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CEO DIRECTORS, EXECUTIVE INCENTIVES, AND CORPORATE STRATEGIC INITIATIVES

Olubunmi Faleye
Northeastern University

Abstract

I study how directors who are chief executive officers (CEOs) of other firms affect board effectiveness. I find that CEOs are paid more and their compensation is less sensitive to firm performance when other CEOs serve as directors. This is not an employment risk premium because CEO directors are not associated with higher turnover-performance sensitivity. Also, CEO directors have no effect on corporate innovation but are associated with higher acquisition returns, especially for complex deals. My results suggest that the advisory benefits of CEO directors must be balanced against the distortions in executive incentives associated with their board service.

JEL Classification: G34

I. Introduction

Chief executive officers (CEOs) of other firms are a major source of candidates for board positions. Between 1998 and 2005, 15% of the directors of the largest 1,500 firms in the United States are outside CEOs, and 71% of these firms have at least one such director. Yet, in spite of the recent growth of empirical research in corporate governance, not much is known about how these directors affect firm behavior and board effectiveness. In this study, I fill the gap by conducting a broad-based evaluation of the impact of CEO directors on various dimensions of firm activities and board decisions.

In one of the earliest studies on this topic, Fich (2005) reports positive stock price reactions to director appointments when the appointee is an active CEO, suggesting that CEO directors are value enhancing. Given that directors perform two broad functions, namely, monitoring and advising top management (Jensen 1993), this suggests that CEO directors can add value through better

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monitoring and/or better advising. I focus on CEO compensation and executive turnover to examine the monitoring effects of CEO directors and corporate investments in innovation and acquisitions to examine their effects on the board's advising duties.

CEO directors are potentially motivated to oversee top management better because they have more reputational capital at stake. Furthermore, their experience as active CEOs can provide them with important insights and tools to do so. This suggests better compensation and dismissal incentives at firms with CEO directors. Nevertheless, as serving top executives themselves, CEO directors are subject to a unique set of influences that can negatively affect the performance of their monitoring duties. Tajfel and Turner (1979) show that individuals tend to identify with others based on shared characteristics and act with positive bias toward those perceived as members of the in-group. Among all directors, other CEOs are arguably the most similar to the CEO in terms of professional and social experience. Consistent with this, Useem (1984) shows that corporate CEOs are a relatively homogeneous and cohesive group. Thus, CEO directors can identify with the subject CEO and be sympathetic in evaluating and rewarding his or her performance, resulting in higher compensation, lower pay-performance sensitivity, lower turnover rates, and lower sensitivity of turnover to firm performance. Furthermore, the benchmarking process prevalent at many firms can create perverse incentives for CEO directors to inflate the CEO's pay, as this increases average CEO compensation and provides CEO directors the "hard data" they need to justify requests for higher compensation at their own firms.

CEO directors also can significantly affect the board's advising function. Stein (1988) and Knoeber (1986) argue that potentially entrenching governance provisions can facilitate managerial investment in firm-specific human capital and risky but profitable long-term projects. In the same way, a supportive board influenced by other CEOs can provide the implicit assurance necessary to induce the CEO to take strategic risks and invest in profitable long-term projects with uncertain payoffs. In addition, active CEOs bring a unique combination of talent and experience to the board and can thus play important advisory roles in identifying and exploiting strategic opportunities.

I study these issues using firms in the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indexes (collectively S&P 1500) over 1998–2005. First, I relate both the level and performance sensitivity of CEO compensation to measures of the presence of directors who are CEOs of other firms. After controlling for standard economic determinants of executive compensation and various other dimensions of corporate governance, I find that CEOs are paid significantly more when other CEOs serve on their boards. For the average CEO, an additional CEO director increases total compensation by 4.4%, and an increase of 1 standard deviation in the proportion of directors who are outside CEOs increases total pay by 5.2%. Similarly, CEO pay-performance sensitivity is negatively related to the proportion

of directors who are outside CEOs, with my estimates implying that the change in CEO compensation in response to a change in shareholder wealth is 6% lower for a firm with the typical outside CEO board representation relative to a firm with no CEO directors. These results are highly robust.

Next, I focus on executive turnover to further examine the effect of CEO directors on board monitoring. I examine two possibilities, with opposite predictions. First, as discussed earlier and supported by the compensation results, CEO directors can exhibit positive bias in evaluating the CEO. This suggests lower turnover rates and lower turnover-performance sensitivity for firms with more CEO directors. In contrast, as argued by Peters and Wagner (2008), higher compensation can reflect an equilibrium premium for greater employment termination risk. Thus, if CEO directors are more vigilant in detecting and punishing deteriorating performance, one may observe higher compensation in combination with higher turnover rates and higher turnover-performance sensitivity at firms with more CEO directors. The evidence is weakly consistent with the former view: the coefficient of CEO directors is always negative in my turnover regressions, although statistically insignificant, and CEO directors are not associated with an increase in the sensitivity of CEO turnover to firm performance.

These results suggest that board monitoring is weaker when outside CEOs serve as directors, implying that potential value-enhancing effects are more likely through better advising. To investigate this, I first examine corporate investments in strategic innovation, using patents awarded by the U.S. Patent and Trademark Office (USPTO) and new product announcements as proxies. In each case, I find no statistically significant relation between my measure of corporate innovation and the presence of outside CEOs on the board of directors. This result, although inconsistent with the argument that outside CEOs provide a safety net of sympathetic directors that allows the CEO to focus on long-term strategy, is consistent with Meulbroek et al. (1990) and Atanassov (2008), who show that entrenching governance and corporate control provisions do not ameliorate managerial myopia.

Finally, I analyze acquisition returns as a further test of whether CEO directors add value, especially in a clearly identifiable strategic initiative involving significant board input. In this case, I find concurring evidence: an additional CEO director increases acquisition returns by 20 basis points. Further analysis reveals that this effect is stronger when board advising is potentially more important, that is, when the deal is more complex. For these deals, the acquisition related value-added per additional CEO director is 52 basis points, compared to only 14 basis points when the deal is less complex.

This article contributes to three related but separate literatures. The first considers CEO service on external boards, focusing on implications for the sending firm. Booth and Deli (1996) show that CEOs of high-growth firms hold fewer outside directorships, and Perry and Peyer (2005) report positive abnormal returns

when a firm's CEO is appointed to the board of another firm. Fich (2005) shows that abnormal returns to director appointments are higher when the appointee is an active CEO. I extend and complement this literature by providing evidence on how CEO directors affect the behavior and operations of the receiving firm. Specifically, it appears that CEO directors add value through better advising rather than better monitoring. If anything, monitoring is weaker when outside CEOs serve as directors.

In contemporaneous work, Fahlenbrach, Low, and Stulz (2010) analyze the appointment of outside CEOs as directors, showing that such appointments are more likely for large, well-established firms with lower insider ownership. They also report no significant changes in operating performance and monitoring effectiveness following these appointments. The latter results are different from my findings, but the differences are mainly attributable to a disparity in our respective measures of the presence of CEO directors. Fahlenbrach, Low, and Stulz use an indicator variable that equals 1 if a company has at least one CEO director, and 0 otherwise. In contrast, my primary measure is the number of CEO directors as a percentage of all directors. As reported later, there is considerable variation in the percentage of CEO directors among firms with at least one such director in my sample. Thus, a continuous variable allows a better use of the information in the data. More important, these contrasting results suggest that lumping firms having a nominal CEO director representation with those having a significant CEO director presence potentially obfuscates the effects of these directors. Rather, it seems that allowing for differences in the potential influence of CEO directors based on their proportional board representation provides the opportunity to tease out the nuances of how these directors affect corporate governance.

This article also contributes to the literature that analyzes the effects of director connections and board interlocks on executive compensation. Hallock (1997) reports higher compensation for CEOs in interlocking directorships with their board members, and Barnea and Guedj (2008) show that CEOs are paid higher salaries when directors are more connected to other people in the network of board members. By focusing on CEO directors, I show that even subtle connections, mainly in the form of professional identity, can have significant ramifications for the firm and its shareholders.

Finally, I contribute to the literature on how board characteristics affect firm decisions and shareholder outcomes. Although originally focused on broad board attributes such as board size and board composition, this literature has recently expanded to include micro board features such as specific types of directors (see, e.g., Guner, Malmendier, and Tate 2008 on directors with financial expertise, and Coles, Daniel, and Naveen 2009 on directors joining the board after the CEO). I extend this literature by providing evidence for an important but previously overlooked subset of directors.

II. CEO Directors and Executive Compensation

Data and Variables

My data come from five sources. I obtain director information and board structure data from the RiskMetrics director database. This database provides detailed information on each director of firms in the S&P 1500 index, covering such items as age, gender, principal occupation, interlocking relationships, independence status, and service on the three principal board committees (audit, compensation, and nominating committees). Although the RiskMetrics database provides data starting in 1996, coverage of directors' principal occupations began in 1998. Consequently, my sample also begins in that year.

My CEO compensation data come from Standard & Poor's ExecuComp, and I obtain firm characteristics and accounting data from Compustat and stock return data from the Center for Research in Security Prices (CRSP). Finally, I obtain takeover defenses data from the RiskMetrics corporate takeover defenses database. After eliminating 637 firm-years where the CEO's total compensation is missing or reported as zero, my data cover 3,217 CEOs at 2,105 unique firms over 11,040 firm-years from 1998 to 2005.

Using these data, I construct several variables that I use in my empirical tests. These variables include measures of outside CEO representation on the board, executive compensation, economic determinants of CEO compensation, board structure, and takeover defenses. I discuss these next.

CEO Directors

I define a CEO director as a nonemployee director whose principal occupation is identified by RiskMetrics as the CEO of another firm.[1] I employ two variables to measure the influence of these directors. The first is the percentage of all directors who are CEOs of other firms while the second is the number of such directors.

Executive Compensation

My principal measure of executive compensation is the CEO's total annual compensation, defined as the sum of salary, bonus, the value of stock options and restricted stock granted during the year, long-term incentive payouts, and other miscellaneous compensation amounts. This is the variable TDC1 in ExecuComp. I also

[1] Social identity theory recognizes that individuals can demonstrate positive bias toward groups even after they are no longer active members of those groups. This suggests that former CEOs will likely also identify with the CEO and demonstrate the effects predicted for active CEOs. Unfortunately, the RiskMetrics database does not identify former CEOs, making it impossible to include them in my analysis. Nevertheless, this should bias the tests against finding significant effects for active CEOs since former CEOs are lumped together with other directors rather than being included with active CEOs.

examine equity-based and cash compensation as robustness checks. Equity-based compensation is the value of stock options and restricted stock awarded during the year, while cash compensation is salary plus cash bonus. I inflation-adjust all compensation figures to 1994 constant dollars using the GDP deflator.

Economic Determinants of CEO Compensation

A basic implication of standard economic theory is that CEO compensation depends on the relative demand and supply of top executive talent. Prior theoretical and empirical work (Rosen 1982; Core, Holthausen, and Larcker 1999) suggests that the demand for managerial talent (and thus the necessity and willingness to pay higher wages) increases with firm size, growth opportunities, and operational complexity. Following these authors, I use sales revenue as a proxy for firm size and operational complexity, and market/book ratio as a proxy for investment opportunities. Both are measured with one-year lags.

Managerial talent is difficult to measure with any reasonable degree of precision, and executive effort is largely unobservable. Therefore, agency theory places a significant emphasis on firm performance in the determination of CEO compensation. In addition, Core, Holthausen, and Larcker (1999, p. 379) argue that "firm risk, both as a measure of the firm's information environment and the risk of its operating environment, is a potentially important determinant of the level of CEO compensation." I measure firm performance using annual stock return during the past year and control for firm risk using the standard deviation of annual stock return over the preceding five years.

Board Structure Variables

Prior studies show significant relation between CEO compensation and several board structure variables. Boyd (1994) finds a positive relation between CEO compensation and the percentage of outside directors while Hallock (1997) reports higher compensation for CEOs in interlocking directorships with their board members. In addition, Core, Holthausen, and Larcker (1999) show that total CEO compensation is positively related to CEO duality, board size, director age, and the proportion of affiliated directors but negatively related to the percentage of the firm's stock owned by the CEO.

In view of these studies, I construct several variables to control for differences in board structure. I measure board size using the number of directors and define three measures of board composition. The first is the percentage of employee directors, while the second and third are the percentages of affiliated outside directors and interlocked outside directors, respectively. I measure CEO duality with an indicator variable that equals 1 when the CEO also serves as board chairman, and 0 otherwise. My measure of director age is the average age of all directors as reported by RiskMetrics. I also control for several CEO characteristics

including stock ownership, tenure, and the number of external corporate boards on which the CEO serves.

Takeover Defenses

Takeover defenses alter the balance of power between shareholders and top management by reducing the ability of the former to remove or otherwise discipline the latter. Thus, these provisions can affect the level of CEO compensation. Prior studies (Agrawal and Knoeber 1998; Zingales 1998) suggest two opposing effects. First, weak antitakeover protection increases management's vulnerability, which increases the CEO's compensation risk and participation threshold. This implies a negative relation between antitakeover provisions and executive compensation. On the other hand, strong takeover protection can result in managerial entrenchment and increase the CEO's ability to extract excessive rent from the firm, which implies a positive relation.

Few prior studies have empirically examined these issues. Borokhovich, Brunarsky, and Parrino (1997) find that compensation discrepancies increase in favor of CEOs of firms adopting supermajority and fair price charter amendments. Similarly, Bertrand and Mullainathan (1999) find that compensation increases following the passage of state antitakeover legislation. In contrast, Agrawal and Knoeber (1998) report that lower takeover protection increases executive compensation.

I measure antitakeover protection using the shareholder rights index developed by Gompers, Ishii, and Metrick (2003). This index consists of 24 takeover defenses, including poison pills, classified boards, supermajority voting, blank check preferred shares, limits on special meetings and shareholder action by written consents, dual-class stock, and fair price provisions. I use data from the RiskMetrics corporate takeover defenses database to construct the index.

Descriptive Statistics

Table 1 presents descriptive statistics for all the preceding variables. In Panel A, I show summary information for my measures of executive compensation. Average and median total CEO compensation in 1994 dollars are $5.02 million and $2.43 million, respectively, with a standard deviation of $12.60 million. Similar patterns apply to equity-based and cash compensation. Their average and median values are $3.21 million and $1.02 million for equity-based compensation and $1.36 million and $0.94 million for cash compensation. Their standard deviations are $11.95 million and $1.60 million, respectively.

Panel B of Table 1 shows that most firm-years (70.7%) have at least one outside CEO director. On average, these directors constitute 14.7% of the typical

TABLE 1. Descriptive Statistics.

	Observations	Minimum	Mean	Median	Maximum	Std. Dev.
Panel A. CEO Compensation						
Total compensation ($thousand)	11,040	$0.001	$5,019.707	$2,430.969	$611,401.893	$12,595.904
Equity-based compensation ($thousand)	11,040	$0.000	$3,205.835	$1,016.450	$607,077.480	$11,952.485
Cash compensation ($thousand)	11,040	$0.000	$1,360.598	$940.542	$38,385.876	$1,595.990
Panel B. CEO Directors						
%Active CEO director	11,040	$0.000	0.147	0.125	0.875	0.133
#Active CEO director	11,040	$0.000	1.465	1.000	14.000	1.480
Active CEO director dummy	11,040	$0.000	0.707	1.000	1.000	0.455
Panel C. Economic Determinants						
Sales ($million)	11,039	$0.000	$4,720.664	$1,245.380	$272,909.110	$12,892.477
Assets ($million)	11,040	$15.437	$12,196.100	$1,599.278	$1,249,464.632	$55,368.539
Market/book ratio	11,011	0.005	1.614	1.124	78.423	1.950
Stock return	10,533	−0.960	0.191	0.110	26.194	0.697
Standard deviation of stock return	10,482	0.010	0.512	0.369	11.843	0.552
Panel D. Board Structure and Takeover Defenses						
Board size	11,040	3.000	9.520	9.000	27.000	2.871
%Employee director	11,040	0.000	0.206	0.167	0.750	0.115
%Affiliated director	11,040	0.000	0.138	0.111	0.900	0.138
%Interlocked director	11,040	0.000	0.009	0.000	0.500	0.035
Average director age	11,040	40.333	58.994	59.300	75.556	3.987
G-index	10,334	1.000	9.141	9.000	17.000	2.599

(Continued)

TABLE 1. Continued.

	Observations	Minimum	Mean	Median	Maximum	Std. Dev.
Panel E. CEO Characteristics						
CEO duality	11,040	0.000	0.670	1.000	1.000	0.470
Tenure as CEO	10,355	0.000	7.025	5.000	54.000	7.259
External corporate boards	11,040	0.000	0.615	0.000	9.000	0.944
%Stock owned	10,859	0.000	3.288	1.155	76.163	6.226

Note: The sample consists of 11,040 annual observations for 3,217 CEOs at 2,105 firms between 1998 and 2005. Compensation data are from ExecuComp. CEO characteristics, director, and takeover defenses data are from RiskMetrics. Accounting data are from Compustat, and stock market data are from the CRSP. In Panel A, total compensation is the sum of salary, bonus, the value of stock options and restricted stock granted during the year, long-term incentive payouts, and other miscellaneous compensation amounts. Equity-based compensation is the value of stock options and restricted stock awarded during the year. Cash compensation is salary plus cash bonus. All compensation amounts are in thousands of 1994 constant dollars. In Panel B, a CEO director is a nonemployee director whose principal occupation is the CEO of another firm. %Active CEO director is the percentage of all directors who are active CEOs. #Active CEO director is the number of directors who are active CEOs. Active CEO director dummy equals 1 when at least one director is an active CEO, and 0 otherwise. In Panel C, sales is net sales revenue in millions of 1994 dollars. Assets is total assets in millions of 1994 dollars. Market/book ratio is the market value of common equity plus the book values of preferred equity and long-term debt divided by the book value of assets. Stock return is percentage one-year stock market return. Standard deviation of stock return is the standard deviation of percentage return over the preceding five years. In Panel D, board size is the number of directors. %Employee director is the percentage of all directors who are employees of the firm. %Affiliated director is the percentage of directors who are outsiders having a business or personal relationship with the firm or any of its employee directors. A director is interlocked if an employee director serves on the board of that outside director. %Interlocked director is the percentage of all directors who are interlocked. Average director age is the average age of all directors. G-index is an index of 24 takeover defenses. These defenses include poison pills, classified boards, supermajority voting, blank check preferred shares, limits on special meetings and shareholder action by written consents, dual-class stock, and fair price provisions (see Gompers, Ishii, and Metrick 2003 for details about the index). In Panel E, CEO duality equals 1 when the CEO also serves as board chairman, and 0 otherwise. Tenure as CEO is the number of years the CEO has served as such. External corporate boards is the number of other corporate boards on which the CEO serves. % Stock owned is the percentage of the firm's equity owned by the CEO.

board. The median percentage of CEO directors is 12.5%.[2] Panel C shows that my sample firms are fairly large, with average and median sales revenue of $4.72 billion and $1.25 billion. Mean and median total assets are $12.20 billion and $1.60 billion, and market/book ratio averages 1.61, with a median of 1.12. On average, the firms earned a stock market return of 19.1% per year during my sample period, with a median of 11.0% and a standard deviation of 51.2%.

I report descriptive statistics for board structure, CEO characteristics, and takeover defenses in Panels D–E of Table 1. The median board has nine members, of whom 16.7% are employees and another 11.1% are gray directors, that is, nonemployee directors having a business or personal relationship with the firm or any of its employees. The median CEO has been CEO for five years, serves on no external corporate boards, and owns 1.16% of the company's stock. The CEO also serves as board chairman in 67% of the sample. The index of takeover defenses has a mean of 9.1 and a median of 9.0, which are similar to those reported in several prior studies.

Empirical Results

I begin my analysis by dividing the sample into quartiles, based on the percentage of CEO directors. Average proportions of CEO directors are 0.0%, 10.2%, 17.8%, and 33.7% for the first through the fourth quartiles, respectively. I then compare inflation-adjusted total CEO compensation across the four groups as a way of providing initial insight into the effect of CEO directors on the level of executive compensation. I summarize results in Panel A of Table 2.

As the table shows, average total compensation for CEOs in the first quartile is $3.77 million, increasing to $5.02 million, $4.88 million, and $6.71 million for CEOs in the second, third, and fourth quartiles, respectively. A similar pattern obtains in the distribution of median total compensation, increasing monotonically from $1.89 million for CEOs in the first quartile to $2.47 million, $2.48 million, and $3.34 million for those in the second through the fourth quartiles. Both the *F*-test (corrected for clustering at the CEO-firm level) and the Wilcoxon rank-sum test indicate that the means and medians are significantly different at the 1% level.

It is plausible that larger firms are more likely to attract CEOs as directors. Because larger firms typically pay their CEOs more, the preceding results can simply reflect the effect of firm size on CEO compensation. In Panel B of Table 2, I present results for the largest firms in my sample, defined as the top quartile based on sales revenue. Consistent with larger firms paying their CEOs more,

[2]This is higher than the 11% reported by Fahlenbrach, Low, and Stulz (2010). The difference can be attributed to at least two factors. First, their firms are smaller on average than my firms. Because larger firms tend to have more CEO directors, this potentially explains the difference. Second, whereas they report new CEO directors as a percentage of all new director appointments, my figures are based on the full board, not just new appointments. Consequently, the two numbers are not directly comparable.

TABLE 2. Univariate Comparisons of CEO Compensation by CEO Directors.

Quartile	Observations	%CEO Director	Mean Total Compensation	Median Total Compensation
Panel A. Full Sample				
1st	3,234	0.000	$3,768.84	$1,886.79
2nd	2,429	0.102	$5,018.56	$2,469.55
3rd	2,756	0.178	$4,879.13	$2,475.30
4th	2,621	0.337	$6,712.02	$3,335.79
Panel B. Largest Firms				
1st	434	0.000	$8,088.99	$5,079.57
2nd	655	0.095	$9,348.36	$5,687.59
3rd	696	0.182	$9,226.65	$6,437.25
4th	975	0.341	$12,093.34	$6,998.19
Panel C. Best Performing Firms				
1st	804	0.000	$4,550.36	$2,231.59
2nd	568	0.103	$7,119.60	$3,201.84
3rd	682	0.177	$6,578.34	$2,895.62
4th	579	0.338	$10,730.59	$4,020.92
Panel D. Best Performing Largest Firms				
1st	101	0.000	$8,350.04	$5,136.99
2nd	147	0.096	$12,134.14	$6,928.57
3rd	141	0.185	$11,926.14	$8,578.70
4th	195	0.338	$20,971.37	$9,020.88

Note: A CEO director is a nonemployee director whose principal occupation is the CEO of another firm. %CEO director is the percentage of all directors who are active CEOs. Total compensation is the sum of salary, bonus, the value of stock options and restricted stock granted during the year, long-term incentive payouts, and other miscellaneous compensation, in thousands of 1994 dollars. Largest firms are those in the top quartile of sales revenue. Best performing firms are those in the top quartile of stock return. Best performing largest firms are in the top quartile of both sales revenue and stock return.

average and median total compensation for these firms are $9.2 million and $5.6 million, significantly larger than the corresponding figures of $5.02 million and $2.43 million for the full sample. Nevertheless, CEO compensation increases as the fraction of active CEO directors increases, just as in the full sample. Specifically, average and median CEO compensation increase from $8.1 million and $5.1 million for CEOs of large firms with no outside CEO directors to $12.1 million and $7.0 million for large-firm CEOs in the fourth quartile. The difference is significant at less than the 1% level.

I perform similar analyses for the best performing firms (top quartile, based on prior-year stock return) and the best performing largest firms. As Panels C and D of Table 2 show, CEO compensation significantly increases with the proportion of directors who are CEOs of other firms in both categories.

Regression Analysis

Although the univariate results of Table 2 suggest that CEOs are paid higher when other CEOs serve on their boards, I present them only as a first look at the data, not as definitive evidence of how CEO directors affect executive pay. In this subsection, I control for other determinants of CEO compensation by estimating pooled time-series cross-sectional regressions with year and industry dummy variables and standard errors corrected for clustering at the CEO-firm level. The dependent variable is the natural logarithm of total CEO compensation. Table 3 shows the results.

In the first column, the coefficient on the proportion of CEO directors is 0.3841. It is statistically significant at the 1% level. The standard deviation of the fraction of CEO directors is 0.133. Thus, an increase of 1 standard deviation in the proportion of CEO directors increases the CEO's total annual compensation by approximately 5.2%. Compared to average CEO compensation of $5.02 million, this amounts to a $261,000 increase in inflation-adjusted total pay.

I obtain similar results when I repeat my regressions using the number rather than the fraction of CEO directors. As the second column of Table 3 shows, each additional outside CEO on the board increases the CEO's total compensation by a statistically significant 4.4%, with a *p*-value of .001. In the same way, an additional CEO director is associated with increases of 4.7% and 3.5% in equity-based and cash compensation. I also obtain comparable results in untabulated regressions using an indicator variable that equals 1 when at least one director is an outside CEO.[3]

These results contrast with those of Fahlenbrach, Low, and Stulz (2010) who report that the presence of CEO directors has no effect on executive compensation in their sample. Although they attribute the difference to the inclusion of firm fixed effects in their regressions, my results are robust to controls for firm fixed effects as discussed later. Rather, it appears that the difference arises because their measure of CEO directors is a binary variable that equals 1 when there is at least one CEO director on the board. In regressions using this variable and including firm fixed effects, I find results similar to theirs.[4] However, in regressions using a continuous variable (either the number or percentage of CEO directors), I find a significant effect for CEO directors, with or without firm fixed effects. Because there is a wide variation in the number and percentage of CEO directors among firms with at least one such director in my sample,[5] a continuous variable allows a

[3] Unreported tests also show that the CEO's equity-based and cash compensation are both significantly and positively related to active CEO directors.

[4] As noted earlier, the indicator variable is significant when I include industry rather than firm fixed effects.

[5] Minimum and maximum percentages of CEO directors among these firms are 4.5% and 87.5%, respectively, with mean and median of 20.8% and 18.2% and a standard deviation of 11.1%. Similarly,

TABLE 3. CEO Directors and the Level of Executive Compensation.

	1	2
%Active CEO directors	0.3841***	—
	(.004)	
#Active CEO directors	—	0.0428***
		(.001)
Firm size	0.0190***	0.0189***
	(.000)	(.000)
Market/book	0.0957***	0.0954***
	(.000)	(.000)
Stock return	0.1235***	0.1238***
	(.000)	(.000)
STDRET	0.0187	0.0188
	(.627)	(.625)
Board size	0.0706***	0.0639***
	(.000)	(.000)
%Insiders	−0.8312***	−0.8205***
	(.000)	(.000)
%Gray	−0.3501**	−0.3431**
	(.046)	(.049)
%Interlocked	0.1179	0.0790
	(.839)	(.893)
Average age	−0.0025	−0.0023
	(.635)	(.665)
CEO tenure	0.0019	0.0020
	(.650)	(.641)
CEO BRDS	0.1194***	0.1177***
	(.000)	(.000)
CEO duality	0.2560***	0.2558***
	(.000)	(.000)
CEO ownership	−0.0360**	−0.0361***
	(.000)	(.000)
G-index	0.0098	0.0100
	(.313)	(.299)
Sample size	9,072	9,072
Adjusted R^2	0.2745	0.2748

Note: Total compensation is the natural log of the sum of salary, bonus, value of stock options and restricted stock granted during the year, long-term incentive payouts, and other miscellaneous compensation amounts. %Active CEO directors is the percentage of all directors who are active CEOs of other firms. #Active CEO directors is the number of all directors who are active CEOs of other firms. Firm size is sales revenue for the prior year in billions of dollars. Market/book is the market value of common equity plus the book values of preferred equity and long-term debt divided by the book value of assets, measured with one-year lag. Stock return is the prior-year percentage stock return. STDRET is the standard deviation of percentage stock return over the preceding five years. Board size is the number of directors. %Insiders is the percentage of all directors who are employees of the firm. %Gray is the percentage of directors who are outsiders having a business or personal relationship with the firm or any of its employee directors. %Interlocked is the percentage of all directors who are interlocked (an employee director serves on the board of that outside director). Average age is the average age of all directors. CEO tenure is the number of years the CEO has served as such. CEO BRDS is the number of other corporate boards of which the CEO is a member. CEO duality equals 1 when the CEO also serves as board chairman, and 0 otherwise. CEO stock ownership is the percentage of the firm's equity owned by the CEO. G-index is an index of 24 state-imposed and firm-adopted takeover defenses (see Gompers, Ishii, and Metrick 2003 for details about the index). Each regression includes year and two-digit SIC code industry dummies. The *p*-values based on robust standard errors clustered at the CEO-firm level are shown in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

better use of the information in the data and is therefore the approach adopted in this study.

Other results in Table 3 are comparable to those in prior studies. Consistent with Jensen and Murphy (1990), I find that larger firms and better performing firms pay their CEOs more. Similarly, I find that total CEO compensation is higher when the CEO also serves as board chairman or the board is larger, which is consistent with Core, Holthausen, and Larcker (1999). Also consistent with these authors, I find a negative relation between CEO compensation and CEO stock ownership. I also find that CEO pay increases with the number of other corporate boards on which the CEO serves, thus suggesting that better connected CEOs receive higher pay, which is consistent with Barnea and Guedj (2008) who study the effect of director networks on the level of CEO compensation.

Exploring Simultaneity

Although the results in Table 3 suggest a causal relation running from CEO directors to executive compensation, they could also be consistent with an alternate explanation where causation runs from executive compensation to CEO directors. For example, it is conceivable that outside CEOs are attracted to the boards of high-paying firms. I address this concern using two approaches. First, I estimate regressions where I replace the CEO director variable with its value in 1998. Thus, I use the fraction (or number) of CEO directors in 1998 to explain the variation in executive compensation in subsequent years, which should mitigate the concern about reverse causation. Bebchuk and Cohen (2005), Faleye, Mehrotra, and Morck (2006), and Cheng (2008) follow the same approach in similar contexts. As the first two columns of Table 4 show, results obtained with this approach are similar to the main results in Table 3. In particular, both the fraction and number of CEO directors in 1998 are significantly and positively related to executive compensation in subsequent years.

A limitation of the preceding approach is that it may not address the issue of potential reverse causation if the variable of interest is sticky. In this case, if the CEO director variable in 1998 is strongly related to its future values, using the historical value will not rule out reverse causation. To address this, I examine the correlation between the 1998 value of the CEO director variable and its value in subsequent years to evaluate its stickiness over time. For the full sample (1998–2005), the correlation is 0.622, which is understandable because the full sample also includes 1998. As Table 5 shows, the correlation drops monotonically from 0.550 for 1999–2005 to 0.363 for 2004–2005. To provide some context for evaluating these correlations, I also examine similar correlations for two other

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minimum and maximum numbers of CEO directors are 1 and 14, with mean and median of 2.1 and 2.0, respectively, and a standard deviation of 1.36.

TABLE 4. Exploring Simultaneity.

	Panel A. Historical CEO Director Variables		Panel B. Firm Fixed Effect Regressions	
%Active CEO directors	0.4680***	—	0.3493**	—
	(.003)		(.019)	
#Active CEO directors	—	0.0452***	—	0.0238*
		(.001)		(.053)
Firm size	0.0172***	0.0170***	0.0040**	0.0041**
	(.000)	(.000)	(.039)	(.035)
Market/book	0.1201***	0.1200***	0.0405***	0.0406***
	(.000)	(.000)	(.003)	(.003)
Stock return	0.1027***	0.1021***	0.1017***	0.1020***
	(.004)	(.004)	(.000)	(.000)
STDRET	0.0245	0.0262	0.0206	0.0205
	(.600)	(.576)	(.596)	(.600)
Board size	0.0702***	0.0645***	0.0260***	0.0221**
	(.000)	(.000)	(.004)	(.016)
%Insiders	−0.8743***	−0.8713***	−0.1845	−0.2145
	(.000)	(.000)	(.322)	(.249)
%Gray	−0.3986*	−0.3961*	−0.2111	−0.2156
	(.059)	(.067)	(.161)	(.152)
%Interlocked	0.1608	0.1400	1.1718**	1.1946**
	(.804)	(.830)	(.033)	(.033)
Average age	0.0036	0.0035	−0.0096	−0.0106*
	(.561)	(.572)	(.111)	(.077)
CEO tenure	0.0033	0.0034	0.0022	0.0023
	(.486)	(.466)	(.442)	(.419)
CEO BRD	0.1148***	0.1130***	0.0424**	0.0424**
	(.000)	(.000)	(.011)	(.011)
CEO duality	0.2402***	0.2406***	0.0161	0.0169
	(.000)	(.000)	(.624)	(.606)
CEO ownership	−0.0348***	−0.0349***	−0.0177**	−0.0178**
	(.000)	(.000)	(.012)	(.012)
G-index	0.0011	0.0014	0.0016	0.0019
	(.920)	(.900)	(.928)	(.913)
Adjusted R^2	0.2925	0.2927	0.6391	0.6388
Sample	7,508	7,508	9,072	9,072

Note: The dependent variable is the natural log of the CEO's total compensation in 1994 dollars. The CEO director variables in Panel A are values of these variables in 1998. Firm size is sales revenue for the prior year in billions of dollars. Market/book is the market value of common equity plus the book values of preferred equity and long-term debt divided by the book value of assets, measured with one-year lag. Stock return is the prior-year percentage stock market return. STDRET is the standard deviation of percentage stock return over the preceding five years. Board size is the number of directors. %Insiders is the percentage of all directors who are employees of the firm. %Gray is the percentage of directors who are outsiders having a business or personal relationship with the firm or any of its employee directors. %Interlocked is the percentage of all directors who are interlocked (an employee director serves on the board of that outside director). Average age is the average age of all directors. CEO tenure is the number of years the CEO has served as such. CEO BRDS is the number of other corporate boards of which the CEO is a member. CEO duality equals 1 when the CEO also serves as board chairman, and 0 otherwise. CEO stock ownership is the percentage of the firm's equity owned by the CEO. G-index is an index of 24 takeover defenses. Regressions in Panel A include year and industry dummies. Regressions in Panel B include year and firm dummies. The *p*-values based on robust standard errors are shown in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

TABLE 5. Examining the Relative Stickiness of CEO Directors.

	1998–2005	1999–2005	2000–2005	2001–2005	2002–2005	2003–2005	2004–2005
1998%Active CEO directors	0.4680***	0.4654***	0.3861**	0.3847**	0.3806**	0.3939*	0.2887
	(.003)	(.004)	(.020)	(.026)	(.044)	(.058)	(.278)
Correlation between 1998 and contemporaneous %Active CEO directors	0.622	0.550	0.500	0.458	0.417	0.382	0.363
Sample size	7508	6,307	5,220	4,218	3,250	2,355	1,491
Adjusted R^2	0.293	0.304	0.307	0.298	0.285	0.280	0.243
Correlation between 1998 and contemporaneous board size	0.829	0.793	0.765	0.744	0.725	0.705	0.690
Correlation between 1998 and contemporaneous staggered boards	0.948	0.938	0.925	0.920	0.913	0.906	0.892
Correlation between 1998 and contemporaneous ROA	0.653	0.568	0.528	0.510	0.473	0.445	0.452
Correlation between 1998 and contemporaneous leverage	0.771	0.722	0.685	0.654	0.627	0.605	0.583
Correlation between 1998 and contemporaneous sales	0.912	0.912	0.906	0.899	0.892	0.883	0.876
Correlation between 1998 and contemporaneous assets	0.937	0.944	0.950	0.954	0.957	0.962	0.968

Note: The entries in the first row are the years over which the regressions are estimated and the correlations between 1998 values and contemporaneous values calculated. The second row displays coefficients of the 1998 percentage of CEO directors in these regressions. The regressions are similar to those in Table 4 and include all the variables in that table. The *p*-values based on robust standard errors corrected for firm level clustering are in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

governance variables used in prior studies in similar regressions: board size in Cheng (2008) and staggered boards in Bebchuk and Cohen (2005). As Table 5 shows, the correlation between 1998 board size and future board size ranges from a high of 0.829 for 1998–2005 to a low of 0.690 for 2004–2005. Similarly, the correlation for staggered boards ranges from a high of 0.948 for 1998–2005 to a low of 0.892 for 2004–2005. The correlation coefficients are higher than the corresponding coefficient for the CEO director variable for each future subperiod, suggesting that board size and staggered boards are stickier than the proportion of CEO directors. I also examine similar correlation structures for four nongovernance variables: operating performance (return on assets [ROA]), leverage, sales revenue, and total assets. In each case, the correlation between 1998 values and future values is higher than the corresponding correlation between 1998 CEO directors and future values of the CEO director variable. These results suggest that the CEO director variable is not as sticky as other governance variables used in similar tests in the literature and several nongovernance variables.

I repeat the regressions in Panel A of Table 4 using the subperiods discussed earlier. As Table 5 shows, the historical CEO director variable is significant in all future periods except 2004–2005. The lack of significance in the latter appears to be a power issue stemming from the significantly lower sample size (1,491 observations, compared to 9,072 for the full sample) because the contemporaneous CEO director variable as well as most of the control variables are not significant in this particular regression. Thus, even after focusing on the distant future with relatively low correlations between historical and contemporaneous values of the CEO director variable, the variable remains positive and statistically significant.

As a second approach to addressing potential simultaneity issues, I estimate additional regressions with firm fixed effects. Given that they focus entirely on within-firm variation, these regressions remove the effects of any time-invariant unobservable firm characteristics but can yield levels of significance that are considerably lower than those produced by methods that use both within- and between-firm variation. Nevertheless, when I estimate regressions with firm fixed effects, I still find a positive and significant relation between executive pay and both the fraction and number of CEO directors.[6] These regressions are reported in the third and fourth columns of Table 4.

Overall, although it is impossible to completely rule out simultaneity issues in the absence of controlled experiments, the results presented in this section suggest that my basic findings are not mere artifacts of some confounding underlying issues. Rather, they suggest that the results in Table 3 correctly represent the effect of CEO directors on executive compensation.

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[6] As previously reported, the CEO director indicator variable is not significant in regressions with firm fixed effects.

Other Robustness Checks

Barnea and Guedj (2008) show that CEOs are paid higher salaries when directors are more connected to other people in the network of board members. Because it is possible for CEO directors to be better connected than others, my results can potentially be attributable to the effects of director interconnections rather than the presence of CEO directors. To examine this possibility, I construct the degree measure of director connections following standard methodology.[7] I then relate the network measure to the fraction of CEO directors to examine the extent to which the two variables are related. I find that degree explains 15% of the variation in the fraction of CEO directors. Thus, 85% of the variation in the proportion of CEO directors is unexplained by director interconnections, which suggests that the set of CEO directors is mostly noncoincident with the set of well-connected directors. Consistent with this, when I include the two variables in my compensation regressions, I find that both are statistically significant. Thus, the effect I document is separate and distinct from the effect of director interconnections reported by Barnea and Guedj.

Another concern is that higher pay simply reflects greater compensation risk. Thus, if CEO directors tilt executive compensation toward riskier pay such as equity-based compensation, it may be necessary to offer higher pay to compensate for the greater risk exposure, resulting in a spurious relation between CEO directors and the level of executive compensation. I reject this explanation for two reasons. First, as reported in footnote 3, CEO directors are associated with significantly higher levels of both equity-based and cash compensation, which suggests that the higher level of total compensation is not driven by higher equity-based pay. Second, when I regress the ratio of equity-based pay to total compensation on my CEO director variables and the control variables in Table 3, I find that none of the CEO director variables (the fraction/number of CEO directors and the CEO director indicator variable) is significant. I do not tabulate these results because of space considerations.

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[7]For each director in each year, degree equals the number of other directors with whom he or she shares at least one board membership. Firm-level degree equals average degree for each firm's directors. Firm-level degree averages 14.19 in my sample (1998–2005), compared to 15.96 reported by Barnea and Guedj (2008) for their sample (1996–2004). I attribute the difference to two reasons. First, Barnea and Guedj's firms are somewhat larger than my firms (mean and median assets of $13.9 billion and $2.0 billion, compared to $12.2 billion and $1.6 billion). Because larger firms tend to have better connected directors, this explains part of the difference. Second, degree declines over time. As reported by Barnea and Guedj, degree declines monotonically from an average of 18.39 in 1996 to an average of 13.41 in 2004. The decline is most pronounced after 2003. Because my sample covers the later part of Barnea and Guedj's sample, this further explains the difference in degree.

CEO Directors and Pay-Performance Sensitivity

The preceding section suggests that CEOs are paid more when other CEOs serve on their boards. A related and equally important question is whether CEO directors systematically bias the pay determination process in favor of the CEO by decoupling executive compensation and firm performance. In this section, I focus on this question by analyzing the effect of CEO directors on pay-performance sensitivity.

Jensen and Murphy (1990), Yermack (1996), Faleye (2007), and several others define pay-performance sensitivity as the dollar change in CEO compensation per $1,000 change in shareholder wealth, estimated by regressing annual changes in CEO compensation on annual changes in shareholder wealth. Using data from the CRSP database and following these authors, I calculate the change in shareholder wealth for each year as the product of the percentage return to shareholders during the year and the firm's market value at the end of the preceding year. I then regress the first difference of total CEO compensation on the one-year lagged change in shareholder wealth, introducing an interaction term between the proportion of CEO directors and the change in shareholder wealth to identify the effect of outside CEOs on pay-performance sensitivity. I expect this interaction term to be negative and significant under the hypothesis that CEO directors reduce the sensitivity of CEO pay to firm performance.

Yermack (1996) shows that firms with smaller boards exhibit greater pay-performance sensitivity; I therefore include an interaction term between board size and the change in shareholder wealth in my regressions. Furthermore, Cichello (2005) and Aggarwal and Samwick (1999) find that pay-performance sensitivity is significantly affected by firm size and firm risk, while Faleye (2007) shows that the compensation of entrenched management is less sensitive to firm performance. I control for these results by including interaction terms between the change in shareholder wealth and firm risk (as measured by the standard deviation of returns), firm size (as measured by sales revenue), and managerial entrenchment (as measured by the shareholder rights index of Gompers, Ishii, and Metrick 2003). I also control for the potential effects of other board and CEO characteristics on the CEO's pay-performance sensitivity. The first column of Table 6 presents results of these regressions.

Consistent with prior studies, the table shows a positive and significant relation between the change in CEO compensation and the change in shareholder wealth, indicating that CEOs in general earn more when their firms perform better and less when they perform poorly. In the first column, the interaction term between the change in shareholder wealth and the proportion of CEO directors is negative and statistically significant at the 5% level. The coefficients imply that a $1,000 change in shareholder wealth results in a change of $2.85 in total CEO compensation for a firm with no CEO directors. In contrast, the same $1,000 change in shareholder wealth produces a change of $2.69 in total CEO compensation at the firm with the

TABLE 6. CEO Directors and Pay-Performance Sensitivity.

	ΔTotal Compensation	ΔEquity Compensation	ΔCash Compensation
ΔShareholder wealth	2.851**	2.488**	0.306**
	(.012)	(.025)	(.048)
%Active CEO directors	1269.758**	1415.874***	107.123
	(.026)	(.001)	(.141)
ΔShareholder wealth ×	−0.866**	−0.841*	−0.015
%Active CEO directors	(.043)	(.057)	(.677)
ΔShareholder wealth ×	−0.007	−0.002	−0.001
Firm size	(.784)	(.937)	(.606)
ΔShareholder wealth ×	0.015	0.012	0.001
STDRET	(.282)	(.368)	(.440)
ΔShareholder wealth ×	2.542***	2.748***	−0.248**
STDROA	(.002)	(.001)	(.034)
ΔShareholder wealth ×	−0.004	−0.008	−0.001
Board size	(.729)	(.471)	(.978)
ΔShareholder wealth ×	0.727**	0.529	0.034
%Insider directors	(.036)	(.111)	(.453)
ΔShareholder wealth ×	0.408	0.416	−0.021
%Gray directors	(.172)	(.141)	(.567)
ΔShareholder wealth ×	1.889*	2.436**	0.081
%Interlocked directors	(.056)	(.048)	(.790)
ΔShareholder wealth	−0.047**	−0.041**	−0.005*
Average age	(.014)	(.033)	(.074)
ΔShareholder wealth ×	0.002	0.004	0.001
CEO tenure	(.746)	(.469)	(.198)
ΔShareholder wealth ×	0.039	0.026	0.007
CEO BRDS	(.266)	(.456)	(.378)
ΔShareholder wealth ×	0.308***	0.294***	−0.008
CEO duality	(.003)	(.004)	(.347)
ΔShareholder wealth ×	−0.042***	−0.042***	−0.002**
CEO ownership	(.001)	(.001)	(.012)
ΔShareholder wealth ×	−0.022*	−0.021*	−0.001
G-index	(.061)	(.090)	(.315)
Sample size	7,853	7,853	7,928
Model *F*-statistic	5.35	4.83	6.65
(*p*-value)	(.000)	(.000)	(.000)

Note: The dependent variable is the change in CEO compensation in thousands of 1994 dollars. ΔShareholder wealth is the product of the percentage return to shareholders during the year and the firm's market value at the end of the preceding year, in millions of 1994 dollars. %Active CEOs is the percentage of all directors who are active CEOs of other firms. Firm size is sales revenue for the prior year. STDRET is the standard deviation of percentage stock return over the preceding five years. STDROA is the standard deviation of return on assets over the preceding five years. Board size is the number of directors. %Insiders is the percentage of all directors who are employees of the firm. %Gray is the percentage of directors who are outsiders having a business or personal relationship with the firm or any of its employee directors. %Interlocked is the percentage of all directors who are outsiders and on whose boards an employee director serves. Average age is the average age of all directors. CEO tenure is the number of years the CEO has served as such. CEO BRDS is the number of other corporate boards of which the CEO is a member. CEO duality equals 1 when the CEO also serves as board chairman, and 0 otherwise. CEO ownership is the percentage of the firm's equity owned by the CEO. G-index is an index of 24 takeover defenses. The regressions include each variable interacted with ΔShareholder wealth as a stand-alone variable although the coefficients on these (except %Active CEOs) are not reported to conserve space. Each regression also includes year and two-digit SIC code industry dummies. The *p*-values based on robust standard errors clustered at the CEO-firm level are shown in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

typical CEO board membership, representing a 6% reduction in pay-performance sensitivity.

I also repeat my pay-performance sensitivity regressions using the changes in equity-based and cash compensation as dependent variables. The results are comparable to those for total compensation except that the interaction term is not significant in the regression for cash compensation, though it remains negative. They are presented in the second and third columns of Table 6.

Additional Analysis

Although the full board typically approves all executive compensation decisions, the compensation committee is responsible for assessing the firm's overall compensation structure, as well as administering and reviewing all executive compensation programs. Therefore, I perform additional tests that focus on outside CEOs serving on the compensation committee by defining variables analogous to those for the full board: the fraction and number of compensation committee members who are outside CEOs. Results for both compensation level and pay-performance sensitivity are comparable to those reported for the full board. Specifically, an increase of 1 standard deviation in the percentage of outside CEOs on the compensation committee increases the average CEO's compensation by 4.7%, and each additional outside CEO on this committee increases the CEO's total pay by 6.4%. Similarly, the interaction term between the fraction of outside CEOs on the compensation committee and the change in shareholder wealth is negative and statistically significant at the 5% level. I do not tabulate these results to conserve space.

I also examine whether passage of the Sarbanes–Oxley Act (SOX) in 2002 has any effect on CEO directors and how they affect executive compensation. Since the scandals of 2001–2002, corporate governance and issues of managerial accountability have come under increased scrutiny and many boards have embraced changes supposedly aimed at improving the quality of their firms' governance. For instance, some firms now limit the number of external boards on which their CEOs can serve, and anecdotal evidence suggests that some CEOs decline invitations to join external boards for fear of potential personal liability. Consistent with this, I find a decline in the proportional board representation of outside CEOs, from mean and median of 16.0% and 14.3%, respectively, during 1998–2002 to 12.3% and 11.1% during 2003–2005. Nevertheless, I still find a positive and statistically significant association between outside CEO board membership and top executive compensation in the post-SOX era.

III. CEO Directors and Executive Turnover

The results on executive compensation suggest that CEO directors provide poorer incentives to top management. Yet compensation is only one aspect of executive

incentives, and termination prospects are potentially just as important. Peters and Wagner (2008) show that turnover risk is priced in executive compensation, so that higher turnover propensity induces higher pay. Thus, a positive association between CEO directors and top management compensation can be an equilibrium outcome if these directors also are more likely to terminate the CEO. This will be the case if they enhance the board's ability to identify performance deterioration and take speedy remedial actions. In contrast, a negative effect for CEO directors on termination prospects will strengthen the compensation results in suggesting that CEO directors systematically favor the CEO in performing their monitoring duties.

Following recent studies (e.g., Bebchuk, Cremers, and Peyer 2008; Coles, Daniel, and Naveen 2009), I use the ExecuComp database to identify CEO turnovers. Thus, a turnover occurs in a year if a new individual is identified in ExecuComp as the firm's CEO for that year. This produces an overall turnover rate of 11.78%, which is comparable to the 11.82% reported by Bebchuk, Cremers, and Peyer (2008).

Next, I split the sample into quartiles based on the percentage of CEO directors in the year preceding the turnover and examine turnover rates across the four quartiles. Turnover rates are 12.7%, 13.5%, 12.4%, and 12.3% for the first through fourth quartiles, respectively.[8] The likelihood ratio chi-square test indicates that the difference in turnover rates is not statistically significant, with a *p*-value of .693.

This suggests that CEOs do not face increase termination risk when other CEOs serve on the board. Nevertheless, previous research identifies other factors that affect the likelihood of CEO turnover. Coughlan and Schmidt (1985) report a significant negative relation between the likelihood of turnover and firm performance as measured by market-adjusted returns, and Denis, Denis, and Sarin (1997) show that the probability of turnover is negatively related to managerial ownership. In addition, Yermack (1996) reports a negative association between board size and CEO turnover. Similarly, Goyal and Park (2002) show that the probability of turnover is significantly lower when the CEO also serves as board chairman, and Weisbach (1988) reports a positive effect for board composition as measured by the dominance of outside directors. Thus, it is crucial to control for these factors to isolate the effect of CEO directors.

For this purpose, I estimate cross-sectional time-series logistic models, with standard errors corrected for firm-level clustering. The dependent variable is a dummy variable coded as 1 for firm-years with CEO turnovers and 0 for firm-years with no turnovers. I measure performance using market-adjusted stock

[8]Overall turnover rate for sample years with lagged CEO director data is 12.64%, which is slightly larger than the full sample rate of 11.78%. This most likely reflects the well-known increase in CEO turnover rate in more recent years.

returns, where the market is defined as the CRSP value-weighted portfolio of NYSE/AMEX/NASDAQ stocks.[9] I define managerial ownership as the proportion of outstanding shares owned by the CEO as reported in ExecuComp, board size as the number of directors, and CEO duality as an indicator variable that equals 1 when the CEO also serves as board chairman, and 0 otherwise. Following Weisbach (1988), I control for the dominance of outside directors using an indicator variable that equals 1 when a majority of directors are outsiders.[10] Finally, I control for CEO age as well as industry and year effects. All variables (with the exception of year and industry dummies) are measured with one-year lags to ensure that the values correspond to the departing CEO (or the board that replaced the CEO).

Table 7 presents results of these regressions. In the first column, the percentage of CEO directors is negative, suggesting that CEO directors reduce the board's propensity to replace the CEO. The second column reports similar results for the number of CEO directors. However, neither is statistically significant at conventional levels. Even then, these results are inconsistent with the argument that the CEO faces greater employment risk when other CEOs serve as directors. This is similar to Fahlenbrach, Low, and Stulz (2010), who also find that CEO directors are not associated with greater likelihood of CEO turnover.

In the third and fourth columns of Table 7, I examine the effect of CEO directors on the sensitivity of CEO turnover to firm performance by including additional terms interacting market-adjusted stock returns with the CEO director variable. As shown by Norton, Wang, and Ai (2004), the coefficient on the interaction term in a nonlinear model (such as a logistic regression) does not equal the marginal effect of the interaction term. Following their approach, I estimate the marginal effect of CEO directors on turnover-performance sensitivity across different probability thresholds and values for the independent variables. For the regression that uses the percentage of CEO directors (third column), average interaction effect is 0.0394, with a standard error of 0.0638 and a *z*-statistic of 0.6303. Similarly, average interaction effect is 0.0059, with a standard error of 0.0065 and a *z*-statistic of 0.9159 in the regression that uses the number of CEO directors (fourth column). Thus, the interaction term, although positive on average, is statistically insignificant. This is consistent with the earlier results on turnover rate in that it suggests that CEOs do not face increased employment risk when other CEOs serve on the board. If anything, the results are mildly suggestive that both turnover rate and turnover-performance sensitivity are lower when outside CEOs serve as directors.

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[9]Results are unchanged when I use the equal-weighted portfolio.

[10]The majority outside director or outsider-dominated board dummy variable equals 1 when more than 50% of directors are outsiders, and 0 otherwise. Results are invariant to alternative definitions that use 60% and 75% as the cutoff point. Results also remain unchanged when I use the continuous percentage of independent directors.

TABLE 7. CEO Directors and Executive Turnover.

	1	2	3	4
Excess return	−0.3909***	−0.3913***	−0.4354***	−0.4614***
	(.000)	(.000)	(.001)	(.000)
%Active CEOs	−0.2669	—	−0.2690	—
	(.269)		(.265)	
#Active CEOs	—	−0.0186	—	−0.0183
		(.417)		(.427)
Excess return × %Active CEOs	—	—	0.3082	
	—		(.615)	
Excess return × #Active CEOs	—	—	—	0.0528
				(.397)
Board size	0.0399***	0.0424***	0.0400***	0.0426***
	(.002)	(.002)	(.002)	(.002)
Board independence	−0.0546	−0.0581	−0.0542	−0.0578
	(.521)	(.497)	(.525)	(.499)
Managerial ownership	−0.0198***	−0.0195***	−0.0198***	−0.0195***
	(.008)	(.008)	(.008)	(.008)
CEO duality	0.0300	0.0277	0.0298	0.0271
	(.686)	(.708)	(.688)	(.714)
CEO age	0.0315***	0.0316***	0.0315***	0.0317
	(.000)	(.000)	(.000)	(.000)
Intercept	−4.9217***	−4.9580***	−4.9234***	−4.9631***
	(.000)	(.000)	(.000)	(.000)
Sample size	8,957	8,957	8,957	8,957
Likelihood ratio χ^2	257.943***	257.423***	258.267***	258.391***
	(.000)	(.000)	(.000)	(.000)

Note: The dependent equals 1 for firm-years with CEO turnovers and 0 for other years. Excess return is annual stock return less same-period return on the CRSP value-weighted portfolio of NYSE/AMEX/NASDAQ stocks. %Active CEOs is the percentage of all directors who are active CEOs of other firms. #Active CEOs is the number of all directors who are active CEOs of other firms. Board size is the number of directors. Board independence equals 1 when a majority of directors are outsiders, and 0 otherwise. Managerial ownership is the proportion of outstanding shares (including exercisable options) owned by the CEO as reported in ExecuComp. CEO duality equals 1 when the CEO also serves as board chairman, and 0 otherwise. CEO age is measured in years. All variables are measured with one-year lags. Each regression also includes year and two-digit SIC code industry dummies. The *p*-values based on robust standard errors clustered at the firm level are shown in parentheses.

***Significant at the 1% level.

Other results in Table 7 are broadly similar to those in prior studies. As in Coughlan and Schmidt (1985), the coefficient on market-adjusted return is negative, implying that poorer performance significantly increases the likelihood of a turnover. I also find that turnover probability significantly decreases with managerial ownership, as in Denis, Denis, and Sarin (1997). Consistent with several prior studies, age is positively related to the probability of a turnover. However, I do not find any significant effect for board independence and CEO duality, though board size has a positive effect.

TABLE 8. CEO Directors and Corporate Innovation: Univariate Results.

Panel A. Full-Sample Summary Statistics

	N	Minimum	Mean	Median	Maximum	Std. Dev.
Patents	9,266	0.00	29.32	0.00	3,622.00	152.90
Products	9,266	0.00	0.79	0.00	78.00	3.28

Panel B. Univariate Comparisons across CEO Director Quartiles

			Patents		Products	
Quartile	*N*	%CEOs	Mean	Median	Mean	Median
1st	2,660	0.0%	14.50	0.00	0.46	0.00
2nd	2,165	10.4%	29.14	0.00	0.73	0.00
3rd	2,304	18.0%	33.61	0.00	0.81	0.00
4th	2,137	33.6%	43.30	1.00	1.23	0.00

Note: Patents is the number of patents awarded per year by the U.S. Patent and Trademark Office. Products is the number of new product and/or service announcements per year in newspaper and newswire reports in Factiva. %CEOs is the percentage of all directors who are active CEOs of other firms.

IV. CEO Directors and Corporate Innovation

The evidence presented so far suggests that CEO directors tend to systematically favor the CEO in performing their monitoring duties. Although this is associated with significant costs to shareholders in the form of poorer executive incentives, it can benefit investors by reducing managerial myopia. Specifically, a sympathetic board dominated by fellow CEOs can encourage the CEO to invest in risky, long-term projects such as corporate strategic innovation. This is analogous to Stein (1988), who argues that takeover protection can help alleviate managerial myopia. Furthermore, the professional experience of CEO directors can position them to better counsel top management in pursuing strategic initiatives.

I focus on two measures of corporate innovation: patents awarded by the USPTO and the number of new product and/or service announcements. These measures are preferable to the traditional measure of innovation, that is, research and development expenditures (R&D), because R&D is principally an input into the innovation process and may not necessarily adequately represent its outcome. Besides, higher R&D may simply reflect managerial spending on pet projects rather than significant corporate innovation activities.

I hand-collect patent data by searching the USPTO website. Similarly, I obtain data on new product and service announcements by searching newspaper articles and newswire reports in Dow Jones Factiva. Panel A of Table 8 provides summary statistics for the three variables. Mean and median annual patents awarded are 29.3 and 0.0, with a maximum of 3,622 patents and a standard deviation of

152.9 patents. Similarly, average and median annual new product announcements are 0.8 and 0.0, with a maximum of 78 new product announcements and a standard deviation of 3.3 announcements.

Panel B of Table 8 displays results of univariate comparisons of my proxies for corporate innovation across the four quartiles of outside CEO board membership. As the table shows, average number of patents and new product announcements increase monotonically from 14.48 and 0.46 for the first quartile to 43.28 and 1.23 for the fourth. The differences are significant at the 1% level in both cases.

This suggests a positive association between corporate innovation and outside CEOs serving on the board. Nevertheless, a firm conclusion cannot be reached without controlling for other factors that potentially affect innovation. Prior research suggests several: R&D, firm size, firm age, leverage, growth opportunities, and takeover defenses (Hall and Ziedonis 2001; Atanassov 2008). In addition, I control for several managerial characteristics that can affect the CEO's propensity to engage in innovative activities. These include CEO equity compensation, stock ownership, age, and duality.

I use the natural logarithm of total assets as a proxy for firm size and measure firm age as the number of years since incorporation, obtained from Mergent Online. Leverage is the ratio of long-term debt to total assets, and the market/book ratio proxies for growth opportunities. I use the G-index of Gompers, Ishii, and Metrick (2003) as a measure of takeover defenses and use ExecuComp data to calculate CEO equity compensation (ratio of stock option and restricted stocks awarded to total compensation) and stock ownership (ratio of shares owned to total shares outstanding). CEO age is measured in years, and CEO duality is a binary variable that equals 1 when the CEO also serves as board chair, and 0 otherwise.

Next, I estimate regressions controlling for these variables. Because the number of patents and new product announcements are count variables and most firms have no patents and no new product announcements during my sample period, the regressions are zero-inflated Poisson models estimated with year and industry fixed effects and standard errors corrected for clustering at the firm level. As Table 9 shows, neither the percentage nor the number of CEO directors is statistically significant in any of these regressions. I obtain similar results in unreported regressions that use a dummy variable that equals 1 when at least one director is an outside CEO.

These results suggest that corporate investments in innovative long-term projects are not enhanced by the presence of potentially sympathetic directors. In a sense, this can be interpreted as a subtle manifestation of the quiet life argument of Bertrand and Mullainathan (2003). They show that when protected from takeover threats, managers prefer to avoid the costly efforts and difficult decisions associated with a swift response to technological shocks. In the same manner, managers appear to prefer the quiet life and refrain from investing in innovative advances when directors are sympathetic.

TABLE 9. CEO Directors and Corporate Innovation: Regression Results.

	Patents	Patents	Products	Products
%Active CEOs	−0.1774	—	−0.1363	—
	(.617)		(.610)	
#Active CEOs	—	−0.0464	—	−0.0334
		(.118)		(.163)
Firm size	0.8752***	0.8822***	0.6503***	0.6572***
	(.000)	(.000)	(.000)	(.000)
Firm age	0.0061*	0.0062*	−0.0021	−0.0021
	(.067)	(.062)	(.211)	(.203)
R&D	0.0541***	0.0538***	0.0328***	0.0328***
	(.000)	(.000)	(.000)	(.000)
Leverage	−0.4448	−0.4563	−1.1383***	−1.1496***
	(.386)	(.365)	(.003)	(.002)
Growth opportunities	−0.0001	0.0002	0.0059**	0.0061**
	(.992)	(.939)	(.021)	(.018)
Takeover defenses	−0.0474	−0.0466	−0.0349*	−0.0342*
	(.138)	(.147)	(.060)	(.064)
CEO equity compensation	0.0225	0.0242	−0.3234***	−0.3139***
	(.878)	(.870)	(.002)	(.003)
Managerial ownership	−0.0240**	−0.0249**	0.0006	0.0002
	(.050)	(.045)	(.858)	(.951)
CEO age	−0.0093	−0.0084	−0.0244***	−0.0237***
	(.510)	(.548)	(.000)	(.000)
CEO duality	0.2811**	0.2824**	0.0172	0.0221
	(.050)	(.050)	(.832)	(.784)
Intercept	−2.6916**	−2.7627**	−3.2412***	−3.3410***
	(.050)	(.047)	(.001)	(.000)
Sample size	7,346	7,346	7,346	7,346
Zero observations	3,999	3,999	5,695	5,695

Note: Patents is the number of patents awarded per year by the U.S. Patent and Trademark Office. Products is the number of new product and/or service announcements per year in newspaper and newswire reports in Factiva. %Active CEOs and #Active CEOs are the percentage and number of directors who are active CEOs of other firms, respectively. Firm size is the natural logarithm of total assets. Firm age is the number of years since the firm's incorporation. R&D is the ratio of research and development expenditures to total assets (in percentage) as reported in Compustat, or 0 when missing. Leverage is the ratio of long-term debt to total assets. Growth opportunities is the market/book ratio. Takeover defenses is an index of 24 takeover defenses. CEO equity compensation is the ratio of stock option and restricted stocks awarded to the CEO to his or her total compensation. Managerial ownership is the ratio of shares and exercisable options owned by the CEO to total shares outstanding. CEO age is measured in years. CEO duality is a binary variable that equals 1 when the CEO also serves as board chair, and 0 otherwise. Each regression is a zero-inflated Poisson model with year and two-digit SIC code industry dummies. The *p*-values based on robust standard errors corrected for firm level clustering are shown in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

V. CEO Directors and Acquisition Returns

An acquisition is a major strategic initiative involving significant board input and oversight. In general, directors' role can include identifying a target, contacting

TABLE 10. Summary Statistics for Bidder Returns.

Window	CAR	*p*-value	% Negative	Sample
[–1, +1]	−0.12%	.342	50.5%	2,457
[–1, +5]	−0.10%	.533	51.0%	2,457
[–3, +3]	−0.15%	.368	51.7%	2,457
[–3, +5]	−0.14%	.440	51.6%	2,457
[–5, +1]	−0.16%	.326	51.2%	2,457
[–5, +5]	−0.14%	.471	51.2%	2,457

Note: CAR is cumulative abnormal return. Each [x, y] window is the number of days before deal announcement (x) to the number of days after deal announcement (y) over which the cumulative abnormal return is calculated.

and negotiating with target management, and structuring and approving the deal. Because of this significant board involvement, an acquisition provides a natural context for studying whether CEO directors perform beneficial roles that enhance value creation.

I obtain acquisition data from the Securities Data Corporation (SDC) database. The data cover 1998–2005 and include all deals valued at $1 million or more involving a U.S. acquirer. After eliminating private acquirers and those with insufficient or unavailable data in the Compustat, CRSP, ExecuComp, RiskMetrics directors, and RiskMetrics corporate takeover defenses databases, the sample is reduced to 2,457 acquisitions involving 910 unique acquirers. Mean and median deal values are $1.07 billion and $127.50 million, respectively, with a maximum of $89.17 billion.

Following standard event-study methodology, I estimate the market model for each acquisition over 255 days (–301, –46) preceding the announcement date and then use estimated parameters to calculate abnormal returns for various windows around the event date. Table 10 summarizes the results. As the table shows, average cumulative abnormal return (CAR) is negative but insignificant for each of the six event windows examined, ranging from –0.10% for the [–1, +5] window to –0.16% for the [–5, +1] window. The proportion of negative CARs ranges from a low of 51% over the [–5, +1] window to a high of 52% for the [–3, +5] window.

Regression Analysis

Next, I estimate regressions of acquirer returns on CEO directors to examine whether these directors have any effect on value creation in an acquisition context. The regressions control for other variables known to affect acquirer returns. These include several deal attributes such as method of payment (Travlos 1987), target's status as a public or private company (Chang 1998), relative size of the combining firms (Asquith, Bruner, and Mullins 1983), whether the deal is a tender offer or competed deal (Jarrell and Poulsen 1989), and whether the target and

acquirer operate in different industries (Morck, Shleifer, and Vishny 1990). I also control for the acquirer's board structure, that is, board size (Yermack 1996) and board composition (Byrd and Hickman 1992) as well as other firm and CEO characteristics, including firm size (Moeller, Schlingemann, and Stulz 2004), growth opportunities (Servaes 1991), leverage (Maloney, McCormick, and Mitchell 1993), cash holdings (Harford 1999), takeover defenses (Masulis, Wang, and Xie 2007), and CEO duality (Masulis, Wang, and Xie 2007), age, and tenure as CEO. All firm characteristics are measured as of the end of the fiscal year preceding the acquisition's announcement.

Summary Statistics

Table 11 presents descriptive statistics for these variables. Cash payments average 61.4% of deal value, with 48.2% of deals completely cash financed. Mean and median relative deal sizes are 15.4% and 3.8%, respectively, and 60.1% of all deals occur within the same two-digit primary SIC industry group. Approximately 36.0% and 37.5% of targets are privately and publicly held, respectively. Tender offers account for 7.9% of deals, and 2.8% have more than one competing bidders. Mean and median market/book ratios are 2.31 and 1.41, respectively. Long-term debt averages 16.8% of total assets, with a median of 14.1%. The average bidder held cash and marketable securities amounting to 35.5% of sales revenue in the year preceding the deal, with a median of 13.2%. The median board has nine directors, of which 16.7% are employees. The median CEO is 54 years old, has been CEO for five years, and also serves as board chair. Consistent with several prior studies, the index of takeover defenses averages 9.0, with a median also of 9.0.

Regression Results

Table 12 presents regression results. The dependent variable in the first and second columns is the three-day cumulative abnormal return, CAR [–1, +1]. The third and fourth columns use CAR [–3, +3] as a robustness check. In addition to the control variables described above, these regressions also include year and industry fixed effects. Furthermore, I correct standard errors for clustering at the firm level because 501 of the 910 unique firms in my sample made multiple acquisitions during the sample period.

As shown in the first column of Table 12, the percentage of CEO directors is positive and statistically significant at the 5% level. Its coefficient of 0.0264 implies that an increase of 1 standard deviation in the percentage of CEO directors while holding other variables at their sample means increases acquisition returns by 35 basis points. Compared to the sample average CAR [–1, +1] of –0.12%, this is economically highly significant. I obtain similar results in the second column of Table 12, which uses the number of CEO directors. The coefficient is 0.0020, which is also significant at the 5% level. Thus, each additional CEO director increases

TABLE 11. CEO Directors and Acquisition Returns: Summary Statistics for Control Variables.

	Sample	Minimum	Mean	Median	Maximum	Std. Dev.
%Cash	2,457	0.000	0.614	0.909	1.000	0.441
All cash deals	2,457	0.000	0.483	0.000	1.000	0.500
Relative size	2,457	0.000	0.154	0.038	6.106	0.360
Intraindustry	2,457	0.000	0.601	1.000	1.000	0.490
Private target	2,457	0.000	0.360	0.000	1.000	0.480
Public target	2,457	0.000	0.375	0.000	1.000	0.484
Tender offer	2,457	0.000	0.079	0.000	1.000	0.270
Competed deal	2,457	0.000	0.028	0.000	1.000	0.165
Firm size	2,457	3.045	8.136	7.994	14.050	1.809
Growth opportunities	2,457	0.078	2.311	1.413	78.423	3.582
Leverage	2,457	0.000	0.168	0.141	1.179	0.151
Cash holdings	2,457	0.000	0.355	0.132	13.077	0.775
Board size	2,457	3.000	10.010	9.000	24.000	3.303
Board composition	2,457	0.000	0.662	0.692	0.941	0.172
Takeover defenses	2,457	2.000	8.998	9.000	16.000	2.656
CEO age	2,457	37.000	53.545	54.000	81.000	10.076
CEO tenure	2,457	0.000	7.053	5.000	50.000	7.204
CEO duality	2,457	0.000	0.637	1.000	1.000	0.481

Note: %Cash is the percentage of the deal value paid in cash by the acquirer. Relative size is the ratio of the deal value to the acquirer's market capitalization at the end of the year before the deal. All cash deals, intraindustry, private target, public target, tender offer, and competed deal are binary variables that equal 1 when the deal is 100% cash financed, target and acquirer operate in the same two-digit primary SIC code industry, target is classified as privately held by SDC, target is classified as publicly held by SDC, deal is a tender offer, and there are more than one competing bidders, respectively, and 0 otherwise. Firm size is the natural logarithm of total assets. Growth opportunities is the market/book ratio. Leverage is the ratio of long-term debt to total assets. Cash holdings is the ratio of cash and marketable securities to sales. Firm size, growth opportunities, leverage, and cash holdings are measured as of the end of the fiscal year preceding the deal. Board size is the number of directors and board composition is the ratio of independent directors to all directors, where an independent director is unaffiliated with the firm or any of its employee directors beyond his directorship. Takeover defenses is an index of 24 takeover defenses. CEO age is in years. CEO tenure is the number of years the CEO has served as such. CEO duality equals 1 when the CEO also serves as board chair, and 0 otherwise.

CAR by 20 basis points. I obtain comparable results in the third and fourth columns of Table 12, for which the dependent variable is the seven-day cumulative abnormal return, CAR [–3, +3].

These results suggest that outside CEO directors are valuable when the firm makes an acquisition and are consistent with the argument that CEO directors play significant advisory roles that facilitate the exploitation of valuable acquisition opportunities. They differ from those of Fahlenbrach, Low, and Stulz (2010), who report no relation between acquisition returns and the presence of CEO directors in their sample. The discrepancy appears to be attributable to differences in our measure of the presence of CEO directors. As stated previously, Fahlenbrach, Low, and Stulz use a binary variable that equals 1 when the board has at least one CEO director, whereas I use the percentage and number of CEO directors on the

TABLE 12. CEO Directors and Acquisition Returns: Regression Results.

	CAR [−1, +1]		CAR [−3, +3]	
%Active CEOs	0.0264**	—	0.0289*	—
	(.015)		(.059)	
#Active CEOs	—	0.0020**	—	0.0025**
		(.026)		(.042)
All cash deals	0.0080***	0.0080***	0.0022	0.0022
	(.006)	(.006)	(.568)	(.570)
Relative size	−0.0122**	−0.0122**	−0.0092	−0.0091
	(.023)	(.023)	(.149)	(.150)
Intraindustry	0.0066**	0.0066**	0.0038	0.0039
	(.019)	(.018)	(.327)	(.314)
Private target	−0.0041	−0.0041	0.0027	0.0028
	(.245)	(.256)	(.579)	(.565)
Public target	−0.0232***	−0.0233***	−0.0215***	−0.0216**
	(.000)	(.000)	(.000)	(.000)
Tender offer	0.0102**	0.0104**	0.0172***	0.0174**
	(.035)	(.031)	(.006)	(.006)
Competed deal	−0.0021	−0.0022	−0.0129	−0.0130
	(.792)	(.777)	(.279)	(.275)
Firm size	−0.0017*	−0.0016	−0.0018	−0.0018
	(.098)	(.113)	(.207)	(.209)
Market/book	0.0001	0.0001	−0.0001	−0.0001
	(.967)	(.928)	(.855)	(.877)
Leverage	−0.0047	−0.0049	0.0069	0.0069
	(.655)	(.648)	(.670)	(.668)
Cash holdings	−0.0035**	−0.0036**	−0.0021	−0.0022
	(.020)	(.016)	(.356)	(.337)
Board size	0.0001	−0.0003	−0.0002	−0.0006
	(.925)	(.616)	(.758)	(.363)
Insider board	0.0054*	0.0051*	0.0038	0.0037
	(.060)	(.072)	(.296)	(.311)
Takeover defenses	−0.0005	−0.0004	−0.0008	−0.0008
	(.355)	(.431)	(.232)	(.269)
CEO age	0.0002	0.0002	0.0005**	0.0005**
	(.219)	(.232)	(.021)	(.022)
CEO tenure	0.0001	0.0001	0.0001	0.0000
	(.620)	(.632)	(.919)	(.912)
CEO duality	0.0003	0.0005	−0.0059	−0.0059
	(.911)	(.876)	(.141)	(.147)
Sample size	2,457	2,457	2,457	2,457
Adjusted R^2	0.084	0.085	0.068	0.068

Note: The dependent variables are the bid announcement returns measured over the [−1, +1] and [−3, +3] windows. %Active CEOs is the percentage of all directors who are active CEOs of other firms. #Active CEOs is the number of all directors who are active CEOs of other firms. Relative size is the ratio of the deal value to the acquirer's market capitalization at the end of the year before the deal. All cash deals, intraindustry, private target, public target, tender offer, and competed deal are binary variables that equal 1 when the deal is 100% cash financed, target and acquirer operate in the same two-digit primary SIC code industry, target is classified as privately held by SDC, target is classified as publicly held by SDC, deal is a tender offer, and there are more than one competing bidders, respectively, and 0 otherwise. Firm size is the natural log of total assets. Growth opportunities is the market/book ratio. Leverage is the ratio of long-term debt to total assets. Cash holdings is the ratio of cash and marketable securities to sales. Firm size, growth opportunities, leverage, and cash holdings are measured as of the end of the fiscal year preceding the deal. Board size is the number of directors, and board composition is a dummy variable that equals 1 when the percentage of independent directors is greater than the sample median, and 0 otherwise. Takeover defenses is an index of 24 takeover defenses. CEO age is in years. CEO tenure is the number of years the CEO has served as such. CEO duality is a binary variable that equals 1 when the CEO also serves as board chair, and 0 otherwise. Each regression includes year and two-digit SIC code industry dummies. The *p*-values based on robust standard errors corrected for firm level clustering are shown in parentheses.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

board. In unreported regressions that employ the binary variable, I find that it is not statistically significant.

Other results in Table 12 are similar to those in prior studies. As in Travlos (1987) and several other studies, cash payments are positively related to acquisition returns. Similarly, intraindustry deals attract higher announcement returns, which is consistent with Morck, Shleifer, and Vishny (1990) and Scanlon, Trifts, and Pettway (1989). Abnormal returns are also higher when the deal is a tender offer, as in Jarrell and Poulsen (1989). In contrast, CAR is lower when the target is publicly held, which is consistent with Chang (1998). Announcement returns also decrease with relative deal size, which is similar to Moeller, Schlingemann, and Stulz (2004), and with cash holdings, as in Harford (1999). However, none of the CEO characteristics and board structure variables is consistently significantly related to CAR at conventional levels.

Robustness Checks

This section reports results of additional tests that evaluate the robustness of my results on the effect of CEO directors on acquisition returns. First, I repeat all analysis using CAR computed over alternative event windows. These windows include [–5, +5], [–5, +1], [–1, +5], and [–3, +5]. Results are qualitatively similar to those reported in Table 12 for the [–1, +1] and [–3, +3] windows.

As reported earlier, 501 of the 910 firms in my sample made multiple acquisitions during the sample period. The results presented above include each acquisition for these firms. If serial acquirers improve their acquisition performance by learning from prior experience and are more likely to have CEO directors, this potentially biases my results by overweighting these firms. I address this concern in several ways. First, I form annual equal- and value-weighted portfolios for each firm with multiple acquisitions in the same year and use the portfolio returns in my analysis. Second, I exclude all but the first acquisition in each year for each firm. Next, I exclude all but the first acquisition for each firm during the entire sample period. Finally, I exclude all transactions for firms with multiple acquisitions. Regardless of which approach I choose, results remain similar to those reported for the full sample.

I also examine the robustness of my results to a potential self-selection bias. As argued by Li and Prabhala (2007), the decision to attempt an acquisition is likely nonrandom. Thus, regressions that do not control for this selection bias can produce misleading results. To address this, I repeat my analysis using Heckman selection models. In the first stage, I model the acquisition choice as a function of several variables suggested by Harford (1999), including cash holdings, prior performance, leverage, internal growth opportunities, firm size, and managerial ownership. I supplement these with several governance variables: board size, board composition, proportion of CEO directors, CEO age, and CEO–chairman duality.

Significant variables in the selection regression are cash holdings (+), firm size (+), leverage (–), internal growth opportunities (+), and CEO–chairman duality (–). Results of the outcome models are similar to those in Table 12. Specifically, I continue to find that CEO directors are associated with significantly higher acquisition returns.

Creating Value in Acquisitions: Monitoring or Advising?

The results presented thus far in this section suggest that CEO directors are valuable when a firm makes an acquisition. This can be because these directors provide better strategic advising stemming from their unique professional experience. The preceding discussion leans toward this interpretation. Nevertheless, higher acquisition returns also are consistent with CEO directors being better monitors, for example, by preventing management from overbidding or bidding on value-destroying deals. Here, I report additional tests to shed light on this issue.

As a starting point, I test whether firms with greater advising needs have more CEO directors because this would presumably be the case if such directors provide better advising. Following Coles, Daniel, and Naveen (2008), I construct an index of advising needs based on scope of operations, firm size, and leverage. I then classify firms scoring above the median on this index as high-advising-needs firms and those below the median as low-advising-needs firms. Mean and median percentage of CEO directors are 17.3% and 15.4% for high-advising-needs firms, compared to 14.4% and 14.3% for low-advising-needs firms. Both differences are significant at the 1% level, implying that firms with greater advising needs appoint more CEO directors.

Next, I focus on acquisitions presumably involving greater board advising to test whether CEO directors are more valuable in those cases. First, I estimate regressions similar to those in Table 12 for deals valued at above $1 billion on the premise that these very large deals require more advising because of their greater complexity. This is similar to the argument in the recent literature that larger firms are more complex and in need of greater advising. I find that although the CEO director variable is significant in both the regression for deals valued above $1 billion and those valued below that threshold, the coefficient is much bigger in the regression for the largest deals. Specifically, in the regression for acquisitions valued at above $1 billion, the coefficient of the proportion (number) of CEO directors is 0.0720 (0.0052), compared to 0.0195 (0.0014) in the regression for deals valued at or below $1 billion.

Yet the complexity of an acquisition is not necessarily fully dependent on its raw dollar value. For example, a $100 million deal by a company whose market capitalization is $120 million is presumably a complex deal to that company even if it would not be a complex deal to another company valued at, say, $1 billion. Thus, I use the ratio of the deal value to the acquirer's market capitalization in the

year before the deal to create a second category of complex deals. Here, I classify deals valued at greater than 50% of the acquirer's prebid market capitalization as complex and those below this threshold as noncomplex. I then estimate separate regressions for the two categories. Once again, I find that the CEO director variable is significant in both regressions but more important in the regression for complex deals. The coefficient of the percentage (number) of CEO directors is 0.1333 (0.0109) in the regression for deals valued at above 50% of the acquirer's prebid market capitalization, compared to 0.0203 (0.0016) for deals with relative size lower than 50%.

Overall, although it is impossible to rule out that the observed effects of CEO directors on acquisition returns are attributable to better monitoring, these results suggest that it is more likely attributable to better advising by these directors. It appears that the skills and professional experience of CEO directors equip them to perform important advisory functions that facilitate value creation in an acquisition context.

VI. Summary and Conclusion

Active CEOs are a major source of candidates for board positions. Between 1998 and 2005, 71% of S&P 1500 firms have at least one outside CEO director while 15% of directors serving on the average board during this period are outside CEOs. In this study, I report evidence suggesting that this practice has significant implications for firm behavior and board effectiveness.

First, I show that CEOs are paid more and their compensation is less sensitive to firm performance when other CEOs serve on their boards. This excess compensation does not appear to be a premium for greater employment risk as CEO turnover rate and turnover-performance sensitivity are not significantly related to CEO directors. Furthermore, investment in corporate innovation does not increase with CEO directors. However, CEO directors seem important in identifying valuable external strategic opportunities in that the abnormal returns of an acquisition increase with CEO directors.

These results illustrate both the potential costs and benefits of having other top executives as directors. On the cost side, CEO directors can distort executive incentives when they view themselves as members of the same group, overestimating the effort and skill requirements of their job and rationalizing higher compensation packages. Yet the acquisition results suggest that outside CEOs can play important advisory roles in identifying valuable external opportunities. My results complement and extend prior studies on executive service on other boards, most of which focus on implications for the sending firm. By providing extensive evidence on how the receiving firm is affected, this study permits a broader evaluation of the effects of the CEO's service on other boards. I hope, in the

end, that these results help firms maximize the benefits of appointing CEO directors by encouraging these directors to confront their potential biases while alerting other directors to the possibility that performance evaluation and compensation counsel provided by CEO directors are not necessarily objective.

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