The Value of a Rolodex: CEO Pay and Personal Networks*

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Abstract: Whom a CEO knows has a substantial impact on pay. An additional connection to an executive or director *outside the firm* increases a CEO's compensation by over $17,000 on average, and explains about 10% of total pay. An additional premium is associated with "important" members: insiders at other firms, geographically local connections, or those within the same industry. Needy firms – those whose non-CEO executives are poorly connected and those geographically isolated from industry peers - pay the highest prices for a CEO's rolodex. Pay-for-connectivity is unrelated to several measures of corporate governance, evidence against rent extraction in favor of a market-based explanation for CEO pay.

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"As first-year CEO Brad Smith tries to reshape software maker Intuit for the online age, he has opened his Rolodex and is cribbing ideas from some tech industry icons. A dinner with Hewlett-Packard (HPQ) CEO Mark Hurd sparked ideas for a massive benchmarking project and reinforced Smith's conviction that Intuit (INTU) had to lay off 7% of its staff. Conversations with Google (GOOG) inspired a program that lets Intuit engineers contribute 10% of their time to experimental projects. And Smith rang up Facebook Chief Operating Officer Sheryl Sandberg to help Intuit shape online user communities around its products…"

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I. Introduction

Two prevailing views continue to dominate research on the levels of CEO compensation. The first contends that CEOs are able to transfer wealth from shareholders through lax corporate governance (e.g., Bebchuk and Fried, 2004)), while, in the second, CEOs are worth what they are paid (e.g., Gabaix and Landier, (2008)). While an extensive literature has emerged to explore the lax governance hypothesis,[1] evidence that CEO pay reflects a manager's value-added is scarce. This is understandable. To make a compelling case for the 'market-value' perspective (Bertrand (2009)), one needs not only to identify difficult-to-observe CEO attributes or actions likely to affect firm value, but also to measure and link these to pay.[2] The attribute we explore in this paper is a CEO's *rolodex* - a transferrable network of personal connections to those outside the firm.

Claiming that a firm can benefit from its CEO's network is hardly controversial. Networks allow for the aggregation and diffusion of information, which ultimately is the lifeblood of the firm. Companies constantly adjust competitive strategies in response to innovations in market conditions, competitive threats, macroeconomic factors, regulatory

[1] See, for example, Yermack (1996), Conyon (1997), Core, Holthausen, and Larcker (1999), Bertrand and Mullainathan (2000), Bertrand and Mullainathan (2001), Hartzell and Starks (2003), and Yermack (2004).

[2] On the unobservability of ability and consequent difficulty of ranking CEOs, Bertrand (2009) writes, "While it is quite easy to rank the quality of, say, tennis players, it is difficult to envision how a similar ranking is established for CEOs."

changes, legislation, input prices, etc. A manager with connections to lots of people or, more importantly, to the *right* people can be a source of information and influence that, in turn, allows the firm to make better decisions. In practice, network benefits may accrue even more directly - e.g., the granting of explicit favors as shown in studies of "politically connected" firms (e.g., Faccio (2006) and Bertrand, Kramarz, Schoar, and Thesmar (2005)).[3]

However, because a CEO's network is excludable, network members (managers) can extract rents in the labor market from those outside desiring access (shareholders).[4] Thus, unless the CEO labor market is perfectly competitive, the market-value paradigm predicts a wage premium in situations where a CEO can leverage personal connections to benefit the firm. We focus exclusively on the relation between CEO pay and his or her *external* connections – directors and executives at other firms. This allows a sharp distinction between the governance and market-value hypotheses because connections to those outside the firm cannot be milked to enrich the CEO at shareholders' expense. That is, if we observe firms paying a premium for connected CEOs, it is because such connections confer value to the firm, not because they allow the CEO to hijack the pay setting process.

By contrast, a number of closely related studies have recently explored the problem from the governance perspective, finding that CEOs are paid more when they share social ties to board members (Hwang and Kim (forthcoming)) or institutional monitors (Butler and Gurun,

[3] Faccio (2006) examines 42 countries and finds that firms with connections to government officials enjoy easier access to financing, lower taxes and greater market share. Bertrand, Kramarz, Schoar, and Thesar (2007) focus on a sample of French firms and find that CEOs with personal connections to politicians can extract benefits such as tax subsidies for their firms (although there is some evidence of quid pro quo). Similarly, Faccio, McConnell, and Masulis (2006) and Goldman, Rocholl, and So (2008) document value for political connections.

[4] Excludability in this context does not mean that the CEO can literally prevent the firm from contacting an individual in his or her network. Instead, we require only that the CEO's cooperation improve the value a firm can extract from a network member. For example, it is difficult to imagine that the firm could, without the CEO's involvement, contact one of his or her college classmates for advice.

2008).[5] These channels are not our interest. Although such *internal* connections may in fact weaken the firm's governance and lead to inefficient rent extraction by CEOs, theories emphasizing the real, economic benefits of "friendly boards" (e.g., Adams and Ferreria, 2007) caution that such an interpretation may be premature.

Our sample spans some 2,700 CEOs of large, public firms during the period 2000-2007. The workhorse of our analysis is the BoardEx database, which, among others, reports a CEO's past or current business relationships, affiliations with charitable or volunteer organizations, boards on which the CEO has served, and school(s) attended. For every CEO in our sample, we construct the simplest possible measure for connectedness: a CEO's *rolodex* is the sum of other external executives or directors related to the CEO through any of these channels.

We find that an additional connection is worth roughly $17,700 in total compensation when measured in dollars (0.07% in logarithmic specifications). This translates to large marginal effects. A one-standard-deviation increase in the number of external connections changes the CEO's pay by over 11%. Interestingly, the effect of connections on pay is concave. Given that the information provided by network members is likely to contain some redundancy, this is expected. A capital-constrained firm may be willing to pay handsomely for a CEO connected to an investment banker, but at the margin, it is unlikely that a 5th investment banking connection would be similarly valued.

Immediately, the possibility arises that the *rolodex* variable may be capturing aspects of the CEO's productivity unrelated to his networking ability, and it is these that drive the wage premia we observe for well-connected CEOs. In part to address this and similar endogeneity concerns, we conduct a number of additional tests. First, we examine the individual elements of

[5] See also Barnea and Guedj (2006), which shows that CEOs are paid more when their board members have been "conditioned" to pay high salaries by sitting on other high-paying boards. Schmidt (2008) and Fracassi and Tate (2008) show that connections to firm insiders can influence other activities, e.g., mergers and acquisitions.

the *rolodex* variable. We find that all connection types–social, past professional, and school–are each significant determinants of pay, even when included simultaneously in regression analyses.

School connections, in particular, pose a challenge for alternative explanations not directly related to the CEO's network. Specifically, we find that a CEO's number of school connections is strongly related to pay, *even after including school fixed-effects*. Because school connections are formed many years prior to becoming CEO, there is no potential for reverse causality, whereby CEOs may acquire more connections because they are well paid (e.g., being asked to join a charity board). Furthermore, including school-fixed effects means that identification is achieved only from year-to-year variation in the number of graduates at a particular school that go on to become executives and directors. This washes out any unobserved heterogeneity in skill or work ethic that would influence school choice or acceptance. Importantly, such a transformation allows us to disentangle "talent" effects (proxied by individual schools) from pure "network" effects (proxied by time-series variation within a given school).

Further evidence that a CEO's *rolodex* itself is valuable (as opposed to proxying for the CEO's latent ability) is that the labor market assigns higher prices to more "valuable" connections. To measure the importance of a connection, we make three designations: 1) to those within the firm's industry (similar firms likely have the most relevant information), 2) to other firm "insiders" (those engrossed in day-to-day activities vs. more mildly involved directors), and 3) to "nearby" executives and directors. The final distinction is made not only to capture differences in information accessibility, but also because, in some circumstances (e.g., firms that compete in local product markets), the value of the information itself may depend on geographical proximity. In pay regressions, we find that such valuable connections are in fact associated with larger wage premia. When we consider their interactions, the effects are even stronger. For example, for each "local" connection to another firm within the same industry, a

CEO's pay increases by .44%, nearly three times the increase (.15%) compared to someone "remotely" located and in another industry. Other combinations of valuable connections have similarly large effects.

We then explore the determinants of the network wage premium from the *firm's* perspective. To do so, we develop proxies intended to capture how much a firm benefits from its CEO's connectivity. The first is the firm's geographic isolation from its industry peers, under the assumption that such isolation imposes at least some barrier to the transmission of information relevant for the firm. When we compare CEO compensation between firms that are located within and outside industry clusters, two interesting patterns emerge. First, we find that overall, CEOs in clusters command a substantial wage premium. This finding is consistent with the theoretical predictions in Almazan, de Motta, and Titman (2007), whereby more able workers locate in clusters to maximize their human capital. However, when we analyze the interaction term, we find that the *rolodex* effect is over 50% larger *outside* of clusters. This suggests that geographically isolated firms, with presumably reduced access to local information generated in clusters, attempt to compensate for this disadvantage in the labor market. Moreover, this finding is further evidence that networks are measuring something distinct from a CEO's ability, skill, or work ethic. If the *rolodex* were measuring any of these, we would expect the coefficient to be higher in industry clusters, where a CEO's outside options are maximized.

The second proxy is the firm's existing connectedness through its other (non-CEO) executives and/or directors. Similar to being geographically isolated, it is expected that a firm with few existing connections will place the highest marginal value on its CEO's *rolodex*. Confirming this intuition, when we interact the non-CEO's connections with the CEO's *rolodex*, the effect is negative, and highly significant. Firms that need connections the most, those with directors who themselves are *not* well-connected, pay some 80% more for each of the CEO's connections.

Finally, in light of previous evidence that a CEO's connections to his or her own board members can weaken corporate governance, we formally consider the possibility that this channel is responsible for our results. The specific concern is that a larger network of *external* connections may increase the probability of having an *internal* connection to a board member (that between the CEO and a member of his or her own board), which may lead to a spurious relation between pay and external connections. We confirm prior work and find a statistically and economically significant relationship between own board-CEO connectivity and CEO pay; however, when we add the CEO's external connections to the regression we find that own board-CEO connectivity is not insignificant, while external connections remain highly so. This raises the possibility that what was previously interpreted as a measure of poor governance (own board-CEO connectivity) may have been partially capturing the CEO's overall connectivity, particularly the ability to make valuable external connections.[6]

The results contribute to our understanding of CEO compensation in three ways. First, we identify a specific CEO attribute that has a meaningful impact on pay, complementing recent analysis of CEO fixed-effects by Graham, Li, and Qiu (2008). Second, given several recent studies indicating that a CEO's connections can harm shareholders, our evidence provides a different perspective on the role of a CEO's network as it relates to firm value. Specifically, the effect of (potentially governance-driven) internal connections on CEO pay appears to be an artifact of its correlation with valuable external connections (that cannot be governance-driven), and substantially alters the resulting interpretation. More evidence of a market-value view is that more useful connections (e.g., those to important people within the same industry) are more expensive than those less useful ones, and firms with the highest networking needs pay the highest prices. Finally, we document two new facts: CEO pay overall is higher in industry

[6] We also check that our result is unrelated to governance by splitting the sample by the corporate governance index (Gompers, Ishii and Metrick, 2003), the entrenchment index (Bebchuk, Cohen and Ferrell, 2009), and board size (Yermack, 1996). We find no difference for the *rolodex* variable between any split of the data based on these classifications.

clusters, although this is somewhat mitigated by the fact that isolated firms pay more for each element of the CEO's *rolodex*.

The paper is organized as follows. In the subsequent section, we describe the data and the construction of variables, and then, in Section III, present the results of our main specification relating CEO's personal connections to pay and our initial evidence of diminishing marginal returns to connectivity. Section IV considers which connection "types" command the steepest wage premia. In Section V, we consider the problem from the firm's perspective, asking whether firms most starved for connections pay the highest prices for access to a CEO's network. Section VI discusses our views on a number of alternative hypotheses, and performs a set of robustness checks. We conclude in Section VII.

II. Data and Variable Constructions

The data in this study are collected from several sources. Return and pricing data are from CRSP and accounting data are from COMPUSTAT annual files. CRSP and COMPUSTAT are linked through the CRSP-COMPUSTAT link file generated by CRSP and restricted to firms with common shares only (share code 10 and 11 according to CRSP). The geographic location of a company's headquarters comes from the COMPUSTAT quarterly files. We obtain the five-digit zip code from the COMPUSTAT quarterly files and then match the zip code to the latitude and longitude of the centroid where the five-digit zip code resides. The mapping between the latitude and longitude of the centroid and the zip code is provided by the SAS Institute, which receives data from the US Census Bureau.

We obtain the biographic information of senior executives and directors from the BoardEx database provided by Management Diagnostic Limited. Management Diagnostic

Limited is a private research company specializing in collecting and disseminating social network data on company officials of US and European public and private companies.

The BoardEx database is organized as a time series of hypertext-linked individual curriculum vita. At a specific point in time - the "report date" in BoardEx - an individual's curriculum vitae is constructed based on the most recent disclosure information obtained by the analysts at the Management Diagnostic Limited. The curriculum vitae contains college, graduate and professional education and degree information, past employment history (including beginning and ending dates of various roles), current employment status (including primary employment and outside roles), and social activities (club memberships, positions held in various foundations and charitable groups, among others).

Management Diagnostic Limited provided us the complete set of active and inactive companies incorporated in the United States with market capitalization greater than or equal to ten million dollars by the beginning of 2000. The inactive companies were publicly traded companies at one point in time during the period between January, 2000, and December, 2007, but no longer traded by the end of December, 2007. We focus on the period 2000-2007 because conversations with staff at Management Diagnostic Limited and our exploration of the data reveal that, prior to 2000, BoardEx's coverage of US public companies is extremely limited. Using data after 2000 thus mitigates the effects of survivorship bias. Other authors who have used the BoardEx database chose a similar sample window due to these concerns (Fracassi and Tate, 2008), or opted to focus on one year of cross-sectional observations (Fernandes, Ferreira, Matos and Murphy, 2008).

The unique company-level identification code in BoardEx is called "Company ID." However, there is no existing link between "Company ID" in BoardEx and identifiers from other commonly used databases. We create the link between the BoardEx database and other commonly used databases in several steps. First, for active companies, BoardEx provides the

ticker symbol, the International Security Identification Number (ISIN) and the company name.[7] The "Company ID" in BoardEx is matched with the Permanent Company Identification Code (PERMCO) created by the Center for Research in Security Prices (CRSP) by ticker symbol and CUSIP (derived from ISIN). For the inactive companies, BoardEx does not always keep the ticker symbol and the ISIN. If the ticker symbol and the International Security Identification Number are not provided, we match the company name recorded by BoardEx with the most recent name of a company in CRSP using a name recognition program implementing the Levenshtein algorithm.[8] To ensure the quality of the matching procedure, we manually checked all matches and made necessary adjustments.

Our matching procedure yielded 8,428 unique company matches between the BoardEx and CRSP databases. In terms of BoardEx's coverage of common stocks in CRSP, at the beginning of the sample period, BoardEx covered about 66% of CRSP stocks representing about 85% of market capitalization in CRSP. At the end of the sample period, BoardEx covered about 74% of the CRSP stocks representing about 92% of market capitalization in CRSP. Understanding the scope of coverage is important in interpreting our connection variables. When we say that a CEO has *N* connections, we mean he is connected to *N* unique officers and directors that have firms in our linked BoardEx/CRSP/COMPUSTAT database. The connections variable will not include connections to individuals in private firms (which are in BoardEx but not in the CRSP database) or firms not covered by BoardEx (which are in the CRSP database).

After matching firms in BoardEx to PERMNOs and GVKEYs, we again use the Levenshtein algorithm to match CEO names in BoardEx with CEO names in ExecuComp (after

[7] For the US firms, the International Security Identification Number is essentially constructed by appending "US" to the front and a single-digit check code to the end of the regular nine-digit CUSIP number.

[8] The Levenshtein algorithm computes the least number of operations necessary to modify one string to another string. For instance, two perfectly matched strings will require zero steps to modify one string to the other.

an initial match of their firms by GVKEY) and then hand-check the matches. Our final sample consists of 2,723 unique CEOs from 1,791 unique firms between 2000 and 2007.

Unlike some prior studies, we do not require the CEO connections to be confined within the ExecuComp universe of firms. Therefore, this paper perhaps provides the most complete characterization of CEO connections among a large sample of publicly traded firms in the US.

In our analysis of CEO education and school connections, we use BoardEx's Institute ID to uniquely identify schools. Unfortunately, BoardEx does not have a unique ID for degree type, only a description of the executive's "qualification." Following Cohen, Frazzini and Malloy (2008), we map each of the 8000+ degree descriptions into one of six types: (1) Undergraduate, (2) Masters, (3) MBA, (4) Ph.D., (5) Law, and (6) Other. When we say two individuals attended the same school and received the same degree, we mean that they have the same Institute ID and the same degree type.

Table 1 provides some summary statistics on our connections variables, control variables and compensation variables in our sample. A CEO has an average of 123 total connections, comprised of social connections (mean 66), old professional connections (mean 42) and school connections (mean 15). By construction, CEOs have fewer multi-dimensional connections. For example, the average number of school *and* degree connections a CEO has (i.e., the number of individuals in the linked BoardEx/CRSP database that went to school together with the CEO and received the same type of degree) is only 8. We also find large variation in the number of total connections a CEO has across each connection type. For example, the standard deviation of social connections is 96 and at least 10% of our CEOs have over 200 social connections each.

III. External Networks and CEO Compensation

Our main objective is to understand how a CEO's external connections are valued in the labor market. We therefore begin by estimating linear regressions of CEO pay on the number of external connections we can infer from BoardEx. Table 2 shows the results of estimating a

number of such specifications, progressively increasing in the number of control variables. Here, the variable of interest is called "*rolodex*," defined as

$$rolodex_i = social_i + past\_professional_i + school_i.$$

In the above definition, "*rolodex*" summarizes the total number of connections belonging to a CEO, and "*past_professional"* connections are connections between executives who no longer work for the same firm. This latter variable excludes connections in which both individuals currently work for the same firm. A "*school*" connection is assigned between two people that attend the same university and have graduation years that are less than 2 years apart. By construction, connections made during school years predate the CEO's current year of employment (i.e., we do not include the few school connections where the graduation year is after the current-year observation). Finally, we include a CEO's *social* connections as part of the *rolodex*. Two people share a social connection if they are members of the same social organization. As in Schmidt (2008) and Fracassi and Tate (2008), we only form social connections among individuals who have "active roles" in social organizations, which means we require the role description in the BoardEx database to be more than a "member" for all organizations except clubs.

In Panel A of Table 2, we regress each CEO's total compensation on *rolodex*, along with a progressively larger set of covariates. With the exception of CEO fixed-effects, our control variables are taken from Graham et al. (2008). The first four columns show the results when specifying compensation in dollars. Column 1 indicates that an additional connection is worth roughly $20,000. When controls for various firm characteristics (e.g., size, market-to-book), CEO tenure, and tenure squared are added in Column 2, the magnitude diminishes slightly to about $17,000 but remains highly significant.[9] Year and industry controls are added in columns

[9] In no specification is CEO age a significant determinant of pay, so we exclude it.

3, with little change on the *rolodex* coefficient. Standard errors are robust for heteroskedasticity, and are clustered by firm to allow for unobserved firm-level shocks to compensation to persist across time.

Column 4 presents evidence of diminishing returns to connectivity. When the square of *rolodex* is added to the specification in column 3, we find a positive, significant coefficient on *rolodex* but a negative, significant coefficient on *rolodex squared*. In other words, although a larger network is always preferred, the marginal benefit to the firm decreases as the number of connections increases.[10] One plausible interpretation is that whatever benefits the firm derives from the network, these are (at least partially) redundant across individual network members.

To see this, consider a CEO with a school connection to an investment banker specializing in his industry. The banker is likely to have valuable information about credit conditions, demand for new issues of the firm's securities, or other information allowing the firm to hone its financing decisions. However, it is difficult to imagine that access to a *second* investment banker confers similar benefit. Almost certainly, some of this information will be redundant, which will lead a rational firm to pay less for it.

The next four rows present the results when total compensation is expressed in natural logarithms, so that the coefficients correspond approximately to percentage changes in total compensation rather than to dollar changes. Without controls for firm characteristics, an additional connection increases a CEO's total pay by nearly .3%. However, when firm attributes are included, the point estimates are cut to between 0.08% and 0.10%. Taking column 7 as the most informative estimate, we find that a one-standard-deviation change in the size of the CEO's rolodex (137) is associated with an 11% increase in total compensation. Similarly, the mean

[10] Note also that, in standard wage regressions (including ours), wages are concave in experience. Here, the intuition is similar: the set of skills or information workers are required to master is finite, such that the marginal effect of experience on the worker's outside option gradually diminishes.

rolodex size in our sample is 122, suggesting that at least 10% of the average CEO's compensation reflects a return on his investment in networking.[11]

In Panel B, we present the same tests, only here we exclude all performance pay. As expected, when only salary is considered, the magnitudes are much lower. The fourth column indicates that an additional connection is worth slightly less than one thousand dollars in salary, with a robust *t*-statistic over twelve. Likewise, with respect to the logarithm of salary, another connection increases salary by about .037%, a result significant at the 2% level.

That network connections are rewarded across all pay types (for salary alone and when incentives are added) indicates an interesting dichotomy. The salary results suggest that connections have *passive* value - firms benefit from a CEO's network even in the absence of his efforts. For example, we can imagine a well-connected CEO increasing a manufacturer's visibility with wholesale customers who are relatively indifferent between suppliers producing homogenous products. Even without extensive effort from the CEO, sales may increase. More generally however, we would expect the full value of a network connection to be realized after an *active* investment of time or effort by the CEO. Continuing with the example, whatever sales windfalls may occur are likely to be magnified if the CEO initiates, rather than simply fields, sales calls to network members. In this way, we can view network connections as having two sources of value, each of which show up in the expected ways in our pay regressions. However, in our remaining analysis, we present results only for total CEO pay, but note that, in the vast majority of cases, similar effects are found when salary alone is considered.

Table 3 presents the results when the log of total compensation is regressed on the individual components of the *rolodex* variable: *school, past professional*, and *social*. We conduct this exercise primarily to demonstrate robustness, as we will show that each element alone is a strong determinant of compensation. However, this decomposition also allows us to

[11] We say "at least" because our universe is not the entire universe of connections. See Section II for a description of the discrepancies between the universe of firms in BoardEx and the universe of firms in CRSP and COMPUSTAT.

rule out alternative interpretations, particularly that the *rolodex* variable may be capturing some element of the CEO's skill or work ethic unrelated to the ability to generate or maintain network relationships.

For comparison, we replicate the main (aggregated) result for total pay in the first column. The second column of Table 3 includes each of three components of *rolodex* simultaneously in the regression. It demonstrates that each maintain economic and statistical significance in the regression. An additional social (professional, school) connection is worth .06% (.06%, .10%) in pay. When social connections are estimated separately in the regression in column 3, we find an additional social connection is worth .08% in pay. The cross-sectional variability of social connections in our data is large, with a standard deviation of nearly 100 members, translating into an average effect on total pay of nearly 9%.

With social connections in particular, it is possible that our pay regressions are mis-specified through reverse causality: CEOs may be pursued by organizations and charities (where they form connections) *because they are well paid*. This concern is especially troubling given the fact that we know very little about the timing of social connections. An unfortunate feature of social connections (not shared with past professional or school connections) is that we only rarely can tell from BoardEx when the connection was formed (see also Schmidt (2008), Fracassi (2008), Fracassi and Tate (2008)), admitting the possibility that some relationships may be formed during or after the CEO's tenure with his current firm. Accordingly, in the following analysis, we separately consider past professional connections and school connections (these are not subject to the reverse causality concern) and later create a *robust rolodex* variable in order to demonstrate that our main results hold when we exclude social connections in Table 8.

Column 4 of Table 3 provides direct evidence against reverse causality. It considers separately the impact of a CEO's past professional connections on current compensation and indicates that having worked with or served on boards with other directors or CEOs has an

impact of approximately 0.10% in total compensation. A single standard deviation in the number of past professional connections (66) increases pay by nearly 7%. This refutes the reverse causality view, as it is not possible that current pay can create past connections.

The final columns of Table 3 are dedicated to school connections, which are seen to have the largest effect on pay of any connection type. Compared to the average marginal effect for an element of the *rolodex* variable (0.08%), school connections are over three times as important (0.26%), and highly significant (Column 5). The average CEO shares overlapping school ties with approximately fifteen other directors and executives, so that the average marginal effect translates to roughly 3-4% in total compensation, or roughly $200,000. Obviously, this evidence cannot be explained away by reverse causality, as school connections are formed many years prior to his appointment as CEO.[12]

On the other hand, it is likely that the number of a CEO's school connections may be correlated with his skill, ability, work ethic, or other determinants of his future productivity. In Figure 1, we present a frequency chart showing that a small set of elite schools produce a disproportionate number of CEOs. Although Figure 1 shows that although over 50% of CEOs graduate from a school that produces no other CEO (in our sample) but him or her, a substantial number of institutions produce many CEOs. The second panel shows that the five schools graduating the most CEOs-Harvard Business School, Stanford University, Harvard University, Wharton School of Business, and MIT-account for 497 chief executives, over 18% of the entire sample. However, these are elite institutions with stringent admission and graduation requirements. The concern is obvious: a large number of school connections may simply proxy for having attended an elite school, which is almost certainly correlated with management ability.

To control for such selection effects, Table 3 also includes school dummies for educational institutions in Column 6. Critically, adding school-fixed effects does not prevent the

[12] The mean age of a CEO is fifty-five years old, removing school connections by roughly thirty years' time.

school connections variable from being separately identified in the regression. The reason is that although the school-fixed effect applies to each graduate of a given school, the number of its graduates that go on to become public company executives or directors fluctuates over time. One reason is that schools may change enrollments over time; another is simply the random variation in the number of "successful" people attending a given school in a given year.[13] With school-fixed effects included, the coefficient on *school* connections is identified only through this time-series variation. Because the future life outcomes of a CEO's classmates are unlikely to be related to the CEO's ability or work ethic (after controlling for all of them having attended a common school), this is evidence of a "pure" network effect in the determinants of pay.

Although including school-fixed effects (column 6) decreases the magnitude of the *school* connections coefficient from .26% to .17%, it remains significant, with a p-value of 3.6%. Column 7 considers an even stronger measure of school connections, those in which both individuals also received the same degree (*school and degree* connections). We see that the coefficient on *school and degree connections* is substantially larger at .37%, and also remains significant in the presence of school-fixed effects (column 8).

It is now easy to see that those attending elite schools benefit *twice*. Although attending an elite school may signal superior ability or training, it also increases the size of one's network, which, as shown, is rewarded in the labor market.

In summary, our analysis of each connection type provides strong evidence against alternative explanations for our results. Moreover, we have also found that differential effects on pay from each connection type. This is unsurprising given that each type of connection is formed in a different venue, and most likely at a different period in the CEO's life. As we have seen, connections formed early in a CEO's life (school connections) appear to have the most explanatory power, followed by professional and social associations. However, the specific price

[13] Fluctuation in prevailing labor market conditions provides one plausible reason for such year-to-year variation, as described in Schoar (2007). We deal explicitly with such "recession" year effects at the beginning of the CEO's career in Section VI.

a firm pays for a connection is likely to depend both on attributes of the connection itself, as well as firm-specific factors that determine its marginal benefit from such connections. In the next two sections, we explore each of these issues.

IV. Valuable Connections

We have emphasized *access to information* as one channel through which a CEO's network of external connections can benefit the firm.[14] If true, then the most "important" names in a CEO's *rolodex* - those that convey the most valuable information - should command the highest wage premia.

Consider the steps required for externally collected information to benefit the firm. It must first be *generated* by network members, and must then be *transmitted* to the CEO. For the first step, we develop two proxies that we think are correlated with the quality of information generated by network members: whether they are a firm insider (executive), or whether their firms share Fama-French-30 industry classifications. For transmission, we use geographical proximity. As we show, each of these is associated with an additional wage premium, consistent with the idea that firms do in fact derive informational benefits from the CEO's network.

Insider Connections

We first distinguish between a connection to a board member and one to a member of the executive team. Intuitively, directors and executives have different roles within the firm, and as such, different access to firm-specific information. While executives are intimately involved with the firm's day-to-day operations, directors are often modeled (e.g., Adams and

[14] In addition, there may be other benefits of having a well-connected CEO, e.g., calling in "favors" from government officials or from other network members who may influence the firm's fortunes. See Faccio (2006), Faccio, Masulis, and McConnell (2006), and Bertrand, Kramarz, Schoar, and Thesmar (2005), for evidence that political connectedness (either at the firm or CEO level) can accrue benefit to the firm. Through these channels as well, the same argument would predict wage premia for connected CEOs.

Ferreira (2007)) as advisors who depend on executives to share information with *them*. In other words, although both directors and executives possess valuable information, the latter's central role in the firm's operations means they are likely to be better informed. This claim is supported by studies of stock trading patterns. Ravina and Sapienza (2008) compare the insider trading profits from corporate executives and independent directors, and find that trades initiated by independent directors are less profitable than those of the executives.[15]

Motivated by this argument, in Table 4, we break up *rolodex* into connections to insiders, those that BoardEx classifies as "Executive directors" (EDs), and directors, those that BoardEx classifies as "Supervisory Directors" (SDs). When *rolodex* is replaced by these two variables in column 1, we find that the coefficient on *Connections to Insiders* is .237% and significant while the coefficient on *Connections to Directors* has small magnitude, and is statistically indistinguishable from zero. Furthermore, a test of the linear restriction that these two variables are the same has a p-value of .017.

Industry Connections

It seems rather obvious that a bank would find information about credit markets more relevant than information about demand for paper pulp. The second column of Table 4 breaks up *rolodex* into *industry* connections and *out-of-industry* connections depending upon whether the CEO's connection shares the same Fama-French 30 industry as the CEO. The coefficient on *industry* connections (.111%) is twice the size of the coefficient on *out-of-industry* connections (.0542%). However, the large standard error on the coefficient estimate for *industry* connections makes it statistically insignificant, and a linear restriction test also fails to statistically distinguish the size of the two coefficients.

Sharper inferences are possible when we combine *industry* with other dimensions of value. For example, Column 6 of Table 4 replaces *rolodex* with *industry connections to insiders*

[15] Note that both groups earn market-adjusted profits (indicating that both possess private information), but that those of executives are larger (indicating they are more informed).

and *out-of-industry connections to directors*. Comparing multi-dimensional connections generates much larger differences in size of the coefficients. As seen, an additional industry connection to an insider is worth .328%, an additional out-of-industry connection to a director is worth only .069%, and a linear restriction test rejects the null of equality with a p-value of .084.

Local Connections

From Table 3, we have already seen some evidence that "close" connections are particularly worthwhile, although not in a geographic sense. *School* connections, formed early in a CEO's life and in a setting designed to promote networking (especially at graduate business schools), are roughly three times as valuable as those formed through common jobs or social organizations. Moreover, sharing both a *degree* and *school* increases the value of a connection by another 80%, even when school fixed effects are included. This suggests not only that CEOs are rewarded for whom they claim to know, but also for their ability to access these network members: CEOs who get their calls returned by important people are rewarded the most.

In this section, we pursue an additional measure of closeness – geographic proximity. Intuitively, people are most likely to come in contact with those that live or work nearby. This argument is not new. Bayer, Ross and Topa (2008), Bertrand, Kramarz, Schoar, and Thesmar (2005), and Faccio and Parsley (forthcoming) all argue that the basis of social and political connections is primarily based on geographic origin.[16] To the extent that such frequent interactions facilitate transfers of information,[17] we would expect a wage premium for a CEO's close rather than remote connections.

[16] A large body of well-established sociology literature documents that individual social networks are local in a geographic sense. See Bayer, Ross and Topa (2008) provide a thorough review of this topic for a review.

[17] Many papers find evidence that geographic proximity facilitates information transfers. Duflo and Saez (2002) study individuals' retirement account decisions. Their findings indicate that co-workers in the same department significantly affect an individual's choice of mutual fund vendor. Hong, Kubik and Stein

In addition to making information easier to transmit, geographic close connections may possess "special" information of a local variety. For example, firms that compete locally (e.g., geographically concentrated retail) may find that the information gleaned from local CEOs and directors especially useful.

We define a CEO's *local* connections as those to directors or executives of firms within 100 km (62 miles) of the CEO's firm headquarters. For example, consider a CEO whose firm is headquartered in Dallas, TX. A college classmate who serves as a director of a firm headquartered in Fort Worth, TX would be classified as a local connection (more specifically, a school *and* local connection). In contrast, we define *remote* connections as those to directors or executives over 2000 km (approximately 1250 miles). We find similar results with other distance breakpoints.

The third column of Table 4 considers the effect of local vs. remote connections. When we include local and remote connections in the main specification, the coefficient on *local connections* is larger (.151%) than that on *remote connections* (.113%). Combining location with other dimensions magnifies the effect. For example, Column 4 shows that local industry connections are worth far more (.438%) than remote out-of-industry connections (.151%), a difference that is statistically significant.

The final column aggregates all three of our "valuable connections" proxies together: *insider, industry,* and *local.* As seen, an additional connection satisfying all three criteria increases the CEO's compensation by over 90 basis points, in contrast to an insignificant effect for one satisfying none. The difference is highly significant (p=0.000).

(2004) show how more "social" households–households that interact with their neighbors or attend church–are more likely to invest in the stock market, especially in the geographic area where the average stock market participation rates are high. Loughran and Schultz (2004) provide strong evidence of localized trading behavior among investors of NASDAQ stocks. They find that on days when cities experience a blizzard trading volume falls by more than 17% on the day of the storm, and by 15% the following day. Coval and Moskowitz (1999) find mutual fund managers prefer to hold companies close by ("localized holdings"). Coval and Moskowitz (2001) suggest that one of the reasons mutual fund managers prefer localized holdings is because of access to management and the ability to generate private information.

V. Firms that Need Connections

The evidence just considered indicates that not all elements of the CEO's *rolodex* are equally valued, as one would expect if firms balance the costs of compensation against the associated benefits. Indeed, that the effect is strongest for connections to particularly valuable parties – other executives, those within the same industry, and those geographically close – suggests that firms do in fact consider such trade-offs.

In this section, we consider a further set of cross-sectional predictions, but instead of the properties of the *rolodex*, we examine properties of *firms* that influence their willingness to pay for a CEO's connectivity.

Isolated Firms

The first characteristic we consider is a firm's geographic position relative to its industry peers. Specifically, we distinguish between firms located within industry "clusters" from those more geographically isolated.[18] Via their location, we posit that clustered firms are already privy to local information networks (e.g., DeMarzo et al. (2003)), and thus have a reduced need to be connected to the network through their CEO's *rolodex*.

To construct industry clusters, we rank all firms within a given Fama-French 30 industry by the number of firms that are located within 100 km. We designate as clustered those firms above the median after such a ranking procedure. Our results are not sensitive to this definition

[18] Note that this is a different classification than the *local* vs. *non-local* distinction made in the previous section. *Local* connections are defined purely on distance between firm headquarters. Here, the distinction is based on industry concentration, i.e., the number of same-industry firms located within a specific radius (defined below). That is, nothing precludes a CEO of a geographically isolated firm from having multiple *local* connections. Similarly, a firm can be located within an industry cluster, even if the CEO has few (or no) *local* connections.

of clustering.[19] For example, if we use each firm's industry rank variable rather than clustered vs. un-clustered dummies, the results are nearly identical.

Table 6 shows the effect of the *rolodex* variable both inside and outside of industry clusters. In the first column, firms in clusters pay slightly above .06% per *rolodex* connection, whereas in the second column, firms outside industry clusters pay over .09%. Because some industries are more likely to form geographic clusters than others (Almazan, de Motta, Titman, and Uysal, forthcoming) industry effects do not drive these differences (industry dummies are in all regressions). The *cluster* variable is defined within industries, so that columns one and two each contain the same number of firms within each Fama-French industry.

The third column shows the results when all firms are aggregated, with dummy variables for *cluster, rolodex*, and their interaction. Consistent with the first two columns, the coefficient on *cluster* remains positive at 0.11% per connection, and highly significant (*t*-statistics = 6.23). When all firms are aggregated, the interaction between *cluster* and *rolodex* is negative and significant at the 2% level. Well-connected CEOs can always extract higher wages, but more so if their firms are isolated from their industry peers.

Interestingly, the coefficient on the *cluster* variable alone is highly significant, indicating that CEOs of clustered firms enjoy a substantial premium to that of their peer CEOs at remote firms. Although not the main focus of our analysis, we note that this is consistent with theories of firm and worker location choice based on investments in human capital, e.g., Almazan, de Motta, and Titman (2007). In their model, a firm's ability to profit from its growth opportunities depends on its proximity to other firms, from which it can pool labor resources. This competition for labor can drive wages upward, leading to higher compensation in industry clusters.

[19] In unreported results, we analyzed the effects of clustering under a number of alternative specifications. For example, we analyzed the cluster relationship across industries, and replicated our main within industry analysis for 500 km and 1000 km breakpoints. None of these alternatives change the nature of our results.

A second possibility relates to our main hypothesis that CEOs are able to extract value from their personal connections. Although BoardEx provides useful data in a number of dimensions, it, of course, does not include a comprehensive inventory of a CEO's network. If industry clusters provide more opportunities for connections to be formed, and if our *rolodex* variable is not exhaustive (as it certainly is not), then *cluster* may be picking up residual connections that may be rewarded by the labor market. Two pieces of evidence provide support for this interpretation. First, the value of *rolodex* is about 17% higher for CEOs working in clusters than for those that do not (average 132 vs. 113). This relation holds even for each component of the *rolodex* variable: *school, past professional,* and *social* connections are 14%, 28%, and 12% higher in clusters, respectively. The positive correlation between connectedness and clustering means that any omitted connections in the *rolodex* variable may manifest through the *cluster* variable, providing another reason why firms in clusters pay higher overall levels.

The second piece of evidence is what happens to the *cluster* variable when we add the CEO's *local* connections to the regression. Shown in the fourth column is the wage regression for all firms, excluding *rolodex* but including *cluster*. The coefficient on *cluster* indicates that firms in clusters pay a premium of about 10%, significant at the 1% level. However, when *local* connections are included, the magnitude of *cluster* drops by a third, and becomes significant at only the 7% level. Thus, although there are likely cluster effects on CEO compensation that are unrelated to his personal network, external connections seem to play an important role in explaining the stark differences in compensation between clustered and isolated firms.

The final three columns examine only the effect of a CEO's *local* connections, both in and out of industry clusters. Consistent with our earlier results on the aggregated *rolodex* variable, columns six and seven show that it is *local* connections that make the biggest difference when comparing firms in and out of clusters. Columns five and six demonstrate that a CEO's total pay increases by .16% for each local connection if the CEO's firm is inside an industry cluster, but by

over .27% if the firm is outside an industry cluster. The final column shows that this difference is significant at the 2% level.

Our geographic clustering analysis is important for two reasons. In addition to identifying which firms are most willing to reward connections with the highest wage premia, it also provides strong evidence against the alternative hypothesis that the CEO's opportunity cost (rather than connectedness) is driving the observed premium. (For example, a large network might allow a CEO to find alternative employment quickly or make it more likely to find a good outside "match" firm.) Although plausible, this story is inconsistent with the evidence on location and clustering. For the CEO's non-network outsider opportunities to drive this result, the CEO's portfolio of outside options will be worth *more* outside of industry clusters. This is implausible. Clusters offer fewer firms outside employment, reducing the chance of a better firm-worker match (Almazan, de Motta, and Titman (2007)). Additionally, employment transition costs are almost certainly higher outside a concentrated business district with many similar firms. Instead, the evidence suggests that firms peripheral to industry concentrations are most willing to pay for a connected CEO's network, through which they can still reap the informational benefits.

Firms with Few Connections

Another way to measure a firm's need for external connectivity is its *existing* network, i.e., the degree to which the firm's other directors and executives are already connected. Presumably, firms with existing connections through non-CEO directors or board members already are afforded network benefits (see, for example, Perry and Peyer (2005) and Güner, Malmendier and Tate (2007)). If true, then firms with substantial existing networks will be less apt to pay for a CEO's network, similar to the distinction between clustered versus non-clustered firms.

To test this idea, we define three new variables associated with the CEO's firm. *Connectivity of directors* is the average number of connections of the firm's supervisory directors;

connectivity of firm insiders is the average number of connections of the firm's executive directors; and *firm connectivity* is the average number of connections of both supervisory directors and executive directors. Our main hypothesis is that firms with high existing connectivity will pay less for a CEO's network connections. The results are presented in Table 6. The first two columns show that firms with above (below) median *firm connectivity* pay .09% (.05%) for each connection of the CEO. Well-connected firms pay less for each CEO connection. This is also confirmed in Column 3 when all firms are included in the regression and we interact *firm connectivity* with *rolodex*. As seen, the interaction is highly significant.

Interestingly, the final column shows firms with valuable existing networks pay more in absolute levels to their CEOs. Although CEO pay increases by a mere 0.08% for each non-CEO connection compared to 0.14% for each CEO connection, this is expected. After all, from the CEO's perspective, such "second order" are still expected to be valuable although less so than first-order connections (*rolodex*). For example, suppose firm A's board member knows an executive at firm B. Then, the CEO of firm A is connected to the executive at firm B *through the board member*. Although such second-order connections are most likely weaker, these can nevertheless be valuable information-generating assets for the CEO. Well-connected non-CEO executives and directors can advise the CEO, which in turn makes the CEO more productive (e.g., Adams and Ferreira (2007)).

VI. Alternative Hypotheses and Robustness

Poor Governance

Several papers have recently posited that a CEO's "connectedness" may have undesirable externalities, particularly if it weakens corporate governance. Hwang and Kim (forthcoming) find that when CEOs are socially connected to their own board members, compensation is higher and exhibits lower pay-for-performance sensitivity. Similar arguments are found in

Richardson, Seary, and Tuna (2005), Barnea and Guedj (2007), Butlter and Gurn (2008), Fracassi and Tate (2008), and Nguyen-Dang (2008).[20] With regard to our study, the specific concern is that CEOs with more external connections may be more likely to have one or more connections to a board member (an internal connection), which previous studies have shown increases compensation. Such omitted variable bias could lead to spurious correlation between our *rolodex* variable and the CEO's compensation.

There are two reasons why this interpretation is difficult to square with our findings. First, although such an explanation is consistent with the most basic tests (Table 2), it is unclear why any of the additional cross-sectional results would hold according to a governance explanation. For example, why would firms outside industry clusters have weaker corporate governance, and if so, why would such weakly governed non-clustered firms reward local connections more?

Second, and more directly, we find that our results are neither weaker nor stronger when we explicitly control for corporate governance, as in Table 7. The top panel considers a number of alternative measures for corporate governance used in other studies. The first and second columns show that the coefficient on *rolodex* is economically no different between the "dictatorship" and "democratic" firms in Gompers, Ishii, and Metrick (2003). In the third column, we consider all firms with a non-missing GIM index value and find that that, while *rolodex* is positive and significant in the regression (.07%), the interaction between *rolodex* and a "dictatorship" dummy is insignificant. Similarly, splitting the sample by medians of the "entrenchment" index, i.e., E-index (Bebchuck, Cohen and Ferrell, 2009) generates no statistical or economic differences between high E-Index firms and low E-Index firms (columns 4, 5 and 6).

The bottom panel attempts to directly control for the issues emphasized by Hwang and Kim (forthcoming), and Fracassi and Tate (2008), among others. In columns 1 and 2, we

[20] See also Schmidt (2008) and Fracassi (2008) for other firm behavior that is correlated with poor governance, as measured by common personal connections between executives and board members.

separately consider the compensation arrangements of CEOs that have a connection (of any type) to a board member of *their* firms. Such CEOs are termed as being "connected to board" in Table 7. Comparing the two columns reveals no evidence that such internal connections, presumably those that weaken the objectivity of the pay setting process, do not drive our results. The *rolodex* variable remains positive and significant for both sets of firms, and interestingly, the most independent boards pay roughly 60% *more* for each of the CEO's external connections.

The remaining columns present more evidence against a governance explanation for our findings. In column 3, we confirm prior results, showing that a CEO with a board connection is paid over 7% more than a counterpart with no such internal connection. This is what previous studies have interpreted as driven by compromised governance, presumably due to the CEO's ability to lobby his or her own compensation committee. However, when we add the CEOs *rolodex* to the specification in column 4, we find that the coefficient on the *connected to board* dummy variable shrinks and becomes statistically insignificant, while the coefficient on *rolodex* remains highly significant. Recall also that *rolodex*, by construction, contains no internal connections.

That the *connected to board* variable does not survive this specification suggests an alternative interpretation of the overall evidence. First, external connections appear highly significant determinants of pay, independent of any governance effects. With regard to internal connections, Adams and Ferreria (2007) describe a model in which the CEO is advised by board members, facilitating information transfers than increase firm value. To the extent that personal connections between the CEO and board improve information flow, the CEO's marginal productivity will increase, as will his pay. However, we note that while such an explanation would resolve both internal and external (*rolodex*) connections simultaneously influencing the CEO's pay, Table 7 does not provide evidence that they do.

The final column of the bottom panel considers the size of the board as another measure of governance, with the idea that smaller boards govern more effectively (Yermack, 1996). As

before, we find no evidence that poor governance is responsible for our results. Columns 5 and 6 consider the main specification among big (more than 8 members) and small boards, respectively. We find that the coefficient on *rolodex* is actually higher among smaller boards, the opposite of what we would expect if poor governance were driving our results, but consistent with smaller boards (with fewer external connections) being most willing to pay for a CEO's network. Column 7 considers the entire sample and adds an interaction term between *rolodex* and a *big board* dummy, where we find a negative and significant interaction. The final columns consider even a stronger signal of poor governance: big boards with a connection between the CEO and a board member. Again, evidence for poor governance driving the *rolodex* result is non-existent. In the final specification, *rolodex* remains highly significant, while even the triple interaction (*rolodex * big board * connected to board*) is insignificant.

Macroeconomic Conditions

Recent work by Schoar (2007) suggests that labor market conditions when a CEO begins his or her career may have lasting impacts on career outcomes. For example, entering the job market in a recession appears to impede a CEO's progression through the promotion process, lengthening the time until being appointed chief executive.[21] Although Schoar (2007) does not analyze CEO pay specifically, her general insight is that becoming CEO is highly path dependent, so that starting conditions can influence the eventual productivity of those that become CEOs.

Conceivably, such path dependence could also affect the size of a CEO's *rolodex*. With school connections for example, we are able to identify "pure" network effects by focusing on the year-to-year variation in the number of graduates of any particular school that go on to become executives or directors. If, however, recession effects influence graduates' labor market

[21] Schoar (2007) is careful to point out that while her findings are consistent with this interpretation, her population *excludes* candidates that did not eventually become CEOs. This alters neither the significance nor interest of the findings, but does mean that such "recession" effects cannot be interpreted as marginal probabilities of eventually becoming CEO.

outcomes (e.g. who is hired, how quickly they are promoted, how much companies invest in their human capital, etc.), then our causal interpretation of the *rolodex* variable is less satisfying.

To address this concern, we follow Schoar (2007), and identify recession years from the National Bureau of Economic Research.[22] Also following Schoar (2007), we code as "recession CEOs" those who were 25 years old during an NBER-identified recession.[23] When we analyze our main specification (untabulated), we find no meaningful differences between CEOs that began in recession years (coefficient on *rolodex* is 7 basis points) versus those that began in non-recession years (8 basis points). In the full sample, a dummy variable indicating whether the CEO entered the labor market in a recession year remains insignificant, as does the interaction between the recession indicator and the *rolodex* variable. Additionally, we have conducted the identical exercise for all our tests (particularly school connections), and find that none of our results are weakened. We conclude that the connection result we document is distinct from the economic conditions prevailing at the time CEOs begin their management careers.

Robust Rolodex

Our interpretation of the evidence takes a casual stand: CEOs with more connections can extract higher wages from their firms. However, one concern discussed earlier is that the causality may go the opposite way: CEOs have larger networks *because* they are well-paid. Recall that only social connections–for which we have little information concerning the timing of the connection–are subject to the reverse causality critique. Therefore, in Table 8, we reproduce the key results of each table with *rolodex* defined only as the sum of *school*

[22] NBER recession years are reported at http://wwwdev.nber.org/cycles/cyclesmain.html

[23] There are at least two reasons for this convention, as opposed to using the CEO's graduating year. First, the decision of when to attend school is endogenous, and is conceivably correlated with the CEO's ability or outside opportunities. Second, a substantial number of CEOs graduated from multiple institutions, making it difficult to precisely identify a single "event year" for the beginning of their management careers.

connections and *past professional* connections. We call this the *robust rolodex* variable. By focusing only on connections that must have been formed prior to the CEO's employment, we intentionally exclude the possibility that the firm's board is paying for current or future connections. Every element in the CEO's *robust rolodex* variable was formed before the CEO arrived at his current post.

As seen in Table 8, the results for *robust rolodex* are similar to those for the *rolodex* variable. When social connections are excluded, the first column shows that the point estimate increases slightly to over .08% (from .07% with the *rolodex* variable in Table 2). The second column considers valuable connections with *robust rolodex* and again finds that local industry connections to insiders are worth far more (a statistically significant .1%) than remote, out-of-industry connections to directors (statistically insignificant -.2%). A linear restriction test of the equality of these coefficients rejects the null with a p-value of .02. Column 3 confirms our prior result that firms out of industry clusters pay more for each *robust rolodex* connection. The interaction term (*robust rolodex* * *cluster dummy*) is negative and significant at the 1% level. Column 4 confirms our prior result that firms with poor connectivity also pay more for a CEO's Rolodex. The interaction term (*robust rolodex* * *firm connectivity*) is negative and also significant at the 1% level. Finally, the last column illustrates the effect of *robust rolodex* when there is a connection to a board member. We see that even in the presence of a connection to a member of one's own board, external connections remain highly significant.

CEO Fixed Effects

A number of recent papers have emphasized the explanatory power of fixed effects as they relate to management behavior and compensation. For example, Bertrand and Schoar (2003) show that CEOs have persistent "styles," so that firm policy is predictable from current management's policies at *previous* firms. Graham et al. (2008) show that incorporating CEO

dummies into pay regressions nearly triples the explanatory power, and argues that such manager fixed effects reflects otherwise unobservable attributes that influence productivity.

By contrast, our setting is not particularly amenable to the inclusion of CEO fixed effects. Perhaps the most obvious reason is that a CEO's *rolodex*, while not completely constant over his or her tenure, exhibits far less time-series than cross-sectional variation. To see this, consider that a CEO's *school* connections vary over time only as classmates enter and exit the BoardEx database (e.g., through being awarded new board seats, dying, etc.). Table 1 indicates that across all observations, the standard deviation of *school* connections is 22.5, but the *within-CEO* variation is only 1.3. Combining this with our relatively short sample period, the statistical power from tests including CEO dummies makes inference nearly impossible.

However, the cross-sectional nature of our tests does not imply that CEO fixed effects are not important. To the contrary, our evidence emphasizes a *particular* CEO attribute that is both (relatively) constant over time and substantially influences pay. Such managerial attributes are precisely what CEO fixed effects absorb in pay regressions, allowing our study to identify at least some of the unobservable heterogeneity that exists across CEOs.

VII. Conclusion

From business school curricula to the popular press, it has long been recognized that networking is an important, if not crucial, ingredient of success for top executives. A Google search including the terms "CEO" and "network" reveals hundreds of professional groups whose stated mission is to facilitate the transmission of information between top business executives. One such group targeting financials, the Bank CEO Network, boasts explicitly that its members "access information", "establish working relationships", and "interact with industry experts on topics dealing with current issues and opportunities". A number of public bank CEOs are

quoted, including Guaranty Bank and Trust CEO Huey Townsend who describes the network's value for his bank: [24]

"…One of the most beneficial parts of [the CEO Bank Network] is getting to know others in similar size banks that you can talk with, share ideas with, and use as a resource as things happen in your bank. I have many times called upon other members of the group that I am in, and I have always been able to get information that is helpful to my situation."

As this quote suggests, there are a number of dimensions through which a firm can benefit from its CEO's network of personal connections. However, because personal networks are private (the firm cannot easily access the CEO's connections without his assistance), the CEO has some pricing power in the labor market, implying that the value created though the CEO's network should be reflected in his wage. This paper is the first to find empirical support for this claim.

We find that, on average, a CEO's personal connections to other directors and executives of public companies ("external connections") are powerful predictors of both his salary and total compensation. In aggregate, the returns to a CEO's network account for over 10% of his total pay. Moreover, we find that network connections likely to be most valuable–to those within the same industry, to those geographically close, or to executives involved in other firms' day-to-day operations–command the highest wage premium. Such cross-sectional variation in the value of external connections poses a particular challenge to alternative explanations (e.g., the network capturing the CEO's general ability or work ethic).

Additionally, we find that firms most likely to benefit from external connectivity pay the highest prices. Firms isolated from their industry peers pay more for each personal connection within the CEO's network; similarly, firms with poorly connected board members (i.e., those with fewer external connections) pay higher prices for their CEOs' networks. Each of these

[24] http://www.bankceomember.com/html/what_members_say.html

results holds for a variety of connection types, including prior connections formed during school years, and those formed from past working relationships.

The effect of external connections on pay does not appear related to the firm's governance environment. Specifically, we confirm previous studies by showing that when a CEO is connected to a member of *his* or *her* own board member through a social, school, or past professional connection, pay increases. However, the effect of such internal connections is neutralized when we include the CEO's connections to those *outside* the firm, which cannot influence the CEO's pay through weaker governance. Reconciling these views is possible by recognizing that connectivity is endogenous–CEOs with many external connections are more likely to be internally connected, although only the former should impact firm value.

Our analysis focuses on the labor market implications of CEO connectivity, and stops short of pinpointing particular channels through which CEO connectivity benefits firms. Research on the value of a CEO's political connections (e.g., Faccio (2006) and Bertrand, Kramarz, Schoar, and Thesmar (2005)) notwithstanding, anecdotal evidence such as the above quote indicates a number of likely channels through which a CEO's personal connections can accrue value to the firm (e.g., financing, increased sales, efficiency improvements, etc.). Identifying the specific channels by which an executive's external network benefits the firm remains a promising avenue for future research.

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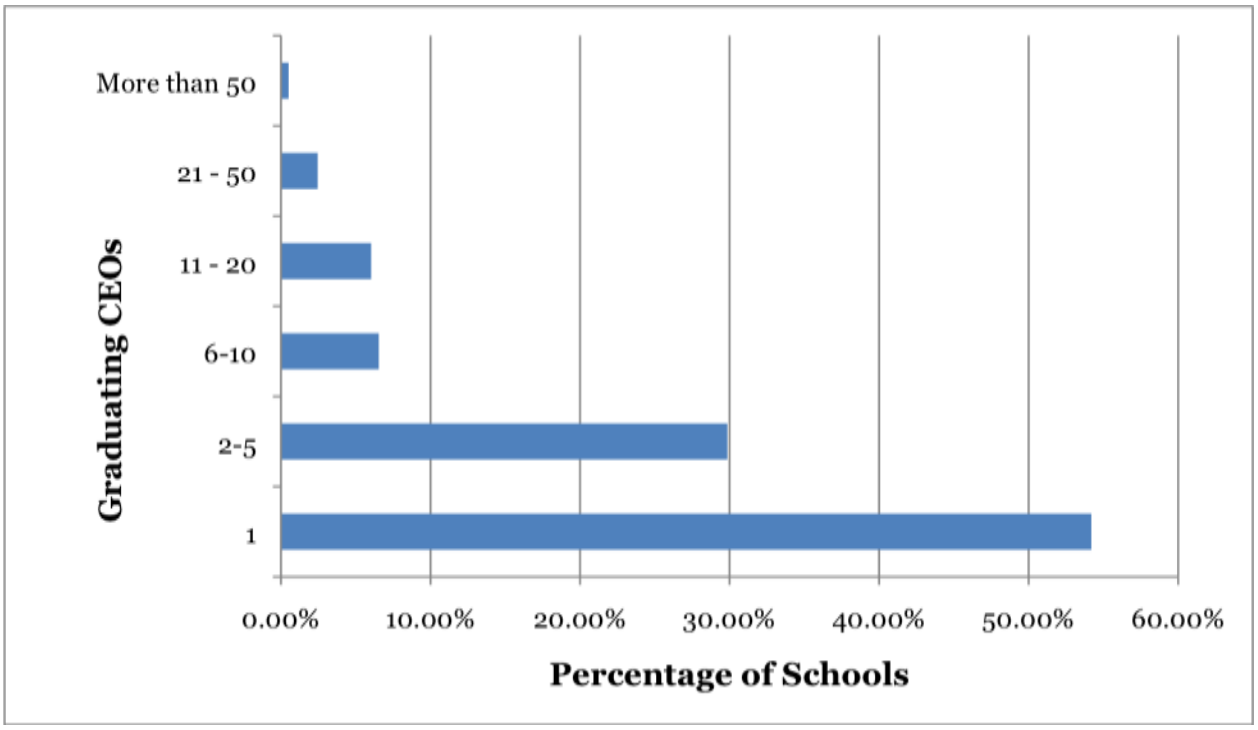
Figure 1: CEOs and Schools

The top figure graphs the percentage of schools in our sample with different ranges of graduating CEOs in our sample. The bottom table displays the top 25 schools ranked by the number of graduating CEOs. NOTE: BoardEx makes a distinction between professional schools and underlying institutions (e.g., Harvard Business School is distinct from Harvard University).



Top 25 Schools (# of CEOs in our sample)

1. Harvard Business School (202)	10. Columbia University (38)	18. University of Chicago (26)
2. Stanford University (91)	10. Princeton University (38)	18. UCLA (26)
3. Harvard University (81)	12. Stanford University, GSB (37)	20. Northwestern University (25)
4. Wharton School of Business (63)	13. New York University (35)	20. University of Illinois (25)
5. MIT (60)	14. Dartmouth College (33)	20. University of Notre Dame (25)
6. Cornell University (44)	15. USC (32)	23. University of Texas (24)
7. University of Michigan (43)	16. Yale University (31)	23. Kellogg School of Management (24)
8. University of Wisconsin (41)	17. UC Berkeley (27)	25. Indiana University (23)
9. Purdue University (40)		

Table 1: Summary Statistics

Total compensation (TDC1), Salary, Bonus and Option Pay are from ExecuComp. Tenure is the time (in years) since the executive became CEO at the firm. Age is the CEO's age according to ExecuComp. Assets and Sales are taken from Compustat. Last Year (Two Years) Return is the raw one-year (two-year) cumulative return ending on the fiscal year end date. Idiosyncratic volatility is the average squared error taken from a CAPM regression of monthly returns over the past 5 years. Market-to-Book is the ratio of market to book equity. Rolodex is the sum of School Connections, Social Connections and Past Professional Connections. Past Professional Connections are between executives who no longer work for the same firm, School Connections are between two people that attend the same university and have graduation years that are less than 2 years apart, and Social connections are between two people who are members of the same social organization. Following Fracassi (2008) and Fracassi and Tate (2008), we only form social connections among individuals who have "active roles" in social organizations which means we require the role description in the BoardEx database to be more than a "member" for all organizations except clubs. A Local connection is made between two people whose firms have headquarters that are less than 100 kilometers apart. An Industry connection is made between two people who work in the same Fama-French 30 industry. A Degree connection is made between two people who received the same degree type. The Robust Rolodex is the sum of School Connections and Old Professional Connections. The Local Rolodex is the sum of local school connections, local social connections and local past professional connections.

	Mean	Median	Standard Deviation	10th Percentile	90th Percentile
Total Compensation (thousands)	5937.08	2937.52	245599.06	737.67	12627.77
Salary	697.51	650.00	367.08	322.92	1084.27
Bonus	794.95	332.00	1744.07	0.00	1867.32
Option Pay	4442.85	1655.69	24339.39	51.21	15718.07
Tenure	6.97	5.00	7.24	1.00	16.00
Age	55.51	56.00	7.43	46.00	64.00
Assets	16058.48	1751.50	80879.86	276.11	24153.00
Sales	5851.32	1351.39	17355.70	225.76	12959.25
Last Year Return	17.76%	10.61%	59.53%	-32.82%	67.05%
Last Two Years Return	40.66%	21.54%	123.56%	-39.98%	119.66%
Idiosyncratic Volatility	0.0043	0.0014	0.0085	0.0001	0.0117
Market-to-Book	2.86	2.05	2.78	0.90	7.71
Rolodex	122.61	75.00	137.00	4.00	308.00
School Connections	15.39	6.00	22.45	0.00	46.00
Social Connections	65.63	23.00	95.60	0.00	202.00
Past Professional Connections	41.60	16.00	66.39	0.00	118.00
Local Rolodex	26.91	12.00	38.69	0.00	73.00
Robust Rolodex	56.98	30.00	74.20	2.00	148.00
School & Degree Connections	8.16	2.00	14.42	0.00	21.00
Industry Social Connections	12.77	3.00	23.43	0.00	40.00
Local Profession Connections	21.31	9.00	33.76	0.00	57.00

Table 2: Connections, Salary and Total Compensation

The Rolodex is the sum of past professional connections, school connections and social connections. Prior Year (2-Year) Return is the 1-year (2-year) cumulative return ending at the firm's fiscal year-end. Idiosyncratic volatility is the variance from a CAPM regression of monthly returns over the prior 60 months. Tenure is the time (in years) the CEO has been with his firm. Industry refers to the Fama-French 30 industries. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Total Compensation				Dependent Variable: Log(Total Compensation)			
Rolodex	19.99***	16.39***	17.71***	28.55***	0.00294***	0.000739***	0.000684***	0.00148***
	(2.893)	(3.061)	(3.081)	(5.884)	(0.000156)	(0.000147)	(0.000146)	(0.000232)
Rolodex Squared				-0.0233***				-1.51e-06***
				(0.00710)				(3.39e-07)
Total Assets		0.0243***	0.0227***	0.0245***				
		(0.00344)	(0.00332)	(0.00294)				
Log(Assets)						0.355***	0.410***	0.408***
						(0.0133)	(0.0153)	(0.0151)
Prior Year Return		-838.6*	-413.9	-665.8		-0.0380*	0.0241	-0.0101
		(472.7)	(456.1)	(478.7)		(0.0222)	(0.0226)	(0.0222)
Prior 2-Year Return		944.2***	1142***	926.8***		0.0649***	0.0975***	0.0689***
		(310.4)	(331.2)	(312.1)		(0.0146)	(0.0160)	(0.0145)
Idiosyncratic Volatility		99511**	115174**	111029**		7.913***	6.857**	6.275*
		(44560)	(52290)	(51313)		(3.006)	(3.315)	(3.248)
Market to Book		522.1***	-0.549	424.1***		0.0719***	0.000155*	0.0565***
		(100.5)	(0.483)	(98.28)		(0.00605)	(8.25e-05)	(0.00576)
Tenure		-37.45	-51.38	-54.95		0.0113**	0.0122**	0.0117**
		(69.17)	(74.57)	(74.44)		(0.00556)	(0.00547)	(0.00541)
Tenure Squared		-0.0530	0.110	0.279		-0.000610***	-0.000653***	-0.000633***
		(1.715)	(1.850)	(1.866)		(0.000204)	(0.000199)	(0.000199)
Year Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Industry- Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Observations	11078	10579	10579	10579	11070	10571	10571	10571
Adjusted R^2	0.012	0.024	0.023	0.026	0.107	0.320	0.345	0.360

	Dependent Variable: Salary				Dependent Variable: Log(Salary)			
Rolodex	0.977***	0.874***	0.916***	1.295***	0.00119***	0.000342**	0.000385**	0.000747***
	(0.0740)	(0.0736)	(0.0720)	(0.135)	(0.000130)	(0.000147)	(0.000161)	(0.000243)
Rolodex Squared				-0.000754***				-6.87e-07*
				(0.000282)				(3.75e-07)
Total Assets		0.000513**	0.000444*	0.000491**				
		(0.000230)	(0.000235)	(0.000236)				
Log(Assets)						0.134***	0.151***	0.149***
						(0.0133)	(0.0181)	(0.0184)
Prior Year Return		-9.820**	-5.545*	-6.745*		-0.00481	-0.00250	-0.000799
		(3.917)	(3.309)	(3.834)		(0.00944)	(0.00991)	(0.00962)
Prior 2-Year Return		-12.99***	-8.685***	-9.631***		-0.0175**	-0.0130*	-0.0113
		(2.231)	(2.049)	(2.243)		(0.00800)	(0.00753)	(0.00773)
Idiosyncratic Volatility		-8508***	-6138***	-6145***		-12.14***	-9.099***	-9.076***
		(630.3)	(669.9)	(666.3)		(2.238)	(2.401)	(2.400)
Market to Book		2.414	-0.0360***	2.064		0.000367	3.15e-05	-0.00321
		(2.387)	(0.0138)	(2.425)		(0.00544)	(3.47e-05)	(0.00501)
Tenure		4.775**	3.764*	3.672*		0.00897**	0.00828**	0.00807**
		(2.194)	(2.053)	(2.044)		(0.00379)	(0.00403)	(0.00405)
Tenure Squared		-0.118	-0.0878	-0.0828		-0.000203	-0.000174	-0.000167
		(0.0842)	(0.0767)	(0.0763)		(0.000135)	(0.000140)	(0.000141)
Year-Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Industry-Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Observations	11144	10643	10643	10643	11063	10565	10565	10565
Adjusted R^2	0.133	0.194	0.254	0.259	0.036	0.121	0.149	0.150

Table 3: Total Compensation and Rolodex Components

School connections count the number of individuals in the BoardEx database who attended the same school and graduated within a year of the CEO. School and Degree connections are the same as school connections with the additional requirement that the CEO and individual acquired the same degree (degrees are classified into 6 categories as in Cohen, Frazzini and Malloy, 2008). Past professional connections are the sum of professional connections where the CEO and connected individual no longer work at the same firm. Social connections are the sum of connections of individuals with "active roles" in the same social organization (Fracassi and Tate, 2008). Controls are Log(Assets), Prior Year Return, Prior 2 Years Return, Idiosyncratic Volatility, Market to Book, Tenure and Tenure Squared as in Table 2. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Log(Total Compensation)							
Rolodex	0.000684***							
	(0.000147)							
Social Connections		0.000642***	0.000786***					
		(0.000226)	(0.000224)					
Past Professional Connections		0.000574**		0.000773***				
		(0.000273)		(0.000263)				
School Connections		0.00154**			0.00226***	0.00168**		
		(0.000628)			(0.000625)	(0.000800)		
School and Degree Connections							0.00368***	0.00260**
							(0.000886)	(0.00114)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES	YES	YES
School-Fixed Effects	NO	NO	NO	NO	NO	YES	NO	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	10571	10571	10571	10571	10571	9204	10571	9204
Adjusted R^2	0.358	0.358	0.356	0.355	0.355	0.455	0.356	0.455

Table 4: Total Compensation and Important Connections

Local (Remote) connections are equal to number of individuals in the Rolodex who work for firms with headquarters less than 100 (more than 2000) kilometers apart. Industry (Out-of-Industry) Connections are equal to number of individuals in the Rolodex who work (do not work) in the same Fama-French 30 industry. Connections to Insiders (Directors) are equal to the number of individuals in the Rolodex that BoardEx classifies as an "Executive Director" ("Supervisory Director"). Combinations of Industry, Out-of-Industry, Local, Remote, Insider and Director connections are similarly defined. Controls are Log(Assets), Prior Year Return, Prior 2 Years Return, Idiosyncratic Volatility, Market to Book, Tenure and Tenure Squared as in Table 2. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively. The last row reports the p-value from a linear restriction test (F-test) testing whether the coefficients of the two variables in the column are equal.

	Dependent Variable: Log(Total Compensation)						
Connections to Directors	-0.000996 (0.000660)						
Connections to Insiders	0.00237*** (0.000763)						
Out-of-Industry Connections		0.000542*** (0.000164)					
Industry Connections		0.00111 (0.000707)					
Remote Connections			0.00113** (0.000480)				
Local Connections			0.00151*** (0.000425)				
Remote and Out-of-Industry Connections				0.00151*** (0.000373)			
Local and Industry Connections				0.00438*** (0.000960)			
Remote Connections to Directors					-0.00343 (0.00549)		
Local Connections to Insiders					0.00372*** (0.000820)		
Out-of-Industry Connections to Directors						0.000693*** (0.000267)	
Industry Connections to Insiders						0.00328** (0.00141)	
Industry, Local Connections to Insiders							0.00902*** (0.00201)
Out-of-Industry, Remote Connections to Directors							-0.00270 (0.00368)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	10571	10571	10571	10571	10571	10571	10571
Adjusted R^2	0.359	0.358	0.357	0.357	0.357	0.357	0.357
p-value of Linear Restriction Test	0.0167	0.4673	0.589	0.0104	0.1939	0.0842	0.0052

Table 5: Total Compensation and Industry Clusters

The Rolodex is the sum of old professional connections, school connections and social connections. For each Fama-French 30 industry, we rank firms by the number of other firms in their industry that have headquarters within 100 kilometers. Inside (Outside) cluster refers to firms with more than (less than) the median number of firms in their industry within 100 kilometers. The Cluster Dummy takes the value 1 if a firm has more than the median number of firms in their industry within 100 kilometers. Local are equal to number of individuals in the Rolodex who work for firms with headquarters less than 100 kilometers apart. Controls are Log(Assets), Prior Year Return, Prior 2 Years Return, Idiosyncratic Volatility, Market to Book, Tenure and Tenure Squared as in Table 2. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Log(Total Compensation)							
	Inside Cluster	Outside Cluster	All Firms	All Firms	All Firms	Inside Cluster	Outside Cluster	All Firms
Rolodex	0.000681***	0.000906***	0.00108***					
	(0.000225)	(0.000166)	(0.000173)					
Cluster Dummy			0.149***	0.0971***	0.0659*			0.108***
			(0.0444)	(0.0363)	(0.0360)			(0.0400)
Rolodex * Cluster Dummy			-0.000503**					
			(0.000214)					
Local Connections					0.00172***	0.00160***	0.00273***	0.00323***
					(0.000490)	(0.000589)	(0.000794)	(0.000751)
Local Connections * Cluster Dummy								-0.00195**
								(0.000849)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	5354	5217	10571	10571	10571	5354	5217	10571
Adjusted R^2	0.306	0.425	0.347	0.341	0.343	0.304	0.421	0.343

Table 6: Total Compensation and Firm Connectivity

The Rolodex is the sum of past professional connections, school connections and social connections for the CEO. Firm connectivity is the average number of connections of non-CEO insiders and directors. Connectivity of Directors is the average number of connections of non-CEO supervisory directors (SDs) in Boardex. Connectivity of Firm Insiders is the average number of connections of non-CEO executive directors (EDs) in Boardex. High(Low) Connectivity firms are those with an above (low) median value for Firm Connectivity. Controls are Log(Assets), Prior Year Return, Prior 2 Years Return, Idiosyncratic Volatility, Market to Book, Tenure and Tenure Squared as in Table 2. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Log(Total Compensation)					
	Low Connectivity Firms	High Connectivity Firms	All Firms	All Firms	All Firms	All Firms
Rolodex	0.000903***	0.000538***	0.00139***	0.00123***	0.00110***	0.00138***
	(0.000184)	(0.000182)	(0.000263)	(0.000220)	(0.000197)	(0.000257)
Firm Connectivity			0.00204***			
			(0.000364)			
Rolodex * Firm Connectivity			-5.63e-06***			
			(1.41e-06)			
Connectivity of Directors				0.00140***		0.00111**
				(0.000396)		(0.000455)
Connectivity of Directors * Rolodex				-3.63e-06***		-2.67e-06**
				(9.81e-07)		(1.05e-06)
Connectivity of Firm Insiders					0.00116***	0.000812***
					(0.000224)	(0.000223)
Connectivity of Firm Insiders * Rolodex					-4.24e-06***	-2.99e-06**
					(1.33e-06)	(1.35e-06)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	5300	5271	8526	10479	8752	8718
Adjusted R^2	0.289	0.401	0.355	0.360	0.356	0.356

Table 7: Total Compensation, Connectivity and Corporate Governance

Dictator (Democratic) firms are those with a Gompers-Ishii-Metrick Index of 14 or higher (5 or lower). A High (Low) E-Index firm has an above (below) median Entrenchment Index value in our sample. Connection to Board means the CEO has either a past professional, social or school connection to a board member. Connection to Board Dummy takes the value 1 if the CEO has a social, past professional or school connection to a member of the board of directors and is zero otherwise. Big (Small) Boards are those with more than (no more than) 8 members. Controls are Log(Assets), Prior Year Return, Prior 2 Years Return, Idiosyncratic Volatility, Market to Book, Tenure and Tenure Squared as in Table 2. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Log(Total Compensation)					
	Dictator Firms	Democratic Firms	All Firms	High E-Index Firms	Low E-Index Firms	All Firms
Rolodex	0.000391	0.000313	0.000706***	0.000661***	0.000737***	0.000793***
	(0.000555)	(0.000538)	(0.000151)	(0.000151)	(0.000252)	(0.000293)
Dictator Dummy			0.107			
			(0.0752)			
Rolodex * Dictator Dummy			0.000202			
			(0.000380)			
High E-Index						0.0516***
						(0.0189)
Rolodex * High E-Index						-3.46e-05
						(8.13e-05)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	553	497	9117	5444	4835	10279
Adjusted R^2	0.473	0.540	0.353	0.384	0.336	0.356

	Dependent Variable: Log(Total Compensation)							
	Connected to Board	Not Connected to Board	All Firms	All Firms	Small Boards	Big Boards	All Firm	All Firms
Rolodex	0.000555***	0.000817***		0.000703***	0.000906***	0.000529***	0.00149***	0.00154***
	(0.000162)	(0.000227)		(0.000211)	(0.000230)	(0.000150)	(0.000341)	(0.000363)
Connected to Board			0.0723*	0.0582				0.0312
			(0.0413)	(0.0412)				(0.0453)
Rolodex * Connected to Board				-6.56e-05				-3.31e-05
				(0.000238)				(0.000295)
Board Size							0.0144*	0.0113
							(0.00788)	(0.00876)
Rolodex * Board Size							-8.80e-05***	-0.000108***
							(3.17e-05)	(3.43e-05)
Big Board * Connected to Board								0.0242
								(0.0590)
Rolodex * Big Board * Connected to Board								0.000261
								(0.000263)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	6261	4310	10571	10571	6522	4049	10571	10571
Adjusted R^2	0.397	0.313	0.355	0.358	0.263	0.393	0.359	0.359

Table 8: Robust Rolodex

The Rolodex is the sum of past professional connections and school connections. All other variables are defined in previous tables. Robust standard errors clustered by firm are in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Dependent Variable: Log(Total Compensation)				
Robust Rolodex	0.000847***		0.00146***	0.00211***	0.00123***
	(0.000229)		(0.000287)	(0.000507)	(0.000360)
Robust Rolodex: Remote, Out-of-Industry Director Connections		-0.00223			
		(0.00475)			
Robust Rolodex: Local, Industry Insider Connections		0.0101***			
		(0.00283)			
Cluster Dummy			0.138***		
			(0.0403)		
Robust Rolodex * Cluster Dummy			-0.00107***		
			(0.000393)		
Firm Connectivity				0.00197***	
				(0.000348)	
Firm Connectivity * Robust Rolodex				-9.71e-06***	
				(2.80e-06)	
Connected to Board					0.0935**
					(0.0432)
Connected to Board * Robust Rolodex					-0.000602
					(0.000402)
Firm Controls (from Table 2)	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES
Industry-Fixed Effects	YES	YES	YES	YES	YES
Observations	10571	10571	10571	8526	10571
Adjusted R^2	0.356	0.355	0.358	0.354	0.357