NBER WORKING PAPER SERIES

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Working Paper 19809
http://www.nber.org/papers/w19809

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
January 2014

We thank Rajesh Aggarwal, Olubunmi Faleye, Wayne Lee, Tomas Jandik, Johanna Palmberg, Jingxian Wu, Tim Yeager, and seminar participants at the National University of Singapore, Oklahoma State University, the Ratio Colloquium for Young Social Scientists, the University of Alberta, the University of Arkansas, and the University of Illinois at Urbana-Champaign for helpful discussions. The authors gratefully acknowledge financial support from the Bank of Canada, the Social Sciences and Humanities Research Council, the National Science Foundation and the Arkansas Science and Technology Authority, with resources managed by the Arkansas High Performance Computing Center. These are the views of the authors and do not necessarily reflect the views of the Bank of Canada or the National Bureau of Economic Research.

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NBER Working Paper No. 19809
January 2014
JEL No. D85,G02,G3,G34,G38,K22,L2,Z13

ABSTRACT

Shareholder valuations are economically and statistically positively correlated with more powerful independent directors, their power gauged by social network power centrality measures. Sudden deaths of powerful independent directors significantly reduce shareholder value, consistent with independent director power "causing" higher shareholder value. Further empirical tests associate more powerful independent directors with fewer value-destroying M&A bids, more high-powered CEO compensation and accountability for poor performance, and less earnings management. We posit that more powerful independent directors can better detect and counter managerial missteps because of their better access to information, their greater credibility in challenging errant top managers, or both.

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1. Introduction

Fama (1980, 294) entrusts self-interested independent directors, valued for their reputations for maximizing shareholder value, with informing and, if necessary, disciplining errant CEOs. Independent directors with damaged reputations hold fewer subsequent directorships and court personal liability (Srinivasan 2005; Fos & Tsoutsoura 2013; Brochet & Srinivasan 2013). While multimillion dollar judgments, such as those the directors of Enron and WorldCom ended up paying personally, are rare (Black et al. 2006), Voltaire's observation that "In this country it is a good thing to kill an admiral from time to time to encourage the others" may pertain. As with hostile takeovers, also rare, the threat may suffice to affect CEO behavior. These potential costs of inaction press self-interested independent directors towards behaving as Fama posits.

Nonetheless, empirical evidence linking more independent directors to higher shareholder valuations is recalcitrant (Weisbach 1988; Daily & Dalton 1992; Yermack 1996; Dalton et al. 1998; Bhagat & Black 1999; Heracleous 2001; Bhagat & Black 2002; Shivdasani & Zenner 2004; Dulewicz & Herbert 2004; Erickson et al. 2005; Weir & Laing 2001; though see also Duchin, Matsusaka & Ozbas 2010). Overall, Hermalin & Weisbach's (2003) assessment "there does not appear to be an empirical relationship between board composition and firm performance" stands essentially unchallenged (Adams, Hermalin & Weisbach 2010).

This dogged statistical independence of legally independent directors requires explanation. Higgs (2003, p. 39) advances one explanation, reporting that on British boards

> *"Almost half of the non-executive* [independent] *directors surveyed … were recruited to their role through personal contacts or friendships. Only 4% had had a formal interview, and 1% had obtained their job through answering an advertisement. This situation … can lead to an overly familiar atmosphere in the boardroom."*

Mace's (1971, 99) quotes CEOs explaining their selecting outside directors who are "friendly, if you will" and "non-boat-rockers"; with one CEO avowing "selecting outside directors … much like a trial lawyer goes about the selection of a jury". Bebchuk and Fried (2006), Cohen et al. (2013) and many others argue that little has changed, and that independent directors selected for diffidence are unlikely to challenge the CEO who appoints them, and insufficiently informed to recognize looming governance problems in any event. Were independent directors utterly ineffective, no correlation between director independence and firm valuation would be evident.

Fama (1980) posits a second explanation: that economic selection so effectively culls firms with ineffective independent directors and depressed shareholder valuations that none are evident. Thus, if independent directors, and boards more generally, were always either fully effective or fully ineffective, their structures would appear irrelevant.

We propose a third explanation. Following the social psychology literature, (Proctor and Loomis 1951; Sabidussi 1966; Bonacich 1972; Freeman 1977, 1979; Watts & Strogatz 1998; Hanneman & Riddle 2005; Jackson 2008) we construct power centrality measures for every director in the United States, discerning connections from commonalities in their *curriculum vitae*. We combine four commonly used power centrality measures: *degree centrality* (the number of people with whom the individual has direct connections), *closeness centrality* (her mean degrees of separation from all others in the network), *betweeness centrality* (the number of pairs of people between whom she serves as a connection), and *eigenvector centrality* (a recursive measure in which each individual's social power is a weighted average of the social power of her direct connections). [1] More important connections provide more access to information and more capacity for influencing others – that is, more power.

We say an individual is *powerful* if and only if three out of four of her power centrality measures lie within the top quintiles of their respective distributions. This is justifiable for three reasons. First, power centrality measures have Power Law distributions, wherein e.g. 20% of individuals have 80% of the power. Second, requiring at least three centrality measures in their top quintiles excludes pathological cases, such as a director whose many connections all go through her well-connected CEO. Such a director might have high closeness and eigenvector centralities, but her low degree and betweenness centralities would bar her from being classified as powerful. Third, differences in interpreting these alternative measures are incompletely understood. Finally, the different measures have different degrees of robustness to incomplete data. Aggregating lets us combine all aspects of connectedness and lets the different measures complement each other. We say a firm has a powerful independent board if a majority of its directors are legally independent and a majority of its independent directors are powerful.

We find that firms with powerful independent boards have economically and statistically significantly higher firm valuations. A baseline point estimate links a powerful independent board to a 4.2% higher average Q ratio all else equal. An event study of director sudden deaths shows that powerful independent directors cause higher valuations. Finally, we link powerfully independent boards to significantly fewer value-destroying takeover bids, more abnormal CEO turnover after poor performance, more performance-related CEO pay, and less earnings manipulation. All of these relationships suggest that powerfully independent boards more effectively monitor and discipline errant CEOs.

We posit a behavioral theory of independent director effectiveness: independent directors can better fulfill the charge Fama assigns if they are more powerful. Because more socially powerful independent directors have more and more important connections, they have better information and more influence. Mace (1971, 186) recounts directors explaining that they avoid criticizing the CEO "to avoid looking like idiot". Better information removes this impediment. Mace cites CEOs explaining that they "do not want penetrating, issue-provoking questions, but only those that are gentle, supportive and an affirmation that the board approves of him" and that "board members should manifest by their queries, if any, that they approve of the management. If a director feels he has any basis for doubts or disapproval … he should resign." More powerful directors, with their own extensive web of connections, can more effectively challenge an errant CEO, rally others to action, and (if necessary) resign without materially reducing their own social power.

Our findings are highly robust. All regressions include firm and year fixed effects and cluster residuals by firm. The findings are robust to reasonable changes in the definitions of key variables, lists of control variables, and winsorization thresholds. Including controls for the social power of the CEO (Adams et al. 2010; El-Khatib et al. 2013), the CEO not chairing the board (Fama and Jensen 1983; Jensen 1993), the social power and independence of a non-CEO chair, and the social power of inside directors does not materially change the central findings. Moreover, neither a powerful CEO nor a powerful non-CEO chair, whether independent or not,

[1] Milgram (1967) famously estimates the mean closeness centrality between randomly chosen pairs of Americans as "6º of separation".

has any statistically robust impact on shareholder valuation.[2]

The remainder of the paper is organized as follows. Section 2 presents a behavioral theory of independent director efficacy motivating our power measures. Section 3 describes the data and variables. Section 4 presents the results and robustness checks. Section 5 concludes.

2. Data and Variables

This section describes the social connection data and the mathematics we use to calculate these centrality measures. We then define a powerful independent director (PID) as an individual with at least three of these four centrality measures falling in their top quintiles of the distributions of the centrality measures of all officers and directors of listed firms included in Boardex.

2.1 Social Network Centrality as A Measure of Power

Social network theory (Milgram (1967), Proctor and Loomis (1951), Sabidussi (1966), Bonacich (1972), Freeman (1977, 1979), Watts and Strogatz (1998)) provides a set of network centrality measures, which in different ways measure a person's power. These measures, computed from ties between thousands of individuals, are intuitively plausible and empirically validated in diverse contexts (Padgett and Ansell (1993), Banerjee et al. (2012)).

A social network, representing individual as nodes, social connections as lines between nodes, and the quickest routes for one individual to reach another as geodesic distances (shortest paths) between nodes, allows the calculation of each individual's power centrality, commonly interpreted as her social power. We employ four alternative measures of power centrality.

The simplest is an individual's *degree centrality* (D), the number of direct connections that individual has with other people. Thus, D is an integer between 0 and N-1. Intuitively, a director with more connections may have more direct sources of information and more acquaintances to influence.

A second measure, called *betweenness centrality* (B) is the number of shortest paths between the $(N-1)\times(N-2)/2$ possible pairs of other people that pass through the individual in question. Intuitively, a director with a higher B has more power to connect people with each other and more power to provide information about people to each other. Padgett and Ansell (1993) use high betweenness to explain the Medici family dominance in 15th century Florence: other elite families generally connected to each other only through the Medicis, who had direct times to most elite families.

A third measure, *closeness centrality* (C) averages the degrees of separation – that is, the number of links in the shortest paths – between the individual in question and every one of the other $N - 1$ individual in the network. Closeness centrality is defined as $N - 1$ divided by the sum of these degrees of separation. Intuitively, having closer connections to more people gives an individual readier access to their information and more potential to influence them.

A fourth measure, *eigenvector* centrality (E) is recursively calculated. Intuitively, E is a weighted average of the importance of the individual's direct contacts, with weights determined by the importance of their direct connections, with weights … and so on.

[2] Such a chair is an alternative potential voice of dissent against an errant CEO. Morck, Shleifer and Vishny (1989), Finkelstein and D'Aveni (1994), and others link CEOs chairing their own boards to low shareholder value. However, Anderson and Anthony (1986), Stoeberl and Sherony (1985), Faleye (2007), and Coles et al. (2013) report a positive correlation, while Brickley, Coles, and Jarrell (1997), Rechner and Dalton (1991), Baliga, Moyer, and Rao (1996), and Dalton et al. (1998) dispute these findings.

Taken together, these centrality measures can be interpreted as meaningfully measuring an individual's power (Hanneman and Riddle (2005, Chapter 10)). High centrality individuals are more able to receive information, and to pass information along or not strategically. More connections and more central network positions mean more resources, more friends to fall back on, and more powerful friends, all of which lessen the downside of challenging an errant CEO.

We use relational data reported in BoardEx from 1996 through 2010 to approximate the social network of executives and directors of over 8,000 U.S. public and private firms. These data include background information that let us estimate both current business relationships and common backgrounds potentially indicating relationships going back many decades. Each individual in the network is a node, and each connection (past and current) is a link. These connections are all professional.

We say a link exists between two individuals if their graduate or professional education overlap, if they share prior or current common work experience in listed and unlisted firms, or if they shared board membership in non-profit organizations. We further say that such a link exists in a given year if it existed the previous year. Obviously, a director's network also includes links from her social life – connections through family, neighbors, and friends – but these data cannot be collected systematically. The advantage of using only professionally formed connections to construct our network is that the data are from proxy statements and annual reports, and thus likely to be more objective, comparable across individuals, and free of self-selection bias. The cost of using only professionally formed connections is that our representation of the network likely misses many connections in these individuals' true (unobservable) networks.

In total, our data include roughly 12 million pairs of connections formed through positions at listed firms, and another 9 million pairs formed through education and positions at unlisted firms and non-profit organizations.[3] This includes all reported individuals in BoardEx with at least one connection to the rest of the network. Table 1 reports the number of nodes in each year's network

[Table 1 about here]

For each year, using an IBM iDataPlex supercomputer, we calculate the four measures of power centrality for each individual in the network. As detailed below, some measures of centrality are based on the shortest social distances between pairs of individuals. Not including individuals from unlisted firms and firms outside the list of S&P 1500 would miss prominent individuals, such as bankers and hedge fund managers, who serve as bridges to shorten one's social distance to many parts of the network.

For each individual, *degree centrality* is simply the number of unique and direct connections; that is

$$D_i \equiv \sum_{j \neq i} x_{ij}$$

where $x_{ij} = 1$ if individuals i and j have a connection that year, and zero otherwise.

The first step for calculating both closeness and betweenness centralities is to identify the shortest social distance (or geodesic distance, g) between any pair of individuals in the network.

[3] We lack information on the quality of these 21 million pairs of connections. For example, we do not know whether the individuals at each end of the link are friendly or hostile, close friends or just acquaintances, talk daily or every ten years or never.

If i does not know j directly, but knows k who knows j, then the shortest social path from i to j is $i - k - j$, and thus i and j have a shortest distance of $g_{i,j} = 2$.

An individual's *closeness centrality* is the inverse of the sum of the shortest distances between her and every other individual in the network:

$$Closeness_i = \frac{n-1}{\sum_{i \neq j \in N} g_{ij}}$$

This definition assumes that the entire network is connected: that is, there exists at least one path between any two nodes. However, our data on business professionals contain a number of small sub-networks not connected to the rest of the nodes. Setting the shortest distance between two unconnected nodes to $g_{ij} = \infty$ in such a case is untenable because one infinite value in the denominator reduces all closeness measures to zero. Excluding infinite g_{ij} from the calculation is also problematic. Individual A in a small network might have a much higher *Closeness* than individual B in a large network, but A might have much less power than B, whose influence extends across many more people. As an extreme case, consider a sub-network with two connected individuals. Dropping all unconnected nodes leaves each has the highest possible Closeness value, one; yet they have negligible social influence because they are unconnected to the remaining 300,000+ business professionals.

To account for these data issues, we modify closeness centrality to

$$C_i \equiv \frac{n-1}{\sum_{i \neq j \in N} g_{ij}} \times \frac{n}{N}$$

where n is the size of the sub-network (or component) individual i belongs to, and N is the total number of individuals in the entire network. This definition scales the original closeness measures by the size of the individual's network to more accurately reflect her overall social power. It follows that individuals in a larger network have higher closeness values than those in smaller networks, all else equal.

Betweenness is the incidence of an individual lying on the shortest path between pairs of other members of the network. For every possible triplet of individuals i, j and k, we define the indicator variable

$$m_{i,j}(k) = \begin{cases} 1 & \text{if } k \text{ is a node on a geodesic linking } i \text{ and } j \\ 0 & \text{otherwise} \end{cases}$$

The *betweenness centrality* of k is then

$$B_i \equiv \sum_{i<j \neq k \in N} \frac{m_{i,j}(k)/m_{i,j}}{(n-1)(n-2)/2}$$

where $m_{i,j}$ is the number of geodesics linking i and j. This adjustment is necessary because, while the length of the shortest path between two individuals is unique, they may be linked by more than one equally short path.

Eigenvector centrality is recursively calculated. Individual i's eigenvector centrality is his importance, weighed by the similarly calculated importance of all his direct contacts, each weighted by the importance of their direct connections, and so on. More formally, assume the existence of this measure for person i, and denote it E_i. In matrix notation, with $\mathbf{E} \equiv [E_1, \ldots E_i, \ldots E_N]$, the recursions collapse into the condition that $\lambda\mathbf{E}'\mathbf{E} = \mathbf{E}'\mathbf{AE}$. Thus, $\mathbf{E}$ is an eigenvector of the matrix of connections $\mathbf{A}$, and λ *is* its associated eigenvalue. To ensure that $E_i \geq 0$ for all individuals, the modified Perron-Frobenius theorem is invoked and the eigenvector centrality values of the individuals in the network are taken as the elements of the *eigenvector* $\mathbf{E}^*$ associated with $\mathbf{A}$'s *principal eigenvalue*, λ^*.

To make the centrality measures comparable with each other and over time, we rank the raw values of each centrality measure for all individual each year and assign a percentile value, with 1 the lowest and 100 the highest, to each individual's centrality measures each year. In other words, regardless of the size of the network, a person with a higher valued centrality percentile is more centrally positioned in the network than a person with lower value. We denote these normalized rank-transformations of D_i, B_i, C_i, and E_i as d_i, b_i, c_i, and e_i respectively.

[Tables 2 about here]

Table 2 presents summary statistics for the power centrality measures. Panel A presents the raw figures. The mean CEO *betweenness* of 0.00450% indicates that the mean CEO in our sample lies on between four and five of every thousand shortest paths between pairs of other individuals. Note that the mean exceeds the 75th percentile and the maximum is 0.362%. Loosely speaking, the great majority of the connectedness power in the network is in the hands of the most connected individuals. The typical director's mean closeness is 25.3%, indicating that the typical director is about four (1 / 0.253 = 3.94) degrees of separation from any other randomly chosen individual. The median degree centrality of 94 for CEOs indicates that the median CEO has direct ties with 94 other individuals in the network. The raw eigenvector centrality measures are not readily amenable to intuitive explanation.

Hereafter, we focus in on officers and directors of S&P 1500 firms, as provided by Risk Metrics. That is, we merge the percentile centrality measure data described in Panel B of Table 2 with BoardEx date on the names of the CEOs and directors of listed firms, matching by individual's first, middle, last names; company names, and years. This generates a final panel containing 132,020 director-years from 1999-2010. The mean percentile centrality within this group is 78, the maximum is 100, the minimum is 1, and the standard deviation is 20.9.

We define a director as an *independent director* (ID) if the director is so designated in the firm's submissions to the SEC. The legal definition of an independent director requires "no relationship with the company, except the directorship and inconsequential shareholdings, that could compromise independent and objective judgment" (Securities and Exchange Commission 1972). We designate that firm h's board is an *independent board* (IB) a majority of its directors are independent directors, and record this with the firm-year indicator variable

$$IB_h \equiv \begin{cases} 1 & \text{if a majority of firm } h\text{'s board are independent directors} \\ 0 & \text{otherwise} \end{cases}$$

We define an individual as *powerful* in terms of a specific centrality measure in a given year if her centrality measure lies within the top quintile of the measure's empirical distribution across all CEOs and directors (not just those in S&P1500 firms). To operationalize this we define four individual-year indicator variables, one for each percentile centrality measure, each set to one if that measure falls in the top quintile of its distribution across all the executives and directors included in Tables 1 and 2, and to zero otherwise. Thus, we denote whether or not individual i is powerful in terms of her degree centrality using

$$\delta(d_i \geq 80) \equiv \begin{cases} 1 & \text{if } d_i \geq 80 \\ 0 & \text{otherwise} \end{cases}$$

and define $\delta(b_i \geq 80)$, $\delta(c_i, \geq 80)$, and $\delta(e_i \geq 80)$ analogously.

Table 2 Panel C presents the correlation matrix of the centrality measures for CEOs, non-CEO Chairs and directors. The four centrality measures are highly correlated, with correlation coefficients averaging 64%, and statistical significance under 0.01. For example, Jeffrey Garten, served at BlackStone and Lehman Brothers, as Dean of Yale's School of Management, and in the Nixon, Ford, Carter, and Clinton administrations, exhibits high centrality by all four measures: his mean d_i over the sample period is at the 94th percentile, his b_i is at the 98th, his c_i, at the 93rd, and his is also e_i at the 93rd percentile. The correlations are imperfect for various reasons. For example, an individual with low degree centrality (direct connections to relatively few other people) might nonetheless have high betweenness and eigenvector centrality if those people in turn connect to highly powerful people. Thus, Ray Wilkins Jr., a director of H&R Block in 2000, ranks only in the 66th percentile in degree centrality, but the importance of some of those connections push his betweenness, centrality up to the 93th percentile.

We avoid nuanced distinctions between the four measures because these are problematic and may vary across networks. For example, connections might proxy for access to information (Freeman 1979; Freeman, et al. 1980; Hossain et al. 2007; Kiss and Bichler 2008). If so, degree centrality implicitly assumes that information decays completely after one degree of separation (Bolland 1988), while the closeness and eigenvector measures assume a gradual decay as degrees of separation increase. Betweenness is then interpretable as capturing the number potentially distinct information flows the individual can tap. In contrast, if power is primarily ability to influence other people's decisions, different considerations arise. For example, Borgatti (2006) argues that, while individuals with higher closeness power centrality might be better at diffusing information, those with higher betweenness power centrality are better at disrupting the flow of information to others in the network. Thus, Lee et al (2010) argue that betweenness best captures "power as influence". However, the number of one's direct connections might also be interpreted as the number of people one can directly influence, and the closeness and eigenvector measures potentially then capture how easily one can persuade friends to influence friends. A range of strategic issues arise in either case, the modelling of which is beyond the scope of this study.

In addition, sampling omissions may destabilize some measures more than others. Costenbader and Valente (2003, 2004) find degree centrality the most stable and eigenvector centrality the least stable. Because we may well miss some links between individuals in this network, sampling omission is a potential concern.

Given these conflicting and incompletely resolved issues, and the high empirical correlations between the four measures in our data, we follow Hossain et al (2007) and employ a composite measure defining power centrality based on each individual's three largest centrality measures. Robustness checks below use alternative measures.

We say individual i is powerful, setting her value of P to one, if three or more of her power centrality measures fall into the top quintiles of their distributions. That is,

$$P_i \equiv \begin{cases} 1 & \text{if } \delta(d_i \geq 80) + \delta(b_i \geq 80) + \delta(c_i \geq 80) + \delta(e_i \geq 80) \geq 3 \\ 0 & \text{otherwise} \end{cases}$$

If the individual in question is both an independent director and a powerful individual, we say she is a *powerful independent director* (PID). We aggregate individual data to the firm-level, and set the indicator variable PIN to one if a majority of firm *h*'s independent directors are PIDs and to zero otherwise. Thud, we define

$$PIN_h \equiv \begin{cases} 1 & \text{if a majority of firm } h\text{'s independent directors are PIDs} \\ 0 & \text{otherwise} \end{cases}$$

Finally, we create an indicator variable *powerful independent board* (PIB) for firms with a majority of independent directors and a majority of them PIDs. That is,

$$PIB_h \equiv IB_h \times PIN_h$$

In other words, PIB_h is one in a given year for firm h if a majority of its board is *independent directors* and a majority of these are *powerful.*

In addition, we say a firm has a non-CEO chair of the board and set the indicator variable NCC_h to one if firm *h*'s CEO is does not also chair its board of directors, but to zero otherwise. We then designate firm *h* as having a powerful non-CEO chair if $NCC_h = 1$ and the person serving as chair is powerful, in that at least three of her four centrality measures fall into the top quintiles of their distributions. That is, we say firm *h* has a powerful non-CEO chair as

$$PNC_h \equiv \begin{cases} 1 & \text{if } h\text{'s board is chaired by individual } i\text{, who is not its CEO \& has} \\ & \quad \delta(d_i \geq 80) + \delta(b_i \geq 80) + \delta(c_i \geq 80) + \delta(e_i \geq 80) \geq 3 \\ 0 & \text{otherwise} \end{cases}$$

Finally, we analogously identify a firm as having a powerful CEO (PCEO) if at least three of its CEO's four centrality measures in the top quintiles of their distributions. Thus, we say firm *h* has a powerful CEO as

$$PCEO_h \equiv \begin{cases} 1 & \text{if } h\text{'s CEO is individual } i\text{, who has} \\ & \quad \delta(d_i \geq 80) + \delta(b_i \geq 80) + \delta(c_i \geq 80) + \delta(e_i \geq 80) \geq 3 \\ 0 & \text{otherwise} \end{cases}$$

The average CEO centrality is the 74th percentile, and the median is the 80th percentile, indicating that half of S&P 1500 CEOs are *powerful CEOs*.

We require all firms to have a minimum of three years in the sample. Our final sample includes 15,889 firm-years for 1,956 unique firms. Table 3 lists the names and definitions of the variables used in the tables to follow.

[Table 3 about here]

Table 4 tallies the percentages of majority independent boards and powerfully independent boards, the percentages of firms that separate the CEO and chair jobs and that appoint a powerful director as the non-CEO chair. Over our sample period of 1999 to 2009, boards with independent directors increase monotonically, as do boards with a majority of PIDs. Likewise, an increasing fraction of firms separate the CEO and board chair jobs and name a powerful director as the non-CEO chair. The importance of powerful independent directors on key board committees also rises steadily through time.

[Table 4 about here]

2.2 Firm Governance and Financial Variables

We obtain financial accounting data from Compustat and stock return data from CRSP for our sample of S&P 1500 firms from 1999 to 2009. CEO compensation data are from ExecuComp and additional data on each director of the S&P 1500 boards are from Risk Metrics. These includes her age and assignments to audit, nominating, and compensation committees.

We measure shareholder valuation by a firm's *Tobin's Q*, the book value of total assets plus the market value of common shares minus book value of equity and deferred taxes, all divided by the book value of total assets.[4]

We also include control variables known to affect Tobin's Q. These include various firm characteristics: *size*, the logarithm of total assets; *leverage*, total debt over total assets; *profitability*, net operating cash flow plus depreciation and amortization; *growth*, net capital expenditure over the previous year's net property, plant and equipment (Yermack (1996)); and intangibles, *advertising* and *R&D* expenditure, each scaled by total assets and set to zero if unreported (Hall (1993)). We also control for key corporate governance variables shown elsewhere to affect Q ratios. These include *CEO age* (Morck et al. (1988)) and *board size* (Yermack (1996)), in logarithm form, and the *e-index* of Bebchuk, Cohen and Farrell (2009) – a composite index reflecting the absence or presence of economically important management entrenchment devices: supermajority requirements on amending corporate charters, similar requirements for mergers, limits on amending bylaws, staggered boards, poison pills, and golden parachutes.

Table 5 Panel A presents summary statistics. In our sample, the mean of Tobin's average Q is 1.58 and its standard deviation is 1.55. The average board has nine members. Over the entire sample period, independent directors are a majority in 91% of our observations, but a majority of these are powerful in only 52% of the observations. The mean independent director centrality in our sample of S&P 1500 firms is at the 81th percentile of the distribution for all directors and CEOs.. The summary statistics of the other variables accord with those in other studies using these data.

[Tables 5 about here]

3. Empirical Results and Discussion

We hypothesize that a predominance of powerful independent directors might affect shareholder value. In exploring this hypothesis, we also consider the presence of a powerful CEO, powerful non-CEO chair, or powerful non-independent directors.

3.1 Power Structure of the Board and Shareholder Value

Table 6 regresses Tobin's average Q ratio on industry and year fixed-effects and a standard set of

[4]

control variables, allowing for firm-level clustering. The control variables attract typical coefficients and significance levels. Larger firms, larger boards, more levered firms, and firms with more entrenched managers (indicated by a higher *e-index*) all have significantly lower shareholder valuations. Firms with more capital investment, higher R&D spending, and higher profitability are tend to have higher Tobin's Q ratios.

[Table 6 about here]

Our key variable of interests is the indicator variable *powerful independent board* (PIB). Regressions 6.1 through 6.3 shows that shareholders attach a statistically significant valuation premium to firms with powerfully independent boards (PIB), but not to firms with powerful CEOs (PCEO) or powerful directors other than the CEO chairing the board (PNC). Regressions 6.4 through 6.6 repeat these comparisons, but use continuous measures: the power centrality of the CEO (CEOC), the mean power centrality of independent directors (IDC), and the power centrality of the chair if the chair is not the CEO (NCCC). These regressions show that more powerful independent directors correlate with higher valuations, but that more powerful CEOs and non-CEO chairs do not. Regressions 6.7 and 6.8 include each set of three power centrality measures, and show that only the power centrality of the independent directors correlates with higher shareholder valuations.

The coefficients associated with independent director power in Table 6 are highly economically significant. For example, regression 6.2 implies that shareholders attach a premium of 4.2% (0.0658 over the mean Q ratio of 1.58) to the market value of a firm with a powerfully independent board.

[Table 7 about here]

Table 6 contrasts starkly with the uniformly statistical insignificance of standard measures of board independence and the separation of the roles of CEO and chair. Panel A of Table 7 reproduces typical regressions of this genre. The fraction of directors designated independent in the firm's financial statements, a dummy for a majority of directors so designated, and a dummy for a two-thirds majority of independent directors all attract either negative or insignificant coefficients. A dummy for the CEO not chairing the board is likewise insignificant. At face value, these regressions suggest that powerful independent directors predominating correlates with elevated valuations, while nominally independent directors predominating do not.

Panel B of Table 7 lets us compare powerful independent directors to powerful insider directors. Regressions 7B.1 and 7B.2 show that a majority of insider directors being powerful, like the PIB dummy for a majority of independent directors being powerful, correlates with elevated shareholder valuations. Regressions 7B.3 through 7B.5 show that a powerful insider other than the CEO chairing the board correlates with higher value, but a powerful independent director doing so does not. Regressions 7B.6 and 7B.7 run a horserace between all these indicators, and find that a powerfully independent board attracts a nearly 50% larger point estimate than does a powerfully non-independent board, but that both indicators remain highly significant. At face value, these results point to power mattering more than independence for directors, and power mattering for a non-CEO chairing the board only if the chair is an insider.

3.2 The Direction of Causality

The panel regressions in Table 6 and 7 are consistent with powerful independent directors, powerful non-independent directors, and powerful non-independent non-CEO chairs elevating shareholder valuations (direct causality). However, high shareholder valuations might also help firms attract and retain powerful directors (reverse causality); or some other factor might both elevate shareholder valuations and draw powerful directors (latent factor causality). Latent factor problems are mitigated in Tables 6 and 7 by including control variables designed to proxy for plausible latent factors. This section undertakes a series of tests to distinguish direct from reverse causality.

Our first approach is an event study of stock market reactions to the sudden deaths of corporate directors. Using LexisNexis and Google searches, we construct a list of directors in our sample who die while serving on their boards and ascertain the date and the cause of death in each case. We exclude deaths coincident with confounding events, such as earnings or M&A announcements, the 9-11 attacks, etc.; as well as deaths following prolonged illnesses. Each decedent director is classified as independent or not and as powerful or not as above. These deaths are defensibly exogenous changes to the power of independent directors in affected firms' boards, and their associated stock price reactions measure their impacts on shareholder valuation.

[Figure 1 about here]

Figure 1 summarizes the results graphically. Firms' stock prices drop substantially on news of a powerful independent director's sudden death. In contrast, news of other directors' sudden deaths causes either little change or, in the case of powerful insider directors, a stock price increase.

[Table 8 about here]

Panel A of Table 8 begins by reproducing the findings of Nguyen and Nielsen (2010) that, on average, stock prices fall on news of independent directors sudden deaths. However, regardless of the window, and regardless of how the CARs are weighted, stock prices drop only on news of the sudden death of a powerful independent director, and actually rise on news of the sudden death of a non-powerful independent director. Panel A suggests that the finding that stock prices drop on news of independent director deaths is driven by the deaths of powerful independent directors.

Panel B tests the statistical significance of the patterns presented in Figure 1 and Panel A. Each column summarizes a regression of CAR on main effects for directors being powerful (PD) and independent (ID) as well as their cross produce, which is equal to our powerful independent director dummy (PID). The main effect of the independent director dummy is uniformly insignificant, indicating that independent director sudden deaths do not move the stock price if the decedent is not powerful.

The main effect of the powerful director dummy is positive across the board and significant in three of the eight regressions. Because the regressions all include the PID cross-product as well, these positive and intermittently significant main effect coefficients indicate that stocks do not fall, and may well rise, on news of the sudden death of a powerful insider director. The interaction, the PID dummy, attracts a significantly negative coefficient in every case, except for the value-weighted analysis using the seven day window [-3, +3], which attracts a similar point estimate but a p-level of only 14%. The negative coefficients on PID are uniformly larger than the positive coefficients on PD, so the net reaction to powerful independent director deaths is negative. In the three regressions where PD attracts a positive significant coefficient, the net effect upon news of the death of a powerful independent director is negative, but insignificant. Thus, five of the eight regressions in Panel B suggest a negligible stock price reaction to the sudden death of a powerful insider director and a significantly negative stock price reaction to the sudden death of a powerful independent director. The other three regressions point to a significantly positive reaction to the sudden death of a powerful insider director and negligible reaction to the sudden death of a powerful independent director.

These findings are consistent with the results in Tables 6 and 7 reflecting causality flowing from a powerfully independent board to elevated shareholder value, and from elevated shareholder value to more powerful insiders on the board. The effects in Panels A and B are economically significant. For example, the sudden death of a powerful independent director triggering a 2% drop share price drop implies a loss in shareholder value of over $200 million, given the average market capitalization of $11.64 billion in the relevant sample of firms.

Panel B of Table 7 highlights a statistically significant relationship between high shareholder valuation and a powerful non-independent board, defined as one with a majority of its non-independent directors being classified as powerful (it need not have a majority of non-independent directors). We find only twelve sudden deaths of powerful insider directors; but the mean cumulative abnormal return around these events is positive and significant – for example, *CAR*[-1,3] = 1.61% (p = 0.02) – suggesting that powerful insider directors do not elevate shareholder valuations, and that shareholders actually celebrate their demise. However, the relatively small sample cautions against accepting this ghoulish conclusion too readily. The panel also highlights a statistically significant connection between high shareholder valuations and powerful insider directors chairing the board, but only a handful die suddenly.

We therefore resort to an alternative method of causal inference, Granger causality tests, to explore these issues and to assess the robustness of the causality results from the event study tests above. In such tests, variable X is said to *Granger-cause* variable Y if lagged values of X significantly explain Y after controlling for lagged values of Y. Here, X is an indicator variable for powerful non-CEO chairs (or another director power measure) and Y is the firm's Q ratio. The exercise thus runs firm-year panel regressions of Q ratios on its own lags and on lagged values of the board power indicators, adjusted for firm-level clustering and including industry and year dummies.

[Table 9 about here]

Consistent with more powerful independent directors elevating shareholder valuations, the left panel of Table 9 shows all combinations of lags of the two independent director power measures, PIB and IDC, Granger causing shareholder valuation. The right panel finds no evidence of the continuous measure of independent director power, IDC, Granger causing shareholder valuations; but suggests reverse causality, though at a three year lag only, if independent director power if gauged by the PIB indicator. Table 9 thus supports causation flowing from director power to shareholder valuations, but does not entirely rule out reverse causality occurring as well.

Table 9 reveals reverse causality underlying the correlation between Q and non-independent director power. The left panel finds no evidence of either the continuous measure, NIDC, or the dummy, PNIB, Granger causing shareholder valuations. In contrast, the right panel reveals statistically significant evidence that shareholder valuations Granger cause firms to have powerful non-independent directors. Table 9 thus reinforces the evidence above that powerful people tend to become non-independent directors at already highly valued firms.

The Granger causality tests also favor high valuations attracting powerful people to chair their boards. In contrast, neither a powerful independent chair, as reflected by PINC or INCC, nor a powerful non-independent chair, as reflected by PNINC or NINCC, Granger causes shareholder valuations. The picture is muddied somewhat if powerful independent and non-independent non-CEO chairs are pooled to make one set of power centrality measures – a dummy PNC for a powerful director as the non-CEO as chair and the mean power centrality of the non-CEO chair, NCCC. This exercise suggests causality flowing in both directions.

Overall, Table 9 is consistent with the event studies above in favoring direct causality: more powerful independent directors Granger cause high Tobin's Q. Reverse causality, Tobin's Q also Granger causing powerful non-independent directors, is not utterly precluded, but finds far less robust support in the data. In contrast, the data favor reverse causality, in that a high Tobin's Q Granger causes a firm to have a powerful non-independent non-CEO as chair, over direct causality, a powerful non-independent non-CEO as chair Granger causing the firm's Q ratio.

[Table 10 about here]

Lastly, Table 10 links changes in Tobin's Q to changes in the power structure of the board. The table shows an additional PID correlating with a significant five to six percent increase in shareholder valuation. In contrast, a net increase in powerful non-independent directors (PNIDs) is uncorrelated with shareholder valuation, as is the entry or exit of a powerful non-independent chair other than the CEO (PNINC). A powerful independent director assuming the chair actually correlates with a 2.5% drop in shareholder valuation.

While this exercise is conceptually an event study, the annual frequency of observations of Q makes causal inference noisy. Given this caveat, the timing of changes in the numbers of powerful independent directors is consistent with more such directors causing investors to value a firm's shares more highly. In contrast, the timing of powerful non-independent directors' and powerful non-CEO chairs' entries and exits does not correspond with changes in shareholder valuations consistent with these directors and chairs causing the correlations with elevated shareholder valuations evident in Tables 6 and 7.

Given the results in Tables 8, 9 and 10, we conclude that the weight of empirical evidence favors more powerful independent directors elevating shareholder valuations, but that other powerful people on the board – more powerful non-independent directors, powerful independent directors chairing the board, and powerful non-independent directors other than the CEO chairing the board – do not appear to cause higher shareholder valuations. These exercises, despite their admitted limitations, serve to isolate powerful independent directors causing high Q ratios as the key robust conclusion of Tables 6 and 7.

3.3 How Powerful Independent Directors Matter

Taking the thesis that powerful independent directors elevate shareholder value as an operating hypothesis, this section explores channels through which this effect might operate. We therefore consider situations in which the potential for corporate governance problems is plausibly especially large, and explore the importance of powerfully independent boards in these situations.

M&A

Mergers and acquisitions often rank among CEOs' most economically important decisions. Many acquisitions result in substantial bidder shareholder value losses, and boards' failure to provide sound advice, or to rein in CEOs who ignore it, is often blamed (Morck et al. (1990), Moeller et al (2004, 2005)). If powerful non-CEO chairs and powerful independent directors render boards more effective, their presence ought to decrease the incidence of shareholder value-destroying M&A bids.

A sample of acquisitions by S&P 1500 firms from 2000 to 2009 for which Securities Data Company (SDC) data are available lets us identify takeovers of listed firms by listed firms and estimate their value to the acquiring firm (the bidder's CAR) and to shareholders (the size-weighted average of the two firms' announcement CARs). This exercise excludes acquirers with pre-acquisition majority ownership of post-acquisition ownership below 100% to eliminate effects associated with stalled takeovers. This leaves 632 takeovers by 379 distinct acquirers.

[Table 11 about here]

Table 11 presents OLS regressions of the cumulative abnormal returns of, alternatively, the bidder or the bidder and target around the merger announcement on either the powerfully independent board dummy variable, PIB, or the mean independent director power centrality, IDC. Cumulative abnormal returns are measured from three days prior to the announcement date until three days after it, and denoted CAR[-3, 3].

Controls include the log of CEO age (Jenter and Lewellen, 2011), log bidder size (Moeller, et al. 2004, 2005), the E-index entrenchment measure of Bebchuk, et al., 2009), dummies for the target and bidder being in the same industry (Morck, Shleifer, and Vishny, 1990) and for the payment being primarily in the bidder's stock (Myers and Majluf, 1984), and year and bidder industry fixed effects. In addition, the size of the deal is measured as deal value over bidder size in regressions explaining the bidder CAR, but as deal value over combined size in regressions explaining the combined CAR. Finally, because El-Khatib, Fogel, and Jandik (2013) find firms with better connected CEOs more prone to undertake value destroying M&A, we also control for the dummy indicating a powerful CEO, PCEO, in regressions where the dummy PIB measures independent director power, and for the continuous CEO power centrality measure CEOC in regressions where the continuous variable IDC measures independent director power. In general, the controls attract coefficients consistent with prior studies. In particular, CEO power measures enter significant and negative, with coefficient point estimates consistent with the findings of El-Khatib et al. (2013).

Acquirers with powerfully independent boards make statistically and economically significantly better M&A decisions. A powerfully independent board correlates with a bidder CAR higher by 1.6% and a combined CAR higher by 1.5%. Given number and sizes of the deals in our sample, this constitutes an economically significant addition of $498 million to acquirer shareholder wealth and of $495 million to overall shareholder wealth.

Free Cash Flow

Jensen (1986) argues that self-interested managers are apt to retain earnings and invest excessively from shareholders perspective, and thus to pay lower dividends than shareholders would prefer. This free cash flow agency problem is known to be more commonplace in firms with lower shareholder valuations, higher cash flows, and lower dividend payouts (Lang and Litzenberger 1989; Lang, Stulz and Walkling 1991; La Porta et al. 2000). Our proxy for the likely free cash flow problems is therefore an indicator variable set to one if the firm has all of the following: a below median Tobin's Q, an above median cash flow to property, plant and equipment ratio, and a below median dividend payout ratio; and to zero otherwise.

[Table 12 about here]

Jensen (1986) argues that free cash flow agency problems are apt to be worse in firms where boards are less effective in advising and monitoring the CEO. To explore this, Table 12 presents probit regressions of the likely free cash flow problem dummy on either the powerfully independent board dummy, *PIB*, or the continuous independent director power centrality variable, *IDC*. Consistent previous studies, lower leverage and greater managerial entrenchment also correlate significantly with the likely free cash flow problems indicator.

Consistent with Jensen's prediction, a both independent director power measures attract negative significant coefficients. The effects are also economically significant. For example, PIB corresponds to a 22% lower likelihood of a firm being designated as likely to suffer from free cash flow problems.

Abnormal CEO successions

Boards fulfill their monitoring duties by, among other things, firing CEOs who oversee persistently poor firm performance. Weisbach (1988) reports weak past financial performance increasing the odds of a forced CEO exit in firms with more independent boards. To investigate this issue, we follow Vancil (1987), who argues that a board satisfied with the departing CEO generally selects a senior officer – one of the old CEO's team - as the successor so as to disturb existing policies as little as possible; and that a new CEO from outside reliably indicates the board's dissatisfaction with the status quo. To mitigate the influence of normal CEO retirement, we follow Morck et al. (1990) and restrict our tests to a subsample of CEO successions where the departing CEO is aged 60 or younger. We thus flag as *abnormal successions* firm-year observations in which a CEO younger than 60 steps aside for a successor from outside the firm.

[Table 13 about here]

Table 13 presents probit regressions of a dummy variable, set to one for abnormal successions and to zero otherwise, on the firm's total stock return the prior year, *RET*, an independent director power measure and, following Weisbach (1988), their interaction. The alternative power measures are: the powerful independent board dummy, *PIB*, a powerfully independent nominating committee dummy variable, *PIBN*, set to one if a majority of the independent directors on the nominating committee are powerful independent directors (PIDs), the continuous mean independent director centrality measure, IDC, and an analogously defined mean of the power measures of independent directors on the nominating committee, *IDCN*.

Weisbach argues that the coefficient on the interaction reflects the board's propensity to fire an underperforming CEO. In Table 13, these coefficients are uniformly negative, and two of the four, those of the interactions of lagged stock returns with *PIB* and *PIBN* are statistically significant. Including additional controls for CEO power and non-CEO chair power and independence leaves the independent director power interactions virtually unchanged, and the added controls are uniformly insignificant. These findings are consistent with powerful independent directors dominating the full board or the nominating committee upping the odds of an underperforming CEO being fired and replaces by an outsider.

CEO Compensation

We collect data from ExecuComp on the cash, equity, and total compensation of CEOs, and use log transformations of these as dependent variables. The key variable of interest on the right hand side is the interaction of the past stock return with a dummy flagging a powerfully independent board. The control variables include the past stock return (Murphy, 1985), CEO power, CEO age (McKnight, 2000), CEO entrenchment index (Bebchuk, et al., 2009), firm size (Murphy, 1985), board size (Hermalin and Weisbach, 2001), leverage (Ortiz-Molina, 2007), profitability (Deckop, 1988), and capital and R&D spending (Cheng, 2004).

[Table 14 about here]

Table 14 presents the regression coefficients and significance levels on the key variables. CEO pay is total compensation in Panel A, equity-linked compensation in Panel B, and cash compensation in Panel C. Paralleling Table 13, we set the dummy variable *PIBC* to one if the firm's compensation committee has a majority of PIDs and to zero otherwise; and denote the mean power centrality of all the independent directors on that committee *IDCC*.

Panel A shows that powerfully independent boards and compensation committees generally award CEOs higher total compensation packages. Regressions 14A.5 to 14A.8 show that this effect persists after controlling for powerful CEOs – who appear to command higher pay in general. Total CEO pay is positively related to the prior year's stock return, but no more or less in firms with powerfully independent full boards or compensation committees. Consistent with prior findings, the CEOs of larger or more profitable firms also command higher pay, as do CEOs whose entrenchment renders them less accountable to shareholders. More R&D intensive firms also pay their CEOs better.

Panel B, explaining CEO equity-linked compensation, presents a generally similar picture. Older CEOs' pay is less linked to past returns, as is the pay of CEOs running firms with large advertising budgets. The most important difference is that firms with more powerfully independent full boards and compensation committees tie CEO equity-linked pay significantly more tightly to past stock returns in three of the eight specifications. Remarkably, CEO equity-linked compensation is unrelated to past stock returns in firms whose boards and compensation committees lack a substantial presence of powerful independent directors. Panel C resolves this puzzle by revealing the positive correlation between CEO pay and the lagged stock return evident in Panel A to be due to higher cash compensation.

Earnings Management

Empirical evidence links more extensive earnings management to less effective internal control procedures (Doyle et al. (2007)), less disciplinary executive turnover (DeAngelo (1988), Dechow and Sloan (1991), and less independent boards and audit committees (Klein (2002).

This section examines the possible importance of powerful independent directors on the board or audit committee in limiting earnings management. Abnormal earnings accruals are estimated as in Jones (1991), but adjusting for growth in credit sales (Dechow et al. (1995)), and benchmarked against a control firm – that with the closest ROA in the same industry that year (Kothari et al. (2005)).

[Table 15 about here]

Each regression in Table 15 explains abnormal earnings accruals with an alternative independent director power measure: either the dummy *PIB* or the continuous measure IDC for the full board, or their analogs reflecting the power of independent directors on the audit committee, the dummy variable *PIBA* and the continuous measure *IDCA*. The table reveals abnormal accruals to be significantly lower in firms with powerfully independent boards or audit committees in five of the eight specifications, and bordering on being significantly lower (p = 0.11) in two more. The point estimate in 15.1 amounts to roughly half of the overall mean value of abnormal accruals, and so the effect is economically significant. The coefficients on the controls show earnings management to be greater if the CEO is older or less powerful, or if the firm engages in less capital investment. Reported earnings are also higher in firms that manage earnings more aggressively. These findings are consistent with powerful independent directors elevating shareholder valuations by limiting earnings management.

3.4 Robustness Checks

The results presented above survive a battery of robustness checks. Throughout the analysis, we test for outliers and windsorize the continuous variables to mitigate outlier influence in the results.

Our main analyses define a powerful independent director (PID) as one with at least three of the four centrality measures lying in the top quintiles of distributions based on the centrality measures of all officers and directors of listed firms covered by BoardEx. Qualitatively similar results ensue, by which we mean identical patterns of signs, significance, and rough coefficient magnitudes to those in the tables, if use top quintiles of distributions based on all officers and directors of listed and unlisted firms. Using the top 15% or 25%, rather than top quintiles, of the distributions also generates qualitatively similar results.

Also, in constructing the power centrality measures, we assume that, once one person knows another, the connection persists until one of them dies. As robustness checks, we construct alternative versions of the network, and recalculate the power centrality measures assuming connections form only after three years of overlap, and assuming connections break after five years of non-overlap, and both. Qualitatively similar results to those in the tables ensue in each case.

The precise way the PIB dummy is constructed does not drive our results. First, the exact fraction of independent directors we require to be PIDs in order for PIB to be set to one does not greatly affect our results: other reasonable values, such as 3/5, 2/3, 3/4, or 4/5, yields qualitatively similar results, by which we mean identical patterns of signs and significance to those in the tables, along with plausible coefficient point estimates given the specific robustness exercise.

Reasonable alternative measures of the power centrality of independent directors tell much the same story as the variables in the table. For example, a *PID ratio*, the number of PIDs divided by the number of independent directors, a continuous variable ranging from 0 to 1, yields results qualitatively similar to those in the tables.

Further robustness checks utilize alternative continuous power measures: the arithmetic mean of the individual's three highest centrality measures, expressed in percentiles, rather than of all four. For example, for individual i, this alternative continuous centrality measure is $C_i = \frac{1}{3}(d_i + b_i + c_i + e_i - \min[d_i, b_i, c_i, e_i])$. Constructing analogs of our various dummies and based on this procedure again generates qualitatively similar results to those shown in the tables.

We ensure that our method of approximation to calculate Tobin's Q, using Compustat variable names, Q = [at + (prcc_f × csho) - ceq – txdb]/at, does not drive our results. As a robustness check, we also calculate the numerator as the sum of market value of common shares, book value of short-term and long-term debts, liquidating value of preferred shares, and deferred taxes and investment tax credit, while using the same denominator of total book assets. Qualitatively similar results ensue.

The results indicating the effects of powerful independent board on firm values in Tables 6 and 7 are very robust. For example, we cluster the standard errors by firm to control for persistence at the firm level and include industry fixed effects to control for unobserved time invariant latent industry factors. Clustering by industry, which also allows for cross-correlations between firms within each industry, generates qualitatively similar results to those in the table, by which we mean identical patterns of signs and significance as well as comparable point estimates. Regressions including all possible combinations and permutations of the variables in the table yield qualitatively similar results to those in the tables in every case. Dropping the control variables, but retaining year and firm fixed effects, also generates qualitatively similar results, except that a powerful CEO becomes significantly associated with higher Q ratios. Restoring the controls one-by-one reveals R&D spending critical in rendering PCEO insignificant: R&D intensive firms tend to have powerful CEOs, but both are included, the R&D variable retains significance while PCEO does not. Powerful CEOs have a higher median age, but dropping the CEO age variable does not qualitatively change the results.

Similarly, the results on PIBs positive impact on M&A performance are robust to alternative lists of controls. For example, including all the controls used in Table 6 yields qualitatively similar results – and the additional control variables are uniformly insignificant. Including the powerful dummy variables or continuous power centrality measures for powerfully non-independent directors and/or independent and/or non-independent non-CEO chairs likewise yields qualitatively similar results, and the added power measures are likewise uniformly insignificant. The sole exception is that the powerfully non-independent board dummy, *PNIB*, attracts a negative and significant signs if PCEO is dropped. Including the PCEO dummy renders the coefficient of PNIB insignificant.

The measures of the presence, independence or non-independence of a powerful director other than the CEO chairing the board – the dummies PNC, PINC or PNINC, respectively and their continuous analogs NCCC, INCC or NINCC, respectively – are not shown in Tables 11 through 15 except in cases where one is significant. Including these variables as additional controls in these tables generates qualitatively similar results and the added variables are uniformly insignificant.

Table 13 drops CEO turnover events where the departing CEO is over 60 to exclude normal CEO retirements to ensure that an outsider as successor more reliably indicates a forced turnover event. Using 65, rather than 60, renders the coefficients associated with powerful independent directors insignificant, as does using all CEO turnover events regardless of the exiting CEO's age.

In Table 15, as a robustness check, abnormal accruals are also estimated using an alternative variant of the method in Jones (1991) that benchmarks accruals against a control firm – that with the closest ROA in the same industry that year (Kothari et al. (2005)). Qualitatively similar results ensue.

4. Conclusions

We conclude that independent directors who are powerful elevate shareholder wealth – in part at least by preventing value-destroying decisions such as economically unsound merger bids and excessive free cash flow retention, by meaningfully linking CEO pay to firm performance, and by forcing out underperforming CEOs. Independent directors who are not powerful do none of these things. These findings may explain why a robust link between independent directors on boards and firm value has proved so elusive; and thereby reconcile Fama's (1980) thesis that independent directors can maximize shareholder valuations by advising and, where necessary, disciplining or replacing CEOs with the observation of Bebchuk and Fried (2006) that independent directors often do no such thing.

The incidence of weak independent directors suggests that CEOs may select them for impotence. Mace (1976) quotes a sought-after director describing the job's qualifications thus:

> *"I have one friend that's just greatest agreer that there ever was, and he is on a dozen boards. I know other fellows that have been recommended to some of the same companies as directors, but have never gotten anywhere on the list to become directors. Because if a guy is not a yes man – no sir, he is an independent thinker – then they are dangerous to the tranquility of the board room. Company presidents are afraid of them – every damn one of them"*

Post mortems of corporate governance shipwrecks suggest this has not changed greatly in many boards, often describing corporate cultures that equated dissent with disloyalty. For example, an Enron executive describes an "atmosphere of intimidation" in which many could see problems looming, but none dared confront the CEO (Cohan 2002).

We posit that more powerful independent directors are less apt to be "yes men" because their social networks provide information that lets them more reliably identify CEO waywardness and influence that lets them more effectively challenge a wayward CEO. This thesis draws support from the social psychology literature showing that voiced dissent can interrupt unthinking obedience to authority (Milgram 1967), conformity to group behavior (Asch 1951), and other firms of "groupthink" (Janis 1971) so as to elicit rational decision-making. Milgram posits that humans reflexively obey authority, citing Darwin's (1871) thesis that such a reflex elevated the survival odds of prehistoric hominids and therefore may well be biologically innate. Dissent against an authority figure better effect such an interruption if voiced by a more credible alternative authority (Milgram 1967, 1974). We suggest that more powerful independent directors constitute a more informed and credible alternative voice of dissent against a wayward CEO, and can thus more reliably interrupt "groupthink" in the full board or relevant board committee. This has implications for corporate governance research, public policy, and business ethics.

These findings extend the use of social power measures in finance pioneered by Hwang and Kim (2009), who show that CEOs with strong social ties to their independent directors have more scope for self-interested behavior. Our findings utilize social power measures in an entirely different way that highlights director heterogeneity (Ferris, Jagannathan & Pritchard 2003;

Faleye, Hoitsash & Hoitash 2012) by showing heterogeneous director social power to be economically important. They also underscore Bebchuk and Fried's (p. 4) call for behavioral models of director decision-making on the grounds that "various social and psychological factors – collegiality, team spirit, a natural desire to avoid conflict within the board team, and sometimes friendship and loyalty" can render independent directors impotent. Our findings suggest that such models might develop Kahneman's (2011) thesis that people default to "rule of thumb" decision making (thinking fast) and only resort to the more metabolically costly alternative of identifying, estimating and analyzing possible outcomes and their probabilities (thinking slow) after thinking fast fails to converge. In this setting, the rule of thumb of obedience to authority (supporting the CEO) fails to converge if equally credible rival authorities (a sufficient number of sufficiently powerful independent directors) disagree. However rational actors are not entirely precluded as information cascade models might also be extended to represent such behavior.[5]

To the extent that shareholder value maximization is a public policy objective, corporate governance regulations might be evaluated for their ability to instill optimal dissent. Obviously, corporate boards cannot become debating societies. Adams, Almeida, and Ferreira (2005) and others rightly note that CEOs selected for expertise necessarily know things that others do not know, and that excessively powerful boards might unduly curtail trailblazer CEOs. The findings above suggest that reforms to the director nomination and selection processes and boards might be evaluated, in part at least, for their propensity to screen out "yes men" while protecting legitimate CEO discretion.

Finally, these results suggest a framework for interpreting business ethics in corporate boards. Hirschman (1970) explains that people, confronted with unethical or inept behavior in an organization, have three response options: exit, voice, and loyalty. By selecting independent directors for impotence, a discreditable CEO leaves them only two choices: resign or become a loyal "yes man". As Milgram (1974) discusses at length, the "loyalty" option typically does not nullify the individual's ethical sense. Milgram's subjects administered electric shocks to a stranger (a confederate) when ordered to do so, and explained their actions as "doing my duty", "doing what was expected of me", "loyalty to the experimenter", and "not making a scene" in exit interviews.[6] Milgram describes this behavior as an *agentic shift* - a deontological (duty-based) norm displacing a teleological (outcomes-based) norm, rather than as a suspension of ethical norms.[7] In other words, "yes men" directors come to view themselves as more ethical if they better fulfill their duty to support their CEO. Discussions of business ethics on boards might usefully consider the economic implications of deontological ethics and the feasibility and implications of fostering teleological ethical thinking by directors.

[5] See e,g, Bernardo and Welch (2001). Obedience to a leader or group is arguably a form of bounded rationality akin to an information cascade (Banerjee 1992; Bikhchandaqni et al. 1992).

[6] These results are extensively replicated (See Blass 2004; Packer 2008; Morck 2009, 2010).

[7] See Sheridan & King (1972; Martin et al. (1976); Miller (1986); Merritt & Helmreich (1996); Blass (1998, 2000, 2004); Tarnow 2000; and many others. Burger (2009) reproduces the agentic shift, but not its interruption, and acknowledge that this may reflect their more limited experimental framework.

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Figure 1: Cumulative abnormal returns on news of sudden deaths of directors
Directors are distinguished by status of decedent as independent or insider, and by powerful or not powerful.

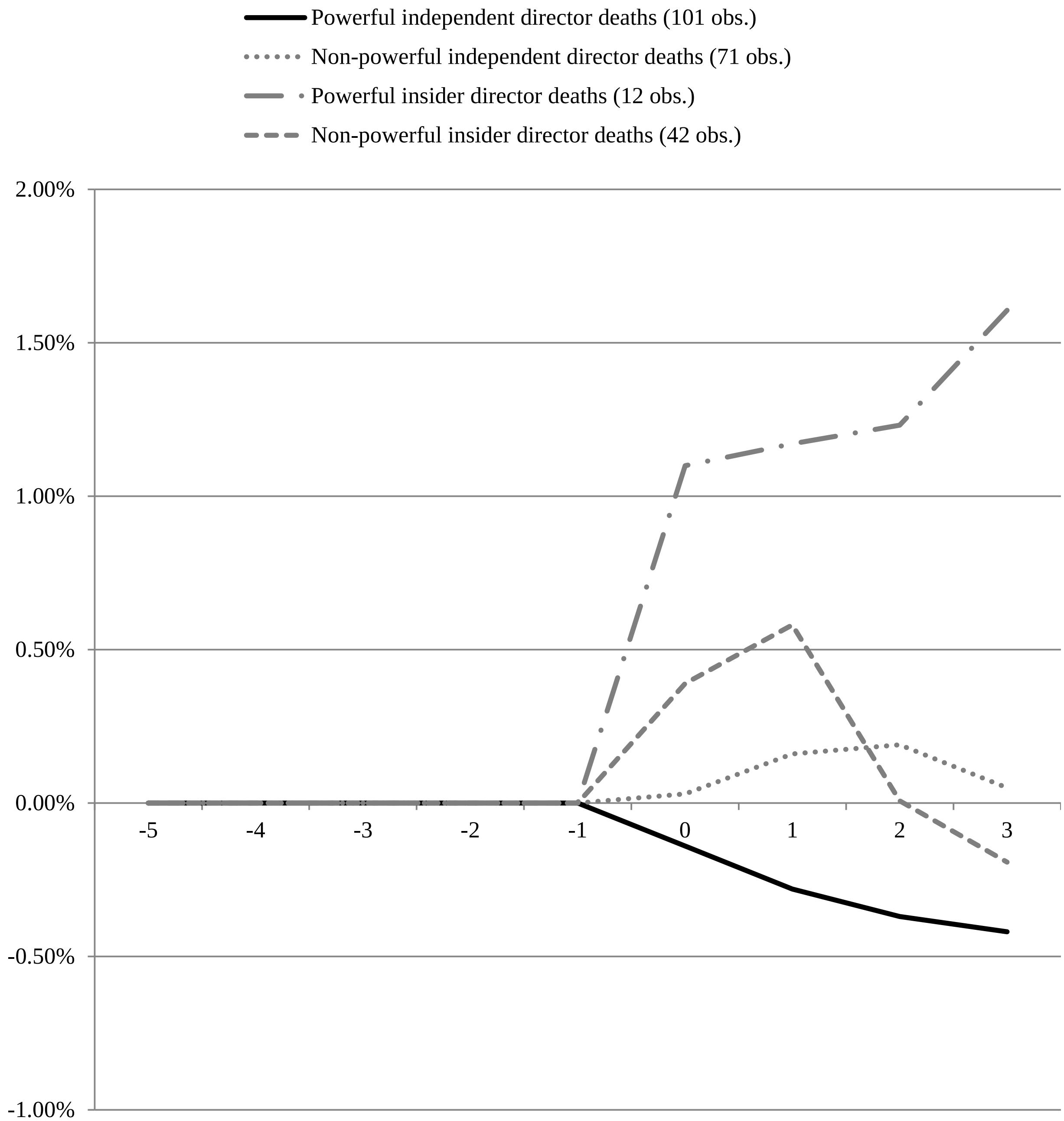

Table 1: Corporate Executives and Directors Social Network Characteristics

Each Node is a director or business executive with at least one connection to other directors or executives. The Listed Network includes all business professionals who ever worked at or served on the board of a listed firm. The Largest Component of the Listed Network includes those connected to the largest sub-network based on ties established in listed firms. The Full Network includes all directors or executives with at least one connection to another business professional who ever worked at any firm, public or private, covered by BoardEx from 1998 through 2010.

Year	**Nodes in Listed Firm Network**	**Nodes in Largest Component of Listed Firm Network**	**Nodes in Full Network (Listed & Unlisted Firms)**
1998	191,049	167,211	267,979
1999	200,156	178,209	275,377
2000	210,220	190,310	283,643
2001	219,321	201,059	291,002
2002	228,375	211,299	298,138
2003	237,980	222,129	305,074
2004	249,126	234,714	313,040
2005	261,823	249,123	322,010
2006	276,237	264,915	332,341
2007	292,131	281,985	343,779
2008	305,399	295,763	336,175
2009	313,958	304,460	384,489
Mean	248,815	233,431	312,754

Table 2: Officer and Director Power Centrality Measure Characteristics

The social networks described in Table 1 contain nodes representing 15,889 CEO-years with 3,302 unique CEOs, 5,682 non-CEO chairs-year with 1,702 unique directors, and 132,000 Director-years with 19,223 unique directors. Other nodes represent corporate executives, bankers, and other business executives included in Boardex, but not serving as a CEO, chair or director of the S&P 1500 sample from 1999 to 2010. Panels A and B tabulate summary statistics of raw and percentile centrality measures for CEOs, non-CEO Chairs, and directors. Panel C presents Pearson correlation coefficients, clustered at individual level, of the centrality measures. The upper triangle (above the diagonal line) uses raw measures and the lower triangle using percentile measures. All correlation coefficients are significant at the 1% level.

Panel A: Characteristics of Raw Power Centrality Measures

			Mean	Std. Dev.	Min	25th	Median	75th	Max
CEOs	**Betweenness**	B_i	0.00450%	0.0111%	0.00%	0.0000425%	0.000795%	0.00396%	0.362%
	Closeness	C_i	24.8%	3.03%	0.00619%	22.8%	24.9%	26.9%	33.6%
	Degree	D_i	192	261	3	45	94	218	3,006
	Eigenvector	E_i	0.0563%	0.375%	0.00%	0.0000921%	0.000731%	0.00824%	4.10%
Non-CEO Chairs	**Betweenness**	B_i	0.00709%	0.0156%	0.00%	0.000159%	0.00147%	0.00690%	0.336%
	Closeness	C_i	25.2%	3.09%	0.00856%	23.2%	25.2%	27.2%	33.7%
	Degree	D_i	171	216	6	41	84	209	2,064
	Eigenvector	E_i	0.0658%	0.403%	0.00%	0.000120%	0.000963%	0.00922%	4.11%
Directors	**Betweenness**	B_i	0.00973%	0.0229%	0.00%	0.000147%	0.00216%	0.00905%	0.677%
	Closeness	C_i	25.3%	3.20%	0.000688%	23.2%	25.4%	27.6%	34.4%
	Degree	D_i	197	245	1	43	104	245	2,211
	Eigenvector	E_i	0.0581%	0.371%	0.00%	0.000129%	0.00213%	0.0117%	4.15%

Panel B: Characteristics of Power Centrality Measure Percentage Ranks

CEOs	**Betweenness**	b_i	76.2	24.0	1	66	84	94	100
	Closeness	c_i	74.7	21.4	2	61	80	92	100
	Degree	d_i	72.1	23.5	2	56	78	92	100
	Eigenvector	e_i	73.7	21.2	1	61	78	92	100
Non-CEO Chairs	**Betweenness**	b_i	80.5	22.4	1	73	88	97	100
	Closeness	c_i	76.2	20.8	2	64	82	93	100
	Degree	d_i	74.9	22.3	3	60	81	94	100
	Eigenvector	e_i	75.2	20.6	1	63	79	92	100
Directors	**Betweenness**	b_i	79.8	25.7	1	73	90	98	100
	Closeness	c_i	78.2	21.3	1	66	85	95	100
	Degree	d_i	77.0	22.4	1	63	86	95	100
	Eigenvector	e_i	76.5	20.9	1	65	81	94	100

Panel C: Pearson Correlation of CEO and Director Centrality Measures

			Betweenness	Closeness	Degree	Eigenvector
CEOs	Betweenness	b_i	1.00	0.356	0.726	0.352
	Closeness	c_i	0.737	1.00	0.596	0.248
	Degree	d_i	0.802	0.872	1.00	0.577
	Eigenvector	e_i	0.656	0.933	0.786	1.00
Non-CEO Chairs	Betweenness	b_i	1.00	0.417	0.771	0.266
	Closeness	c_i	0.756	1.00	0.623	0.257
	Degree	d_i	0.808	0.883	1.00	0.569
	Eigenvector	e_i	0.658	0.931	0.787	1.00
Directors	Betweenness	b_i	1.00	0.388	0.780	0.273
	Closeness	c_i	0.748	1.00	0.616	0.232
	Degree	d_i	0.809	0.887	1.00	0.501
	Eigenvector	e_i	0.677	0.942	0.813	1.00

Table 3: Variables and Definitions

Variable	Definition
Measures of Independent Directors' Power	
Independent Board (IB)	Dummy set to 1 if more than 50% of directors are independent (as defined in financial statements) and 0 otherwise
Powerful Independent Director (PID)	A director-level dummy, used to construct firm-level variables, and defined as follows: An independent director is a *powerful independent director (*PID) if at least three of his four centrality measures are in their distributions' top quintiles
Powerful Non-Independent Director (PNID)	A director-level dummy defined as follows: An insider director is a *powerful non-independent director (*PNID) if at least three of his four centrality measures are in their distributions' top quintiles
Powerful Independent Board (PIB)	Dummy set to 1 if an independent board is powerful, meaning that more than 50% of independent directors are powerful, and 0 otherwise
Powerful Non-Independent Board (PNIB)	Dummy set to 1 if a majority of insider directors are powerful, and 0 otherwise
Independent Director Centrality (IDC)	Mean of the top 3 centrality measures for all independent directors on board
Non-Independent Director Centrality (NIDC)	Mean of the top 3 centrality measures for all insider directors on board
Measures of Chair's Power	
Non-CEO Chair (NCC)	Dummy set to 1 if the CEO does not chair the board and 0 otherwise
Non-CEO Chair Centrality (NCCC)	Mean of chair's top 3 centrality measures if CEO is not chair, 0 otherwise
Powerful Non-CEO Chair (PNC)	Dummy set to 1 for a non-CEO chair whose top three centrality measures average falls above the 80th percentile of all business professionals and 0 otherwise
Powerful Independent Non-CEO Chair (PINC)	Dummy set to 1 for an independent non-CEO chair whose top three centrality measures average falls above the 80th percentile of all business professionals and 0 otherwise
Powerful Non-independent Non-CEO Chair (PNINC)	Dummy set to 1 for a non-independent non-CEO chair whose top three centrality measures average falls above the 80th percentile of all business professionals and 0 otherwise
Independent Non-CEO Chair Centrality (INCC)	Mean of chair's top 3 centrality measures if an independent director is the chair, 0 otherwise
Non-independent Non-CEO Chair Centrality (NINCC)	Mean of chair's top 3 centrality measures if an insider director, not the CEO, is chair, 0 otherwise
Measures of CEO Power	
Powerful CEO (PCEO)	Dummy set to one if CEO is *powerful* – defined as at least three of CEO's four centrality measures (degree, closeness, betweenness and eigenvector) in their distributions' top quintiles
CEO Centrality (CEOC)	Mean of the top 3 centrality measures for the CEO

Regression Variables	
Tobin's Q (Q)	The book value of total assets minus the book value of equity plus the market value of equity minus deferred tax obligations, divided by total book assets
CEO Age (CEOA)	CEO age
Board Size (BSIZE)	Total number of directors on board
E-Index (ENDX)	Entrenchment Index (Bebchuk, Cohen, and Ferrell, 2009)
Assets (ASSETS)	Total assets, in billions of dollars
Leverage (LEV)	Total debt over total assets
Probability (PROF)	Net income over total assets
Tangibility(TANG)	Property, Plant, and Equipment over total assets
Capital Investment(CAPEX)	Net Capital expenditure over last year's property, plant and equipment
Cash Flows(CF)	The sum of net income, depreciation, and amortization over last year's property, plant and equipment
Research &Development (R&D)	Research & Development expense over total assets
Advertising (ADV)	Advertising expense over total assets
Event Study Variables	
Stock Return(RET)	Annual stock return minus the NYSE/AMSE/NASDAQ market index value weighted return
Sudden Death (DEATH)	An indicator variable set to one on the date of a powerful independent director's sudden death and zero otherwise
Measures of Changing Independent Director Power	
PID Addition (PIDA)	Dummy set to 1 if at least one new PID joins the board and 0 otherwise
PID Deletion (PIDD)	Dummy set to 1 if at least one new PID leaves the board and 0 otherwise.
Measures of Independent Directors' Power in Specific Decisions	
PID Ratio on Nominating Committee (PIDN)	Ratio of PIDs over total number of directors on nominating committee
PID Ratio on Auditing Committee (PIDA)	Ratio of PIDs over total number of directors on auditing committee
PID Ratio on Compensation Committee (PIDC)	Ratio of PIDs over total number of directors on compensation committee
Centrality of Nominating Comm. Members (IDCN)	Mean of the top 3 centrality measures for independent directors who serve on nominating committee
Centrality of Auditing Comm. Members (IDCA)	Mean of the top 3 centrality measures for independent directors who serve on auditing committee
Centrality of Compensation Comm. Members (IDCC)	Mean of the top 3 centrality measures for independent directors who serve on compensation committee

Other variables	
Bidder Return (BRET)	Cumulative Abnormal Return between [-3, +3] to a bidder upon merger announcement
Combined Return (CRET)	Cumulative Abnormal Return between [-3, +3] to the combined entity, calculated as the asset weighted CARs of the bidder and the target, upon merger announcement
Free Cash Flow (FCF)	Dummy set to 1 if a firm's cash flow is higher than two digit SIC industry median, dividend payout is lower than two digit SIC industry median, and Tobin's Q is lower than two digit SIC industry median.
CEO Pay – Total (TDC)	Log of total compensation (tdc1), defined as the sum of salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted using Black-Scholes, long-term incentive plans payouts, and all other compensations.
CEO Pay – Salary (SAL)	Log of cash compensation
CEO Pay – Options (OPT)	Log of stock option compensation
Earnings Manipulation (EM)	The absolute value of discretionary accruals generated from the modified Jones model

Table 4: Characteristics of CEOs, Independent Directors, Chairs, and Committees

No. firms is number of S&P 1500 firms in sample each year. Board characteristics include: PCEO is set to one if the CEO is designated as powerful, that is having at least three of her four power centrality measures lying in the top quintiles of their overall distributions. PCEO is one if the CEO is designates as powerful. **BSIZE**, mean directors per board; **NID is the number of a firm's** directors designated independent in SEC filings and **IB** is one for firms with a majority of independent directors so defined and zero otherwise. **NPID/ID** is the fraction of independent directors designated as powerful and **PIB** is one for independent boards for whom a majority of independent directors are powerful. Board chair characteristics are: **NCC,** set to one if the CEO is not the chair and to zero otherwise, and **PNC,** set to one if NCC is one and if the non-CEO chair is designated as powerful. Board committee characteristics are the means of dummies set to one if majorities of the Audit, Compensation and Nominating **committee members** are powerf ul.

	CEOs			**Full boards**				**Board chairs**		**Board committees**		
				Independent Directors		**Powerful Independent Directors (PIDs)**				**Audit**	**Compensation**	**Nominating**
Year	***No. of Firms***	***PCEO***	***BSIZE***	***NID / BSIZE***	***IB***	***NPID / ID***	***PIB***	***NCC***	***PNC***	***PIDA***	***PIDC***	***PIDN***
1999	1,110	44.7	9.74	58.7	76.9	34.5	42.3	30.5	17.7	43.6	49.1	31.4
2000	1,233	46.4	9.58	61.8	80.2	36.2	43.8	29.9	17.2	46	50.4	31.8
2001	1,343	46.4	9.44	63.3	81.9	37.8	45.1	30.8	18.0	48.9	51.6	33.8
2002	1,327	46.9	9.42	65.5	86.1	39.8	49.4	30.7	17.2	50.5	52.8	38.7
2003	1,372	47.1	9.38	67.6	89.5	41.3	51.0	31.9	18.1	52.5	54	47.8
2004	1,384	47.3	9.36	69.7	93.1	42	52.4	34.5	19.8	52.9	54.6	52.2
2005	1,354	46.5	9.36	71.2	93.9	43.4	52.8	36.6	22.0	54.5	55.8	53.1
2006	1,341	47.7	9.48	71.6	94.9	44.6	55.9	38.3	22.5	55.2	57.3	52.8
2007	1,367	46.2	9.32	76.3	99.1	46.9	56.6	40.5	24.7	56.9	59.5	56.7
2008	1,417	44.8	9.43	77.2	99.1	48	57.8	40.9	25.8	56.8	59.6	56.8
2009	1,376	46.2	9.43	77.2	98.8	49.2	58.5	43.0	27.5	59	60.8	58.1
2010	1,265	46.1	9.44	78.3	99.3	49.9	59.5	39.8	25.7	59.8	61.7	59
All	15,889	46.4	9.44	70.1	91.4	43	52.3	35.8	21.4	53.2	55.7	48.1

Table 5: Firm-level Summary Statistics

Summary statistics of variables defined in Table 3. Sample includes 15,889 firm-year observations.

		Mean	Standard deviation	Q1	Median	Q3
Independent Board	*IB*	0.914	0.281	1	1	1
Powerful Independent Board	*PIB*	0.523	0.499	0	1	1
Powerful Non-Independent Board	*PNIB*	0.313	0.464	0	0	1
Independent Director Centrality	*IDC*	81.1	14.9	74.3	84.9	92.1
Non-independent Director Centrality	*NIDC*	55.1	35.8	0	66.8	85.3
Non-CEO Chair	*NCC*	0.358	0.479	0	0	1
Powerful Non-CEO Chair	*PNC*	0.214	0.410	0	0	0
Powerful Independent Non-CEO Chair	*PINC*	0.111	0.314	0	0	0
Powerful Non-independent Non-CEO Chair	*PNINC*	0.103	0.304	0	0	0
Non-CEO Chair Centrality	*NCCC*	28.5	39.7	0	0	74
Independent Non-CEO Chair Centrality	*INCC*	13.0	31.1	0	0	0
Non-independent Non-CEO Chair Centrality	*NINCC*	15.5	31.8	0	0	0
Powerful CEO	*PCEO*	0.464	0.499	0	0	1
CEO Centrality	*CEOC*	77.3	19.2	65.3	82.3	93
Powerful independent Auditing Committee	*PIBA*	0.490	0.500	0	0	1
Powerful independent Compensation Committee	*PIBC*	0.520	0.500	0	1	1
Powerful independent Nominating Committee	*PIBN*	0.442	0.497	0	0	1
Auditing Committee Members Centrality	*IDCA*	80.7	16.3	73.3	85.0	92.8
Compensation Committee Members Centrality	*IDCC*	80.9	18.1	74.0	86.2	93.6
Nominating Committee Members Centrality	*IDCN*	70.7	32.0	64.0	83.8	92.8
Tobin's Q	*Q*	1.58	1.55	0.848	1.19	1.83
CEO Age	*CEOA*	55.7	7.33	51	56	60
Board Size	*BSIZE*	9.44	2.62	8	9	11
E-Index	*ENDX*	2.72	1.4	2	3	4
Total Assets (in $bil.)	*ASSETS*	16.8	89.2	0.755	2.12	7.37
Leverage	*LEV*	0.225	0.181	0.066	0.212	0.339
Profitability	*PROFIT*	0.126	0.101	0.07	0.121	0.176
Capital Expenditure	*CAPEX*	0.049	0.062	0.013	0.0324	0.0638
Cash Flow	*CF*	0.0908	0.125	0.0407	0.0878	0.142
R&D	*R&D*	0.024	0.0444	0	0	0.0279
Advertising	*ADV*	0.0102	0.0245	0	0	0.00584
CEO Pay – Total (in $mil.)	*TDC*	5.65	10.3	1.50	3.15	6.44
CEO Pay – Salary (in $mil.)	*SAL*	1.42	2.15	0.635	0.951	1.50
CEO Pay – Options (in $mil.)	*OPT*	2.10	8.79	0	0	1.70
Earnings Manipulation	*EM*	0.00819	0.0870	-0.0228	0.0113	0.0464

Table 6: Firm Value, Powerful Independent Directors, and a Powerful Non-CEO as Chair

Shareholder valuation, measured by Tobin's average Q ratio (Q), explained by OLS regressions on measures of CEO, chair, and independent director presence and power as well control variables including industry and year fixed effects. Variables are as described in Table 3. Sample is 13,933 firm-year panel of S&P 1500 firms from 1999 to 2010. Numbers in parentheses are robust probability levels with clustering by firm. Boldface denotes significance at 10% or better.

	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8
Powerful CEO dummy (PCEO)	0.0364 (0.26)						0.0224 (0.50)	
Powerful independent board dummy (PIB)		**0.0658** **(0.04)**					**0.0557** **(0.10)**	
Powerful non-CEO chair (PNC)			0.0499 (0.16)				0.0429 (0.23)	
CEO power centrality (CEOC)				0.000189 (0.84)				-0.00105 (0.35)
Independent director power centrality (IDC)					**0.00254** **(0.04)**			**0.00322** **(0.04)**
Non-CEO chair power centrality (NCCC)						0.000179 (0.63)		0.000106 (0.78)
log (ceo age)	**-0.183** **(0.09)**	-0.160 (0.14)	-0.156 (0.14)	**-0.180** **(0.09)**	-0.148 (0.17)	-0.169 (0.12)	-0.143 (0.19)	-0.138 (0.21)
log(board size)	**-0.303** **(0.00)**	**-0.312** **(0.00)**	**-0.309** **(0.00)**	**-0.302** **(0.00)**	**-0.311** **(0.00)**	**-0.305** **(0.00)**	**-0.318** **(0.00)**	**-0.310** **(0.00)**
e-index	**-0.0597** **(0.00)**	**-0.0605** **(0.00)**	**-0.0589** **(0.00)**	**-0.0593** **(0.00)**	**-0.0601** **(0.00)**	**-0.0588** **(0.00)**	**-0.0605** **(0.00)**	**-0.0592** **(0.00)**
log (total assets)	**-0.0433** **(0.00)**	**-0.0470** **(0.00)**	**-0.0382** **(0.01)**	**-0.0393** **(0.01)**	**-0.0502** **(0.00)**	**-0.0377** **(0.01)**	**-0.0487** **(0.00)**	**-0.0469** **(0.00)**
book leverage	-0.137 (0.26)	-0.136 (0.26)	-0.138 (0.26)	-0.137 (0.26)	-0.140 (0.25)	-0.137 (0.26)	-0.138 (0.26)	-0.140 (0.25)
profitability	**5.384** **(0.00)**	**5.376** **(0.00)**	**5.393** **(0.00)**	**5.391** **(0.00)**	**5.377** **(0.00)**	**5.393** **(0.00)**	**5.374** **(0.00)**	**5.378** **(0.00)**
investment	**0.796** **(0.01)**	**0.806** **(0.01)**	**0.782** **(0.01)**	**0.784** **(0.01)**	**0.821** **(0.01)**	**0.782** **(0.01)**	**0.813** **(0.01)**	**0.813** **(0.01)**
R&D/total assets	**8.674** **(0.00)**	**8.596** **(0.00)**	**8.694** **(0.00)**	**8.733** **(0.00)**	**8.569** **(0.00)**	**8.738** **(0.00)**	**8.524** **(0.00)**	**8.609** **(0.00)**
advertising / total assets	**1.767** **(0.05)**	**1.736** **(0.05)**	**1.821** **(0.04)**	**1.798** **(0.04)**	**1.723** **(0.05)**	**1.820** **(0.04)**	**1.739** **(0.05)**	**1.740** **(0.05)**
Industry fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388

Table 7: Firm Value and Board Characteristics

Tobin's Q (Q) explained by extent of board's legal independence and independent director power, as well as all control variables from Table 6 and industry and year fixed effects (not shown). Variables are as described in Table 3. Sample is a 13,933 firm-year panel of S&P 1500 firms from 1999 to 2010. Numbers in parentheses are robust probability levels clustering by firm. Boldface denotes significance at 10% or better.

Panel A. Legally Independent directors versus powerful independent directors

	7A.1	7A.2	7A.3	7A.4	7A.5	7A.6	7A.7
Powerful independent board dummy (PIB)						**0.104 (0.00)**	**0.102 (0.00)**
Fraction of directors independent	**-0.211 (0.02)**				**-0.335 (0.02)**	**-0.302 (0.00)**	**-0.384 (0.01)**
Majority of directors independent dummy (IB)		-0.0521 (0.30)			0.0461 (0.42)		0.0152 (0.79)
Two-thirds of directors independent dummy			-0.0517 (0.12)		0.0346 (0.42)		0.0309 (0.47)
CEO does not chair the board dummy				-0.0101 (0.74)	-0.0187 (0.54)		-0.0187 (0.54)
Control variables	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes
Adjusted R-squared	0.389	0.388	0.388	0.388	0.389	0.390	0.390

Panel B. Powerful Independent Directors versus Powerful Insider Directors

	7B.1	7B.2	7B.3	7B.4	7B.5	7B.6	7B.7
Powerful CEO dummy (PCEO)							0.0163 (0.63)
Powerful independent board dummy (PIB)	**0.0530 (0.10)**					**0.0592 (0.06)**	**0.0554 (0.09)**
Powerful non-independent board dummy (PNIB)	**0.0873 (0.00)**	**0.0951 (0.00)**				**0.0588 (0.06)**	**0.0566 (0.08)**
Powerful independent non-CEO chair (PINC)			-0.0551 (0.28)	-0.0751 (0.13)		-0.0637 (0.21)	-0.0636 (0.21)
Powerful non-independent non-CEO chair (PNINC)			**0.153 (0.00)**		**0.160 (0.00)**	**0.124 (0.01)**	**0.126 (0.01)**
Control variables	Yes	yes	yes	yes	yes	Yes	Yes
Firm fixed effects	Yes	yes	yes	yes	yes	Yes	Yes
Year fixed effects	Yes	yes	yes	yes	yes	Yes	Yes
R^2	0.389	0.389	0.389	0.388	0.389	0.390	0.390

Table 8: Cumulative Abnormal Returns on Powerful Independent Director Sudden Deaths

This table reports t-test statistics and OLS regressions of Cumulative Abnormal Returns when a director suddenly died. The abnormal returns are calculated after the director death over four event windows including [-3, 3], [-1, 1], [-1, 2], and [-1, 3], respectively. Numbers in Panel A are percentages of CARs over these windows. Boldface indicates t-test statistics with p-values rejecting equal means at 10% significance or less. Panel B are regressions of CARs on dummies of IB and PIB and controls. Controls include director age at death plus firm characteristics as in Table 6. Numbers in parentheses are probability levels rejecting the null hypothesis of zero coefficients. Boldface indicates significance at 10% or better.

Panel A: Mean CAR comparisons surrounding the sudden deaths of independent directors (*IB=1*) versus other directors (IB = 0) and of powerful independent directors (*PID=1*) versus other independent directors (PID = 0)

	Weights	**Equal**				**Value**			
	Events	**Director sudden deaths**		**Independent director sudden deaths**		**Director sudden deaths**		**Independent director sudden deaths**	
	Dichotomy	**Independent**		**Powerful**		**Independent**		**Powerful**	
		Y	**N**	**Y**	**N**	**Y**	**N**	**Y**	**N**
Event Window	**[-1, +1]**	-0.0285	0.572	-0.320	0.387	-0.0197	**0.618**	-0.311	0.394
	[-1, +2]	-0.0275	0.142	-0.308	0.372	0.0602	0.219	-0.251	**0.503**
	[-1, +3]	-0.0265	0.0665	-0.250	0.291	0.0247	0.158	-0.252	0.419
	[-3, +3]	-0.247	0.154	-0.383	-0.0532	0.0267	-0.0385	-0.121	0.237
	Events	172	54	101	71	172	54	101	71

Panel B: Regressions of CARs on dummies for sudden death of an independent director (*IB*), a powerful director (PD), and a powerful independent director (*PID*). Sample is 226 sudden director deaths.

	8B.1	**8B.2**	**8B.3**	**8B.4**	**8B.5**	**8B.6**	**8B.7**	**8B.8**
weights	**equal**	**equal**	**equal**	**equal**	**value**	**value**	**value**	**value**
window	**[-1, +1]**	**[-1, +2]**	**[-1, +3]**	**[-3, +3]**	**[-1, +1]**	**[-1, +2]**	**[-1, +3]**	**[-3, +3]**
Powerful director (PD)	0.0168 (0.14)	**0.0231** **(0.06)**	**0.0288** **(0.05)**	**0.0289** **(0.10)**	0.0133 (0.23)	0.0178 (0.16)	0.0219 (0.14)	0.0197 (0.17)
Independent director (ID)	0.00187 (0.78)	0.00743 (0.31)	0.00866 (0.32)	0.00435 (0.68)	0.000720 (0.91)	0.00680 (0.36)	0.00748 (0.39)	0.00714 (0.40)
Powerful Independent director (PID)	**-0.0239** **(0.06)**	**-0.0299** **(0.03)**	**-0.0342** **(0.03)**	**-0.0322** **(0.10)**	**-0.0204** **(0.10)**	**-0.0254** **(0.07)**	**-0.0286** **(0.08)**	-0.0233 (0.14)
Intercept	0.00199 (0.71)	-0.00372 (0.52)	-0.00574 (0.40)	-0.00488 (0.55)	0.00322 (0.54)	-0.00177 (0.76)	-0.00329 (0.64)	-0.00477 (0.48)
R^2	0.023	0.022	0.020	0.014	0.021	0.016	0.014	0.010

Table 9: Granger Causality Tests

The left panel runs regressions of y's on lags of y's and lags of x's and the right panel runs x's on lags of y's and lags of x's. In both panels, y is Tobin's Q and x's are one of the indicator variables PIB (one if a majority of independent directors are powerful), PNIB (one if a majority of non-independent director are powerful), PINC (one if the chair is a powerful independent director), or PNINC (one if the chair is a powerful non-independent director) or one of the continuous variables IDC (mean independent director power centrality), NIDC (mean non-independent director centrality), INCC (chair's power centrality if an independent director is chair), or NINCC (chair's power centrality if a non-independent director other than the CEO is chair). The left panel provides joint F statistics and p-levels for lags of x, in OLS regressions explaining Q and also including lags of Q. The right panel reports joint F statistics and p-levels for probit regressions running x's on lags of y's and lags of x's when x is one of the dummies, and for OLS regressions when x is one of the continuous centrality variables. Numbers in the parentheses are probability levels for rejecting the null hypothesis that the lags are jointly statistically insignificant.

	Board power Granger causes shareholder value			**Shareholder value Granger causes board power**		
Power measure ($X_{i,t}$) is:	$Q_{i,t} = \sum_{s=1}^{S} a_s Q_{i,t-s} + \sum_{s=1}^{S} b_s X_{i,t-s} + u_{i,t}$			$X_{i,t} = \sum_{s=1}^{S} a_s X_{i,t-s} + \sum_{s=1}^{S} b_s Q_{i,t-s} + u_{i,t}$		
	1 lag	***2 lags***	***3 lags***	***1 lag***	***2 lags***	***3 lags***
PIB	**3.24 (0.07)**	**4.84 (0.01)**	**3.43 (0.02)**	2.64 (0.11)	4.59 (0.10)	**17.82 (0.00)**
PNIB	0.38 (0.54)	0.91 (0.40)	1.00 (0.39)	**10.69 (0.00)**	**8.30 (0. 02)**	**17.12 (0.00)**
PINC	2.08 (0.15)	2.00 (0.14)	0.23 (0.88)	**6.48 (0.01)**	**10.35 (0.01)**	5.17 (0.16)
PNINC	1.87 (0.17)	1.13 (0.32)	0.37 (0.78)	**7.89 (0.01)**	**10.39 (0.01)**	**9.79 (0.02)**
IDC	**4.33 (0.04)**	**3.97 (0.02)**	**4.99 (0.00)**	2.05 (0.15)	1.36 (0.26)	1.16 (0.32)
NIDC	0.07 (0.79)	0.62 (0.54)	2.1 (0.10)	**15.49 (0.00)**	**3.81 (0.02)**	**6.60 (0.00)**
INCC	0.17 (0.68)	1.90 (0.15)	1.26 (0.29)	**9.77 (0.00)**	**7.81 (0.00)**	**3.69 (0.01)**
NINCC	3.76 (0.05)	0.96 (0.38)	0.69 (0.56)	**10.81 (0.00)**	**10.43 (0.00)**	**3.91 (0.01)**

Table 10: First Differences in Tobin's Q and Changes in Board Power Structure

Regressions explaining year-on-year change in Tobin's average Q with *ΔPIDs* and *ΔPNIDs*, respectively defined as net increases in the number of powerful independent directors (PIDs) and powerful non-independent directors (PNIDs), both scaled by the total number of directors, as well as by indictor variables reflecting changes in the chair of the board. The indicator variable *ΔPINC* takes the value +1 if the chair this period is a powerful independent director and the chair the previous chair was not, -1 if the chair this period is not a powerful independent director and the chair the previous period was, and 0 in all other cases. The indicator variable change in ΔPNINC is +1 if the chair this period is a powerful non-independent director other than the CEO and the chair the previous chair was not, -1 if the chair this period is not a powerful non-independent director other than the CEO and the chair the previous period was, and 0 otherwise. Control variables are first differences of variables defined in Table 3. The sample is a 13,933 panel of firm-annual difference observations. Numbers in the parentheses are probability levels adjusted for clustering by firm.

	10.1	**10.2**	**10.3**	**10.4**	**10.5**
Δ PIDs	**0.0592** **(0.08)**				**0.0612** **(0.07)**
Δ PNID		0.0472 (0.56)			0.0448 (0.58)
Δ PINC			**-0.0240** **(0.05)**		**-0.0253** **(0.04)**
Δ PNINC				0.0310 (0.27)	0.0339 (0.24)
Δ CEO age	0.108 (0.19)	0.111 (0.18)	0.108 (0.19)	0.111 (0.18)	0.110 (0.18)
Δ log(board size)	**-0.119** **(0.01)**	**-0.113** **(0.02)**	**-0.107** **(0.02)**	**-0.108** **(0.02)**	**-0.126** **(0.01)**
Δ E-Index	0.00756 (0.20)	0.00735 (0.21)	0.00737 (0.21)	0.00723 (0.22)	0.00805 (0.17)
Δ log(assets)	**-0.380** **(0.00)**	**-0.376** **(0.00)**	**-0.375** **(0.00)**	**-0.376** **(0.00)**	**-0.379** **(0.00)**
Δ book leverage	**-0.536** **(0.00)**	**-0.541** **(0.00)**	**-0.542** **(0.00)**	**-0.541** **(0.00)**	**-0.539** **(0.00)**
Δ profitability	**1.924** **(0.00)**	**1.929** **(0.00)**	**1.927** **(0.00)**	**1.930** **(0.00)**	**1.924** **(0.00)**
Δ investment rate	0.218 (0.19)	0.217 (0.19)	0.213 (0.20)	0.217 (0.19)	0.217 (0.20)
Δ R&D /assets	-0.602 (0.43)	-0.597 (0.43)	-0.597 (0.43)	-0.595 (0.43)	-0.607 (0.43)
Δ Advertising /assets	-1.475 (0.14)	-1.480 (0.14)	-1.478 (0.14)	-1.474 (0.14)	-1.461 (0.14)
Intercept	-0.0408 (0.00)	-0.0413 (0.00)	-0.0420 (0.00)	-0.0415 (0.00)	-0.0406 (0.00)
R^2	0.063	0.063	0.063	0.063	0.063

Table 11: Value Destroying M&A Activity

Cumulative abnormal returns from day -3 to day +3 around dates of M&A announcement by S&P 1500 firms between 1999 and 2009, explained by OLS regressions on measures of CEO and independent director power as well as control variables, including industry and year fixed effects. Variables are as described in Table 3. Numbers in parentheses are robust probability levels with clustering by bidder. Boldface denotes significance at 10% or better

	11.1	11.2	11.3	11.4
CAR [-3, +3] of	***Bidder***	***Bidder***	***Combined***	***Combined***
PIB	**0.0155** **(0.04)**		**0.0148** **(0.04)**	
IDC		**0.000777** **(0.03)**		**0.000396** **(0.26)**
PCEO	**-0.0346** **(0.00)**		**-0.0304** **(0.00)**	
CEOC		**-0.00127** **(0.00)**		**-0.000871** **(0.00)**
Log (CEO age)	0.0721 (0.01)	0.0656 (0.02)	0.0387 (0.14)	0.0290 (0.27)
Log(board size)	-0.00316 (0.77)	-0.000736 (0.94)	-0.0166 (0.11)	-0.0143 (0.17)
Entrenchment index	0.00209 (0.35)	0.00223 (0.33)	0.00297 (0.17)	0.00276 (0.21)
Same industry dummy	-0.00513 (0.43)	-0.00359 (0.58)	-0.00329 (0.60)	-0.00233 (0.71)
Stock payment dummy	**-0.0174** **(0.02)**	**-0.0164** **(0.02)**	**-0.0169** **(0.02)**	**-0.0166** **(0.02)**
Deal value over bidder size	**-0.0331** **(0.00)**	**-0.0333** **(0.00)**		
Deal value over combined size			**0.0283** **(0.05)**	**0.0281** **(0.05)**
Observations	632	632	632	632
R^2	0.0592	0.0568	0.0406	0.0313

Table 12 Powerful Independent Directors and Free Cash Flow Agency Problems

Probit regression of free cash flow problem on measures of CEO, chair, and independent director presence and power as well control variables including industry and year fixed effects. Variables are as described in Table 3. The free cash flow measure is a dummy which takes the value of one if a firm's cash flow is higher than the Fama-French 17-industry (FF-17) median, dividend payout is lower than FF-17 median, and Tobin's Q is lower than FF-17 median, and zero otherwise. Sample is 13,933 firm-year panel of S&P 1500 firms from 1999 to 2010. Numbers in parentheses are robust probability levels with clustering by firm. Boldface denotes significance at 10% or better.

	12.1	12.2	12.3	12.4	12.5	12.6
PIB	**-0.217** **(0.00)**	**-0.212** **(0.01)**	**-0.220** **(0.00)**			
PCEO		-0.0169 (0.82)	-0.0156 (0.83)			
PNC			0.0674 (0.41)			
IDC				**-0.00700** **(0.00)**	**-0.00797** **(0.00)**	**-0.00817** **(0.00)**
CEOC					0.00134 (0.54)	0.00140 (0.53)
NCCC						0.000568 (0.50)
log (CEO age)	0.107 (0.65)	0.109 (0.64)	0.140 (0.55)	0.0768 (0.74)	0.0708 (0.76)	0.107 (0.65)
log (board size)	0.0961 (0.51)	0.0959 (0.51)	0.0899 (0.54)	0.0890 (0.54)	0.0847 (0.56)	0.0749 (0.61)
e-index	-0.0153 (0.57)	-0.0152 (0.58)	-0.0154 (0.57)	-0.0171 (0.53)	-0.0174 (0.53)	-0.0168 (0.54)
log (total assets)	0.0161 (0.56)	0.0174 (0.53)	0.0185 (0.50)	0.0189 (0.48)	0.0164 (0.54)	0.0188 (0.48)
book leverage	-0.432 (0.02)	-0.429 (0.02)	-0.433 (0.02)	-0.393 (0.04)	-0.399 (0.04)	-0.400 (0.04)
profitability	-0.600 (0.08)	-0.592 (0.09)	-0.588 (0.09)	-0.541 (0.12)	-0.553 (0.12)	-0.543 (0.12)
investment	1.000 (0.02)	0.997 (0.02)	1.000 (0.02)	1.006 (0.02)	1.015 (0.01)	1.017 (0.01)
R&D / total assets	-8.128 (0.00)	-8.079 (0.00)	-8.146 (0.00)	-7.950 (0.00)	-8.061 (0.00)	-8.081 (0.00)
advertising / total assets	-4.206 (0.03)	-4.200 (0.04)	-4.183 (0.03)	-4.177 (0.04)	-4.147 (0.04)	-4.102 (0.04)
R^2	0.0489	0.0490	0.0493	0.0494	0.0497	0.0499

Table 13. Powerful Independent Directors and Forced CEO Turnover

Binomial probit regressions explaining the odds of a forced CEO turnover occurring on independent director power measures – the powerfully independent board dummy *PIB* or the continuous independent director power measure *IDC* for the full board or their analogs for the nominating committee, *PIBN* or *IDCN* – and their interactions with the prior year's total stock return, *RET*, as well control variables including industry and year fixed effects. The forced CEO turnover dummy variable is set to one if a new CEO is brought in from outside the firm during the year and to zero otherwise. Variables are described in Table 3. Sample includes 212 events of forced turnover and 394 events of voluntary turnover from 2000 to 2009. Numbers in parentheses are robust probability levels with clustering by firm. Boldface denotes significance at 10% or better.

	13.1	**13.2**	**13.3**	**13.4**
***power* measure**	***PIB***	***PIBN***	***IDC***	***IDCN***
power	0.0839	0.0296	**0.0109**	0.00237
	(0.47)	(0.80)	**(0.02)**	(0.19)
power* × *RET	**-0.520**	**-0.611**	-0.0112	2.72e-05
	(0.06)	**(0.04)**	(0.35)	(0.99)
RET	-0.00511	-0.0543	0.669	-0.267
	(0.98)	(0.73)	(0.51)	(0.22)
log (*CEO age*)	-0.472	-0.463	-0.460	-0.494
	(0.39)	(0.40)	(0.40)	(0.36)
log (*board size*)	-0.287	-0.277	**-0.436**	-0.356
	(0.24)	(0.27)	**(0.08)**	(0.15)
e-index	-0.0197	-0.0237	-0.0138	-0.0218
	(0.64)	(0.57)	(0.74)	(0.60)
R^2	0.0494	0.0499	0.0511	0.0452

Table 14. Powerful Independent Directors and CEO Compensation

Regressions of the logarithm of CEO pay – total, equity and cash, compensation in Panels A, B and C, respectively – on various independent director power measures – the powerfully independent board dummy *PIB* or the continuous independent director power measure *IDC* for the full board or their analogs for the compensation committee, *PIBC* or *IDCC* – and their interactions with the prior year's total stock return, *RET,* as well as controls including year and industry fixed effects. Regressions 14.4 through 14.8 control for the corresponding CEO power measure, either the powerful CEO dummy *PCEO* or the continuous CEO power measure *CEOC*. All regressions control for the logarithms of CEO age, the logarithms of board size, e-index, the log of total assets, book leverage, profitability, investment, R&D over total assets, and advertising expenses over total assets. Variables are described in Table 3. Sample is a 13,933 firm-year panel of S&P 1500 firms from 1999 to 2010. Numbers in parentheses are robust probability levels with clustering by firm. Boldface denotes significance at 10% or better.

Panel A. CEO Total Compensation

	14A.1	**14A.2**	**14A.3**	**14A.4**	**14A.5**	**14A.6**	**14A.7**	**14A.8**
Independent director *power* measure	***PIB***	***PIBC***	***IDC***	***IDCC***	***PIB***	***PIBC***	***IDC***	***IDCC***
power	**0.256** **(0.00)**	**0.258** **(0.00)**	**0.0145** **(0.00)**	**0.0104** **(0.00)**	**0.208** **(0.00)**	**0.215** **(0.00)**	**0.0103** **(0.00)**	**0.00731** **(0.00)**
power* × *RET	0.0590 (0.31)	0.0398 (0.53)	-0.000167 (0.95)	-0.00204 (0.26)	0.0796 (0.14)	0.0501 (0.35)	0.000812 (0.76)	-0.00191 (0.31)
PCEO					**0.189** **(0.00)**	**0.191** **(0.00)**		
PCEO* × *RET					-0.0409 (0.52)	-0.0232 (0.70)		
CEOC							**0.00595** **(0.00)**	**0.00690** **(0.00)**
CEOC* × *RET							-0.00132 (0.45)	0.000138 (0.95)
RET	**0.0949** **(0.01)**	**0.103** **(0.01)**	**0.126** **(0.54)**	**0.275** **(0.08)**	**0.100** **(0.01)**	**0.107** **(0.01)**	**0.150** **(0.47)**	**0.254** **(0.15)**
R^2	0.277	0.277	0.286	0.284	0.281	0.281	0.290	0.289

Panel B. CEO Equity Compensation

Independent director *power* measure	14B.1 *PIB*	14B.2 *PIBC*	14B.3 *IDC*	14B.4 *IDCC*	14B.5 *PIB*	14B.6 *PIBC*	14B.7 *IDC*	14B.8 *IDCC*
power	**0.917** **(0.00)**	**1.079** **(0.00)**	**0.0475** **(0.00)**	**0.0411** **(0.00)**	**0.736** **(0.00)**	**0.922** **(0.00)**	**0.0361** **(0.00)**	**0.0335** **(0.00)**
power* × *RET	0.152 (0.47)	0.295 (0.14)	0.00761 (0.36)	**0.0156** **(0.09)**	0.182 (0.48)	**0.401** **(0.05)**	0.00876 (0.35)	**0.0200** **(0.06)**
PCEO					**0.709** **(0.00)**	**0.685** **(0.00)**		
PCEO* × *RET					-0.0638 (0.82)	-0.205 (0.38)		
CEOC							**0.0164** **(0.00)**	**0.0166** **(0.00)**
CEOC* × *RET							-0.00153 (0.85)	-0.00609 (0.43)
RET	0.0648 (0.42)	0.0380 (0.71)	-0.460 (0.45)	-1.141 (0.12)	0.0778 (0.33)	0.0624 (0.51)	-0.434 (0.50)	-1.034 (0.16)
R^2	0.659	0.660	0.661	0.662	0.660	0.661	0.662	0.663

Panel C. CEO Cash Compensation

Independent director *power* measure	14C.1 *PIB*	14C.2 *PIBC*	14C.3 *IDC*	14C.4 *IDCC*	14C.5 *PIB*	14C.6 *PIBC*	14C.7 *IDC*	14C.8 *IDCC*
power	**0.0682** **(0.01)**	**0.0920** **(0.00)**	**0.00431** **(0.00)**	**0.00391** **(0.00)**	**0.0486** **(0.06)**	**0.0757** **(0.00)**	0.00274 (0.11)	**0.00299** **(0.01)**
power* × *RET	0.0109 (0.83)	0.0106 (0.84)	7.02e-05 (0.97)	-0.00129 (0.38)	0.00107 (0.98)	-0.000836 (0.98)	7.36e-05 (0.97)	-0.00182 (0.11)
PCEO					**0.0774** **(0.01)**	**0.0724** **(0.02)**		
PCEO* × *RET					0.0176 (0.71)	0.0183 (0.69)		
CEOC							**0.00226** **(0.07)**	**0.00208** **(0.06)**
CEOC* × *RET							-3.42e-07 (1.00)	0.000970 (0.52)
RET	**0.0636** **(0.03)**	**0.0645** **(0.02)**	0.0618 (0.70)	0.169 (0.15)	**0.0631** **(0.03)**	**0.0639** **(0.03)**	0.0614 (0.71)	0.140 (0.32)
R^2	0.188	0.189	0.190	0.191	0.189	0.190	0.190	0.191

Table 15. Powerful Independent Directors and Earnings Manipulation

OLS regressions of the absolute value of modified Jones model discretionary accruals on measures of independent director power measures –the powerfully independent board dummy *PIB* or the continuous independent director power measure *IDC* for the full board or their analogs for the audit committee, *PIBA* or *IDCA* – as well control variables including industry and year fixed effects. Regressions 15.4 through 15.8 also control for the corresponding CEO power measures, either the powerful CEO dummy PCEO or the continuous CEO power measure CEOC. Variables are as described in Table 3. Sample is 13,933 firm-year panel of S&P 1500 firms from 1999 to 2010. Numbers in parentheses are robust probability levels with clustering by firm. Boldface denotes significance at 10% or better.

	15.1	**15.2**	**15.3**	**15.4**	**15.5**	**15.6**	**15.7**	**15.8**
Independent director *power* measure	***PIB***	***PIBA***	***IDC***	***IDCA***	***PIB***	***PIBA***	***IDC***	***IDCA***
power	**-0.00402**	-0.00326	**-0.000263**	**-0.000210**	-0.00334	-0.00259	**-0.000168**	**-0.000137**
	(0.05)	(0.11)	**(0.00)**	**(0.00)**	(0.13)	(0.22)	**(0.05)**	**(0.06)**
PCEO					-0.00246	-0.00272		
					(0.28)	(0.22)		
CEOC							**-0.000138**	**-0.000152**
							(0.04)	**(0.02)**
log *(CEO age*)	**0.0273**	**0.0277**	**0.0251**	**0.0259**	**0.0276**	**0.0280**	**0.0255**	**0.0259**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
log (*board size*)	0.00379	0.00345	0.00402	0.00393	0.00378	0.00349	0.00424	0.00425
	(0.41)	(0.45)	(0.38)	(0.39)	(0.41)	(0.45)	(0.36)	(0.35)
e-index	-0.000197	-0.000246	-0.000144	-0.000169	-0.000170	-0.000208	-4.79e-05	-4.80e-05
	(0.78)	(0.73)	(0.84)	(0.81)	(0.81)	(0.77)	(0.95)	(0.95)
log (*total assets*)	0.000728	0.000638	0.00139	0.00117	0.000988	0.000934	0.00176	0.00170
	(0.47)	(0.53)	(0.19)	(0.25)	(0.35)	(0.38)	(0.10)	(0.11)
book leverage	0.00395	0.00408	0.00370	0.00357	0.00385	0.00395	0.00377	0.00364
	(0.62)	(0.61)	(0.64)	(0.65)	(0.63)	(0.62)	(0.63)	(0.65)
profitability	**0.0670**	**0.0671**	**0.0658**	**0.0658**	**0.0669**	**0.0670**	**0.0651**	**0.0650**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
investment	**-0.114**	**-0.114**	**-0.117**	**-0.116**	**-0.115**	**-0.115**	**-0.119**	**-0.118**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
R^2	0.0373	0.0372	0.0383	0.0381	0.0374	0.0373	0.0388	0.0388