 on the board of company A are also on the board of company B. The back door distance for this pair of directors is equal to one. The right side of Figure 1 captures a link between directors 1 and 2 that is facilitated by a third company. Since the directors of another company are necessary for this link, the back door distance for this pair of directors is equal to two. We refer to such linkages as “back door” (denoted BDD) because they only exist for two directors that are on more than one board and the linkages do not involve the direct linkage between directors (i.e., the fact that directors 1 and 2 are both on the board of company A). These types of potentially important “friend of a friend” linkages are absent from the measures of director interlocks used in prior research.

As is standard in social network analysis, we develop our BDD measures using a rectangular incident matrix that captures the links between the 22,074 directors. Two directors are linked if they serve together on the same board. The resulting affiliation network serves as the primary input into our computations. For the BDD to be defined for a director, this individual must be affiliated with more than one company. For a specific pair of directors for a given firm, we remove their direct links that occur because

they are board members for that firm and then we compute the *shortest* (or geodesic) path between them which must go through other firms. Obviously, the BDD is only defined for companies that have more than one director with outside connections. This path will not be defined if all directors are only together on a given company's board. It may also not exist if there is no path from one director to another director outside the company (though this happens only occasionally).

The affiliation network involving all 22,074 directors is not completely connected. That is, there are pairs of directors that cannot be reached by following paths defined by the director links in the entire network. Sets of directors that are connected are referred to as components, and there are 605 components in our network. The largest component consists of 16,752 directors from 2,455 companies. The other 604 components contain 54 or less people and 5 or less companies. Interestingly, 561 of these components consist of only one company with no overlap to any other company.

The analysis described above generates an exhaustive search for links between all directors in the network. Since our empirical analysis of executive compensation is conducted at the firm level, it is necessary to aggregate these between director relations. In order to develop a parsimonious set of results, we report the relations between all inside directors and all outside directors, and the relations between the CEO and all members of the compensation committee, by considering the minimum BDD between either inside directors and outside directors, or the CEO and the members of the compensation committee.⁵

⁵ Our measure is computed using insiders and outsiders, and ignores the affiliated (or "grey" directors). We assume that the affiliated directors are potentially compromised with regard to independence, and thus we

To see how the aggregation of director relations is performed, consider firm XYZ with 5 directors (two insiders, I1 and I2, one affiliated, A1, and two outsiders, O1 and O2). I1 is the CEO of firm XYZ and the compensation committee is comprised of A1, O1 and O2. The minimum distances between each of the director pairs that are of interest are indicated in parentheses following the director pair as follows: I1-O1 (2), I1-O2 (4), I2-O1 (3), I2-O2 (5), and I1-A1 (1). Our BDD measure that captures the minimum distance between inside and outside directors is equal to 2 (the link between I1 and O1). Our BDD measure that captures the minimum distance between the CEO and the compensation committee is equal to 1 (the link between I1 and A1).

Panel B of Table 2 reports the minimum back door distance (BDD) between inside directors and outside directors and between the CEO and the compensation committee. The BDD measure is increasing in distance between the subsets of directors. For firms where a link does not exist or it is undefined, we code the measure as 14 (which is one unit greater than the largest observed BDD), thereby creating an ordinal measure that is increasing in distance. There are several noteworthy results in Panel B. First, the majority of firms do not have any linkages between insider directors and outside directors (2,373 out of the 3,073 firms for which we could aggregate these linkages have no such link) or between the CEO and the compensation committee (2,334 out of the 2,867 firms for which we could aggregate these linkages have no such link).⁶ Second, the reciprocal interlock (i.e., BDD=1) accounts for a very small portion of all back door linkages. Only

focus only on the links between insiders and outsiders. However, there are at least some affiliated directors in our computation of the links between the CEO and the members of the compensation committee.

⁶ We are not able to calculate the distance between insiders and outsiders or between the CEO and the compensation committee for all firms. For example, some firms have only affiliated or inside directors on the board and for some firms we are unable to identify the CEO. We calculate the BDD measure for the maximum number of firms where we have available data.

179 out of the 700 (i.e., 25.6 percent) firms that have a link between insiders and outsiders are reciprocally interlocked. Likewise, there is a reciprocal interlock between the CEO and the compensation committee for only 111 out of 533 (i.e., 20.8 percent) firms that have any link between the CEO and compensation committee. This result implies that prior research focusing on a very strict definition of an interlock misses a substantial amount of the (back door) links that exist within the director network.

Since our BDD measure is ordinal in nature, changes in the measure are not necessarily interpretable along its continuum. This is especially true for firms where no such link exists (i.e., were we set BDD=14). In section 4, we outline various approaches to address this limitation. Specifically, in our empirical analyses, we use the continuous BDD measure along with several discrete versions of this variable. Finally, it is important to note that panel B of Table 2 only reports the minimum distance between subsets of the board. The empirical results discussed in section 4.2 are also robust to using the average distance or the number of links between these groups.

Executive Compensation

We use the typical approach for measuring the annual flow of compensation to a CEO. Our CEO compensation data is obtained from detailed proxy statement data provided by Equilar for the time period from June, 2002, to May, 2003 that corresponds to the period for which the board of director data is collected. We measure the total dollar value of all expected compensation received by the CEO including actual salary, actual annual bonus, Black-Scholes value of stock options, target value for restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites,

etc.). The mean (median) level of total CEO compensation in our sample is about \$3.41 (\$1.57) million (Table 2, Panel D).

In our empirical tests assessing the impact of various director relations (defined above) on CEO compensation, we consider several specifications. We condition CEO compensation on (i) standard economic determinants, (ii) various CEO characteristics, and (iii) various board characteristics. We include these various sets of control variables to mitigate concerns that our BDD measure simply reflects underlying firm or board characteristics that would typically determine executive compensation (i.e., the BDD simply mimics a known association for CEO compensation and is not a unique variable). Finally, we run both linear and log-linear (using the natural logarithm) specifications of CEO compensation model to examine both the dollar impact of director relations and the elasticity of this relation.

Our economic determinants are standard in the literature (e.g., Core, Holthausen and Larcker, 1999) and they include Book-to-Market, calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), Mkt. Cap. (market value of common equity), ROA (return on assets) calculated as income before extraordinary items (item18) deflated by average total assets (item 6), RET (12 month return) calculated as the percentage change in price inclusive of dividends for the fiscal period, $\sigma(\text{ROA})$ calculated as the standard deviation of ROA using at least 3 and up to 5 years of prior data, and $\sigma(\text{RET})$ calculated as the standard deviation of RET using at least 3 and up to 5 years of prior data. The total compensation variable and all control variables are winsorized at the extreme two percentiles (i.e., values less (greater) than the 2nd (98th) percentile are set equal to the

value of the 2nd (98th) percentile). We also include a vector of industry fixed effects (two-digit SIC) in the regressions. Panel C of Table 2 reports descriptive statistics for these economic determinants for our sample. The mean (median) market capitalization is \$2.46 (\$0.52) billion dollars. The mean Book-to-Market is about 0.57 and the mean firm reported a loss equal to 3 percent of its average assets.⁷

Our CEO characteristics include CEO tenure, CEO age and whether the CEO is the founder of the company. Panel D of Table 2 reports that 16 percent of the CEOs in our sample are founders, the average CEO is 54 years old and has served as CEO for 11 years. These CEO characteristics are used in order to control for the impact of age and tenure on the riskiness of the compensation plan offered to the CEO and the possibility that founder CEOs have a reward structure that is very different from other CEOs.

The board characteristics we examine include board size, board composition, director age, insider appointed directors, the existence of a lead director and whether an outside director is the chairman of the board. Each of these variables has been examined in various studies on corporate governance. One of the key variables in this set of controls is board size. That is, our BDD measure may in part be driven by the size of the board. Large boards have the potential to have more director-to-director relationships, especially when we are aggregating links across sub-sets of directors (e.g., insiders to outsiders). This issue is commonly addressed in social network analysis by scaling the relational measures by board size. For example, the centrality measure of Bonacich (1972) that is commonly used to describe the corporate director network is scaled by the size of the board. To ensure that the relation between director relations and CEO

⁷ The sample sizes vary for each of the variables as we report the descriptive statistics for the maximum sample available. In our regression analysis below we only include firms in each specification that have the full complement of independent variables for the respective specification.

compensation is not driven by board size, we include this variable in our regression analysis.⁸

4. Results

In this section, we present the results of our empirical analyses examining the association between director relations and executive compensation. First, we discuss significant correlations between our BDD measure and various independent variables in our CEO compensation regressions. Second, we discuss the multivariate regression results. There are many alternate specifications for our regression analysis. As discussed above in section 3.2, we examine the linkages between (i) inside directors and independent outside directors, and (ii) CEO and members of the compensation committee. In all cases we focus only on the minimum distance between each director. Alternatives include the average distance or the number of possible linkages between each director pair. These alternatives are highly correlated with the minimum distance and for the sake of brevity we only tabulate results for minimum distance (untabulated results using average distance or number of links generate very similar results to those reported). We also examine continuous and discrete versions of our BDD measure.⁹

4.1 Bivariate correlation results

⁸It is useful to note the BDD measure is at least partially exogenous. While a company can institute policies limiting, or even prohibiting, external board appointments, the firm does not have a direct say in which firms that the director will hold an additional director appointment. Firms can voluntarily align themselves to take advantage of alliances across industry affiliations (e.g., Dooley, 1969 and Burt, 1983), but ultimately it is the interdependence between members of the network that determine the ties within the network. It is not the result of decisions of one firm. This is a desirable feature of the network analysis because it at least partially mitigates the standard endogeneity problems that plague traditional economic analysis.

⁹ We have also examined binary versions of the BDD measure. We summarize these results in section 4.3.

Table 3 reports significant correlations between our director relations measure and Mkt. Cap., Board Size and board composition. We limit our discussion only to correlations that are greater than 0.15 in absolute value for the sake of brevity. The first row of Table 3 reports the correlations for the minimum distance between insider and outside directors. This distance is smaller for large firms, large boards and for firms with a higher percentage of outside directors. These results are somewhat expected because inside directors have greater potential to exhibit a link with other directors if they serve on larger boards and with a larger number of outside directors. Similar correlations are observed in the second row of Table 3 which reports the correlations for the minimum distance between the CEO and the compensation committee. This is also to be expected because the compensation committee is primarily composed of outside directors and outside directors of large firms are more likely to have multiple board memberships.

The remaining six rows of Table 3 convert the continuous BDD measures to discrete variables. As mentioned in section 3.2, the ordinal scale that we use for BDD (from 1 to 14) may not have the natural interpretation of a variable that has an interval scale. For example, increasing the BDD from 1 to 2 is unlikely to have the same substantive impact on board behavior as increasing the BDD from 11 to 12. In order to gain some insight into the measurement properties of the BDD, we convert this measure into three indicator groups. The first group includes firms where the minimum BDD is between one and three, the second group is where the minimum BDD is between four and six, and the third group is where the minimum BDD is greater than six. Firms in the first group (shorter distance) tend to be larger, have larger boards and more independent outsiders on the board. Firms in the third group (longer distance) tend to be smaller, with

smaller boards and fewer independent outsiders on the board. These associations hold for both relations between insiders and outsiders and relations between the CEO and the compensation committee. Since we observe statistically significant correlations between our BDD measures and one of the primary determinants of CEO compensation (i.e., market capitalization) and two common measures of board structure (i.e., board size and the percentage of outside directors on the board), we control for these effects in our multivariate regression tests.

4.2 Multiple regression results

Tables 4 through 7 report our regression results.¹⁰ Each table has two panels. Panel A reports the linear specification where the dollar value of total CEO compensation is regressed on various determinants. Panel B reports the log-linear specification where the natural logarithm of total compensation is regressed on various determinants (where several determinants are also transformed via the natural logarithm). Within each panel we have four models. The first model only includes the standard economic determinants of CEO compensation. This model is the same across the four tables and is included for comparative purposes. The second model adds the BDD measure to the standard economic determinants. The third model adds CEO characteristics (i.e., age, tenure and founder status). Finally, the fourth model adds board characteristics (i.e., percentage of the directors that are outsiders and affiliated, percentage of the inside, affiliated, and outside directors that are older than 70, percentage of the affiliated and outside directors that have a board tenure less than the maximum board tenure for an insider director, board size, presence of a lead director, and presence of an outside chairman of the board).

¹⁰ Observations were deleted if the absolute value of the studentized residual was greater than four. This “outlier” adjustment causes there to be a different sample size for the dollar value and log-linear specifications.

Panel A of Table 4 reports dollar value of CEO compensation regression results using the minimum distance between insiders and outsiders as the BDD measure. The first column reports the standard economic determinant model. CEO compensation is increasing in firm size, growth, performance and is decreasing in the volatility of accounting performance. This specification includes a vector of industry indicator variables and is able to explain 50.7 percent of the cross-sectional variation in executive compensation. We add the BDD measure in Model 2 and find a statistically significant negative coefficient equal to $-\$82,773$ (t-statistic of -5.73). An increase in BDD of one unit is associated with $\$82,773$ less CEO pay. This negative relation is also evident in models 3 and 4 even after we add in the selected CEO and board characteristics. In model 4 the coefficient on BDD remains statistically significant (coefficient estimate of $-\$53,869$ and t-statistic of -3.38). This final specification includes measures of board size and board composition that are correlated with BDD (as reported in Table 3). Including these additional variables does not remove the negative statistical association between BDD and CEO compensation. In panel B we see very similar results for the log-linear specification. The coefficient on BDD ranges from -0.09 (t-statistic of -4.01) in model 2 to -0.06 (t-statistic of -2.45) in model 4. This suggests that a 10 percent increase in the distance between insiders and outsiders is associated with a 0.6 percent decrease in CEO pay. Other associations of note are that CEO pay is decreasing in CEO tenure (log-linear specification only), CEO founder status and chairman outsider status; and CEO pay is increasing in the fraction of outsiders and affiliated directors appointed to the board and board size (linear specification only). These associations are robust across the alternate specifications in Tables 5 through 7.

Table 5 reports regression results for the impact of BDD on CEO compensation for linkages between the CEO and the compensation committee. These tests are perhaps the most informative for our research question because it is the compensation committee that sets (or at least provides a key input into the process that sets) CEO compensation. In panel A, the coefficient on BDD ranges from -\$68,081 (t-statistic of -4.27) in model 2 to -\$40,490 (t-statistic of -2.29) in model 4. Likewise, in the log-linear specification in panel B we find that the coefficient on BDD ranges from -0.02 (t-statistic of -4.25) in model 2 to -0.01 (t-statistic of -2.38) in model 4. A 10 percent increase in the distance between the CEO and the compensation committee is associated with a 0.1 percent decrease in CEO pay. These results are very consistent with the results of the regression analyses using the minimum BDD between insiders and outsiders.

We repeat the analyses in Tables 4 and 5 using discrete versions of the BDD measure in Tables 6 and 7. We define two new indicator variables to capture discrete intervals of BDD. First, we define an indicator variable equal to one if BDD is between one and three, and zero otherwise. Second, we define another indicator variable equal to one if BDD is between four and six, and zero otherwise. The intercept in these specifications captures the average level of CEO pay for firms where BDD is between seven and 14. For the linear specification in panel A of Table 6, we find that the level of CEO pay is greater for firms where BDD is between one and three or between four and six, relative to the group where BDD is greater than or equal to 7, where BDD is measured as the minimum distance between inside and outside directors. While the coefficients on the group where $4 \leq \text{BDD} \leq 6$ (in model 4 the coefficient is \$751,227, t-statistic of 3.28) is greater than the group where $1 \leq \text{BDD} \leq 3$ (in model 4 the coefficient is

\$499,281, t-statistic of 2.21), in unreported F-tests we find that this difference is not statistically significant at conventional levels (the F-statistics for models 2, 3, and 4 are 1.26, 0.01, and 0.75 respectively). For the log-linear specification in panel B of Table 6, we find a positive relation between CEO compensation and the BDD indicator variables. For firms where $1 \leq \text{BDD} \leq 3$, the coefficient on BDD is greater than that for the group where $4 \leq \text{BDD} \leq 6$, across all three models in panel B of Table 6 (the F-statistics for models 2, 3, and 4 are 2.48, 1.23, and 0.60 respectively, with the differences in model 2 significant at conventional levels).

Finally, in Table 7 we see similar results for the discrete BDD measures of the CEO to compensation committee linkages. Firms where the distance between the CEO and compensation committee is less than or equal to six are associated with higher levels of pay and greater elasticity of CEO pay with respect to BDD, relative to firms where the distance between the CEO and compensation committee is greater than or equal to seven.¹¹ (For the linear specifications (panel A), the F-statistics testing coefficient equality across the BDD indicator variables for models 2, 3, and 4 are 0.08, 1.04, and 1.14 respectively. For the log-linear specifications (panel B), the respective F-statistics for models 2, 3, and 4 are 0.43, 0.06, and 0.05. All these F-statistics are insignificant.)

The regression results reported in Tables 4 through 7 use the maximum sample available for each specification. However, this makes it difficult to examine the explanatory power across specifications (i.e., model 1 through model 4) because the sample size changes for each model. In unreported analyses, we also estimated all regression analyses using constant sample sizes of 2,089 (2,115) firms for the linear (log-

¹¹ We also used a variety of alternate cut-offs to create the discrete BDD measure and found very similar results.

linear) inside to outside specifications and, 2,045 (2,069) firms for the linear (log-linear) CEO to compensation committee specifications. The adjusted R^2 of the economic determinants only specification (model 1) is 48.5 (49.2) percent for the linear (log-linear) specification. For model 2, which includes the BDD measure, the adjusted R^2 increases to 49.0 (49.5) percent for the linear (log-linear) specification. This increase in explanatory power is similar across the various BDD measures (i.e., inside directors to outside directors, CEO to compensation committee, and the continuous and discrete versions of the BDD measure). Finally, in model 4 the adjusted R^2 increases to about 50.3 (51.3) percent for the linear (log-linear) specification. The increase in explanatory power from including the BDD measure is between 0.5 to 1 percent for each specification. This increase in explanatory power is small relative to the economic determinants, but it is of roughly the same magnitude as the incremental explanatory power associated with including the CEO characteristics or board characteristics in the compensation regression.¹² Since there is not a well-established benchmark for assessing the size of incremental explanatory power, it is difficult to conclude that BDD either does or does not have a substantive impact on CEO compensation.

Collectively, the regression results indicate a robust negative statistical association between the BDD measure and CEO compensation. Firms with close links between either inside directors and outside directors or between the CEO and the compensation committee are observed to provide higher levels of compensation to their

¹² It is also instructive to note that this level of explanatory power is large when compared to the explanatory power obtained for CEO compensation regressions that include various governance characteristics. For example, Larcker, Richardson and Tuna (2004) note that the addition of 39 structural measures of corporate governance, increases the adjusted R^2 of a CEO compensation regression from 41.1 percent for an economic determinants only specification to 46 percent for a specification including all 39 governance variables (although several of the governance variables in their specification had unexpected signs). Thus, the increase in explanatory power from our BDD measure is comparable to the explanatory power produced by a comprehensive set of governance characteristics.

CEOs. These results are consistent with the agency cost explanation discussed in section 2.2 and suggest that CEOs are able to extract economic rent using the information and influence channels that exist when directors have “back door” links. Moreover, this negative relation is robust to the inclusion of standard economic determinants of CEO pay, as well as various CEO and board characteristics.

4.3 Additional empirical analyses

In unreported analyses, we also examine two alternative BDD measures. First, we use the standard definition of reciprocal director interlocks that has been employed in the prior literature (e.g., Hallock 1997 and Fich and White 2003) and is the typical definition of compensation committee reciprocal interlocks reported in Execucomp. For these regressions we define an indicator variable equal to one if BDD=1 and zero otherwise. This specification groups director relations with a distance greater than one with firm observations where no such link exists (i.e. BDD=14). Using this binary specification, for our linear (log-linear) CEO compensation regressions using the link between inside and outside directors, the t-statistics for models 2 through 4 range from 3.85 to 1.90 (2.80 to 1.97) and coefficient estimates range from \$1,010,860 (0.19) for model 2 to \$538,075 (0.14) for model 4. For our linear (log-linear) CEO compensation regression specifications using the link between the CEO and the compensation committee, the t-statistics for models 2 through 4 range from 1.53 to 0.54 (0.88 to 0.48) and coefficient estimates range from \$499,754 (0.07) for model 2 to \$186,624 (0.04) for model 4. These weaker results are consistent with prior research that has found mixed evidence supporting an association between director relations and executive compensation. The stronger results reported in Tables 4 through 7 suggest that the “back

door” linkages between directors that span more than one firm are an important part of the director network that should be included in any empirical examination of the economic consequences of the relationships within the corporate director network.

Our second alternative BDD measure is an indicator variable that is equal to one if a link between directors exists (irrespective of length) and zero if no link exists (i.e., BDD=14). For our linear (log-linear) CEO compensation regressions, using the minimum distance between inside and outside directors in this binary form, the t-statistics for models 2 through 4 range from 5.38 to 3.57 (3.88 to 2.51) and coefficient estimates range from \$834,253 (0.16) for model 2 to \$612,422 (0.11) for model 4. For our linear (log-linear) CEO compensation regression specifications, using the minimum distance between the CEO and the compensation committee in this binary form, the t-statistics for models 2 through 4 range from 4.23 to 2.44 (4.48 to 2.59) and coefficient estimates range from \$709,611 (0.20) for model 2 to \$453,688 (0.12) for model 4. These results again suggest that the statistical association between “back door” distance and CEO compensation is robust to alternative measurement choices.

5. Summary and Conclusions

The role of the board of directors as part of the governance landscape has received considerable attention from academics, governance rating agencies and regulators. A key task of the board is to determine the compensation package of the CEO. Indeed, characteristics of top executive compensation packages are one of the key inputs into the governance ratings produced by Governance Metrics International, Institutional Shareholder Services, The Corporate Library and other similar organizations.

In this study we examine the impact of corporate board interlocks (broadly defined) on CEO compensation. Previous research examining very narrow definitions of corporate interlocks with small samples has been unable to document a robust association between interlocks and CEO compensation (e.g., Hallock 1997 and Fich and White 2003). Using a comprehensive sample of 22,074 directors in 2002 and applying social network analysis to develop measures for the links between directors, we find a strong negative relation between various measures of the minimum distance from inside directors to outside directors (and from the CEO to members of the compensation committee) and CEO compensation. For example, where a link between the CEO and the compensation committee exists, CEOs receive an extra \$453,688 in total compensation. Although the size of the extra compensation varies, the statistical significance of this relation is robust to the inclusion of standard economic determinants of compensation, alternate specifications of CEO compensation (linear and log-linear), and inclusion of various CEO and board characteristics.

Our study has several implications for corporate governance. First, the results lend support to the claims of regulators and rating agencies that have questioned the ability of boards with substantial ties between directors to serve as effective monitors of management. Our results suggest that CEOs are able to extract economic rents through additional compensation when they have linkages with the directors that serve on the compensation committee or when the inside and outside directors are linked. Second, our study highlights the limitations of existing measures used in the prior research on director interlocks. For example, ExecuComp focuses only on reciprocal interlocks. Such interlocks represent only a small fraction of all linkages between directors. Of the 3,114

firms in our sample only 5.7 percent are reciprocally interlocked, but 24 percent are linked within the network. This implies that prior research has failed to capture a large part of the linkages within the corporate director network either due to looking at small samples or by focusing on solely reciprocal interlocks.

Our study has a number of limitations and it is important to make these explicit. First, we use only one year of data in our analysis and this restricts our ability to generalize to other periods. However, an advantage of our sample period is that it is after (or perhaps concurrent with) the changes introduced by the Sarbanes-Oxley Act, and this means that our results should reflect the current state of corporate governance. In addition, despite being limited to one year, our sample size is very large (3,114 firms) relative to prior work that has examined the association between director interlocks and executive compensation (less than 500 firms). Second, although we examine a variety of alternative specifications and incorporate a large set of control variables, there is always the possibility that correlated omitted variables confound our interpretations. For example, BDD may capture an unobserved economic characteristic that should rationally be used to set CEO compensation (e.g., CEO quality). Third, it is difficult to assess whether the incremental explanatory power associated with the BDD measure is sufficient to make substantive conclusions about whether “back door” links actually have an important impact on CEO compensation. Fourth, the BDD measure is at least partially endogenous and this raises the typical concerns about the consistency of the regression estimates. However, it is useful to note that BDD is *not* strictly endogenous because the choices about directors made by other firms have an important impact on the BDD measure. Finally, we only examine the impact of BDD on CEO compensation. If links

between directors impact their ability and motivation to monitor management, we should also observe BDD to affect financial reporting choices, investment and financing decisions, and perhaps firm performance. These analyses would be an interesting extension for future research.

References

- Bavelas, A. 1950. Communication Patterns in Task-Oriented Groups. *Journal of the Acoustical Society of America*, 22, 271-282.
- Bhagat, S., and B. Black. 2002. The non-correlation between board independence and long-term firm performance. *Journal of Corporation Law*, 27, 2, 231-273.
- Bonacich, P. 1972. Technique for Analyzing Overlapping Memberships. In Costner, H. (Ed.) *Sociological Methodology*, San Francisco, Jossey Bass.
- Brickley, J., J. Coles and R. Terry. 1994. Outside Directors and the Adoption of Poison Pills. *Journal of Financial Economics*, 35, 371-390.
- Burt, R. 1983. Corporate Profits and Cooptation: Networks of Market Constraints and Directorate Ties in the American Economy. New York Academic Press.
- Bushman, R. M., and A. J. Smith. 2001. Financial accounting information and corporate governance. *Journal of Accounting and Economics*, 32, 237-334.
- Byrd, J. and K. Hickman. 1992. Do Outside Directors Monitor Managers? Evidence from Tender Offer Bids. *Journal of Financial Economics*, 32, 195-207.
- Coleman, J. S., E. Katz, and H. Menzel. 1957. The Diffusion of an Innovation Among Physicians. *Sociometry*, 20, 253-270.
- Canyon, M. J., and M. R. Muldoon. 2004. The Small World Network Structure of Boards of Directors. Working paper, University of Pennsylvania and University of Manchester.
- Core, John E., Robert W. Holthausen, and David. F. Larcker. 1999. Corporate Governance, Chief Executive Officer Compensation, and Firm Performance, *Journal of Financial Economics*, 51, 371-406.
- Davis, G. F. 1991. Agents Without Principles? The Spread of the Poison Pill Through the Intercorporate Network. *Administrative Science Quarterly*, 36, 583-613.
- Davis, G. F., M. Yoo and W. E. Baker. 2003. The Small World of the American Corporate Elite, 1982-2001. *Strategic Organization*, 3, 301-326.
- Dooley, P. C. 1969. The Interlocking Directorate. *American Economic Review*, 59, 314-323.
- Fich, E. M., and L. J. White. 2003. CEO Compensation and Turnover: The Effects of Mutually Interlocked Boards. *Wake Forest Law Review*, 38, 935-959.

- Galaskiewicz, J. 1985. *Social Organization of an Urban Grants Economy*. Newbury Park, CA: SAGE Publishing.
- Gompers, P. A., J. L. Ishii, and A. Metrick. 2003. Corporate Governance and Equity Prices. *Quarterly Journal of Economics*, 118, 107-155.
- Granovetter, M. 1974. *Getting a Job*. Cambridge MA, Harvard University Press.
- Hallock, K. F. 1997. Reciprocally Interlocking Boards of Directors and Executive Compensation. *Journal of Financial and Quantitative Analysis*, 32, 331-344.
- Hermalin, B. E. and M. S. Weisbach. 1998. Endogenously Chosen Boards of Directors and Their Monitoring of the CEO. *American Economic Review*, 88 (1), 96-118.
- Kapferer, B. 1969. Norms and the Manipulation of Relationships in a Work Context. In Mitchell, J. C. (Ed.) *Social Networks in Urban Settings*. Manchester University Press.
- Klein, April. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33, 375-400.
- Larcker, D. F., S. A. Richardson, and I. Tuna. 2004. How important is corporate governance?, Working paper, University of Pennsylvania.
- Laumann, E. O., P. V. Marsden and J. Galaskiewicz. 1977. Community-elite influence structures: Extensions of a Network Approach. *American Journal of Sociology*, 83, 594-631.
- Levine, J. H. 1972. The Sphere of Influence. *American Sociological Review*, 37, 14-27.
- Levitt, Jr. A. 2004. Money, money, money. Wall Street Journal editorial, November 22, 2004, p A14.
- Milgram, S. 1967. The Small World Problem. *Psychology Today*, 2, 60-67.
- Mizruchi, M. S. 1992. *The Structure of Corporate Political Action: Inter-firm Relations and Their Consequences*. Harvard University Press.
- Mizruchi, M. S., and L. B. Stearns. 1988. A Longitudinal Study of the Formation of Interlocking Directorates. *Administrative Science Quarterly*, 33, 194-210.
- Morck, R., A. Shleifer, and R. W. Vishny. 1988. Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics*, 20, 293-315.
- Moreno, J. L. 1934. *Who Shall Survive? Foundations of Sociometry, Group Psychotherapy, and Sociodrama*. Washington D.C.: Nervous and Mental Disease Publishing Co. (Beacon House).

Newman, M. E. J., S. H. Strogatz and D. J. Watts. 2001. Random graphs with arbitrary degree distributions and their applications. *Physical Review*, 64, 1-19.

Padgett, J. F., and C. K. Ansell. 1993. Robust action and the rise of the Medici, 1400-1434. *American Journal of Sociology*, 98, 1259-1319.

Palmer, D., R. Friedland, and J. Singh. 1986. The Ties that Bind: Organizational and Class Bases of Stability in a Corporate Interlock Network. *American Sociological Review*, 51, 781-796.

Pfeffer, J., and G. R. Salancik. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. New York, Harper and Row Publishers.

Rao, H., G. F. Davis, and A. Ward. 2000. Embeddedness, Social Identity and Mobility: Why Firms Leave the NASDAQ and Join the New York Stock Exchange. *Administrative Science Quarterly*, 45, 268-292.

Rosenstein, S. and J. G. Wyatt. 1990. Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics*, 26, 175-191.

Schoorman, F.D., M. H. Bazerman, and R. S. Atkin. 1981. Interlocking Directorates: A Strategy for Reducing Environmental Uncertainty. *Academy of Management Review*, 6, 243-251

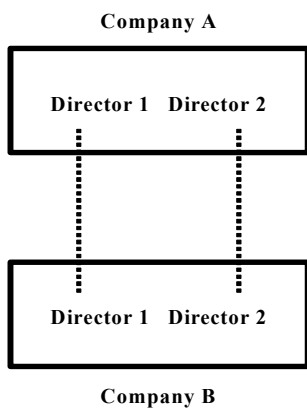
Scott, J. 2000. *Social Network Analysis: A Handbook*. SAGE Publications, London.

Shleifer, A. and R. W. Vishny. 1997, A Survey of Corporate Governance. *Journal of Finance*, 52 (2), 737-783.

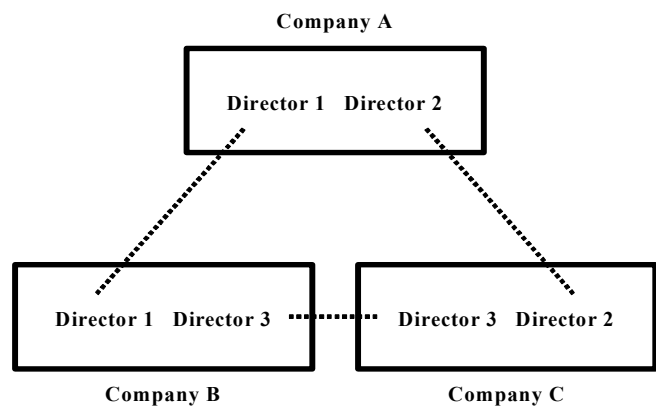
Wasserman, S., and K. Faust. 1994. *Social Network Analysis: Methods and Applications*. Cambridge University Press.

Yermack, D., 1996. Higher Market Valuation of Companies with a Small Board of Directors. *Journal of Financial Economics*, 40, 185-211.

Figure 1
Examples of Computing the Back Door Distance (BDD) Between Board Members



BDD Between Director 1 and Director 2 = 1



BDD Between Director 1 and Director 2 = 2

Table 1
Industry Composition of the Sample

Two-digit SIC	Industry	Percent of Sample	Compustat Composition
1	Crops	0.1	0.2
7	Agriculture Services	0.1	0.1
10	Ores	0.2	1.2
12	Coal	0.2	0.2
13	Oil & Gas	2.5	4.0
14	Quarry	0.2	0.2
15	Building – Light	0.5	0.6
16	Building – Heavy	0.2	0.2
17	Construction	0.2	0.3
20	Food	1.3	1.9
21	Tobacco	0.2	0.1
22	Textile Mill	0.3	0.7
23	Apparel	0.7	0.9
24	Lumber	0.5	0.4
25	Furniture	0.4	0.5
26	Paper	0.9	0.8
27	Printing	1.2	1.2
28	Chemicals	8.0	5.0
29	Petroleum	0.4	0.4
30	Rubber	1.1	1.1
31	Leather	0.4	0.2
32	Stone	0.5	0.6
33	Metal Work – Basic	1.3	1.1
34	Metal Work – Fabrication	1.1	1.4
35	Industrial	4.7	5.2
36	Electrical	6.2	5.5
37	Transport – Equipment	1.5	1.6
38	Instruments	4.7	4.7
39	Misc. Manufacturing	0.8	1.0
40	Railroad	0.3	0.2
42	Motor freight	0.7	0.6
44	Water Transport	0.4	0.3
45	Air Transport	0.8	0.6
46	Pipe Lines	0.0	0.1
47	Transport – Services	0.4	0.3
48	Communications	3.4	3.8
49	Utilities	3.3	3.0
50	Durables – Wholesale	1.6	2.3

Two-digit SIC	Industry	Percent of Sample	Compustat Composition
51	NonDurables – Wholesale	0.8	1.4
52	Garden	0.2	0.2
53	General Stores	0.6	0.6
54	Food Stores	0.4	0.6
55	Auto Dealers	0.5	0.3
56	Apparel – Retail	1.5	0.6
57	Home Equipment	0.5	0.5
58	Eating	0.9	1.4
59	Misc. Retail	1.9	1.7
60	Depositories	10.9	7.9
61	Non-depositories	1.1	1.5
62	Brokers	1.3	1.0
63	Insurance	3.9	2.0
64	Ins Agents	0.7	0.5
65	Real Estate	0.4	1.3
67	Trusts	4.9	6.9
70	Hotels	0.3	0.5
72	Personal Services	0.3	0.3
73	Business Services	12.0	11.0
75	Auto Repair	0.1	0.2
78	Movies	0.3	0.9
79	Amusements	0.8	1.1
80	Health	1.5	1.7
81	Legal	0.0	0.0
82	Educational	0.4	0.3
83	Social	0.1	0.2
87	Engineering – Retail	1.9	1.8
99	Nonclassifiable	0.2	1.0
Total		100%	100%

Table 2
Descriptive Statistics for sample firm characteristics, CEO pay and characteristics,
Board Characteristics, and BDD measures

Panel A: Board Characteristics

Variable	N	Mean	Std. Dev.	Median	Interquartile Range
Board size	3,114	8.60	2.56	8	3
% outsiders	3,114	61.93	17.87	62.50	25
% affiliated	3,114	16.93	16.15	14.29	27.27
% outsiders older than 70	3,114	10.42	16.33	0	20
% affiliated older than 70	3,114	7.55	21.91	0	0
% affiliated appointed by insiders	3,114	42.98	46.74	0	100
% outsiders appointed by insiders	3,114	69.26	34.83	81.82	57.14
Lead director	3,114	0.06	0.25	0	0
Outside director is Chair	3,114	0.11	0.32	0	0

Panel B: BDD measures

Value	Minimum Distance from Insiders to Outsiders		Minimum Distance from the CEO to the Compensation Committee	
	Frequency	%	Frequency	%
1	179	5.8	111	3.9
2	76	2.5	50	1.7
3	114	3.7	82	2.9
4	135	4.4	116	4.0
5	109	3.5	89	3.1
6	53	1.7	50	1.7
7	19	0.6	18	0.6
8	10	0.3	10	0.3
9	0	0	3	0.1
10	2	0.1	2	0.1
11	2	0.1	1	0.0
12	1	0.0	1	0.0
13	0	0	0	0
14	2,373	77.2	2,334	81.4
Total	3,073	100	2,867	100

Panel C: Sample Firm Characteristics

Variable	N	Mean	Std. Dev.	Median	Interquartile Range
Mkt. Cap.	2,895	2,456	5,682	515	1,483
Book-to-Market	2,894	0.57	0.44	0.48	0.47
ROA	2,915	-0.03	0.19	0.02	0.08
RET	2,894	-0.13	0.44	-0.12	0.56
σ (ROA)	2,892	0.09	0.13	0.04	0.09
σ (RET)	2,635	0.67	0.68	0.44	0.51

Panel D: CEO pay and CEO characteristics

Variable	N	Mean	Std. Dev.	Median	Interquartile Range
CEO total compensation	2,897	3,407,435	4,679,026	1,569,429	3,069,888
Founder	2,943	0.16	0.37	0	0
Tenure	2,497	11.36	8.12	9.05	10.78
Age	2,923	53.68	7.58	54	11

Board size is the number of directors serving on the board (Equilar data).

% Outsiders is the fraction of board comprised of outsider directors (Equilar data).

% Affiliated is the fraction of the board that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the “certain transactions” section of the proxy statement is classified as affiliated (Equilar data).

% Outsiders older than 70 is the fraction of outside directors that are older than 70 (Equilar data).

% Affiliated older than 70 is the fraction of affiliated directors that are older than 70 (Equilar data).

% Affiliated Appointed by insiders is the fraction of affiliated directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no affiliated directors (Equilar data).

% Outsiders Appointed by insiders is the fraction of outside directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no outside directors (Equilar data).

Lead Director is an indicator variable equal to one if there is a lead director on the board and zero otherwise (Equilar data). Lead director is an outside director that can call meetings of all outside directors in executive session.

Outsider Chairman is an indicator variable equal to one if an outsider holds the position of chairperson of the board and zero otherwise (Equilar data).

CEO total compensation is calculated using data from Execucomp. It is the total dollar value of all compensation received by the CEO including salary, bonus, the Black-Scholes value of stock options, restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites etc.).

Tenure is the number of years CEO served in that capacity.

Age is CEO age.

Mkt Cap is market value of common equity (Compustat data item 25*item 199).

Book-to-Market is calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), where both book value and the market value are measured at the end of the prior fiscal period.

ROA (return on assets) is calculated as income before extraordinary items (item18) deflated by average total assets.

RET (12 month stock return) is calculated as the percentage change in price inclusive of dividends for the fiscal period. $\sigma(ROA)$ is the standard deviation of ROA using at least 3 and up to 5 years of prior data.

$\sigma(RET)$ is the standard deviation of RET using at least 3 and up to 5 years of prior data.

Table 3
Correlations between Back Door Distance measures and some select variables.
Correlations between Back Door Distance measures and the other variables are less than 0.15 in absolute value.

	Mkt. Cap.	Board Size	% outsiders
minimum distance from insiders to outsiders	-0.34 (<0.01)	-0.23 (<0.01)	-0.15 (<0.01)
minimum distance from the CEO to the compensation committee	-0.30 (<0.01)	-0.20 (<0.01)	-0.16 (<0.01)
minimum distance from insiders to outsiders ≤ 3	0.37 (<0.01)	0.25 (<0.01)	0.16 (<0.01)
minimum distance from insiders to outsiders ≥ 4 and ≤ 6	0.03 (0.07)	0.02 (0.20)	0.03 (0.16)
minimum distance from insiders to outsiders ≥ 7	-0.32 (<0.01)	-0.22 (<0.01)	-0.14 (<0.01)
minimum distance from the CEO to the compensation committee ≤ 3	0.29 (<0.01)	0.20 (<0.01)	0.11 (<0.01)
minimum distance from the CEO to the compensation committee ≥ 4 and ≤ 6	0.11 (<0.01)	0.07 (<0.01)	0.10 (0.01)
minimum distance from the CEO to the compensation committee ≥ 6	-0.29 (<0.01)	-0.20 (<0.01)	-0.16 (<0.01)

Board size is the number of directors serving on the board (Equilar data).
% Outsiders is the fraction of board comprised of outsider directors (Equilar data).
Mkt. Cap. is market value of common equity (Compustat data item 25*item 199).

Table 4
Association between CEO compensation and Back Door Distance
Back Door Distance is measured as the minimum distance between the Insiders to the Outsiders

Panel A: Dollar value of total CEO compensation				
Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	1,471,566.50 (7.00)	2,549,135.10 (8.94)	5,476,381.40 (8.33)	1,555,736.50 (1.71)
Mkt Cap	483.89 (42.85)	457.50 (38.32)	457.40 (34.32)	428.48 (30.77)
Book-to-Market	-681,431.00 (-4.29)	-643,056.90 (-3.97)	-698,694.80 (-3.58)	-694,338.00 (-3.62)
ROA	379,328.31 (0.77)	327,033.61 (0.65)	-155,198.50 (-0.26)	-57,218.70 (-0.10)
RET	480,528.57 (2.74)	532,315.53 (2.99)	778,995.28 (3.60)	733,839.01 (3.45)
σ (ROA)	-2,683,201.00 (-3.65)	-2,441,612.00 (-3.26)	-2,517,005.00 (-2.83)	-2,047,809.00 (-2.33)
σ (RET)	80,055.32 (0.78)	91,766.36 (0.89)	92,164.51 (0.79)	163,016.86 (1.41)
BDD		-82,772.89 (-5.73)	-77,256.64 (-4.85)	-53,868.57 (-3.38)
Founder			-451,348.00 (-2.08)	-296,484.50 (-1.38)
Tenure			-10,306.54 (-1.02)	-3,149.60 (-0.30)
Age			-13,691.75 (-1.26)	-16,140.64 (-1.50)
% outsiders				40,297.07 (5.25)
% affiliated				18,663.60 (2.19)
% outsiders older than 70				-5,878.02 (-1.31)
% affiliated older than 70				1,593.59 (0.50)
% affiliated appointed by insiders				171.42 (0.09)
% outsiders appointed by insiders				146.32 (0.06)
Board size				115,290.95 (3.19)
Lead director				93,604.31 (0.35)
Outsider Chair				-521,399.10 (-2.21)
Industry Indicators	Included	Included	Included	Included
N	2,464	2,441	2,090	2,089
Adj. R ²	50.7%	50.3%	48.2%	49.6%

Table 4 - Continued

Panel B: Natural logarithm of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	10.56 (106.38)	10.90 (83.78)	11.58 (20.50)	10.90 (18.88)
Ln(Mkt Cap)	0.52 (45.09)	0.51 (40.38)	0.51 (35.57)	0.49 (31.27)
Book-to-Market	0.15 (3.33)	0.13 (2.96)	0.16 (3.00)	0.13 (2.52)
ROA	-0.22 (-1.70)	-0.22 (-1.68)	-0.29 (-1.94)	-0.28 (-1.93)
RET	0.47 (9.96)	0.47 (9.98)	0.51 (9.19)	0.50 (9.09)
σ (ROA)	-0.04 (-0.19)	-0.02 (-0.12)	-0.12 (-0.54)	-0.08 (-0.36)
σ (RET)	0.07 (2.45)	0.07 (2.50)	0.07 (2.22)	0.08 (2.60)
Ln(BDD)		-0.09 (-4.01)	-0.07 (-3.06)	-0.06 (-2.45)
Founder			-0.15 (-2.86)	-0.13 (-2.34)
Ln(Tenure)			-0.11 (-4.46)	-0.10 (-3.71)
Ln(Age)			0.01 (0.10)	-0.04 (-0.26)
% outsiders				0.01 (5.97)
% affiliated				0.01 (3.47)
% outsiders older than 70				-0.01 (-1.63)
% affiliated older than 70				0.01 (0.84)
% affiliated appointed by insiders				0.00 (0.63)
% outsiders appointed by insiders				0.00 (0.72)
Ln(Board size)				0.06 (0.68)
Lead director				-0.01 (-0.04)
Outsider Chair				-0.15 (-2.45)
Industry indicators	Included	Included	Included	Included
N	2,496	2,471	2,115	2,115
Adj. R ²	54.5%	54.3%	50.3%	51.3%

Board size is the number of directors serving on the board (Equilar data).

% Outsiders is the fraction of board comprised of outsider directors (Equilar data).

% Affiliated is the fraction of the board that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the “certain transactions” section of the proxy statement is classified as affiliated (Equilar data).

% Outsiders older than 70 is the fraction of outside directors that are older than 70 (Equilar data).

% Affiliated older than 70 is the fraction of affiliated directors that are older than 70 (Equilar data).

% Affiliated Appointed by insiders is the fraction of affiliated directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no affiliated directors (Equilar data).

% Outsiders Appointed by insiders is the fraction of outside directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no outside directors (Equilar data).

Lead Director is an indicator variable equal to one if there is a lead director on the board and zero otherwise (Equilar data). Lead director is an outside director that can call meetings of all outside directors in executive session.

Outsider Chairman is an indicator variable equal to one if an outsider holds the position of chairperson of the board and zero otherwise (Equilar data).

CEO total compensation is calculated using data from Execucomp. It is the total dollar value of all compensation received by the CEO including salary, bonus, the Black-Scholes value of stock options, restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites etc.).

Tenure is the number of years CEO served in that capacity.

Age is CEO age.

Mkt Cap is market value of common equity (Compustat data item 25*item 199).

Book-to-Market is calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), where both book value and the market value are measured at the end of the prior fiscal period.

ROA (return on assets) is calculated as income before extraordinary items (item18) deflated by average total assets.

RET (12 month stock return) is calculated as the percentage change in price inclusive of dividends for the fiscal period. $\sigma(ROA)$ is the standard deviation of ROA using at least 3 and up to 5 years of prior data.

$\sigma(RET)$ is the standard deviation of RET using at least 3 and up to 5 years of prior data.

Table 5
Association between CEO compensation and Back Door Distance
Back Door Distance is measured as the minimum distance between the CEO to the compensation committee

Panel A: Dollar value of total CEO compensation				
Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	1,471,566.50 (7.00)	2,336,484.70 (7.81)	5,150,313.70 (7.65)	1,098,715.40 (1.16)
Mkt Cap	483.89 (42.85)	475.92 (40.00)	475.80 (35.59)	437.69 (31.17)
Book-to-Market	-681,431.00 (-4.29)	-655,147.90 (-4.02)	-678,551.70 (-3.45)	-684,212.80 (-3.52)
ROA	379,328.31 (0.77)	269,878.09 (0.54)	-116,622.50 (-0.20)	-156,838.80 (-0.27)
RET	480,528.57 (2.74)	547,544.56 (3.06)	790,042.50 (3.63)	745,206.00 (3.46)
σ (ROA)	-2,683,201.00 (-3.65)	-2,560,324.00 (-3.42)	-2,736,866.00 (-3.06)	-2,081,155.00 (-2.34)
σ (RET)	80,055.32 (0.78)	99,814.16 (0.96)	112,174.18 (0.95)	206,431.17 (1.76)
BDD		-68,081.09 (-4.27)	-59,954.80 (-3.40)	-40,490.04 (-2.29)
Founder			-534,493.10 (-2.46)	-353,896.20 (-1.63)
Tenure			-8,998.59 (-0.88)	-867.54 (-0.08)
Age			-8,938.35 (-0.81)	-14,695.39 (-1.34)
% outsiders				42,334.75 (5.41)
% affiliated				18,900.65 (2.19)
% outsiders older than 70				-6,452.84 (-1.42)
% affiliated older than 70				1,574.05 (0.49)
% affiliated appointed by insiders				58.12 (0.03)
% outsiders appointed by insiders				279.59 (0.11)
Board size				116,282.40 (3.19)
Lead director				145,483.76 (0.54)
Outsider Chair				-580,739.70 (-2.40)
Industry indicators	Included	Included	Included	Included
N	2,464	2,383	2,045	2,045
Adj. R ²	50.7%	51.3%	48.9%	49.9%

Table 5 - Continued

Panel B: Natural logarithm of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	10.56 (106.38)	10.87 (85.00)	11.61 (20.28)	10.87 (18.48)
Ln(Mkt Cap)	0.52 (45.09)	0.51 (40.88)	0.51 (35.90)	0.49 (31.33)
Book-to-Market	0.15 (3.33)	0.14 (3.06)	0.17 (3.17)	0.14 (2.67)
ROA	-0.22 (-1.70)	-0.20 (-1.51)	-0.25 (-1.66)	-0.25 (-1.64)
RET	0.47 (9.96)	0.47 (9.88)	0.50 (9.03)	0.50 (8.92)
σ (ROA)	-0.04 (-0.19)	-0.02 (-0.08)	-0.11 (-0.48)	-0.06 (-0.28)
σ (RET)	0.07 (2.45)	0.07 (2.66)	0.07 (2.46)	0.08 (2.79)
Ln(BDD)		-0.02 (-4.25)	-0.02 (-3.31)	-0.01 (-2.38)
Founder			-0.17 (-3.13)	-0.14 (-2.64)
Ln(Tenure)			-0.10 (-4.08)	-0.10 (-3.60)
Ln(Age)			-0.00 (-0.01)	-0.05 (-0.33)
% outsiders				0.01 (5.81)
% affiliated				0.01 (3.26)
% outsiders older than 70				-0.01 (-1.50)
% affiliated older than 70				0.01 (0.87)
% affiliated appointed by insiders				0.00 (0.75)
% outsiders appointed by insiders				0.01 (1.11)
Ln(Board size)				0.07 (0.87)
Lead director				0.01 (0.08)
Outsider Chair				-0.15 (-2.51)
Industry indicators	Included	Included	Included	Included
N	2,496	2,413	2,069	2,069
Adj. R ²	54.5%	54.5%	50.5%	51.5%

Board size is the number of directors serving on the board (Equilar data).

% Outsiders is the fraction of board comprised of outsider directors (Equilar data).

% Affiliated is the fraction of the board that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the “certain transactions” section of the proxy statement is classified as affiliated (Equilar data).

% Outsiders older than 70 is the fraction of outside directors that are older than 70 (Equilar data).

% Affiliated older than 70 is the fraction of affiliated directors that are older than 70 (Equilar data).

% Affiliated Appointed by insiders is the fraction of affiliated directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no affiliated directors (Equilar data).

% Outsiders Appointed by insiders is the fraction of outside directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no outside directors (Equilar data).

Lead Director is an indicator variable equal to one if there is a lead director on the board and zero otherwise (Equilar data). Lead director is an outside director that can call meetings of all outside directors in executive session.

Outsider Chairman is an indicator variable equal to one if an outsider holds the position of chairperson of the board and zero otherwise (Equilar data).

CEO total compensation is calculated using data from Execucomp. It is the total dollar value of all compensation received by the CEO including salary, bonus, the Black-Scholes value of stock options, restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites etc.).

Tenure is the number of years CEO served in that capacity.

Age is CEO age.

Mkt Cap is market value of common equity (Compustat data item 25*item 199).

Book-to-Market is calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), where both book value and the market value are measured at the end of the prior fiscal period.

ROA (return on assets) is calculated as income before extraordinary items (item18) deflated by average total assets.

RET (12 month stock return) is calculated as the percentage change in price inclusive of dividends for the fiscal period. $\sigma(ROA)$ is the standard deviation of ROA using at least 3 and up to 5 years of prior data.

$\sigma(RET)$ is the standard deviation of RET using at least 3 and up to 5 years of prior data.

Table 6
Association between CEO compensation and Back Door Distance
Back Door Distance is the minimum distance between the Insiders to the Outsiders.

Panel A: Dollar value of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	1,471,566.50 (7.00)	1,403,356.00 (6.58)	4,403,923.10 (7.18)	796,303.92 (0.92)
Mkt Cap	483.89 (42.85)	456.51 (37.60)	458.67 (33.93)	430.63 (30.67)
Book-to-Market	-681,431.00 (-4.29)	-650,180.00 (4.01)	-710,124.00 (-3.64)	-705,654.70 (-3.67)
ROA	379,328.31 (0.77)	318,633.84 (0.64)	-165,581.40 (-0.28)	-69,566.33 (-0.12)
RET	480,528.57 (2.74)	534,035.32 (3.00)	784,241.69 (3.63)	739,905.74 (3.48)
σ (ROA)	-2,683,201.00 (-3.65)	-2,438,232.00 (-3.25)	-2,494,175.00 (-2.80)	-2,021,730.00 (-2.30)
σ (RET)	80,055.32 (0.78)	91,993.88 (0.89)	87,477.43 (0.75)	156,544.20 (1.35)
$1 \leq \text{BDD} \leq 3$		1,035,477.30 (5.03)	853,970.42 (3.80)	499,281.26 (2.21)
$4 \leq \text{BDD} \leq 6$		729,985.09 (3.44)	870,586.43 (3.74)	751,227.26 (3.28)
Founder			-439,319.20 (-2.03)	-282,995.20 (-1.31)
Tenure			-10,114.08 (-1.00)	-2,746.90 (-0.26)
Age			-14,019.12 (-1.29)	-16,663.56 (-1.54)
% outsiders				40,367.69 (5.26)
% affiliated				18,595.52 (2.19)
% outsiders older than 70				-6,064.90 (-1.35)
% affiliated older than 70				1,353.50 (0.43)
% affiliated appointed by insiders				115.86 (0.06)
% outsiders appointed by insiders				142.82 (0.06)
Board size				117,954.13 (3.25)
Lead director				83,912.61 (0.32)
Outsider Chair				-526,701.60 (-2.23)
Industry indicators	Included	Included	Included	Included
N	2,464	2,441	2,090	2,089
Adj. R ²	50.7%	50.3%	48.2%	49.6%

Table 6 - Continued

Panel B: Natural logarithm of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	10.56 (106.38)	10.67 (103.22)	11.39 (20.55)	10.74 (18.97)
Ln(Mkt Cap)	0.52 (45.09)	0.50 (40.04)	0.51 (35.29)	0.49 (31.17)
Book-to-Market	0.15 (3.33)	0.13 (2.94)	0.15 (2.97)	0.13 (2.50)
ROA	-0.22 (-1.70)	-0.22 (-1.70)	-0.29 (-1.96)	-0.29 (-1.95)
RET	0.47 (9.96)	0.47 (9.98)	0.51 (9.20)	0.50 (9.10)
σ (ROA)	-0.04 (-0.19)	-0.03 (-0.13)	-0.12 (-0.54)	-0.08 (-0.36)
σ (RET)	0.07 (2.45)	0.07 (2.52)	0.07 (2.24)	0.08 (2.61)
$1 \leq BDD \leq 3$		0.20 (3.78)	0.16 (2.81)	0.12 (2.14)
$4 \leq BDD \leq 6$		0.09 (1.67)	0.08 (1.33)	0.07 (1.12)
Founder			-0.15 (-2.85)	-0.13 (-2.34)
Ln(Tenure)			-0.11 (-4.43)	-0.10 (-3.68)
Ln(Age)			0.01 (0.10)	-0.04 (-0.25)
% outsiders				0.01 (5.97)
% affiliated				0.01 (3.46)
% outsiders older than 70				-0.01 (-1.65)
% affiliated older than 70				0.01 (0.85)
% affiliated appointed by insiders				0.00 (0.62)
% outsiders appointed by insiders				0.00 (0.74)
Ln(Board size)				0.06 (0.67)
Lead director				-0.01 (-0.06)
Outsider Chair				-0.15 (-2.46)
Industry indicators	Included	Included	Included	Included
N	2,496	2,471	2,115	2,115
Adj. R ²	54.5%	54.2%	50.3%	51.2%

Board size is the number of directors serving on the board (Equilar data).

% Outsiders is the fraction of board comprised of outsider directors (Equilar data).

% Affiliated is the fraction of the board that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the “certain transactions” section of the proxy statement is classified as affiliated (Equilar data).

% Outsiders older than 70 is the fraction of outside directors that are older than 70 (Equilar data).

% Affiliated older than 70 is the fraction of affiliated directors that are older than 70 (Equilar data).

% Affiliated Appointed by insiders is the fraction of affiliated directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no affiliated directors (Equilar data).

% Outsiders Appointed by insiders is the fraction of outside directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no outside directors (Equilar data).

Lead Director is an indicator variable equal to one if there is a lead director on the board and zero otherwise (Equilar data). Lead director is an outside director that can call meetings of all outside directors in executive session.

Outsider Chairman is an indicator variable equal to one if an outsider holds the position of chairperson of the board and zero otherwise (Equilar data).

CEO total compensation is calculated using data from Execucomp. It is the total dollar value of all compensation received by the CEO including salary, bonus, the Black-Scholes value of stock options, restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites etc.).

Tenure is the number of years CEO served in that capacity.

Age is CEO age.

Mkt Cap is market value of common equity (Compustat data item 25*item 199).

Book-to-Market is calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), where both book value and the market value are measured at the end of the prior fiscal period.

ROA (return on assets) is calculated as income before extraordinary items (item18) deflated by average total assets.

RET (12 month stock return) is calculated as the percentage change in price inclusive of dividends for the fiscal period. $\sigma(ROA)$ is the standard deviation of ROA using at least 3 and up to 5 years of prior data.

$\sigma(RET)$ is the standard deviation of RET using at least 3 and up to 5 years of prior data.

Table 7
Association between CEO compensation and Back Door Distance
Back Door Distance is the minimum distance between the CEO to the compensation committee.

Panel A: Dollar value of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	1,471,566.50 (7.00)	1,389,346.30 (6.53)	4,310,396.70 (6.97)	581,404.57 (0.66)
Mkt Cap	483.89 (42.85)	475.12 (39.69)	476.26 (35.44)	438.15 (31.11)
Book-to-Market	-681,431.00 (-4.29)	-663,811.20 (-4.08)	-693,484.20 (-3.53)	-696,361.50 (-3.58)
ROA	379,328.31 (0.77)	275,103.65 (0.55)	-96,424.83 (-0.16)	-138,543.50 (-0.24)
RET	480,528.57 (2.74)	553,249.82 (3.10)	801,934.20 (3.68)	754,858.31 (3.51)
σ (ROA)	-2,683,201.00 (-3.65)	-2,535,333.00 (-3.38)	-2,692,568.00 (-3.01)	-2,049,352.00 (-2.31)
σ (RET)	80,055.32 (0.78)	100,957.67 (0.97)	114,637.85 (0.98)	208,842.45 (1.78)
$1 \leq \text{BDD} \leq 3$		821,003.52 (3.45)	550,056.29 (2.09)	332,872.36 (1.27)
$4 \leq \text{BDD} \leq 6$		735,296.57 (3.36)	882,863.26 (3.69)	678,528.43 (2.85)
Founder			-531,821.80 (-2.45)	-351,702.60 (-1.62)
Tenure			-8,678.30 (-0.85)	-431.04 (-0.04)
Age			-9,175.78 (-0.83)	-14,915.48 (-1.37)
% outsiders				41,678.38 (5.32)
% affiliated				18,534.97 (2.15)
% outsiders older than 70				-6,559.02 (-1.44)
% affiliated older than 70				1,415.95 (0.44)
% affiliated appointed by insiders				30.69 (0.02)
% outsiders appointed by insiders				135.38 (0.05)
Board size				117,224.16 (3.22)
Lead director				136,695.50 (0.50)
Outsider Chair				-578,466.60 (-2.39)
Industry indicators	Included	Included	Included	Included
N	2,464	2,383	2,045	2,045
Adj. R ²	50.7%	51.3%	49.0%	49.9%

Table 7 - Continued

Panel B: Natural logarithm of total CEO compensation

Explanatory variables	Model 1 (Economic Determinants Only)	Model 2 (Model 1 and BDD)	Model 3 (Model 2 and CEO characteristics)	Model 4 (Model 3 and other board characteristics)
Intercept	10.56 (106.38)	10.63 (102.69)	11.40 (20.35)	10.71 (18.66)
Ln(Mkt Cap)	0.52 (45.09)	0.51 (40.80)	0.51 (35.83)	0.49 (31.29)
Book-to-Market	0.15 (3.33)	0.14 (3.02)	0.16 (3.13)	0.14 (2.64)
ROA	-0.22 (-1.70)	-0.20 (-1.51)	-0.25 (-1.65)	-0.24 (-1.63)
RET	0.47 (9.96)	0.47 (9.89)	0.51 (9.05)	0.50 (8.94)
σ (ROA)	-0.04 (-0.19)	-0.01 (-0.06)	-0.10 (-0.46)	-0.06 (-0.26)
σ (RET)	0.07 (2.45)	0.07 (2.66)	0.07 (2.47)	0.08 (2.79)
$1 \leq BDD \leq 3$		0.21 (3.48)	0.17 (2.65)	0.13 (1.93)
$4 \leq BDD \leq 6$		0.16 (2.84)	0.15 (2.51)	0.11 (1.78)
Founder			-0.17 (-3.13)	-0.14 (-2.64)
Ln(Tenure)			-0.10 (-4.08)	-0.10 (-3.59)
Ln(Age)			0.01 (0.02)	-0.04 (-0.31)
% outsiders				0.01 (5.80)
% affiliated				0.01 (3.26)
% outsiders older than 70				-0.01 (-1.51)
% affiliated older than 70				0.01 (0.87)
% affiliated appointed by insiders				0.00 (0.73)
% outsiders appointed by insiders				0.01 (1.11)
Ln(Board size)				0.07 (0.86)
Lead director				0.01 (0.07)
Outsider Chair				-0.15 (-2.50)
Industry indicators	Included	Included	Included	Included
N	2,496	2,413	2,069	2,069
Adj. R ²	54.5%	54.5%	50.5%	51.5%

Board size is the number of directors serving on the board (Equilar data).

% Outsiders is the fraction of board comprised of outsider directors (Equilar data).

% Affiliated is the fraction of the board that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the “certain transactions” section of the proxy statement is classified as affiliated (Equilar data).

% Outsiders older than 70 is the fraction of outside directors that are older than 70 (Equilar data).

% Affiliated older than 70 is the fraction of affiliated directors that are older than 70 (Equilar data).

% Affiliated Appointed by insiders is the fraction of affiliated directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no affiliated directors (Equilar data).

% Outsiders Appointed by insiders is the fraction of outside directors whose board tenure is less than the maximum board tenure for an insider director. This variable is set to zero if there are no outside directors (Equilar data).

Lead Director is an indicator variable equal to one if there is a lead director on the board and zero otherwise (Equilar data). Lead director is an outside director that can call meetings of all outside directors in executive session.

Outsider Chairman is an indicator variable equal to one if an outsider holds the position of chairperson of the board and zero otherwise (Equilar data).

CEO total compensation is calculated using data from ExecuComp. It is the total dollar value of all compensation received by the CEO including salary, bonus, the Black-Scholes value of stock options, restricted stock grants, target value for performance plans and miscellaneous other pay (including matching contributions for deferred compensation, life insurance, disclosed perquisites etc.).

Tenure is the number of years CEO served in that capacity.

Age is CEO age.

Mkt Cap is market value of common equity (Compustat data item 25*item 199).

Book-to-Market is calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), where both book value and the market value are measured at the end of the prior fiscal period.

ROA (return on assets) is calculated as income before extraordinary items (item18) deflated by average total assets.

RET (12 month stock return) is calculated as the percentage change in price inclusive of dividends for the fiscal period. $\sigma(ROA)$ is the standard deviation of ROA using at least 3 and up to 5 years of prior data.

$\sigma(RET)$ is the standard deviation of RET using at least 3 and up to 5 years of prior data.