

What are friends for? CEO Networks, Pay and Corporate Governance.

Rayna Brown^a
Ning Gao^b
Edward Lee^b
Konstantinos Stathopoulos^{b*}

^aThe Department of Finance
Faculty of Economics & Commerce
The University of Melbourne
Vic 3010
Australia

^bAccounting and Finance Group,
Manchester Business School,
University of Manchester
Crawford House, Booth Street East,
Manchester, M15 6PB, UK.

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* Please address all correspondence to Konstantinos Stathopoulos, Accounting and Finance Group, Manchester Business School, Crawford House, Booth Street East, Manchester, M15 6PB, UK.

Tel: +44 161 275 6863, email: k.stathopoulos@mbs.ac.uk

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Abstract

We investigate the impact of CEO networking on compensation arrangements. Unlike existing studies that are largely based on board interlocks, we use a unique measure that calculates the direct ties the CEO has created during her life. We show that a CEO's compensation is significantly affected by her power in the managerial labor market. We find that the size of the CEO network is positively related to the level of CEO compensation and inversely related to its pay-performance sensitivity. We interpret our results as direct evidence that managerial power influences compensation. However, in firms where shareholders rights are well protected, the impact of the CEO network over pay arrangements diminishes. This implies that outrage cost and governance reduces managerial power in pay negotiation. Overall, our results are consistent with the predictions of the managerial power approach.

JEL Classification: G30, J31, J33.

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1. Introduction

Few issues have attracted as much community and academic debate as the appropriate level and design of executive compensation packages. There are two main streams underlying academic research in this area which have their theoretical foundations in agency theory (see Berle and Means, 1932; Mirrlees, 1976; Jensen and Meckling, 1976). The first is the “optimal contracting approach” which is based on the premise that the value of the firm is maximized if executive compensation is designed to minimize agency costs and the second is the “managerial power approach” (as proposed by Bebchuk *et al.* (2002)) which is the focus of our study.

The “managerial power approach” argues that a firm’s management team can influence decision making with regard to their compensation arrangements by exerting power towards the non-executive, outside directors. The claim is that sub-optimal, non-arm’s length relationships between the managers and members of the compensation committee allow the former to expropriate wealth from shareholders in the form of “rent” (that is, excessive pay). In this study we focus on the compensation arrangements of the Chief Executive Officer (CEO). We expand the definition of “power” to include relationships that the CEO has developed through her current and past employment, education, and other types of social activities (e.g. golf clubs, charity organizations, etc). We illustrate that a larger social network empowers the CEOs and enables them to influence the board and negotiate a more favorable compensation package. Our results also indicate that the existence of powerful shareholders mitigates the effects of CEO power on their pay arrangements.

What is “managerial power”? There are those who argue that huge executive compensation packages often amount to little more than corporate looting and that huge CEO pay reflects a board of directors that is shirking its responsibility by not exercising due care in overseeing and negotiating executive pay (Paredes (2004)). Bebchuk *et al.* (2002) concentrate on the connections between the CEO and the firm’s “nominally independent” directors that are created through “bonds of interest, collegiality or affinity”. This restrictive definition of power only applies to connections *within* the firm.

However, CEOs will also derive power from connections *outside* the firm. Arguably the most powerful tool held by any worker is the threat to withdraw their services temporarily, or to resign. Given the CEO is typically the most powerful member of the corporate elite (Jensen and Zajac (2004)) she holds a very valuable option in the threat to resign. The higher the value of this option the higher the CEO’s reservation value; the company will try to match this value by offering more preferable to the CEO contracts, i.e. higher pay and lower sensitivity. We suggest the value of this option will be positively related to the ability of the CEO to find similar alternative employment. In sociology based social network theory it is argued that workers frequently locate jobs through friends and relatives rather than through the open job market (Granovetter (1973 and 1974)).¹ Drawing on this evidence we suggest a large social network empowers the CEO because it increases the probability of the CEO being able to exercise the option to resign.

¹ It is also acknowledged friends and social networks may influence decisions by many of the world’s companies regarding with whom and how they conduct their business (Jackson (2005)).

Although the “managerial power” hypothesis has considerable intuitive appeal it has only infrequently been subjected to *direct* empirical testing. Moreover, such studies as do exist concentrate on interlocking boards and strong social ties.² The consensus is that interlocking boards have a positive effect on CEO remuneration levels (Core *et al.*, 1999; Fich and White, 2003; Larker *et al.*, 2006).

However, it is weak social ties, rather than strong social ties, that enhance labor force mobility (Granovetter (1972, 1973 and 2005)). Moreover, this is particularly so for persons in high ranking positions (Wegener (1991)). Therefore we do not focus on interlocking boards and strong ties but instead we test a unique measure that aggregates the direct ties the CEO has created during her life. CEOs with many weak ties are likely to receive new information about alternative positions as well as be able to use these ties to either obtain a new job or secure a more favorable contract with their current employer (through the threat of resignation). We test two hypotheses: (i) the larger the social network of the CEO the higher the level of compensation they are able to negotiate, and (ii) the larger the social network of the CEO the lower the pay-performance sensitivity of their compensation. An empirical test of our measure is conducted using US data for the 2005 fiscal year.

We contribute to the literature in the following ways. First, we use an alternative measure of CEO “power”, which allows for the incorporation of weak, direct ties. This measure does not inflate the size of a CEO’s network by including indirect ties,

² Strong social ties link individuals who are similar and the more similar the individuals the stronger the social ties (Wegener, 1991). Weak ties comprise acquaintances with whom we are less likely to be socially acquainted whereas a strong tie implies the individuals are close friends (Granovetter (1983)).

The issue of strong and weak ties is discussed in more detail in following sections.

as may occur with an interlocking board measure. Similarly, it does not underestimate the size of the network by only including strong ties and/or ties developed solely within the current firm. Second, we provide empirical evidence on the relationship between CEO networks and managerial compensation. We find a positive relationship between the size of the social network and the level of total CEO pay. This is consistent with recent studies in the board interlocks literature, e.g. Barnea and Guedj (2006), Larcker *et al.* (2006) and Horton *et al.* (2009). In addition, we find a negative relationship between the size of the social network and the pay-performance sensitivity of the pay package. In both cases our results are consistent with the conclusions of the “managerial power” approach. Third, we show that the impact of CEO power on their pay arrangements is lessened in companies with strong shareholders’ rights. This result has important theoretical and policy implications, which are discussed in detail.

The structure of the paper is as follows. Section 2 provides a brief overview of the literature on executive compensation and social networks. In Section 3 the measurement of our proxy for CEO social networks is discussed together with the applied methodology. An overview of our data is also provided. Our results are presented in Section 4. Some concluding comments are presented in Section 5.

2. Literature Review

2.1 Social Networks

Social network theory (SNT) is the study of how the social structure of relationships around a person, group, or organization affects beliefs or behaviors. Within the corporate setting an important social network is the board of directors and because relationships between directors may affect independence and behavior, such relationships are an important corporate governance issue.³ As stated by Granovetter (2005), social networks affect economic outcomes for 3 main reasons: They affect the flow and quality of information, act as an important source of reward and punishment and build trust that others in the social network will do the “right” thing despite a clear balance of incentives to the contrary.

The size of a social network is captured by the number of social ties. Social ties are often conceptualized as a dichotomy; they are classified as either *weak* or *strong* (Wenger (1991)). Tie strength reflects the closeness of the relationship between individuals. Strong social ties are those we have with family and close friends. Strong ties are indicative of a network in which the members have very similar personalities and background and who are in frequent contact. Weak ties are characterized as ‘distant’ and by infrequent interaction. Granovetter (1973) argues that weak ties are more likely to be sources of new information than strong social ties. Individuals connected by strong social ties already have access to similar information so it is probable that each member can only make a marginal contribution to the group’s information base. In contrast, people with whom only weak social links exist might be

³ See Wellman (1983) for a detailed explanation of the principles of network theory.

able to provide new information, which is of much higher value to the group (Strahilevitz (2004)). Subsequent research on the importance of weak ties has demonstrated that they can be instrumental in the labor market (Ioannides and Loury (2004); Lin (2000); Granovetter (1973 and 1974)) in the diffusion of ideas (Granovetter (1983); Rogers (1995)) and technical advice (Constant, Sproull, and Kiesler (1996)). As new information, in particular employment information, is more likely to flow through weak ties than strong ties, acquaintances built over an entire career are likely to play a special role (Granovetter (2005)).

Social ties can also be classified as either direct or indirect. The majority of the financial economics literature, which we detail in the following two paragraphs, focuses on board interlocks (direct ties), i.e. the practice of directors sitting on each others corporate boards. We believe there are two drawbacks with the interlocking board measures that have been applied in the literature to date. The first, and most obvious, is that interlocks capture only current direct ties, thus excluding indirect ties as well as direct ties developed in the past (Gulati and Westphal (1999)). As a result the size of the social network is underestimated. The second drawback is that even if one relaxes the reciprocity argument and allows for indirect ties to be included, for example “friend of a friend” relationships (Larcker *et al.* (2006)), the strength of a tie is very difficult to estimate. As a result one might inflate the size of the network by including ties that have no value to a director, i.e. neither party in this tie expects any information exchange to take place.⁴

⁴ If Director “A” sits on a board with “B” and if director “B” sits on a board with “C” then “A” is assumed to know “C” and this link is included to the measure (Larcker *et al.* (2006)). Whether A and C

Our measure of a CEO's social network captures the weak, direct ties developed by the CEO during her life. As we explain in Section 3 below, this measure is an appropriate proxy of the size of a CEO's social network. Whilst some ties may be omitted, we believe that we capture the ties that "count" in a business environment while avoiding the biases incurred in other studies.

2.2 Social Networks and Executive Pay Levels

The academic literature on executive compensation suggests that firm size, industry and country effects are the main determinants of executive pay levels (Murphy (1999)). Given the breadth and scope of the academic research in this area, it is surprising how little attention social networks have received as possible determinants of pay arrangements. Even the few papers that exist provide conflicting evidence. For example, Hallock (1997) finds that the pay of interlocked CEOs is on average higher than the pay of CEOs who do not sit in interlocked boards. However, this result weakens after controlling for other economic determinants and is confined only to cash, not total compensation. Core *et al.* (1999) fail to find any association between interlocks and executive pay for a small number of firms during the early 1980s.

More recently, Fich and White (2003) report that CEO compensation increases with interlocking boards and argue this is a consequence of entrenchment. Barnea and Guedj (2006) control for both firm and CEO characteristics and report a strong positive relationship between interlocking boards and CEO compensation. Larcker *et*

actually know each other, which will allow them to exchange information, know-how etc, is not examined. Larcker *et al.* (2006) fail to acknowledge this potential bias in their measure.

al. (2006) find that for a large sample of directors a positive relationship exists between CEO total compensation and the proportion of “friendly” director links in the board. Hwang and Kim (2008) revisit the definition of board independence and expand it to also include social ties. They show that “socially dependent” boards, i.e. boards where the directors have social ties to the CEO, offer higher pay levels to their CEOs. In contrast to this study, they concentrate on within firm social ties, thus ignoring the weak, direct ties the CEO has developed over the years outside the firm. Finally, Horton *et al.* (2009) using large sample UK data calculate qualitative features of board interlocks, such as the centrality of a director to the network and the strength of her ties. They find that executive (non-executive) directors with “better”, i.e. larger with low constraints, networks receive higher (lower) compensation.

A premise of the “managerial power approach” is that CEO remuneration will be higher in firms in which managers have relatively more power. However, to date the proponents of this approach have mainly provided anecdotal evidence to support its main prediction (Bebchuk *et al.* (2002); Bebchuk and Fried (2003 and 2004)). With this study we provide the empirical evidence and therefore fill an important gap in the literature.

2.3 Social Networks and Pay-Performance Sensitivity

According to agency theory minimization of agency costs is achieved by aligning the interests of the agents (managers) and the principals (shareholders); hence it is important to link managerial compensation to corporate performance by means of incentives. The majority of incentives provided to managers are through equity-based

compensation schemes (Murphy (1999)). It follows that the higher the sensitivity of these schemes to firm performance, the higher is the level of incentives provided to a manager.

In a review of this literature Core *et al.* (2003) argue that the level of incentives provided to managers is not randomly or arbitrarily determined (as claimed by the “managerial power approach”) but rather is based on standard economic factors. They identify ‘firm size’ and ‘monitoring difficulty’ as the two most influential factors. Several empirical papers find that the level of incentives for the CEO increases with firm size but at a diminishing rate (Demsetz and Lehn (1985); Himmelberg *et al.* (1999)). Also, a number of studies identify a link between the level of incentives and different proxies of monitoring difficulty. For example, growth opportunities and firm risk (Smith and Watts (1992); Himmelberg *et al.* (1999); Aggarwal and Samwick (1999); Core and Guay (2002)).

According to the managerial power approach, managers will use their power within the firm to negotiate pay contracts that will allow them to cash-out easily. Bebchuk *et al.* (2002) present a series of pay practices that they consider as evidence of managers forcing the implementation of sub-optimal pay schemes. For example, the rare use of reduced-windfall options and the near-uniform use of at-the-money options, reload options, etc. Still the evidence offered is anecdotal. As far as we are aware this is the first study to explicitly test the relationship between managerial power and pay-performance sensitivity. A notable exemption is the recent Hwang and Kim (2008) paper which finds, for a small sample of Fortune 100 companies, that socially dependent boards offer their CEOs contracts with lower pay-performance sensitivity.

However, our definition and measure of managerial power is broader, as it is not limited to within firm connections. In addition, we provide empirical evidence illustrating the importance of corporate governance in mitigating the effect of managerial power when determining the pay-performance sensitivity of the contract. Finally, our analysis covers a much greater cross-section capturing the different practices of more than 1000 US firms.

3. Research Issues and Methodology

3.1 Network Measure

As previously discussed, weak ties play an essential role in transmitting information. The more weak ties one builds through time, through such factors as labor force mobility (moving from job to job) or, in the case of directors, by accepting multiple positions (e.g. various outside, independent directorships) then the larger the size of the network and therefore the more improved the social network. The quality of the network improves with size since a big social network allows access to more sensitive information about employers, employees and jobs (Granovetter (2005)).

Similarly, we argue that if CEOs have many contacts their position in the managerial labor market is strengthened and it is this strength which allows them to exert pressure on the board and to extract “rent”. Our proxy to measure managerial power is broader than that typically provided as it is not restricted to within-the-firm ties. We argue that because our proxy includes all weak ties, past and present it is a better measure of the CEO’s social network than a measure based on board interlocks. However, it excludes indirect ties where the strength and relevance are very difficult to access.

Although the measure applied in this study is simple - a single number - it is comprehensive. We measure the total number of contacts, that is, the total number of people with whom the CEO is acquainted, through her current and past employment, her education, and other types of social activities (golf clubs, charity organizations, etc). There is no presumption as to relative status at the time the contact was made, i.e. the CEO may have been a simple board member when the contact was first made.⁵ There is also no presumption as to the strength of the relationship. Whether the contact was made 10 years ago or 1 year ago, the link will only increase the size of the network by one. Our measure does not control for the possibility that some of these past ties may no longer exist, either due to death or simply because of the strength of the link weakening over the years (people simply lose contact with some old acquaintances). We do not believe that the absence of these qualitative features of the network will bias our results, since we do not expect any of them to be systematically related to the relationship we investigate in this study.⁶

Anecdotal evidence from the corporate world, as well as from the political sphere, demonstrates the importance of incorporating ties developed in the past, even if they were first developed in the distant past. As one prime example let us consider Donald Rumsfeld. Following a successful political career of more than 15 years he became

⁵ For all types of activities, apart from education, BoardEx collects data on the ties developed through board membership. Therefore even for social activities the links for the individual will be counted if she has an active role, e.g. board member of a golf club, trustee of a charitable organization.

⁶ One expects older CEOs to be more affected by the strength-of-link issue, since some of their ties might date many years back. In our sample though the mean/median CEO age is only 55 years old, with only 1% of the observations above 70. In any case, we control in our all analyses for CEO age.

the youngest ever Secretary of Defense (during the period 1975-1977). After a 24-year stint in the corporate world, he returned to politics again as the Secretary of Defense for the Bush administration (2001-2006). In the Bush administration he was joined by old acquaintances from the Ford administration, including, amongst others, Dick Cheney. Likewise, the importance of past social ties is shown in his business career. Rumsfeld's initial successful spell as the CEO of a pharmaceutical company, G.D. Searle & Co. (1977-1985) led to several non-executive positions in this sector and eventually the Chairman's position in another bio-pharma firm, Gilead Sciences (1997-2001).⁷

3.2 Hypotheses

The managerial power perspective predicts a positive relationship between managerial power and rent extraction, i.e. the ability of the manager to receive excessive pay through her contract. Managerial power leads to lower monitoring of the manager and hence more freedom for the manager, which in turn, will be used to the detriment of shareholders. Friendly relations reduce the independence of board members and will make them more sympathetic to higher levels of CEO compensation (e.g. Fich and White, 2003).

However, the focus of our research is not whether the ability of the CEO to influence the board derives from strong ties with the current board but rather whether 'managerial power' in part derives from the social network the CEO has built during

⁷ Information gathered from: <http://www.whitehouse.gov/government/rumsfeld-bio.html>,

<http://www.cbsnews.com/stories/2000/12/28/politics/main260175.shtml>,

http://www.gilead.com/wt/sec/pr_933190157/, accessed on 30/06/2008.

their entire life. The social network empowers the CEO because of the advantage it gives in finding alternative employment. The most probable area for the CEO to exercise this power is with regard to their compensation. The higher the probability the CEO will be able to find an equally good job after resigning the more powerful the position of the CEO relative to the board.

We propose that a CEO with an extensive social network is more likely to be able to exercise the option to resign. If you have many professional contacts then you strengthen your position in the managerial labor market, since you have access to more details about employers, employees and jobs (Granovetter (2005)). In order to prevent the CEO exercising the option to withdraw her services the board must make the cost of resignation to the CEO higher. We argue that to do this the board will make the current compensation package for the CEO more attractive, thus increasing her reservation utility.⁸ This will have the dual effect of increasing the cost of resignation for the CEO and also increasing the cost of recruitment for alternative employers.

Thus we have two main hypotheses. For any given CEO the larger their social network, then (1) the higher the level of compensation they are able to negotiate, and (2) the lower the pay-performance sensitivity of their compensation package.

⁸ This practice is what economists call *efficiency wages*. Firms are willing to offer to specific key employees compensation which is higher than the market rate in order to reduce employee turnover.

3.3 Methodology

The methodology and variables used in this study are standard in the relevant literature (Larcker *et al.* (2006); Milbourn (2003); Aggarwal and Samwick (1999)). The exception is our CEO networking measure which has not previously been used in this research area.⁹ To test hypothesis 1 we estimate the following equation on our cross-sectional data using median regression to reduce the influence of outliers (as in Hall and Liebman (1998); Aggarwal and Samwick (1999); Milbourn (2003)).

$$\begin{aligned} \text{Total Compensation} = & \alpha_0 + \alpha_1 \text{CEO_Network} + \alpha_i \text{CEO_Characteristics} \\ & + \alpha_y \text{CG_Characteristics} + \alpha_z \text{Firm_Characteristics} + \varepsilon \end{aligned} \quad (1)$$

The dependent variable, *Total Compensation*, is the sum of a CEO's annual salary, bonus, other annual (short-term) compensation, value of restricted stock grants, payouts of long-term incentive plans, the Black and Scholes value of the options granted during the year and other annual (long-term) compensation. In order to isolate the effects of CEO networking on compensation we control for other CEO characteristics (age and tenure) that we expect to have a positive effect on pay. We choose these CEO characteristics since they proxy for CEO ability/reputation (Milbourn, 2003). Milbourn (2003) also uses past firm performance as an alternative proxy of CEO reputation; we also control for past performance in our model by including the 3-year, prior to the examined year, industry adjusted return. We use this 3-year window since it matches the median CEO tenure in our sample. Because our measure of CEO social networks may be partially capturing CEO ability (i.e. more

⁹ We are only aware of one recent paper that uses this networking measure in a financial economics context. Fracassi (2008) finds that companies that are socially connected exhibit similar investment policies.

ability leads to greater employment opportunities therefore higher accumulation of ties) it is important to explicitly control for this. This allows us to claim that the managerial power effect on the pay arrangements is above and beyond any managerial ability effect. We also include a vector of control variables that capture corporate governance and other firm characteristics. Corporate governance factors that have been found to influence the level of CEO compensation are: the size of the board of directors (*Board size*), the proportion of independent directors on the board (*Board independence*) and whether the CEO is also the Chairman of the Board (*CEO/Chairman role*).

Board size is an important independent variable not only because of its effect on compensation levels but also because networking measures may partially be driven by the size of the board (Larcker *et al.*, 2006). In this study, the CEO social networks measure is a cumulative one therefore we expect current board size to have only a marginal effect. Other firm characteristics include the market capitalization of the firm at the fiscal year end (*firm size*), the ratio of book value to market value of common equity (*BtM*), the dollar variance of the firm's stock returns calculated using 60 monthly observations preceding the sample year multiplied by the beginning of the year market capitalization (*\$ Variance*) and the industry classification (*Industry dummies*). All independent variables, apart from the dummy *CEO/Chairman role* and the ratio *Board Independence*, are transformed using the cumulative distribution function (CDF), as in Milbourn (2003) and Aggarwal and Samwick (1999).¹⁰ In order to confirm our first hypothesis we expect coefficient α_1 to be positive and significant.

¹⁰ The transformation into CDFs allows us to control for extreme outliers and also facilitates the subsequent analysis on pay-performance sensitivity by helping us readily interpret the estimated

To determine whether there is a negative relationship between the size of the CEOs social network and the pay-performance sensitivity of the CEO's compensation package we estimate equation (2).

$$\begin{aligned} \text{Change in FS Wealth} = & \beta_0 + \beta_1 \$Return + \beta_2 \$Return \times \text{CEO_Network} + \\ & \beta_3 \$Return \times \text{CEO_age} + \beta_4 \$Return \times \text{CEO_tenure} + \\ & \beta_5 \$Return \times \text{Past_Firm_Perf.} + \beta_6 \$Return \times \text{Firm_size} + \\ & \beta_7 \$Return \times \$variance + \text{Uninteracted_variables} + \varepsilon \end{aligned} \quad (2)$$

The dependent variable is the CEO's Change in Firm Specific Wealth, which is calculated as total compensation plus the change in the market value of the CEO's stock and stock option holdings in her company (as of the beginning of the year). The change in the market value of old stock option grants and other stock holdings allows us to better capture the heterogeneity in the empirically estimated pay-performance sensitivities (Murphy, 1999). This measure is calculated as in Milbourn (2003). The independent variables include the firm's dollar return calculated as the percentage annual stock return multiplied by the beginning of the year market value of equity ($\$Return$) as well as the interaction of dollar return with the following variables: *CEO_Network*, *CEO_age*, *CEO_tenure*, *Past_Firm_Performance*, *Firm_size* and *\$variance*. We also include all the variables un-interacted.

Equation (2) uses the methodology developed in Aggarwal and Samwick (1999). It gives us estimated coefficients (β_1 to β_7), which show in an economically meaningful way the direct effect of different factors on the pay-performance sensitivity. The pay-

coefficients in an economically meaningful way for the way in which CEO network affects the pay sensitivities at any size of the social network (Milbourn (2003) p. 253).

performance sensitivity for a CEO that is at the median of the distribution of all these parameters (network, age, tenure, prior firm performance, firm size and variance) is given by $\beta_1 + 0.5 \times \beta_2 + 0.5 \times \beta_3 + 0.5 \times \beta_4 + 0.5 \times \beta_5 + 0.5 \times \beta_6 + 0.5 \times \beta_7$. A CEO with the smallest (largest) values in all these parameters has a sensitivity of β_1 ($\beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \beta_7$). In order for our hypothesis (2) to be confirmed, we expect a negative and significant coefficient β_2 . We use the other 5 factors, as in Milbourn (2003), since they have been shown in prior studies to have substantial effect on pay-performance sensitivity.

Bebchuk *et al.* (2002) argue that an important factor that restrains the CEO's ability to extract rents from the company is the "outrage" cost. If the compensation package is deemed by outsiders as deviating substantially from optimality it might cause an *en masse* reaction against the CEO of the firm. Obviously, for "outrage" to work efficiently and make CEOs refrain from exercising their power when setting their own pay arrangements (or at least reduce the amount of rents), CEOs must believe that outrage could have serious consequences for their position within the firm. Unless shareholders have the power to bring topics for discussion in the annual general meeting (AGM), vote against specific plans or even oust the CEO from the company, the CEO will only incur reputational costs from outrage, thereby limiting its effectiveness. In order to test this argument, we use the Gompers *et al.* (2003) shareholder rights index (*g-score*) and classify our companies into democracies and dictatorships. A company with below (above) median *g-score* is classified as a democracy (dictatorship); for this company, the threat of outrage is expected to carry more weight and we therefore predict that CEOs will use their power less, thus reducing the amount of rents they extract from the company. In order to test this we

run equation (2) separately for the two sub-samples and compare the effect of CEO power on the pay-performance sensitivity.

3.4 Sample and Data

The final sample consists of 1,366 observations with data collected in the following manner: All CEO data is for the 2005 fiscal year and was drawn from two sources. From BoardEx database we collected the CEO networking, age, and tenure variables. This data resulted in 4,524 CEO observations. We then merged this data with the ExecuComp database. The compensation data available from ExecuComp restricted our sample to 1,696 CEOs. We deleted observations for 10 companies that had co-CEOs and 78 observations where the name of the CEO in ExecuComp did not match the CEO name in BoardEx. A further 12 observations were deleted due to missing values in the compensation details. All other accounting and market data used was collected from CRSP-Compustat. Missing values in the variables collected from CRSP-Compustat further reduced our sample down to the 1,366 observations. The Gompers *et al.* (2003) shareholder rights index (*g-index*) was obtained from the IRRC database.¹¹

Table 1 presents summary statistics for all variables used in our empirical analysis. The effect of outliers is evident in a number of variables. Our CEO network variable has an average (median) value of 190 (106). This means that on average the CEOs in our sample have 190 direct ties developed over their lives. Since the majority of social

¹¹ The *g-index* is that published for 2004. This variable is updated on a bi-annual basis and hence the 2004 *g-index* is the appropriate measure to use with 2005 data. A firm's corporate governance policy is not expected to change substantially on an annual basis.

ties comes from current and past employment, this translates approximately to sitting on 20 average-sized boards, either as an executive or non-executive director, over the years (this figure is calculated by dividing the 190 ties by 9.5, which is the average board size in our sample; it equals 12 boards if median values are taken into account). The average (median) CEO flow compensation is \$5.5mil (\$3.2mil) and indicates a substantial increase in the level of CEO annual pay compared to the \$3.3mil (\$1.7mil) reported by Milbourn (2003) for the period 1993-1998. The changes in CEO firm specific wealth show even greater variation with an average (median) pay of \$8.2mil (\$3.7mil). The average CEO in our sample is 55 years old and has been in this role for less than 5 years. This indicates a substantial increase in CEO mobility since the mid-1990s when the average figure was 8.5 years (as reported by Milbourn (2003)).

(Insert Table 1 here)

The average (median) firm in our sample had in 2005 a market capitalization of \$8,220mil (\$2,035mil) and an annual return of 14% (8%). There were on average 9.55 directors sitting on the board, 83% of whom were classified as outside directors. In 61% of the companies the CEO was also the Chairman.

The CEO social network measure we apply in this study is positively correlated with firm characteristics but no correlation coefficient is above 30%. CEO characteristics show limited correlation (below 7%) but the proxies for corporate governance (such as board size and board independence), are more highly correlated (21% and 18%, respectively).

4. Results

4.1 The Effect of CEO Networking on Pay Levels

Table 2 presents our results for the effect of CEO social networks on compensation levels. In model 1 we run a median regression between total compensation and CEO networks; we also control for industry effects. In model 2 we include CEO characteristics, i.e. CEO age and tenure, as well as past firm performance and in models 3 and 4 we include corporate governance and other firm characteristics. Under all specifications the estimated coefficient for CEO networking is positive and highly significant, thus confirming our hypothesis (1). It appears that the greater CEO power within the managerial labor market the higher the total pay she receives from the firm. This is above and beyond any CEO reputational effects and/or other firm specific or industry effects. This result confirms, albeit from a different standpoint given our very different social networking measure, the results of recent studies on board interlocks and pay levels.

(Insert Table 2 here)

4.2 The Effect of CEO Networking on Pay-Performance Sensitivity

Table 3 presents our results on the effect of CEO networks on pay-performance sensitivity. In panel A we run 4 different model specifications on the full sample. In panel B (C) we run the same regressions but only for below (above) median g-score firms. As expected the first model shows, in all panels, that the higher the return to shareholders the higher the change in CEO firm specific wealth. This is in line with

the sharing (between the agents and the principals) of the “output” argument and shows that the pay of US CEOs depends on (is linked to) firm performance. In model 2, we isolate the impact of CEO networks to pay-performance sensitivity. As we predicted in hypothesis (2) the coefficient of the interacted term between dollar returns and our CEO social network measure is negative and highly statistically significant (in all panels). This result illustrates that the higher the CEO power in the managerial labor market the lower the pay-performance sensitivity of the pay package she manages to negotiate. This result is robust to the addition of other factors that are known to affect the sensitivity of pay, i.e. proxies of CEO ability/reputation (model 3) as well as firm size and dollar return variance (model 4). As far as these additional factors are concerned we find a negative effect of CEO age, firm size and dollar return variance on pay-performance sensitivity and a positive effect of CEO tenure and past performance, thus confirming the results of Milbourn (2003).

(Insert Table 3 here)

Panel D of Table 3 compares the differences in the impact of CEO networks on the pay-performance sensitivity between companies that are classified as democracies or dictatorships. Using the estimated coefficients in model 4 (panels B and C), and median values in the other 5 factors affecting the sensitivity, we calculate the estimated pay sensitivities at different CEO networking levels.¹² We observe that as

¹² For example, the first figure in panel D (\$18.30) is calculated using the panel B, model 4 coefficients in the following way: $25.13 - 0.5 \times 4.34 + 0.5 \times 8.65 + 0.5 \times 5.68 - 0.5 \times 3.19 - 0.5 \times 20.46$ (we don't take into account the coefficient for CEO networking since we calculate this figure for the lowest CEO network). The difference between the first and third figure (where we assume maximum CEO

we move from the smallest to the biggest CEO social networks the pay-performance sensitivity reduces substantially; this reduction is more pronounced for companies that fall under the “dictatorships” classification. Indeed, the drop in companies with low shareholder rights is more than 5 times that observed in companies with high shareholder rights (64% drop compared to a 12% drop). The 64% drop in dictatorships is economically significant since it translates to a sensitivity reduction of \$14.78, which approximates the pay sensitivities estimated for democratic firms at any level of CEO networking. This confirms our expectation that CEOs are more prudent in exerting power over their pay packages in companies where the costs of creating outrage can have an immediate effect on the CEO’s position within the firm (e.g. the CEO is fired at the Annual General Meeting).

networking) stems from the size of coefficient β_2 (the coefficient of the interacted variable: dollar return \times CEO Networking).

4.3 Robustness Tests

The “managerial power” perspective claims that there is a correlation between CEO power and rent extraction: the greater the power of the CEO, the higher will be the rent she is able to extract. Bebchuk *et al.* (2002) argue that CEO power depends in large part on the ownership structure of the firm and in particular on the CEO shareholdings. The more shares owned by the CEO, the greater her power within the firm. In this paper, we argue that this definition is restrictive. We claim that it is the CEO power in the managerial labor market (not only within the firm) that is more important in explaining pay arrangements and in particular rent-extraction. We test this argument and include both our CEO networking measure and CEO shareholdings in the regressions reported in Table 4, model 1. Panel A shows that the CEO shareholdings variable is not significant in explaining total compensation, whereas our CEO networking measure remains positive and highly statistically significant. In panel B we observe that CEO shareholdings are positively related to the change in CEO firm specific wealth (as one would expect) but CEO networking retains its negative and significant effect on pay-performance sensitivity.

(Insert Table 4 here)

As previously discussed, in the small number of studies that have examined the relationship between social networks and pay arrangements, various board interlocking measures have been used to proxy for the size of the network. In doing so, they implicitly assume that only current ties are important. We argue that all ties, whether developed recently or over many years, are equally important. Ignoring past

ties substantially underestimates the size of the network. In the regressions presented in Table 4, model 2, we use the number of boards on which the CEO currently sits (either as an executive or non-executive director) as a proxy for current ties.¹³ This measure becomes significant only in panel B, whereas the CEO Network coefficient remains highly significant and with the right sign throughout.

Finally, in order to further ensure the robustness of our results we test different model specifications (untabulated results). First, we add the governance controls used in the pay level specification to the pay-performance sensitivity analysis as well. Second, we use an alternative past performance indicator for the firm. The 3 years period used in our main specification matches the median CEO tenure in our sample. So we now use the 5 year industry adjusted return, which matches the average CEO tenure. Despite these changes our results remain qualitatively the same.

5. Conclusion

This paper examines the relationship between CEO networks and compensation arrangements. We use a broad measure of social network, which takes into account all direct ties developed over the CEO's life. This measure allows us to broaden the definition of CEO power and to avoid the biases inherent in previous studies which result from using board interlocking measures.

Our results support the predictions of the managerial power approach (Bebchuk *et al.* (2002)). In particular we find that the bigger the size of the CEO network, (and

¹³ We do not use the actual number of current ties because they are bound to be correlated with the networking measure (i.e. they are part of our networking measure).

therefore her power in the managerial labor market), the higher the CEO total compensation and the lower the pay-performance sensitivity. We also show that the extraction of rent is more pronounced in firms with low shareholder rights, where the CEO feels protected against the consequences of “outrage”. Our results are robust to different methodologies and model specifications. Even after controlling for CEO and firm characteristics that are known to affect pay arrangements, the size of the CEO network remains a highly significant determinant of the pay package.

This paper also offers new evidence to the debate over the correct CEO power definition. We argue that if we want to better understand the compensation setting process, it is important to measure the CEO power in the managerial labor market and not only within the firm. We borrow arguments from the Social Network Theory and claim that direct ties developed in the past are equally important to current ties in empowering a CEO. We empirically demonstrate that this is the case when we test both our measure and other proxies of CEO power; in all specifications our CEO power measure is equally good or better in explaining pay arrangements.

There are two main limitations in our study, which are common within the corporate governance literature. First, we only study a cross-section of US firms, which makes it difficult to extract generalized conclusions. In our defense, our sample is contemporaneous and includes a substantial number of firms, which allows us to examine the majority of the recent corporate governance practices in this area. Also, our main variable of interest, the CEO’s Social Network, is a cumulative one incorporating ties developed over a large number of years. Therefore any panel data analysis would only capture marginal effects for this variable. Second, there might be

endogeneity issues between the networking variable and other independent variables, such as board size. Still, the correlation between the CEO networking variable and any of the corporate governance variables applied in this study is not above 21%, which essentially shows that the variables are orthogonal (e.g. board size does not explain more than 4.4% of CEO social networks).¹⁴

Finally, a specific limitation to this study is that our measure does not capture all social ties developed by the CEOs. However, as previously discussed, this is not feasible since humans create hundreds of weak, *indirect* links which are difficult to trace. In addition, drawing on social network theory, we illustrate that the ties we do capture (weak, direct ties) are the most important ties in the managerial labor market. In any case, the use of our measure helps avoid the biases of the various board interlocking measures applied in the relevant literature, thus advances this research area.

Overall, we believe that more attention should be paid to the effect of social networks in corporate governance. The managerial power approach has recently provided a new platform to test power relationships.

¹⁴ The correlation coefficient between board size and CEO networks is 21%. Therefore board size explains 4.4% ($R^2 = \rho^2 = 0.21^2$) of the CEO networking variation.

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Table 1 Descriptive Statistics

This table presents summary statistics of the main variables of interest. CEO Network counts the number of social ties (direct ties) the CEO has formed through her current and past employment, education, and other types of social activities (golf clubs, charity organizations, etc). Total Compensation is the sum of a CEO's annual salary, bonus, other annual (short-term) compensation, value of restricted stock grants, payouts of long-term incentive plans, the Black and Scholes value of the options granted during the year and other annual (long-term) compensation. Change in Firm Specific Wealth is total compensation plus the change in the market value of the CEO's stock and stock option holdings in her company (as of the beginning of the year). CEO age is the age of the CEO, in years. CEO tenure is the number of years the CEO has been in this role. Board size is the total number of inside and outside directors sitting on a company's board. Board independence is the ratio of outside directors to board size. CEO/Chairman role is a dummy variable taking the value of one (zero) if the CEO is also (is not) the Chairman of the company. G-score refers to the Gompers *et al.* (2003) governance index. The market value of equity is the firm's market capitalization (in millions) measured at the fiscal year end. Annual return is the firm's stock return over its fiscal year. St. Dev. Returns is the standard deviation of the firm's stock returns calculated over 60 months. Ind-Adj 3yrs Return is the firm's industry adjusted return over the previous 3 years. \$ Return is calculated as the percentage annual stock return multiplied by the beginning of the year market value of equity, and is measured in millions of dollars. \$ Return variance is the St. Dev. Returns multiplied by the beginning of the year market capitalization.

	Obs.	Mean	Median	Max	Min	St. Dev.
CEO Network	1,366	190	106	1,580	6	233.81
Total Compensation (000's)	1,366	5,504	3,245	92,200	0	7,184.52
Change in Firm Specific Wealth (000's)	1,366	8,179	3,724	342,772	-407,713	66,062.84
CEO Age	1,366	55	55	89	36	7.08
CEO Tenure	1,366	4.86	3.3	54.7	0	5.43
Board Size	1,366	9.55	9	24	4	2.54
Board Independence	1,366	0.83	0.86	1	0.4	0.09
CEO/Chairman Role	1,366	0.61	1	1	0	0.49
G-Score	1,215	9.34	9	18	2	2.53
Market Value of equity (mil)	1,366	8,220	2,035	367,474	3.80	24,045.76
Annual Return (%)	1,366	14.03	8	470.86	-97.28	40.26
St. Dev. Returns (%)	1,366	42.19	34.15	129.9	12.2	30.62
Ind-Adj 3yrs Return (%)	1,366	3.23	0	661.87	-89.50	35.01
\$ Return (mil)	1,366	565.43	129.54	59,274	-25,689	3,615.04
\$ Return Variance	1,366	2,323	651.80	91,824	21.71	6,424.09

Table 2 CEO pay and networking

We run median regressions with total compensation as the dependent variable. Total Compensation is the sum of a CEO's annual salary, bonus, other annual (short-term) compensation, value of restricted stock grants, payouts of long-term incentive plans, the Black and Scholes value of the options granted during the year and other annual (long-term) compensation. CEO Network counts the number of social ties (direct ties) the CEO has formed through her current and past employment, education, and other types of social activities (golf clubs, charity organizations, etc). CEO age is the age of the CEO, in years. CEO tenure is the number of years the CEO has been in this role. Board size is the total number of inside and outside directors sitting on a company's board. Board independence is the ratio of outside directors to board size. CEO/Chairman role is a dummy variable taking the value of one (zero) if the CEO is also (is not) the Chairman of the company. Firm size is the firm's market value of equity measured as the market capitalization (in millions) at the fiscal year end. BtM is the ratio of book value of common equity divided by the market value of common equity. Ind-Adj 3yrs Return is the firm's industry adjusted return over the previous 3 years. \$ Variance is the variance of the firm's stock returns calculated using 60 monthly observations preceding the sample year multiplied by the beginning of the year market capitalization. All independent variables, apart from the binary CEO/Chairman role and Board Independence which lies between zero and one, are transformed using cumulative distribution function (CDF). Estimated coefficients for the intercept and industry dummies are suppressed. p-values are in parentheses. * denotes significance at the 1% level.

	(1)	(2)	(3)	(4)
cdf_CEO Network	4,655*	4,803*	3,629*	1,286*
	(0.000)	(0.000)	(0.000)	(0.000)
cdf_CEO Age		427	-240	33
		(0.129)	(0.431)	(0.905)
cdf_CEO Tenure		55	286	712*
		(0.845)	(0.333)	(0.009)
cdf_Ind-Adj 3yrs Return		956*	509	220
		(0.001)	(0.074)	(0.408)
CEO/Chairman Role			760*	230
			(0.000)	(0.161)
cdf_Board_Size			2,652*	284
			(0.000)	(0.392)
Board_Independence			-504	820
			(0.609)	(0.365)
cdf_Firm Size				4,386*
				(0.000)
cdf_BtM				69
				(0.813)
cdf_\$ Variance				2,772*
				(0.000)
Sample Size	1,366	1,366	1,366	1,366
Pseudo-R ²	0.071	0.073	0.097	0.218

Table 3 CEO pay sensitivities and networking

We run median regressions with Change in Firm Specific Wealth as the dependent variable. Change in Firm Specific Wealth is total compensation plus the change in the market value of the CEO's stock and stock option holdings in her company (as of the beginning of the year). CEO Network counts the number of social ties (direct ties) the CEO has formed through her current and past employment, education, and other types of social activities (golf clubs, charity organizations, etc). CEO age is the age of the CEO, in years. CEO tenure is the number of years the CEO has been in this role. Firm size is the firm's market value of equity measured as the market capitalization (in millions) at the fiscal year end. \$ Return is calculated as the percentage annual stock return multiplied by the beginning of the year market value of equity, and is measured in millions of dollars. Ind-Adj 3yrs Return is the firm's industry adjusted return over the previous 3 years. \$ Variance is the variance of the firm's stock returns calculated using 60 monthly observations preceding the sample year multiplied by the beginning of the year market capitalization. In panel A we run the analysis for the full sample. Panel B (C) runs the analysis for below (above) median G-Score companies. In panel D we illustrate the effect of CEO networks on the estimated pay-performance sensitivities. Estimated coefficients for the intercept, the cdf variables that are not interacted with \$ returns and the industry dummies are suppressed. p-values are in parentheses. * denotes significance at the 1% level and ** at the 5% level.

	(1)	(2)	(3)	(4)
Panel A: Full Sample				
\$ Returns	4.18*	17.72*	10.17*	23.81*
	(0.000)	(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Network		-16.76*	-13.25*	-6.33*
		(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Age			-2.13*	-2.14*
			(0.000)	(0.000)
\$ Returns x cdf_CEO Tenure			6.81*	6.72*
			(0.000)	(0.000)
\$ Returns x cdf_Ind-Adj 3yrs Return			5.07*	5.11*
			(0.000)	(0.000)
\$ Returns x cdf_Firm Size				-3.84*
				(0.000)
\$ Returns x cdf_\$ Variance				-17.28*
				(0.000)
Sample Size	1,366	1,366	1,366	1,366
Pseudo-R ²	0.066	0.093	0.113	0.126
Panel B: Democracies				
\$ Returns	3.28*	14.23*	7.21*	25.13*
	(0.000)	(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Network		-13.25*	-8.58*	-2.26*
		(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Age			-3.42*	-4.34*
			(0.000)	(0.000)
\$ Returns x cdf_CEO Tenure			5.18*	8.65*
			(0.000)	(0.000)
\$ Returns x cdf_Ind-Adj 3yrs Return			4.95*	5.68*
			(0.000)	(0.000)
\$ Returns x cdf_Firm Size				-3.19*
				(0.004)
\$ Returns x cdf_\$ Variance				-20.46*
				(0.000)
Sample Size	642	642	642	642
Pseudo-R ²	0.048	0.073	0.097	0.114

Panel C: Dictatorships

\$ Returns	4.57*	23.25*	16.90*	21.00*
	(0.000)	(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Network		-22.85*	-23.09*	-14.78*
		(0.000)	(0.000)	(0.000)
\$ Returns x cdf_CEO Age			-1.28**	-1.48*
			(0.016)	(0.000)
\$ Returns x cdf_CEO Tenure			7.87*	8.27*
			(0.000)	(0.000)
\$ Returns x cdf_Ind-Adj 3yrs Return			7.02*	4.61*
			(0.000)	(0.000)
\$ Returns x cdf_Firm Size				-7.10*
				(0.003)
\$ Returns x cdf_ \$ Variance				-3.38
				(0.111)
Sample Size	573	573	573	573
Pseudo-R ²	0.088	0.131	0.166	0.170

Panel D: Estimated Pay Sensitivities

Democracies

For Median CEO age, CEO tenure, Ind-Adj 3yrs return, firm size and/or firm \$ variance

AND

Minimum CEO Networking	\$18.30
Median CEO Networking	\$17.17
Maximum CEO Networking	\$16.04
Reduction in sensitivity	-12%

Dictatorships

For Median CEO age, CEO tenure, Ind-Adj 3yrs return, firm size and/or firm \$ variance

AND

Minimum CEO Networking	\$23.15
Median CEO Networking	\$15.76
Maximum CEO Networking	\$8.37
Reduction in sensitivity	-64%

Table 4 Alternative CEO Power measures

We run median regressions with Total Compensation and Change in Firm Specific Wealth as the dependent variables (panels A and B, respectively). Total Compensation is the sum of a CEO's annual salary, bonus, other annual (short-term) compensation, value of restricted stock grants, payouts of long-term incentive plans, the Black and Scholes value of the options granted during the year and other annual (long-term) compensation. Change in Firm Specific Wealth is total compensation plus the change in the market value of the CEO's stock and stock option holdings in her company (as of the beginning of the year). CEO Network counts the number of social ties (direct ties) the CEO has formed through her current and past employment, education, and other types of social activities (golf clubs, charity organizations, etc). CEO Shareholdings measures the percentage of total shares owned by the CEO, excluding options. CEO Current Boards is the number of boards the CEO currently sits on (either as an executive or non-executive director). CEO age is the age of the CEO, in years. CEO tenure is the number of years the CEO has been in this role. Board size is the total number of inside and outside directors sitting on a company's board. Board independence is the ratio of outside directors to board size. CEO/Chairman role is a dummy variable taking the value of one (zero) if the CEO is also (is not) the Chairman of the company. Firm size is the firm's market value of equity measured as the market capitalization (in millions) at the fiscal year end. BtM is the ratio of book value of common equity divided by the market value of common equity. \$ Return is calculated as the percentage annual stock return multiplied by the beginning of the year market value of equity, and is measured in millions of dollars. Ind-Adj 3yrs Return is the firm's industry adjusted return over the previous 3 years. \$ Variance is the variance of the firm's stock returns calculated using 60 monthly observations preceding the sample year multiplied by the beginning of the year market capitalization. Estimated coefficients for the intercept, the cdf variables that are not interacted with \$ returns and the industry dummies are suppressed. p-values are in parentheses. * denotes significance at the 1% level and ** at the 5% level.

	(1)	(2)
Panel A: Total Compensation		
cdf_CEO Network	1,361* (0.000)	1,167* (0.000)
cdf_CEO Shareholdings	430 (0.118)	-
cdf_CEO Current Boards	-	423 (0.131)
cdf_CEO Age	-38 (0.880)	20 (0.940)
cdf_CEO Tenure	629** (0.013)	643** (0.013)
cdf_Ind-Adj 3yrs Return	206 (0.392)	199 (0.433)
CEO/Chairman Role	175 (0.245)	143 (0.365)
cdf_Board_Size	284 (0.348)	342 (0.282)
Board_Independence	892 (0.278)	710 (0.411)
cdf_Firm Size	4,632* (0.000)	4,338* (0.000)
cdf_BtM	116 (0.658)	77 (0.781)
cdf_\$ Variance	2,804* (0.000)	2,944* (0.000)
Sample Size	1,366	1,366
Pseudo-R ²	0.218	0.219

Panel B: Change in Firm Specific Wealth		
\$ Returns	5.74*	23.70*
	(0.000)	(0.000)
\$ Returns x cdf_CEO Network	-4.91*	-5.36*
	(0.000)	(0.000)
\$ Returns x cdf_CEO Shareholdings	24.43*	-
	(0.000)	
\$ Returns x cdf_CEO Current Boards	-	-1.79*
		(0.000)
\$ Returns x cdf_CEO Age	2.11*	-0.96*
	(0.000)	(0.000)
\$ Returns x cdf_CEO Tenure	4.13*	6.52*
	(0.000)	(0.000)
\$ Returns x cdf_Ind-Adj 3yrs Return	5.83*	4.79*
	(0.000)	(0.000)
\$ Returns x cdf_Firm Size	-0.17	-3.86*
	(0.861)	(0.000)
\$ Returns x cdf_\$ Variance	-11.30*	-17.32*
	(0.000)	(0.000)
Sample Size	1,366	1,366
Pseudo-R ²	0.197	0.128