



The costs of intense board monitoring[☆]

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ABSTRACT

We study the effects of the intensity of board monitoring on directors' effectiveness in performing their monitoring and advising duties. We find that monitoring quality improves when a majority of independent directors serve on at least two of the three principal monitoring committees. These firms exhibit greater sensitivity of CEO turnover to firm performance, lower excess executive compensation, and reduced earnings management. The improvement in monitoring quality comes at the significant cost of weaker strategic advising and greater managerial myopia. Firms with boards that monitor intensely exhibit worse acquisition performance and diminished corporate innovation. Firm value results suggest that the negative advising effects outweigh the benefits of improved monitoring, especially when acquisitions or corporate innovation are significant value drivers or the firm's operations are complex.

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1. Introduction

Corporate governance and issues of managerial accountability have come under intense scrutiny since the recent spate of corporate scandals. While many solutions have been proffered, the most common cure for corporate woes appears to be increased independence of the board of directors and greater monitoring powers for independent directors. For example, an editorial in *The Economist* called for increases in the number and oversight responsibilities of independent directors.¹ Similarly, NYSE requires the three principal board committees (audit, compensation, and

nominating) of listed companies to be composed solely of independent directors. An implication of these expectations is that many independent directors concurrently serve on multiple oversight committees, resulting in the devotion of significant time to monitoring responsibilities (Heidrick & Struggles, 2007).

In this paper, we study how the devotion of board resources to oversight duties in this manner impacts the board's effectiveness in value creation through its advising and monitoring functions. On one hand, since these committees' primary responsibilities involve overseeing top management, committing significant board resources to them can improve the quality of board monitoring (Vafeas, 2005), leading to reductions in potential agency costs. Furthermore, independent directors serving on multiple monitoring committees can gain a more complete understanding of the firm. This broader view can aid such directors in making more informed decisions, again leading to better outcomes.

Nevertheless, oversight improvements obtained through intense monitoring can be costly because of its effects on board advising. Holmstrom (2005) argues that intense monitoring destroys the trust necessary for the chief executive officer (CEO) to share relevant strategic

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¹ "Under the board talk," *The Economist*, June 15, 2002, pp. 13–14.

information with directors. Similarly, Adams and Ferreira (2007) propose a model in which the CEO does not communicate with a board that monitors too much, while Adams (2009) presents survey evidence suggesting that independent directors receive less strategic information from management when they monitor intensely. Since independent directors' advisory role depends critically on information provided by the CEO (Song and Thakor, 2006; Adams and Ferreira, 2007), this can result in poor advising. In addition, given that directors' time is a finite resource, increasing the time spent on monitoring reduces the time available for advising. Besides, Adams (2009) suggests that intense monitoring leads directors to perceive their primary function as monitoring management and to shy away from offering strategic advice. Thus, intense monitoring can leave directors with little time, less information, and a poorer focus on advising, thereby compromising the board's ability to create value. Finally, intense monitoring can promote managerial myopia by weakening the CEO's perception of board support, which is necessary to encourage investments in risky but value-enhancing ventures such as corporate innovation.

Our objectives are threefold. First, we examine whether the quality of board monitoring is better when most independent directors serve on multiple oversight committees. Second, we examine whether this is associated with weaker advising. Third, we examine how this potential tradeoff between the quality of board monitoring and advising affects firm value, emphasizing the role of the firm's advising requirements in the process. We study these issues using firms in the Standard and Poor's (S&P) 500, S&P MidCap 400, and S&P SmallCap 600 indexes (collectively S&P 1500) over 1998–2006.

We test for monitoring effects by analyzing CEO turnover, executive compensation, and earnings quality. We find that the sensitivity of turnover to firm performance increases with the intensity of board monitoring. We also find improvements in earnings quality, with less discretionary accruals and more informative earnings. Furthermore, we find a significant reduction in excess executive compensation, although there is no evidence of an increase in pay-performance sensitivity. Overall, our results suggest that the quality of board monitoring increases when independent directors devote significant time to oversight responsibilities, which is consistent with several prior studies suggesting that independent directors can be valuable monitors (e.g., Weisbach, 1988; Borokhovich, Parrino, and Trapani, 1996).

Next, we examine how this affects the quality of board advising. We first focus on a strategic event that requires significant board input by analyzing acquisitions. We find that firms with monitoring-intensive boards exhibit worse acquisition performance, with announcement returns lower by 48 basis points and a longer time to deal completion. Yet acquisitions are discrete events and worse acquisition performance needs not imply generalized ineffective strategic advising. Hence, we provide further insight by focusing on corporate investments in innovation. Innovation entails the cultivation of firm-specific human capital and tolerance for experimentation and potentially costly mistakes. This requires that the CEO sees the board as supportive, which

offers the implicit assurance necessary to induce him to assume strategic risks. Intense monitoring can destroy this perception, causing the CEO to focus more on routine projects with relatively safe outcomes rather than on high-risk innovation. Consistent with this, we find that firms with monitoring-intensive boards innovate less, where innovation is measured using research and development (R&D) investments and the quality of patents granted to the company by the U.S. Patent and Trademark Office (USPTO).

Next, we focus on value creation (as measured by Tobin's q) to provide evidence on the net effect of intense board monitoring. Demsetz and Lehn (1985) suggest that, in a frictionless world with no transaction costs, firms will always maintain value-maximizing board structures by speedily adjusting their boards as their circumstances change. For example, they will add more directors to maintain the board's advising capacity when board monitoring increases. Thus, empirical tests will detect no relation between board structure and firm value. Nevertheless, transaction costs and other constraints (e.g., due to public sentiments and/or regulatory requirements) can lead to deviations from optimal board structures and permit a measurable effect on firm value. Consistent with this, we find that firm value is significantly lower when the board monitors intensely. This suggests that the negative advising effects dominate the monitoring improvements, on average. It also suggests differential effects based on firm-specific advising requirements since companies with high advising needs should suffer greater value losses if constrained to have monitoring-intensive boards when their characteristics demand greater board advising.

Coles, Daniel, and Naveen (2008) and Linck, Netter, and Yang (2008) both argue that complex firms have greater advising requirements. Thus, we perform additional analyses to test whether complex firms with monitoring-intensive boards suffer greater negative effects. Following Coles, Daniel, and Naveen (2008), we construct an index of advising needs based on operating complexity and then test whether the effects of intense monitoring are amplified by strategic advising requirements. We find that the reduction in acquisition performance, corporate innovation, and firm value is greater for firms with stronger advising requirements. For example, a firm with significant advising needs whose board monitors intensely experiences an 8.9% reduction in the quality of corporate innovation, compared with no reductions for a low-advising-needs firm with a monitoring-intensive board. Similarly, intense monitoring is associated with a reduction of 9.5% in firm value when advising needs are high, compared with a statistically insignificant reduction of 0.8% for firms with low advising needs. Thus, for firms with high advising needs, weaknesses in board advising outweigh the benefits of intense monitoring, while this does not appear to be the case when advising requirements are low.

This paper makes several important contributions. First, we extend the nascent literature on the board's advising function by providing evidence on the tradeoffs between directors' duty to oversee management and their responsibility to provide strategic counsel that facilitates value creation. Traditionally, academics and regulators tend to focus on directors' oversight duties,

and suggestions for governance improvement are often couched in terms of more intense monitoring by independent directors. Recent theoretical papers (e.g., Holmstrom, 2005; Adams and Ferreira, 2007) argue that this can significantly alter board dynamics by disrupting the relationship between the CEO and independent directors. We provide important evidence by showing that while intense monitoring improves board oversight, the quality of board advising deteriorates when independent directors are principally devoted to oversight duties. Furthermore, the negative advising effects appear to outweigh monitoring improvements, resulting in net value losses especially among firms with greater advising needs. Thus, monitoring effectiveness alone is not a sufficient yardstick for good corporate governance.

We also extend the literature on the impact of directors' time commitment on board effectiveness. Fich and Shivdasani (2006) show that firm value suffers when a majority of outside directors are excessively busy through service on multiple corporate boards. Yet the decision to assume additional board appointments is fundamentally different from directors' obligation to sit on additional committees. The prestige and pay associated with board appointments can motivate directors to justify the allocation of incremental time to each additional board. In contrast, if directors rationally allocate time among their major responsibilities, they may not significantly increase the time devoted to one particular board when they receive additional committee assignments from that board. Rather, time spent on additional committees may come at the expense of the time they would otherwise devote to other board responsibilities at the same firm. We extend the literature by showing that this potential tradeoff has significant implications for the effectiveness with which the board performs its advising and monitoring functions.

Finally, our results have important policy implications. Our findings of improved monitoring provide an empirical basis for recommendations of increased independent director involvement in oversight duties. However, the deterioration in advising quality associated with intense monitoring suggests that an exclusive focus on board monitoring can be detrimental. Thus, there is the need to balance directors' monitoring and advising duties in the design of value-maximizing governance structures. More importantly, and in the same spirit as Coles, Daniel, and Naveen (2008), our results on the different effects of intense board monitoring on firms with high and low advising requirements challenge the one-size-fits-all approach often favored by regulators, shareholder activists, and the popular press. We hope that our results will encourage a more nuanced consideration of relevant factors as firms design their governance structures to maximize value.

The rest of the paper proceeds as follows. Section 2 discusses the relevant literature and develops our hypotheses. Section 3 presents the sample, while Sections 4 and 5 contain our analysis of the effects of intense monitoring on oversight quality and advising effectiveness, respectively. Section 6 focuses on firm value to evaluate its net effect and Section 7 contains additional robustness checks. Section 8 concludes the paper with a brief summary.

2. Hypotheses development

The board of directors performs two primary functions: monitoring and advising top management (Jensen, 1993; The Business Roundtable, 1990). The monitoring role involves overseeing management with a view to minimizing potential agency problems, while the advising role involves assisting management in strategy formulation and execution, as well as providing counsel in other areas of top-level decision making. Much of these responsibilities are delegated to committees, the principal ones being the audit, compensation, and nominating committees. The audit committee oversees the financial reporting and internal control systems while the compensation committee administers and reviews all executive compensation programs. The nominating committee evaluates candidates for board positions, reviews the performance of individual directors, and assesses the strength of the firm's governance structure. These functions constitute the board's principal monitoring duties (see, e.g., Adams and Ferreira, 2007).

Directors are either affiliated with the firm or independent, with the latter having no significant relationships with the company beyond being directors. Because of this perceived objectivity, independent directors are viewed as valuable monitors and their greater involvement in board oversight is usually suggested as a means of improving managerial accountability and protecting shareholders. In fact, the major stock exchanges either mandate (NYSE) or highly recommend (Nasdaq) that the compensation, nominating, and audit committees be entirely staffed with independent directors, while the Sarbanes-Oxley Act of 2002 (SOX) requires the same for the audit committee.

These requirements restrict the structural freedom of boards to assign committee memberships, potentially overcommitting independent directors to monitoring duties (via concurrent service on multiple oversight committees) at the expense of strategic advising. We hypothesize two contrasting effects for this phenomenon: It can lead to improvements in the effectiveness of board monitoring but also can result in lower-quality advising. First, prior studies have shown independent directors as effective monitors in various contexts,² while Vafeas (2005) shows that monitoring quality improves when directors increase the time devoted to oversight duties. In addition, concurrent service on multiple oversight committees can broaden independent directors' understanding of the firm and its operating environment, thereby enhancing their ability to make better-informed decisions. Thus, assigning more monitoring duties to individual independent directors can lead to improvements in oversight quality. We summarize this in our first hypothesis: *Monitoring quality is positively associated with the board's monitoring intensity, where a*

² For example, Brickley and James (1987) show that managerial consumption of perquisites is lower when the board is dominated by independent directors, while Weisbach (1988) and Borokhovich, Parrino, and Trapani (1996) report that firms with more independent directors are more likely to remove poorly performing CEOs and to select replacements from outside the firm.

monitoring-intensive board is one on which a majority of independent directors serve on at least two of the three principal committees. We focus on CEO turnover, executive compensation, and earnings management to test this hypothesis.

Nevertheless, overcommitting independent directors to monitoring duties can negatively affect the quality and effectiveness of board advising through its effects on board dynamics and the relationship between directors and the CEO. Adams and Ferreira (2007) analyze a model where the CEO is less willing to share strategic information with independent directors when such directors monitor intensely, leading to less information exchange and a reduction in the quality of board advising. Adams (2009) provides survey evidence suggesting that directors who perform extensive monitoring duties receive less strategic information from management. She also shows that such directors are less likely to participate in strategic decision-making and their inputs are valued less by the CEO. Thus, increased monitoring, especially by a large fraction of independent directors, can lead to a significant reduction in the effectiveness of board advising.

Fich and Shivdasani (2006) and Core, Holthausen, and Larcker (1999) find that board effectiveness deteriorates when directors are overcommitted as a result of serving on multiple corporate boards. We contend that the dynamics of internal work assignments suggest an even greater potential for overcommitment deriving from committee responsibilities. The expected marginal utility of each additional board appointment is strictly positive, given the prestige and compensation associated with board service. Thus, directors can rationalize devoting incremental time to each additional board. In contrast, the expected utility from sitting on a particular board is relatively fixed. Therefore, rational independent directors may not significantly increase the time devoted to a particular board when that board increases their monitoring responsibilities. Rather, they may simply spend less time on their other major duty, strategic advising. Similarly, the literature on organizational justice (e.g., Leventhal, 1976; Colquitt, Conlon, Wesson, Porter, and Ng, 2001) suggests that directors serving on multiple monitoring committees may perceive inequity relative to other directors if they also have to participate significantly in board advising. Consequently, these directors may minimize their advising efforts in an attempt to restore equity in their relationship with other directors. Consistent with these arguments, Heidrick & Struggles (2007) report that 84% of directors in their survey indicated that “to at least some extent they are now spending more time on monitoring and less on strategy,” while Adams (2009) finds that directors substitute their advising and monitoring roles, advising less when they perceive themselves to be mostly monitors. Furthermore, director litigation exposure is such that directors facing tradeoffs between advising and oversight duties may rationally opt to spend more time on the latter in order to reduce their personal liability exposure (Klausner, Black, and Cheffins, 2005).

These arguments suggest that service on multiple monitoring committees by a significant percentage of independent directors can negatively affect the board's

ability to perform its advising duties. This leads to our second hypothesis: *The effectiveness of board advising is negatively associated with the board's monitoring intensity.* We focus on acquisition performance and corporate innovation to test this hypothesis.

The two hypotheses above predict opposite effects for intense monitoring on the two major functions of the board. Thus, we consider its effect on firm value to understand its net impact on overall board effectiveness. Standard cost–benefit analysis suggests that the net impact depends on whether the positive monitoring effects outweigh the negative advising effects. Since there are no a priori reasons to expect one or the other to dominate, it is reasonable to treat the net effect as an empirical issue.

Even so, recent governance literature emphasizes the importance of firm characteristics in the design of optimal board structures. Boone, Field, Karpoff, and Raheja (2007) show that cross-sectional variations in board structure are partially explained by the specific nature of each firm's competitive environment and managerial team. Similarly, Linck, Netter, and Yang (2008) find that variations in board size and composition are consistent with the costs and benefits of the board's monitoring and advising roles. Thus, if companies optimally choose the intensity of board monitoring and can costlessly adjust their board structures to maximize value, then the expected benefits and costs would offset one another with no net effect on firm value.

Nevertheless, transaction costs and market frictions can prevent firms from maintaining optimal board structures at all times. Coles, Daniel, and Naveen (2008) argue that such transactions costs include frictions imposed by board election processes that confer multi-year terms (e.g., staggered elections); implicit and sometimes explicit assurances that directors, once appointed/elected, will not be removed except for cause; the CEO's personal costs in removing directors with whom he has built a long-term professional and personal relationship; pressures for one-size-fits-all board structures arising from listing requirements, institutional investors, business groups (e.g., Business Roundtable), proxy advisory services, the business press, regulators, politicians, and academia; and the monetary and time costs of searching for new board members. Thus, deviations from optimal board structures can occur, resulting in a detectable relation between board structure and firm value.

Although transaction cost arguments suggest an observable relation between firm value and the board's monitoring intensity, they do not predict the direction of such relation because of the expected opposite effects of intense monitoring on oversight quality and board advising. Nevertheless, they do suggest a negative net effect when advising losses outweigh oversight improvements. Since this is more likely when advising requirements are high, we expect a negative relation between intense monitoring and firm value when advising requirements are significant.³ Coles, Daniel, and Naveen (2008) and Linck, Netter, and Yang (2008) both argue that operating

³ A complementary hypothesis is that firm value increases with intense monitoring when improvements in board oversight dominate losses from poor advising, which is likely to be the case when monitoring needs are high. We consider this hypothesis in Section 6.4.

complexity increases the need for board advising. This leads to our third hypothesis: *Firm value decreases with intense monitoring as operating complexity increases.*

3. Sample and variables

Our sample consists of S&P 1500 companies. We obtain data on these firms from several sources. Data on board attributes come from the RiskMetrics director database. This database provides detailed information on each director, covering such items as age, gender, primary occupation, independence status, and service on the three principal board committees. We are primarily interested in the independence status of directors and their service on the three principal committees. Since RiskMetrics' coverage of this information begins in 1998, our sample also begins in that year.

We obtain accounting data from Compustat, stock return data from the Center for Research in Security Prices (CRSP) database, CEO compensation and turnover data from ExecuComp, and acquisition data from the Securities Data Corporation (SDC) database. We start with 14,381 firm-years from RiskMetrics, and eliminate 1,623 observations due to missing board structure or financial data. We then impose the following two restrictions. First, we require all companies in our sample to have at least two of the three principal committees, resulting in an additional elimination of 127 observations. Second, due to differences in regulatory oversight that can limit the board's role, we eliminate financial firms and utilities, further reducing our sample by 1,995 firm-years. Our final sample thus includes 10,636 firm-years for 2,051 unique firms from 1998 to 2006.⁴

Using these data, we construct several variables that we utilize in all our empirical tests. These variables include measures of the board's monitoring intensity, directors' external time commitment, board structure, and firm characteristics. We discuss these below. In later sections, we discuss other variables used in specific tests, including measures of board monitoring and advising quality, and relevant control variables.

3.1. Variable definitions

We define an independent director as monitoring-intensive if he/she serves on at least two of the three principal monitoring committees. We base this definition on several considerations. First, board committees can be classified broadly as either monitoring or advising. The most common standing committees and their primary functions are the audit (monitoring), compensation (monitoring), nominating/governance (monitoring), finance/investment/strategy (mostly advising), and executive (mostly advising) committees. Second, most directors serve on two or fewer committees.⁵ This suggests that

directors serving on two of the three monitoring committees are much less likely to serve on any other committees. Therefore, we define such directors as monitoring-intensive since most of their duties are monitoring related. We then aggregate this measure at the board level and define a monitoring-intensive board as one on which a majority of independent directors are monitoring-intensive. This allows us to identify firms where independent directors as a group are clearly devoted to monitoring duties.⁶

Essentially, this variable measures the extent to which independent directors' time is devoted to monitoring duties on a particular board. Prior studies (e.g., Fich and Shivdasani, 2006; Ferris, Jagannathan, and Pritchard, 2003) show that service on multiple corporate boards is another important dimension of directors' time commitment. Therefore, we control for directors' external time commitment to properly isolate the effect of our variable. Following Fich and Shivdasani (2006), we define an externally busy board as one where a majority of independent directors serve on three or more corporate boards.

We also create variables measuring other board and firm characteristics that are known to affect directors' effectiveness. These include board size, which we measure as the natural log of the number of directors, board composition (the fraction of independent directors), and director ownership (proportion of outstanding shares owned collectively by all directors). Others are firm size (natural log of market capitalization), investment opportunities (ratio of capital expenditures to sales), and industrial and geographic diversification (number of business and geographic segments).

Table 1 presents descriptive statistics for these variables. Panel A shows that board monitoring intensity increased over our sample period. In 1998, 49% of our sample has a monitoring-intensive board. This increases to a high of 68% in 2005 but falls slightly to 64% in 2006. Overall, 57% of our sample boards are monitoring-intensive. Virtually every firm in our sample has the audit and compensation committees in each year. In contrast, the nominating committee did not become ubiquitous until 2004 although a majority of sample firms always had one over the entire sample period. This raises the possibility that our monitoring-intensity variable may not be consistent over time since many firms have only two of the three committees during the early period of our sample. In Section 7, we discuss additional analyses performed to address this issue. Here, we simply note that our results are not affected by this consideration.

(footnote continued)

of standing committees is distributed as follows: three committees, 22% of firms; four (40%); five (20%); six (12%); and seven (6%). Of the 546 directors serving on these firms' boards, 85% serve on two or fewer committees. Furthermore, 100% of directors in 52% of companies serve on two or fewer committees.

⁶ Our results are similar when we use continuous measures, namely, the percentage and number of independent directors serving on two or more monitoring committees and the average number of monitoring committee memberships per independent director.

⁴ In the following sections, our sample size varies depending on the variables needed for each analysis.

⁵ RiskMetrics does not provide information on board committees besides the audit, compensation, and nominating committees. We hand-collect full committee data on 50 randomly selected firms. The number

Table 1

Descriptive statistics for board and firm characteristics.

The sample consists of 10,636 annual observations for 2,051 firms between 1998 and 2006. Board size is the number of directors. Independent directors are directors with no business or personal relationship with the firm or any of its employee-directors. Board independence is the percentage of independent directors. Monitoring-intensive directors are independent directors serving on at least two of the three principal monitoring committees (audit, compensation, and nominating). Monitoring-intensive board equals one when a majority of independent directors are monitoring-intensive, zero otherwise. Average committee membership is the average number of principal committees on which independent directors serve. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards. Board ownership is the proportion of outstanding shares owned by all directors. Market capitalization and total assets are in millions of dollars. Return on assets is the ratio of operating income before depreciation to total assets. Corporate diversification is the sum of reported geographical and business segments. Investment opportunities is the ratio of capital expenditures to sales. Panel A shows yearly distribution of monitoring-intensive boards and percentage of sample firms that had each committee during each year.

Panel A: Annual distribution of monitoring-intensive boards					
Year	Sample	Monitoring-intensive (%)	Audit (%)	Compensation (%)	Nominating (%)
1998	1,279	48.7	99.9	99.9	58.1
1999	1,273	47.7	99.9	99.9	58.1
2000	1,286	50.3	100.0	99.7	57.9
2001	1,352	53.3	100.0	99.9	59.5
2002	1,113	56.2	100.0	99.8	73.0
2003	1,127	61.9	100.0	99.8	87.9
2004	1,142	67.6	100.0	100.0	96.9
2005	1,061	68.0	99.9	99.9	98.0
2006	1,003	63.8	99.5	99.9	97.8
All years	10,636	56.9	99.9	99.9	74.9

Panel B: Summary statistics for all firm-years					
Variable	Mean	Median	25th percentile	75th percentile	Standard deviation
<i>Board characteristics</i>					
Board size	8.918	9.000	7.000	10.000	2.383
Independent directors	5.803	6.000	4.000	7.000	2.277
Board independence	0.648	0.667	0.545	0.800	0.176
Monitoring-intensive directors	2.843	3.000	2.000	4.000	1.746
Monitoring-intensive board	0.569	1.000	0.000	1.000	0.495
Average committee membership	1.524	1.500	1.200	1.800	0.484
Externally busy board	0.215	0.000	0.000	0.000	0.411
Board ownership	0.101	0.041	0.015	0.121	0.149
<i>Company characteristics</i>					
Market capitalization	6,572.710	1,371.890	534.967	4,256.210	1,7443.510
Total assets	4,753.930	1,229.340	514.384	3,495.770	1,1357.640
Return on assets	0.136	0.135	0.088	0.190	0.100
Corporate diversification	11.171	9.000	5.000	15.000	7.902
Investment opportunities	0.082	0.041	0.024	0.077	0.139

Panel B of Table 1 presents summary statistics for the other variables. The median board has nine members, six of whom are independent directors. On average, these independent directors sit on 1.5 monitoring committees, with a median also of 1.5. Mean and median number of monitoring-intensive independent directors are 2.8 and 3.0, respectively. Also, 21.5% of our sample boards are externally busy, which is comparable to the 21.4% reported by Fich and Shivdasani (2006). On average, directors collectively own 10.1% of outstanding shares, with a median ownership of 4.1%. As expected, our sample firms are fairly large, with average and median market capitalization of \$6.6 billion and \$1.4 billion, and average and median total assets of \$4.8 billion and \$1.2 billion, respectively. They are also well diversified, operating on average in 11 geographical and business segments, with a median of nine. Between 1998 and 2006, the average firm earned a 13.6% annual return on assets (ROA) while spending 8.2% of sales revenue on new capital investments.

4. Monitoring intensity and the effectiveness of board oversight

In this section, we test our hypothesis on the effects of intense monitoring on the quality of board oversight. We focus on three issues: CEO turnover, executive compensation, and earnings quality. Our analysis for each is discussed below.

4.1. CEO turnover

Hermalin (2005) argues that the selection, oversight, and replacement of the CEO constitute some of the most important duties of directors and that the probability of CEO turnover increases with the intensity of board monitoring. Consistent with the latter, Weisbach (1988) shows that boards dominated by outsiders are more likely to replace the CEO following weak performance, while Yermack (1996) reports analogous results for smaller

boards. Similarly, others find that a decrease in the performance sensitivity of turnover generally coincides with weaker monitoring, for example, in situations where executives own significant equity blocks (Denis, Denis, and Sarin, 1997) or the CEO also serves as board chair (Goyal and Park, 2002). In this section, we examine whether intense monitoring is associated with better board oversight by examining the performance sensitivity of CEO turnover.

We start with all CEO turnovers in ExecuComp, i.e., instances where ExecuComp identifies a new individual as the firm's CEO for the year. Next, we read media reports in Factiva, internet news stories, and U.S. Securities and Exchange Commission (SEC) filings around each turnover to identify involuntary turnovers, i.e., those reported as due to dismissals or firings by the board, disagreements with the board, need for new leadership, and similar circumstances that suggest the turnover is forced. This yields an involuntary turnover sample of 138. For each of these, we select a matching non-turnover firm based on industry and total assets in the year immediately preceding the turnover.

Next, we estimate logistic regressions where the dependent variable equals one for forced turnovers and zero for control firms. Our variable of interest is the interaction term between performance and monitoring intensity, which we expect to be negative under the improved monitoring hypothesis. We measure performance as annual stock return less same-period value-weighted return on a portfolio of firms in the same size and book/market deciles. As a robustness check, we also use market-adjusted stock returns, where the market is defined as the CRSP value-weighted portfolio of NYSE/Amex/Nasdaq stocks. In addition, we control for other factors known to affect the likelihood of CEO turnover, including ownership structure (Denis, Denis, and Sarin, 1997), board size (Yermack, 1996), CEO duality (Goyal and Park, 2002), and board composition (Weisbach, 1988). We control for differences in ownership structure using the equity ownership of the CEO and institutional investors. We measure board size as the natural log of the number of directors and CEO duality using an indicator variable that equals one when the CEO also serves as board chair, zero otherwise. Following Weisbach (1988), we measure board independence using a binary variable that equals one when a majority of directors are independent.⁷

Table 2 presents results of these regressions. In column 1, the interaction term is negative and significant at the 1% level. Using its coefficient and following Norton, Wang, and Ai (2004), we estimate the marginal effect of monitoring intensity on turnover-performance sensitivity across different probability thresholds and values for the control variables. The average interaction effect is -0.38 , with a standard error of 0.16 and a z-statistic of -1.97 , which is significant at the 5% level. Thus, the CEO is more likely to be terminated for poor performance when

independent directors devote significant time to monitoring duties. Specifically, a decrease of 10 percentage points in benchmark-adjusted returns increases the odds of forced turnover by 15 percentage points at firms with monitoring-intensive boards but by only six percentage points at other firms. Results in column 2 using market-adjusted returns are qualitatively similar.

While we painstakingly strive to identify forced turnovers correctly, we recognize the difficulties involved in deciphering the intentions of the relevant parties when a CEO leaves office. Therefore, we estimate additional regressions using all CEO turnovers as a robustness check. These regressions are cross-sectional time-series logistic models where the dependent variable is a binary variable coded as one for firm-years with CEO turnovers and zero for others. As columns 3 and 4 of Table 2 show, we continue to find that intense board monitoring is associated with a significant increase in the performance-sensitivity of CEO turnover.

Other results in Table 2 are broadly similar to those in prior studies. Consistent with Coughlan and Schmidt (1985), we find that poor performance significantly increases the likelihood of a turnover. We also find that the probability of forced turnover decreases in managerial ownership, as in Denis, Denis, and Sarin (1997) and with CEO duality as in Goyal and Park (2002). However, we do not find any significant effect for board size and board independence.

4.2. Executive compensation incentives

Besides CEO selection and termination decisions, another important board monitoring function is to provide appropriate managerial incentives through well-designed compensation contracts. In a rational principal-agent world, observed pay is the outcome of arm's length bargaining between self-interested executives and a board of directors seeking to maximize shareholder wealth. Thus, executive compensation levels and changes will depend strictly on economic factors such as managerial labor market conditions and firm performance. Critics such as Bebchuk and Fried (2004) argue that the reality is anything but efficient contracting and that management often manipulates the pay-setting process to its advantage, to the detriment of shareholders.

These issues have been the subject of extensive prior research, with the broad conclusion that compensation incentives improve with the strength of board monitoring. Specifically, Yermack (1996) finds that compensation incentives are better among companies with smaller boards, while Hallock (1997) reports excess compensation for CEOs in interlocking directorships with their board members. Core, Holthausen, and Larcker (1999) show that CEO compensation is positively related with CEO duality, board size, director age, and the proportion of affiliated directors. They also show that CEOs enjoy excess pay when a majority of outside directors serve on multiple other boards. Similarly, Lambert, Larcker, and Weigelt (1993) find that excess CEO pay increases with the number of directors appointed by the CEO, while Faleye

⁷ The independent board dummy variable equals one when more than 50% of directors are independent, zero otherwise. Results are invariant to alternative definitions that use 60% and 75% as the cutoff point.

Table 2

Monitoring intensity and CEO turnover.

The dependent variable in columns 1 and 2 equals one for forced CEO turnovers and zero for a size- and industry-matched non-turnover sample over 1998–2006. The dependent variable in columns 3 and 4 equals one for firm-years with any CEO turnovers and zero for firm-years with no turnovers. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees. Benchmark-adjusted return is annual stock return less same-period value-weighted return on a portfolio based on size and book/market deciles. Market-adjusted return is annual stock return less return on the CRSP value-weighted portfolio of NYSE/Amex/Nasdaq stocks. Externally busy board equals one when a majority of independent directors serve on three or more boards. Board size is the natural log of the number of directors. Board independence equals one when a majority of directors are independent, zero otherwise. CEO duality equals one when the CEO also serves as board chair, zero otherwise. CEO age is measured in years. CEO ownership is the proportion of outstanding shares beneficially owned by the CEO. Institutional ownership is the percentage of outstanding shares owned by institutional investors. Firm size is the natural log of total assets. Each regression includes year and two-digit SIC code dummies. Numbers in parentheses are *p*-values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Forced turnovers		All turnovers	
	(1)	(2)	(3)	(4)
Monitoring-intensive board	-0.164 (0.619)	0.148 (0.624)	0.199** (0.050)	0.159** (0.039)
Benchmark-adjusted return	-0.876* (0.051)	-	-0.420** (0.031)	-
Monitoring-intensive board × Benchmark-adjusted return	-2.593*** (0.002)	-	-0.690*** (0.009)	-
Market-adjusted return	-	-0.772* (0.065)	-	-0.262* (0.051)
Monitoring-intensive board × Market-adjusted return	-	-1.909*** (0.005)	-	-0.368** (0.037)
Externally busy board	-0.094 (0.812)	-0.075 (0.849)	0.224** (0.031)	0.107 (0.230)
Board size	0.289 (0.692)	0.086 (0.905)	0.639** (0.024)	0.430** (0.030)
Board independence	0.480 (0.381)	0.584 (0.283)	0.393** (0.015)	0.154 (0.181)
CEO duality	-1.266*** (0.000)	-1.285*** (0.000)	-0.044 (0.701)	-0.067 (0.428)
CEO age	0.055** (0.020)	0.057** (0.016)	0.156*** (0.000)	0.074*** (0.000)
CEO ownership	-0.244*** (0.000)	-0.238*** (0.000)	-0.109*** (0.000)	-0.033*** (0.001)
Institutional ownership	-0.166 (0.841)	0.141 (0.865)	-0.874** (0.010)	-0.428* (0.082)
Firm size	-0.054 (0.635)	-0.016 (0.891)	-0.118*** (0.005)	-0.076** (0.029)
Sample size	276	276	7489	7,793
Pseudo <i>R</i> -squared	0.230	0.220	0.175	0.062

(forthcoming) reports similar results for the proportion of directors who are active CEOs of other firms.

Based on these results and under our hypothesis that intense monitoring facilitates better oversight, we expect improved compensation incentives at firms with monitoring-intensive boards. We focus on two related issues. First, we examine the association between excess executive compensation and intense monitoring, expecting a negative relation. Next, we analyze the impact of intense monitoring on pay-performance sensitivity. In this case, our improved monitoring hypothesis predicts a positive effect.

We measure excess compensation using residuals from a baseline regression predicting normal compensation as a function of the economic determinants of executive pay. Standard economic theory implies that CEO compensation depends on the relative demand and supply of top executive talent. In this respect, prior work (e.g., Rosen, 1982; Core, Holthausen, and Larcker, 1999) suggests that the demand for managerial talent increases

with firm size, growth opportunities, and operating complexity. Similarly, since managerial talent is difficult to measure and executive effort is largely unobservable, agency theory emphasizes firm performance as an economic determinant of CEO compensation. Furthermore, 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.” Based on these considerations, our model of normal compensation expresses the CEO pay as a function of firm size, operating complexity, growth opportunities, performance, and risk.

Similar to Core, Holthausen, and Larcker (1999), we use total assets as a proxy for firm size and operating complexity, and book/market ratio (calculated as the ratio of the book value of equity to the market value of equity) as a proxy for growth opportunities. We measure firm performance using annual stock returns and ROA, and employ the standard deviation of both over the preceding

Table 3

Monitoring intensity and excess executive compensation.

Panel A presents regressions predicting normal CEO compensation as a function of the economic determinants of executive pay during 1998–2006. Total compensation is the natural log of 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 compensation is the natural log of (one plus) the value of stock options and restricted stock awarded during the year. Cash compensation is the natural log of salary plus cash bonus. Firm size is the natural log of total assets. Book/market is the book value of equity divided by the market value of equity. Stock return is the annual stock return less same-period return on the CRSP value-weighted portfolio of NYSE/Amex/Nasdaq stocks. ROA is operating income before depreciation divided by total assets. STDRET and STDROA are the respective standard deviations of stock return and ROA over the preceding five years. Each regression includes year and two-digit SIC code dummies. Panel B presents regressions explaining excess compensation, defined as residuals from the respective Panel A regressions. The dependent variable in columns 1, 3, and 5 is the actual residual, while the dependent variable in columns 2, 4, and 6 equals one when excess compensation is positive, zero otherwise. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board size is the natural log of the total number of directors. CEO duality equals one when the CEO also serves as board chair, zero otherwise. CEO directors is the number of directors who are CEOs of other firms. Numbers in parentheses are *p*-values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

<i>Panel A: Economic determinants</i>						
	<i>Total compensation</i>		<i>Equity compensation</i>		<i>Cash compensation</i>	
Firm size	0.502***		1.038***		0.315***	
	(0.000)		(0.000)		(0.000)	
Book/market	−0.002*		−0.008**		−0.001	
	(0.054)		(0.007)		(0.919)	
Stock return	0.162***		0.217***		0.232***	
	(0.000)		(0.002)		(0.000)	
ROA	1.367***		2.532***		1.444***	
	(0.000)		(0.000)		(0.000)	
STDRET	0.084***		0.269***		−0.088***	
	(0.000)		(0.000)		(0.000)	
STDROA	2.122***		4.858***		−0.291	
	(0.000)		(0.000)		(0.362)	
Sample size	9,118		8,136		9,118	
Adjusted <i>R</i> -squared	0.475		na		0.219	

<i>Panel B: Excess compensation</i>						
	<i>Total compensation</i>		<i>Equity compensation</i>		<i>Cash compensation</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Monitoring-intensive board	−0.048**	−0.167***	−0.170**	−0.125*	0.008	−0.049
	(0.040)	(0.003)	(0.019)	(0.054)	(0.808)	(0.387)
Externally busy board	0.018	0.163**	0.052	−0.136*	−0.022	0.047
	(0.558)	(0.022)	(0.522)	(0.087)	(0.588)	(0.490)
Board size	−0.146**	−0.453***	−0.696***	−0.738***	0.136	0.089
	(0.010)	(0.000)	(0.000)	(0.000)	(0.177)	(0.512)
CEO duality	0.101***	0.256***	−0.137*	−0.061	0.117***	0.369***
	(0.000)	(0.000)	(0.093)	(0.386)	(0.001)	(0.000)
CEO directors	0.035***	0.071***	0.162***	0.096***	0.000	0.036
	(0.000)	(0.006)	(0.000)	(0.000)	(0.986)	(0.139)
Sample size	9,118	9,118	8,136	8,136	9,118	9,118
Adjusted <i>R</i> -squared	0.008	0.013	0.007	0.011	0.003	0.013

five years as proxies for firm risk. Results of these regressions are presented in the first panel of Table 3. The first column presents results for total compensation, while the second and third columns present results for equity-based compensation (stock option and restricted stock grants) and cash compensation (salary and bonus). All compensation variables in the regressions are natural log transformations.⁸ As expected, we find a positive and

significant association between total compensation and firm size, market/book ratio, stock returns, ROA, the standard deviation of ROA, and the standard deviation of stock returns. Results for equity and cash compensation are broadly comparable.

Panel B of Table 3 presents regressions of our excess compensation measures on the monitoring-intensive board variable and control variables that capture other dimensions of the firm's monitoring environment. These include board size, CEO duality, directors' external busyness, and the number of directors who are CEOs of other firms. The regressions also include year and industry fixed effects, with standard errors corrected for clustering at the firm level.

⁸ Due to the large number of observations with zero equity compensation (16% of our sample), we use $\log(1+\text{pay})$ in the equity compensation model and estimate it using Tobit regression.

As column 1 shows, the natural log of excess total compensation declines by 4.8 percentage points when the board monitors intensely. This is statistically significant at the 5% level. In column 2, the dependent variable equals one when excess total compensation is positive, zero otherwise. Thus, this regression examines the effect of intense monitoring on the propensity to overpay the CEO, regardless of the size of overpayment. The results indicate a significant reduction in the likelihood of excessive executive rent extraction when the board monitors intensely. Specifically, the coefficient implies that intense board monitoring is associated with a reduction of 3.2 percentage points in the probability of overpaying the CEO when other variables are evaluated at their respective sample means.

Columns 3–6 present results of analogous regressions for equity-based and cash compensation. As shown in the table, the excess cash compensation results are not statistically significant, suggesting that intense board monitoring has no impact on excess cash payments to the CEO.⁹ In contrast, the monitoring-intensive board variable is negative and statistically significant in the equity-based compensation regressions.

Next, we focus on the CEO's pay-performance sensitivity. Jensen and Murphy (1990), Yermack (1996), 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. We follow this approach, introducing an interaction term between our measure of intense monitoring and the change in shareholder wealth to capture the effect of the board's monitoring intensity on pay-performance sensitivity. We expect the interaction term to be positive and significant under the hypothesis that intense monitoring facilitates improved compensation incentives. We also control for other variables that potentially affect CEO pay-performance sensitivity, including directors' external busyness, board size, CEO duality, firm risk, and growth opportunities. Results (not tabulated) show that the interaction term is positive but not significant. We obtain similar results for changes in equity-based compensation and cash compensation. Thus, it appears that intense monitoring has no discernible effect on the CEO's pay-performance sensitivity.

4.3. Earnings quality

The separation of ownership and control inherent in the modern corporation necessitates the production of regular financial reports to inform shareholders of the firm's activities. Yet, since executive pay and other evaluation metrics are often tied to reported accounting performance, this provides opportunity for the manifestation of severe agency problems in the form of earnings management. As shareholders' representatives, directors are responsible for

ensuring the quality of information presented in the firm's financial reports, and prior research has examined the association between governance attributes and the quality of reported financial information. Klein (2002) shows that independent boards and audit committees are associated with better earnings quality as measured by lower discretionary accruals, while Xie, Davidson, and DaDalt (2003) report similar results for board and audit committee composition. In this section, we examine whether earnings quality improves when independent directors are significantly committed to monitoring duties.

We use discretionary accruals as a proxy for the degree of bias infused into the financial statements by management and tolerated by the board. Under accrual accounting, firms measure and report their performance by recognizing economic events when they occur rather than when payments are made or received. The goal is to improve the informativeness of the financial reports. However, because the determination of accruals usually involves estimates and judgment, earnings management often manifests itself through discretionary accruals. Absent a specific theory that predicts the direction of accruals management (either income-increasing or income-decreasing), we employ tests using the absolute value of abnormal accruals. Using the unsigned value of abnormal accruals more completely identifies the discretion afforded managers by their boards and in this context does not require assumptions about the board's tolerance with regard to the direction of accounting accruals.

The most notable discretionary accruals model is the Jones (1991) model. We use two variants of this model to test the association between our measure of intense monitoring and the absolute value of discretionary accruals. The first is developed by Dechow, Sloan, and Sweeney (1995) and is commonly termed the modified Jones model. The second is based on Kothari, Leone, and Wasley (2005) who augment the modified Jones model with a control for firm performance.

Next, we estimate the association between these measures and the board's monitoring intensity. Since prior research shows that discretionary accruals are correlated with firm characteristics and performance (Dechow, Sloan, and Sweeney, 1995; McNichols, 2000), we control for firm size using the natural log of market capitalization, leverage using the ratio of total assets to total liabilities (DeFond and Jiambalvo, 1994), book/market ratio, the absolute value of the change in net income, and an indicator variable for firms with two or more consecutive years of negative income (Klein, 2002). Similar to Klein (2002) and Larcker, Richardson, and Tuna (2007), we also control for board size, board independence, and audit committee independence.

The first column of Table 4 reveals that intense monitoring is associated with significant reductions in discretionary accruals. The coefficient implies that the ratio of discretionary accruals to total assets is lower by 41 basis points when the board monitors intensely. Compared to average discretionary accruals of 4.2% of total assets, this represents an economically significant reduction of 9.8% in abnormal accruals. Thus, boards on which a majority of independent directors serve on multiple monitoring committees are better able to curtail

⁹ A plausible explanation for this result is the restriction on the tax deductibility of cash payments to executives imposed by Section 162(m) of the Internal Revenue Code. Passed in 1993, this rule essentially truncates cash payments at \$1 million, thereby reducing cross-sectional variations at the upper end of the distribution of cash compensation.

Table 4

Monitoring intensity and earnings quality.

The dependent variable in the first column is the absolute value of discretionary accruals generated from the modified Jones model over 1998–2006. The dependent variable in the second column is the absolute value of discretionary accruals generated from the modified Jones model augmented with a control for firm performance as in Kothari, Leone, and Wasley (2005). Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board size is the natural log of the total number of directors. Board independence is the percentage of directors that are unaffiliated with the firm beyond their directorship. Audit committee independence is the percentage of independent directors on the audit committee. Firm size is the natural log of market value of equity. Book/market is the book value of equity divided by the market value of equity. The absolute change in net income is the absolute value of the change in net income between years $t-1$ and t . Loss is an indicator variable for firms with two or more consecutive years of negative income. Leverage is the ratio of total assets to liabilities. Numbers in parentheses are p -values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Abnormal accruals	ROA augmented abnormal accruals
Monitoring-intensive board	−0.004*** (0.000)	−0.003*** (0.001)
Externally busy board	0.002 (0.178)	0.003** (0.045)
Board size	−0.019*** (0.000)	−0.016*** (0.000)
Board independence	−0.013*** (0.001)	−0.013*** (0.000)
Audit committee independence	−0.001 (0.933)	0.001 (0.876)
Firm size	−0.001** (0.015)	−0.001*** (0.006)
Book/market	0.001 (0.425)	0.001 (0.347)
Absolute change in net income	0.060*** (0.000)	0.048*** (0.000)
Loss	0.012*** (0.000)	0.008*** (0.000)
Leverage	0.001 (0.933)	0.001 (0.670)
Sample size	9,809	9,809
Adjusted R-squared	0.079	0.060

earnings management. Results in the second column lead to a similar conclusion.

Results for other variables are consistent with prior work. Specifically, we find that earnings management is lower among larger firms and higher among firms with significant net income changes or those reporting consecutive net loss, which is consistent with Klein (2002). We also find that independent boards are associated with significant reductions in earnings management, which is similar to Klein (2002) and Larcker, Richardson, and Tuna (2007).

4.4. Conclusion on monitoring effectiveness

This section shows that intense board monitoring is associated with increased sensitivity of CEO turnover to

firm performance, lower excess compensation, and higher earnings quality. Each of these findings is consistent with our first hypothesis that the quality of board oversight is better when independent directors are intensely involved in monitoring management. It appears that the simultaneous exposure to a broad range of the firm's activities stemming from concurrent service on multiple monitoring committees enhances directors' ability to effectively supervise top management. Next, we turn to the effects of such intense monitoring on the board's advising function.

5. Monitoring intensity and strategic advising

We focus on two related issues in this section. First, we consider a discrete strategic event involving significant board advising (acquisitions). Next, we analyze investments in corporate innovation. Our second hypothesis predicts a negative association in each case, i.e., worse acquisition performance and less innovation among companies with boards that monitor intensely.

5.1. Acquisitions

We obtain acquisition data from the SDC database. The data cover 1998–2006 and include all deals valued at \$1 million or more involving a U.S. acquirer. We exclude deals where the acquirer sought less than 50% of the target and multiple deals announced by the same acquirer on the same date. After eliminating acquirers with no data in the Compustat, CRSP, ExecuComp, and RiskMetrics directors and takeover defenses databases, our sample consists of 1,978 acquisitions involving 771 unique acquirers. We focus on two related issues: acquisition returns and time to deal completion.

5.1.1. Acquisition returns

We employ event study methodology to estimate the market model for each acquisition over a period of 255 days (−301, −46) preceding the announcement date. We then use estimated parameters to calculate cumulative abnormal returns (CAR) over a period of seven days centered on the event date, i.e., over days [−3, +3]. Mean and median CAR are −0.85% and −0.30%; both are statistically significant at the 1% level. For robustness purposes, we also calculate CAR over days [−1, +1]. Mean and median CAR for this window are −0.75% and −0.35%. Both are significant at the 5% level.

Next, we estimate regressions of acquisition returns on the monitoring-intensive board variable to examine the impact of independent directors' devotion to monitoring responsibilities on acquisition performance. We employ two-stage Heckman selection models since Li and Prabhala (2007) argue that the decision to attempt an acquisition is non-random. The first stage models the choice to attempt a bid as a function of variables suggested by prior work (e.g., Harford, 1999): cash holdings, prior performance, leverage, internal growth opportunities, firm size, managerial ownership, and CEO duality. We supplement these with the monitoring-intensive board variable and industry and year fixed effects. The first column of Table 5 shows that larger, cash-rich, high-

Table 5

Monitoring intensity and acquisition performance.

The first column shows results of a first-stage model predicting the decision to attempt an acquisition between 1998 and 2006. The second and third columns present results of second-stage models explaining acquisition returns and time to deal completion, respectively. Reported coefficients in the second and third columns are estimated marginal effects based on coefficients from the first and second stages using Heckman selection models. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Firm size is the natural log of total assets. Cash holdings is the ratio of cash and marketable securities to sales at the end of the preceding year. ROA_{t-1} is return on assets (operating income before depreciation divided by total assets) for the preceding year. Leverage is the ratio of long-term debt to total assets for the prior year. Growth opportunities is market/book ratio. Percent cash is the percentage of the deal value paid in cash by the acquirer. Private target equals one when the target is privately held, zero otherwise. Relative size is the ratio of the deal value to the acquirer's market capitalization at the end of the year prior to the deal. Intra-industry equals one when the target and acquirer share the same two-digit primary SIC code, zero otherwise. Board size is the natural log of the number of directors. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board independence is the percentage of directors that are unaffiliated with the firm beyond their directorship. CEO directors is the percentage of all directors who are CEOs of other firms. *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]. CEO age is measured in years. CEO tenure is the number of years the CEO has served as such. Board ownership is the proportion of outstanding shares owned by all directors. CEO duality equals one when the CEO also serves as board chair, zero otherwise. Each regression includes year and two-digit SIC code dummies. Numbers in parentheses are *p*-values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Acquirer=1	CAR [-3, +3]	Log (length)
Monitoring-intensive board	-0.097** (0.045)	-0.476*** (0.000)	0.015*** (0.000)
Firm size	0.157*** (0.000)	0.365 (0.146)	-0.183*** (0.000)
Cash holdings	0.785*** (0.000)	-	-
ROA_{t-1}	0.467** (0.049)	-	-
Growth opportunities	1.124*** (0.000)	-	-
Leverage	-0.661*** (0.000)	-0.890*** (0.019)	0.520** (0.000)
Percent cash	-	2.665*** (0.000)	-0.537*** (0.000)
Private target	-	0.756** (0.018)	-0.721*** (0.000)
Relative size	-	-1.063 (0.130)	0.741*** (0.000)
Number of bidders	-	-	0.389*** (0.001)
Intra-industry	-	0.601* (0.061)	0.017 (0.757)
Board size	-	0.494 (0.571)	0.140 (0.324)
Externally busy board	-	0.125 (0.741)	0.004 (0.955)
Board independence	-	-0.488 (0.674)	-0.172 (0.379)
CEO directors	-	3.465** (0.012)	-0.473*** (0.029)
<i>G</i> -index	-	-0.081 (0.199)	0.027** (0.013)

Table 5 (continued)

	Acquirer=1	CAR [-3, +3]	Log (length)
CEO age	-	0.026 (0.239)	-0.010** (0.011)
CEO tenure	-	0.013 (0.624)	0.001 (0.779)
Board ownership	-0.907*** (0.000)	-	-
CEO duality	-0.125*** (0.018)	-0.011*** (0.000)	0.073*** (0.000)
Inverse Mills' ratio	-	0.057*** (0.002)	-2.875*** (0.000)
Total firm-years	9,794	9,794	9,664
Firm-years with acquisitions	1,978	1,978	1,848

growth, and better-performing firms are more likely to attempt a bid, while the probability of an acquisition declines with monitoring intensity, leverage, managerial ownership, and CEO duality. These results are consistent with prior literature.

The second column of Table 5 presents results of the second-stage regression of acquisition returns on the monitoring-intensive board variable and several deal, acquirer, and CEO characteristics shown by prior work as significant determinants of acquisition returns. These control variables include the method of payment (Travlos, 1987); whether the target is a private company (Chang, 1998); deal size relative to the acquirer (Asquith, Bruner, and Mullins, 1983); whether both parties operate in the same or different industries (Morck, Shleifer, and Vishny, 1990); and acquirer's size (Moeller, Schlingemann, and Stulz, 2004), leverage (Maloney, McCormick, and Mitchell, 1993), takeover defenses (Masulis, Wang, and Xie, 2007), board size (Yermack, 1996), board independence (Byrd and Hickman, 1992), leadership structure (Masulis, Wang, and Xie, 2007), outside CEO directors, CEO age, and CEO tenure (Faleye, forthcoming). We also include industry and year fixed effects and correct standard errors for firm-level clustering. As Table 5 shows, acquisition returns are lower by 48 basis points when independent directors are intensely committed to monitoring duties. We obtain similar results in unreported regressions where we measure acquisition returns using $CAR[-1, +1]$.¹⁰

Other results in Table 5 are comparable to those in prior studies. As suggested by Travlos (1987), cash payments are positively related with acquisition returns. Similarly, returns are higher when the target is privately held, as in Chang (1998). We also find a positive effect for the fraction of outside CEO directors, as reported by

¹⁰ We also analyze post-merger abnormal operating performance using the procedures in Fee and Thomas (2004) and find that acquisitions by companies with monitoring-intensive boards are associated with lower post-merger operating performance. Specifically, mean (median) abnormal operating margin for acquirers with monitoring-intensive boards are -2.87% (-1.47%), -1.97% (-0.62%), and -1.87% (-0.51%) for the first, second, and third post-merger years, respectively. Comparable figures for acquirers with non-monitoring-intensive boards are 3.00% (1.16%), 2.32% (0.52%), and 2.02% (1.43%), respectively. All differences are significant at the 1% level.

Faleye (forthcoming). In contrast, returns are significantly lower when the CEO also serves as board chair, which is consistent with Masulis, Wang, and Xie (2007).

5.1.2. Time to deal completion

We measure time to deal completion as the natural log of one plus the number of days from deal announcement date to deal effective date, both as reported in the SDC database.¹¹ We then estimate regressions of this variable on the intense-monitoring and control variables in the first and second columns of Table 5, accounting for potential self-selection in the decision to make a bid as discussed earlier. Since it is plausible to expect significant delays in deal completion when there are competing bidders, we include the number of bidders as an additional control variable.¹² Results are presented in the third column of Table 5. As the table shows, the estimated marginal effect of intense monitoring is positive and significant at the 1% level. Thus, deals take longer to complete when independent directors are overburdened with monitoring duties.

Other results are consistent with expectations. Cash deals and acquisitions of private companies are completed more quickly, while larger deals and competed deals take longer. Similarly, time to deal completion decreases with the acquirer's size and the proportion of CEO directors on the acquirer's board but increases with the acquirer's leverage and takeover protection.

5.2. Corporate innovation

Our acquisition results suggest that the board's effectiveness in performing its advising duties is reduced when directors devote excessive time to oversight activities. We recognize, however, that acquisitions are discrete events and that many firms make no acquisition attempts. To provide broad-based evidence on these issues, this section focuses on the effect of monitoring intensity on a more fundamental corporate activity that requires significant board advising, i.e., corporate innovation.

We employ two measures of innovation. The first is R&D investment, which is commonly used as a measure of corporate investment in strategic innovation. We define R&D investment as the ratio of R&D expenditures to total assets. As conventional, we set this variable to zero when Compustat reports R&D as missing. The sample average R&D investment rate is 2.9% of total assets, with a median of zero. Atanassov (2008) argues that R&D is principally an input into the innovation process and may not necessarily represent its outcome. Therefore, we employ a second measure that is less susceptible to this limitation, namely, the quality of patents owned by the company.

Prior research (Trajtenberg, 1990; Hall, Jaffe, and Trajtenberg, 2005) shows that patent citation (rather than simple patent count) is the preferable measure of patent quality. Following these authors, we define patent quality as the average total citations in other patents of patents granted to the company during each year by the USPTO.¹³ We employ two variants of this variable. The first includes all citations while the second includes only non-self citations, that is, citations in patents received by other companies. We obtain these variables from the National Bureau of Economic Research (NBER) patent database as described in Hall, Jaffe, and Trajtenberg (2001) and updated on Bronwyn Hall's Web site. We set patent citation to zero for firm-years with zero patents. Excluding these observations, mean and median total cites per patent are 14.6 and 9.6, respectively, and 12.6 and 8.0 when self-cites are ignored. For the full sample (i.e., including firm-years with zero patents), mean and median total cites are 6.1 and 0.0. If self-cites are excluded, mean and median citations are 5.2 and 0.0, respectively.

Next, we estimate regressions of our measures of corporate innovation on the monitoring-intensity variable, controlling for other relevant variables. For example, prior research (e.g., Atanassov, 2008) shows that corporate patenting activity is significantly associated with R&D expenditures and firm size. Therefore, we control for both variables in our patent citation regressions and firm size in R&D regressions. We also control for leverage and growth opportunities because debt can affect the availability of resources for risky long-term projects as well as managerial incentive to innovate, while growth opportunities can influence the types of projects chosen by management. Finally, we control for several CEO and board attributes reported in prior studies (e.g., Faleye, 2009) as significant determinants of corporate strategic risk-taking. These include CEO tenure, ownership, equity-based compensation (ratio of the value of options and restricted stocks granted to total compensation), and service on other corporate boards (number of other corporate boards of which the CEO is a member) as well as board size (natural log of the number of directors) and classified boards (equals one when directors are elected to staggered terms, zero otherwise).

Results are presented in Table 6. Each regression is a Tobit model because true innovation activity is unobserved for firm-years with zero scores on our measures, i.e., our dependent variables are left-censored. We also include year and industry fixed effects and correct standard errors for firm-level clustering. The dependent variable in the first column is R&D investment. The monitoring-intensive board variable is negative and significant at the 1% level. Its coefficient implies that intense

¹¹ This prevents significant data loss by ensuring that the log transformation is defined for the 26% of our sample observations where the deal announcement and effective dates are the same in SDC.

¹² We do not include this variable in reported CAR regressions because it is observed at deal announcement only for subsequent bids in a contested acquisition. We find similar results to those in the second column of Table 5 in unreported regressions that include the variable as an additional control.

¹³ For each patent, total citation equals the aggregate number of citations to that patent in other patents from the year it was granted until the end of the sample, i.e., 2006. For each firm-year, average citation is the sum of total citations for all patents granted to the firm in that year divided by the number of such patents. Citations are corrected for the truncation bias stemming from the fact that older patents can garner more citations simply because of their longer lives (Hall, Jaffe, and Trajtenberg, 2001).

Table 6

Monitoring intensity and corporate innovation.

The dependent variables are the ratio of R&D expenditures to total assets, average cites per patent, and average non-self cites per patent in the first, second, and third columns, respectively. Each regression is estimated over 1998–2006. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Firm size is the natural log of total assets. R&D investment is the ratio of R&D expenditures to total assets. Leverage is the ratio of long-term debt to total assets. Investment opportunities is the ratio of capital expenditures to sales. CEO equity-based compensation is the ratio of the value of stock options and restricted stock awarded the CEO to the CEO's total compensation. CEO tenure is the number of years the CEO has served as such. CEO ownership is the percentage of the firm's shares beneficially owned by the CEO. CEO directorships is the number of other corporate boards on which the CEO serves. Board size is the natural log of the number of directors. Classified board equals one when directors are elected to staggered terms, zero otherwise. Each regression is a Tobit model with year and industry fixed effects. Numbers in parentheses are *p*-values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	<i>R&D/assets</i>	<i>All patent cites</i>	<i>Non-self patent cites</i>
Monitoring-intensive board	-0.799*** (0.002)	-1.128*** (0.000)	-1.037*** (0.000)
Externally busy board	0.806** (0.025)	1.449*** (0.000)	1.229*** (0.000)
R&D investment	-	1.035** (0.000)	0.932*** (0.000)
Firm size	-0.525*** (0.000)	3.379*** (0.000)	2.887*** (0.000)
Leverage	-0.059*** (0.000)	-0.038*** (0.000)	-0.026*** (0.000)
Investment opportunities	0.059*** (0.006)	-0.121*** (0.000)	-0.131*** (0.000)
CEO equity-based compensation	0.030*** (0.000)	0.013*** (0.002)	0.008*** (0.031)
CEO tenure	-0.006 (0.797)	-0.087*** (0.000)	-0.081*** (0.000)
CEO ownership	-0.102** (0.017)	-0.049*** (0.006)	-0.044*** (0.005)
CEO directorships	0.108 (0.499)	0.970*** (0.000)	0.809*** (0.000)
Board size	-3.029*** (0.000)	-2.239*** (0.000)	-1.677*** (0.000)
Classified board	-1.075*** (0.003)	-1.040*** (0.000)	-0.617*** (0.005)
Sample size	9,792	9,792	9,792
Pseudo <i>R</i> -squared	0.197	0.122	0.122

monitoring is associated with a reduction of 0.8 percentage points in R&D investment rate. Since the unconditional mean R&D investment rate is 2.9% of assets, this represents an economically significant 27% reduction in corporate innovation investment. The second column presents similar results for innovation quality as measured by total patent citations. Specifically, the coefficient implies that patents created by firms with boards that monitor intensely receive 1.1 fewer cites relative to those created by firms without such boards. Compared to the sample average cites of 6.1, this is an economically

significant reduction in the quality of corporate innovation. The third column reports similar effects after removing self-citations. These results suggest that intense board monitoring reduces corporate innovation and are consistent with our premise that managers become more risk averse when they perceive the board as less supportive because of intense monitoring pressures.

Other results in Table 6 are consistent with expectations and/or prior literature. R&D and firm size are each positively related with patent quality, suggesting that larger firms and those that invest more in R&D create better innovations. Similarly, managerial incentive compensation and directors' service on other boards are associated with increases in innovation quality. In contrast, corporate innovation is lower when directors are elected to staggered terms and also declines with managerial ownership, which is consistent with Faleye (2009) and Atanassov (2008).

5.3. Conclusion on advising effectiveness

This section shows that intense board monitoring is associated with lower acquisition announcement returns, lower post-merger operating performance, longer time to acquisition completion, and reduced corporate innovation. Each of these is consistent with our second hypothesis that intense monitoring reduces the effectiveness of directors in strategic advising. When directors' expertise and/or information exchange between the CEO and directors are crucial for better outcomes (e.g., acquisitions), intense monitoring reduces board effectiveness by disrupting the relationship between the two parties. Moreover, our innovation results suggest that intense monitoring increases managerial myopia, leading to less innovation and eroding the firm's competitive advantages. Next, we turn to the net impact of intense monitoring by focusing on its effect on firm value.

6. The net effect: monitoring intensity and firm value

Sections 4 and 5 demonstrate that intense monitoring is associated with better board oversight and weaker advising, respectively. Since the board's principal objective is to create value through its monitoring and advising functions, it follows that intense monitoring can have a positive, negative, or no effect on firm value, depending on the relative magnitude of the monitoring and advising effects. In this section, we focus on firm value to provide evidence on the net effect of intense monitoring on shareholders. As in several prior studies, we measure firm value using Tobin's *q*, defined as the book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets. Mean and median Tobin's *q* are 2.1 and 1.6, respectively, which are comparable to those reported in prior studies.

We recognize that, as a variant of the market/book ratio, Tobin's *q* can proxy for growth opportunities so that cross-sectional differences in Tobin's *q* simply reflect differences in firm-level growth opportunities. Therefore, we control for growth opportunities using the ratio of

capital expenditures to sales as in Yermack (1996) and Faleye (2007).¹⁴ We also control for other variables that are known to explain differences in firm value, including board size (Yermack, 1996), board composition (Rosenstein and Wyatt, 1990), directors' service on other corporate boards (Fich and Shivdasani, 2006), managerial ownership (Morck, Shleifer, and Vishny, 1988), firm size and diversification (Berger and Ofek, 1995), and operating profitability (Yermack, 1996). Finally, we include industry and year fixed effects and correct standard errors for firm-level clustering. Results are presented in Table 7.

As the first column of the table shows, the intense monitoring variable is negative and significant at the 1% level, which suggests that the negative advising effects dominate the monitoring improvements, on average. Its coefficient implies that a monitoring-intensive board is associated with a reduction of 12.1 percentage points in Tobin's q . Compared with the sample average Tobin's q of 2.1, this implies a reduction of 5.8% in the typical firm's total market value, which is economically non-trivial.

6.1. Potential endogeneity issues

A common concern in empirical research relating performance to board structure is the potential for endogeneity issues to confound the relation under study. For example, while our results suggest a causal relation running from intense monitoring to firm value, they are also consistent with an alternate explanation where poorly performing firms require more monitoring by directors. To address this concern, we estimate a regression in which the monitoring-intensive board variable is replaced by its value in 1998 (the first year of our sample). If a company was not covered by RiskMetrics in 1998, we use this variable from the firm's first appearance in the data, provided that the first appearance is not later than 2000. This allows us to examine the effect of historical monitoring intensity on subsequent performance, which should mitigate the concern about reverse causation. Bebchuk and Cohen (2005), Coles, Daniel, and Naveen (2008), and Cheng (2008) also follow this approach in similar contexts. As the second column of Table 7 shows, results of this analysis are very similar to the main results in the first column.¹⁵

¹⁴ In other tests, we examine the robustness of our results to alternative proxies for growth opportunities, including realized sales growth (Bhagat and Black, 2002), the ratio of depreciation expenses to sales (Fich and Shivdasani, 2006), and the ratio of R&D to sales (Fich and Shivdasani, 2006). We use each measure in turn, all four measures simultaneously, and a growth opportunities factor extracted from the four variables using principal component analysis. Our results remain unchanged.

¹⁵ A limitation of this approach is that it may not address reverse causation if the variable of interest is persistent over time, i.e., if the monitoring-intensity variable in 1998 is strongly correlated with its future values, then using the historical value will not rule out reverse causation. Therefore, we calculate the correlation between 1998 and contemporaneous values of the variable, which equals 0.44. This implies that less than 20% of the variation in future monitoring intensity is explained by its 1998 value. To provide some context for evaluating this, we examine correlations for two other governance variables used in prior papers in similar regressions [board size in Cheng (2008) and Coles,

Another potential endogeneity problem is that both firm value and monitoring intensity are affected by some unobservable firm characteristics. If these are time-invariant, then including firm fixed effects in the regression corrects the problem. However, since such regressions focus entirely on within-firm variation, they can yield levels of significance that are considerably lower than those produced by methods that utilize both within- and between-firm variations. Yet, when we estimate our regression with firm fixed effects, we continue to find a negative and significant relation between firm value and intense monitoring as the third column of Table 7 shows.

Prior research suggests that firm value and board structure are jointly determined (see, e.g., Demsetz and Lehn, 1985), in which case estimating reduced form equations without accounting for such simultaneity will result in biased coefficients. The usual solution is to estimate simultaneous equations in Tobin's q and the variables of interest using three-stage least squares (3SLS) (Bhagat and Black, 2002; Coles, Daniel, and Naveen, 2008). Therefore, we estimate a system of equations in Tobin's q and the monitoring-intensive board variable.¹⁶ As the fourth column of Table 7 shows, monitoring intensity is negative and significant in the firm value equation. In contrast, Tobin's q is not significant in the monitoring-intensity equation (not tabulated).

Perhaps the best solution to the problem of endogenous covariates is a controlled or natural experiment involving an exogenous change in the variable of interest. Since such experiments are very rare in empirical governance research, the literature uses quasi-natural experiments when possible. In our case, SOX presents us with such an opportunity because it is a legislative act that significantly increased the participation of independent directors on oversight committees. Therefore, we treat its passage as an exogenous event that allows us to examine the effect of intense monitoring on firm value. First, we identify firms that were not monitoring-intensive pre-SOX (i.e., the intense-monitoring variable equaled zero for each pre-SOX year, 1998–2001). There are 340 such firms, of which 211 became monitoring-intensive post-SOX (i.e., the variable equaled one for at least one post-SOX year, 2003–2006). We then estimate our firm value regression over the 340 firms for the post-SOX period, controlling for each firm's average Tobin's q during the pre-SOX years to account for potential differences in prior performance

(footnote continued)

Daniel, and Naveen (2008), and staggered boards in Bebchuk and Cohen (2005)]. The correlation between 1998 and future board sizes is 0.78 while the corresponding correlation for staggered boards is 0.95. We also examine correlations for four non-governance variables: ROA (0.63), Tobin's q (0.57), sales revenue (0.90), and total assets (0.63). These results suggest that our variable is less persistent than other governance variables used in similar tests in the literature and several non-governance variables, which increases our confidence in the tests.

¹⁶ The Tobin's q equation is similar to that in the first column of Table 7, while the monitoring-intensive board equation expresses monitoring intensity as a function of Tobin's q , R&D intensity, firm size, diversification, operating and market performance, leverage, institutional ownership, CEO-chair duality, CEO ownership, CEO external directorships, externally busy board, combined size of all monitoring committees, board size, and the percentage of independent directors.

Table 7

Monitoring intensity and firm value.

The dependent variable is Tobin's q , defined as total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. The first column presents results using contemporaneous values of the monitoring-intensive board variable. The second column uses first values of the variable provided that the firm first appeared in the sample before 2001. The third column uses firm fixed effects. The fourth column contains Tobin's q results from a systems estimation of Tobin's q and intense monitoring. The preceding regressions are estimated over 1998–2006. The fifth column is estimated for 2003–2006 over the 340 firms whose boards were not monitoring-intensive during any of the pre-SOX years. Externally busy board equals one when a majority of independent directors serve on three or more boards, zero otherwise. Board size is the natural log of the number of directors. Board independence is the percentage of directors who are unaffiliated with the firm beyond their directorship. Firm size is the natural log of the market value of equity. ROA is operating income before depreciation divided by total assets. ROA_{t-1} and ROA_{t-2} are the one- and two-year lag values of ROA. Pre-SOX Tobin's q is average Tobin's q over 1998–2001. Corporate diversification is the sum of geographical and business segments. Investment opportunities is the ratio of capital expenditures to sales. Board ownership is the proportion of outstanding shares owned by all directors. Each regression includes year and two-digit SIC code dummies except for the firm fixed effect regression, which includes firm dummies. Numbers in parentheses are p -values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Full panel	Historical	FFE	3SLS	Post-SOX
Monitoring-intensive board	−0.121*** (0.001)	−0.128** (0.011)	−0.136*** (0.000)	−0.217*** (0.000)	−0.139** (0.012)
Externally busy board	−0.177*** (0.000)	−0.183*** (0.000)	0.048 (0.376)	−0.200*** (0.000)	−0.225*** (0.004)
Board size	−1.476*** (0.000)	−1.444*** (0.000)	−0.704*** (0.000)	−1.665*** (0.000)	−0.724*** (0.000)
Board independence	−0.200 (0.130)	−0.178 (0.216)	−1.032*** (0.000)	−0.440*** (0.000)	−0.127 (0.446)
Firm size	0.463*** (0.000)	0.490*** (0.000)	0.755*** (0.000)	0.472*** (0.000)	0.173*** (0.000)
ROA	2.889*** (0.000)	2.906*** (0.000)	3.626*** (0.000)	3.814*** (0.000)	5.801*** (0.000)
ROA_{t-1}	0.979*** (0.002)	0.777** (0.034)	0.563* (0.072)	0.495 (0.182)	0.133 (0.824)
ROA_{t-2}	−0.464 (0.230)	−0.588 (0.197)	0.267 (0.513)	−0.360 (0.208)	−1.434* (0.096)
Pre-SOX Tobin's q	–	–	–	–	0.236*** (0.000)
Corporate diversification	−0.025*** (0.000)	−0.026*** (0.000)	0.014*** (0.000)	−0.025*** (0.000)	−0.011** (0.028)
Investment opportunities	0.875*** (0.001)	0.354** (0.014)	0.697*** (0.000)	0.436*** (0.005)	−0.107 (0.851)
Board ownership	0.333** (0.011)	0.870*** (0.003)	0.528** (0.047)	3.291*** (0.000)	0.511** (0.044)
Sample size	10,636	9,222	10,636	10,636	1,174
Adjusted R -squared	0.384	0.390	0.670	na	0.599

between firms that became monitoring-intensive post-SOX and those that did not. Results are presented in the fifth column of Table 7. Consistent with our earlier results, the monitoring-intensity variable is negative and statistically significant.

Overall, while it is impossible to completely rule out endogeneity issues in the absence of controlled experiments, these results indicate that our basic findings are not mere artifacts of some confounding underlying issues. Rather, they suggest that the negative advising effects of intense monitoring outweigh its positive monitoring effects, resulting in a net reduction in firm value.

6.2. Channels for value loss

Our firm value results raise the important issue of the channels through which intense monitoring impairs firm value. Specifically, since we show that intense monitoring is associated with better oversight of management, some readers can question why and how such activities are simultaneously harmful to firm value. Earlier, we offered explanations that focus on directors' time constraints and

the effects of intense monitoring on board dynamics, information exchange between the CEO and directors, and the CEO's preference for risk aversion. The evidence on acquisition performance and corporate innovation are consistent with these explanations. Here, we examine this further by conducting tests to evaluate the significance of acquisitions and innovation as channels through which intense monitoring harms firm value. The rationale is straightforward: If our explanations are correct, then the value loss from intense monitoring should be contingent on the significance of acquisition and/or corporate innovation to value creation, i.e., intense monitoring should impose greater competitive disadvantages and value losses on firms operating in industries where acquisitions or corporate innovation are significant value drivers.

To test these conjectures, we create industry-level indexes that measure the relative importance of acquisitions and corporate innovation in value creation. For each two-digit Standard Industrial Classification (SIC) code industry, we define the acquisition activity score for each year as the ratio of the average number of deals per firm in the industry over the preceding three years to the ratio of

the average number of deals per Compustat firm during the same period. If the score is greater than the sample median, we classify the industry as high acquisition activity for that year. Otherwise, the industry is classified as low acquisition activity. For robustness purposes, we create an additional acquisition activity variable based on deal value per dollar of industry asset. We presume that acquisitions are more important for value creation in high acquisition activity industries. We also create an analogous innovation activity variable based on the number of non-self citations of patents granted to firms in each industry and presume that high innovation activity industries are more dependent on corporate innovation in creating value.

Next, we estimate regressions similar to those in Table 7 for high and low acquisition activity industries and high and low innovation industries. Results are presented in Table 8. The first two columns show that the value loss from intense monitoring is concentrated among firms operating in industries experiencing high acquisition activity as measured by the number of deals. Specifically, intense monitoring is associated with a reduction of 18.9 percentage points in Tobin's q in high acquisition industries, compared with no losses in low acquisition industries. We obtain comparable results in unreported regressions where acquisition activity is based on deal value. Similarly, the last two columns of the table show that intense monitoring is associated with significant reduction in firm value only among firms in industries where corporate innovation activity is high.

These results suggest that the deleterious effect of intense monitoring on firm value is attributable at least in part to its impact on acquisition returns and innovation activity. As Table 5 shows, intense monitoring reduces the gains from acquisitions. Thus, when an industry experiences high acquisition activity, member firms with monitoring-intensive boards suffer significant value losses. A similar interpretation holds for the innovation activity results. Furthermore, it is plausible that innovation is more germane to value creation than acquisition, which would predict greater value loss in high innovation industries compared with high acquisition industries. As Table 8 shows, this is indeed the case: Intense monitoring reduces Tobin's q by 25.3 percentage points in high innovation industries, which is 34% worse than the 18.9 percentage point reduction in high acquisition industries.

6.3. Advising needs and the effects of monitoring intensity

Our results thus far point to an inverse relation between value creation and the intensity of board monitoring, thus suggesting that the costs of weak advising outweigh the benefits of improved board oversight. In this section, we pursue this further by examining how the firm's need for advising affects this relation. Specifically, we test whether value losses increase with the need for board advising, which would be the case if the negative overall effects are attributable to weaker strategic advising.

Coles, Daniel, and Naveen (2008) argue that the need for advising increases with operating complexity. Therefore, we use a firm's operating complexity as a proxy for its advising need. We recognize that complexity can be

Table 8

Acquisitions and innovation as channels for value loss.

The dependent variable is Tobin's q , i.e., total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. M&A activity is a measure of acquisition activity in an industry over the preceding three years relative to same-period acquisition activity in the sample. High activity means acquisition activity is higher than the sample median. Innovation activity is a measure of patenting activity in an industry over the preceding three years relative to patenting activity in the sample. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board size is the natural log of the number of directors. Board independence is the percentage of directors who are unaffiliated with the firm beyond their directorship. Firm size is the natural log of the market value of equity. ROA is operating income before depreciation divided by total assets. ROA_{t-1} and ROA_{t-2} are the one- and two-year lag values of ROA. Investment opportunities is the ratio of capital expenditures to sales. Board ownership is the proportion of outstanding shares owned by all directors. Each regression includes year and two-digit SIC code dummies and is estimated over 1998–2006. Numbers in parentheses are p -values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	M&A activity		Innovation activity	
	High	Low	High	Low
Monitoring-intensive board	-0.189*** (0.000)	-0.054 (0.325)	-0.253*** (0.000)	0.017 (0.651)
Externally busy board	-0.159*** (0.007)	-0.200*** (0.003)	-0.206*** (0.005)	-0.100** (0.027)
Board size	-1.442*** (0.000)	-1.427*** (0.000)	-1.929*** (0.000)	-0.744*** (0.000)
Board independence	-0.223 (0.168)	-0.195 (0.306)	-0.169 (0.441)	-0.119 (0.382)
Firm size	0.406*** (0.000)	0.504*** (0.000)	0.566*** (0.000)	0.282*** (0.000)
ROA	2.671*** (0.000)	3.042*** (0.000)	2.847*** (0.000)	3.578*** (0.000)
ROA_{t-1}	1.185*** (0.003)	0.809 (0.134)	0.744* (0.099)	0.847*** (0.000)
ROA_{t-2}	0.133 (0.741)	-1.076 (0.102)	-0.722 (0.147)	0.764** (0.039)
Corporate diversification	-0.017*** (0.000)	-0.033*** (0.000)	-0.035*** (0.001)	-0.100*** (0.002)
Investment opportunities	0.313 (0.203)	1.855*** (0.000)	1.732*** (0.002)	0.135 (0.362)
Board ownership	0.581*** (0.001)	0.096 (0.617)	0.433* (0.070)	0.392*** (0.004)
Sample size	5,332	5,254	5,346	5,241
Adjusted R-squared	0.382	0.395	0.373	0.447

measured along many dimensions and that a firm can be complex along some but not others. To account for this, we employ principal component analysis to extract a complexity factor from three common measures of operating complexity. The first is the number of business and geographic segments in which the firm operates. Firms operating in multiple industries face multidimensional operating challenges and competition. Furthermore, firms operating in multiple geographic segments confront

Table 9

Advising needs and the effects of monitoring intensity.

The dependent variables are Tobin's q , R&D normalized by total assets, patent citations, and $CAR[-3, +3]$ for Panels A, B, C, and D, respectively. High advice firms score at or above the third quartile on an operating complexity factor while low advice firms score at or below the first quartile. Monitoring-intensive board equals one when a majority of independent directors serve on at least two of the three principal board committees, zero otherwise. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board size is the natural log of the number of directors. Firm size is the natural log of the market value of equity. Percent 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 prior to the deal. In addition to these variables, the regressions in Panels A, B, C, and D include all the other control variables in Tables 7, 6 ($R\&D/assets$), 6 ($All\ patent\ cites$), and 5, respectively. These variables are not tabulated to conserve space. Each regression is estimated over 1998–2006. Numbers in parentheses are p -values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	A: Firm value		B: R&D investments		C: Patent quality		D: Acquisition return	
	High advice	Low advice	High advice	Low advice	High advice	Low advice	High advice	Low advice
Monitoring-intensive board	-0.269*** (0.006)	-0.013 (0.722)	-0.631* (0.071)	0.092 (0.189)	-1.036*** (0.001)	-0.677 (0.228)	-0.010*** (0.000)	-0.007*** (0.000)
Externally busy board	-0.159 (0.145)	-0.154*** (0.000)	0.447 (0.303)	-0.045 (0.456)	0.571** (0.036)	6.266*** (0.000)	0.003 (0.500)	0.001 (0.937)
Board size	-2.049*** (0.000)	-0.603*** (0.000)	-1.755* (0.059)	-0.386*** (0.000)	-1.930*** (0.000)	5.762*** (0.000)	0.005 (0.704)	0.008 (0.700)
Firm size	0.613*** (0.000)	0.232*** (0.000)	-1.216*** (0.000)	0.185*** (0.000)	2.893*** (0.000)	4.874*** (0.000)	-0.003 (0.206)	-0.002 (0.616)
Percent cash	-	-	-	-	-	-	0.022*** (0.000)	0.024** (0.043)
Relative size	-	-	-	-	-	-	-0.080*** (0.000)	-0.014 (0.205)
Sample size	2,652	2,676	2,425	2,389	2,425	2,389	2,383	2,456
Adjusted R ²	0.421	0.503	0.096	0.411	0.064	0.163	n/a	n/a
Acquisition firm-years	n/a	n/a	n/a	n/a	n/a	n/a	794	316

additional challenges including understanding the cultural, legal, and political environments of their diverse operating locations. Our second measure is R&D intensity, which we define as the ratio of R&D expenditures to total assets. This is widely used in the literature as a proxy for operating complexity (e.g., Coles, Daniel, and Naveen, 2008; Faleye, 2009). Finally, we include a measure of asset intangibility, defined as one minus the ratio of net property, plant, and equipment to total assets. The factor loadings are 0.26 on the number of business and geographic segments, 0.69 on R&D intensity, and 0.68 on asset intangibility. Thus, the factor assigns higher complexity to diversified R&D intensive firms with few tangible assets. We classify firms with factor scores at or above the third quartile as high advice firms and those with scores at or below the first quartile as low advice.¹⁷ We then estimate acquisition performance, innovation, and firm value regressions for these two categories of firms.

Table 9 presents results of this analysis. Each regression includes all the corresponding control variables in Tables 5–7 although coefficients for these variables are not reported for brevity. Panel A presents results of separate firm value regressions for high and low advice firms. As the table shows, the intense-monitoring variable is negative in both regressions but significant only in the one for high advice firms. Thus, advising requirements exacerbate the value loss from intense board monitoring. In particular, the coefficients imply that a high advice firm

with a monitoring-intensive board suffers a reduction of 26.9 percentage points in Tobin's q relative to a high advice firm with a board that monitors less intensely. Compared to average Tobin's q for these firms, this translates into a reduction of 9.5% in firm value. In contrast, a low advice firm with a monitoring intense board suffers no significant value reduction relative to a low advice firm without such a board.

Panels B and C of Table 9 present similar results for corporate innovation, showing that intense monitoring is associated with significant reductions in strategic innovation only among high advice firms. Specifically, the monitoring-intensity variable is negative and significant in patent quality and R&D regressions for high advice firms as shown in the first and third columns, respectively, but insignificant in analogous regressions for low advice firms in the second and fourth columns.

We also conduct similar analysis for acquisition performance and obtain similar results. Coefficients from Panel D of Table 9 show that monitoring-intensive boards are associated with lower acquisition returns among high and low advice firms. Yet the effect is stronger among high advice firms. Specifically, a monitoring-intensive board reduces acquisition returns by 99 basis points among high advice firms, compared with a reduction of 72 basis points among low advice firms.

These results support our third hypothesis that over-committing independent directors to monitoring duties when the need for advising is great significantly reduces directors' effectiveness and firm value. This is interesting in itself, but it also provides additional evidence that our main results are not due to some spurious underlying

¹⁷ Our results also hold when we split the sample based on median complexity factor scores.

factors. If it were so, we should find no differential effects among different categories of firms, in this instance, high versus low advice firms.

6.4. Monitoring needs, intense monitoring, and firm value

Thus far, our firm value results suggest that the benefits of intense monitoring are eclipsed by its negative effects on board advising, both on average and especially when advising requirements are high. Yet this does not rule out the possibility that intense monitoring can have a positive effect on firm value, e.g., among companies with greater monitoring needs. We focus on firms with significant agency problems and low external monitoring to test this hypothesis. We measure the severity of potential agency problems using free cash flow and the extent of external monitoring using analyst coverage and institutional ownership. We use principal component analysis to create an index of monitoring needs based on these variables, with loadings of 0.60 (free cash flow), -0.49 (number of analysts covering the firm), and -0.64 (institutional ownership). Thus, the factor assigns higher scores to companies with high free cash flow, low analyst coverage, and low institutional ownership. We classify firms with factor scores at or above the third quartile as high-monitoring-needs firms and those with scores at or below the first quartile as low-monitoring-needs firms.

We then estimate separate firm value regressions for the two categories. We find that intense monitoring has a negative effect in each case, although it is only significant in the regression for firms with low monitoring needs. We also estimate regressions for firms at the intersection of high/low monitoring/advising requirements. In this case, intense monitoring is positive but insignificant in the regression for firms with high monitoring and low advising needs. In contrast, intense monitoring is negative and significant in the regression for firms with low monitoring and high advising requirements. Overall, it appears that the need for board monitoring only weakly influences the effect of intense monitoring on firm value. In contrast and as reported earlier, advising requirements play a significant role in whether firm value suffers when the board monitors intensely.

7. Other robustness checks and additional analyses

We noted in Section 3.1 that our monitoring-intensity variable may be affected by the absence of nominating committees in many of our sample firms prior to 2002. To address this concern, we restrict the sample to observations where all three committees are present, which reduces our sample by 25%. We then repeat our tests using this restricted sample. Results remain unchanged from those reported earlier.¹⁸ As an additional robustness check, we impose a further restriction by requiring sample firms to have established the nominating committee before 2002. This ensures that each firm has a

nominating committee before the committee became widespread but reduces our sample even further, by 37% relative to the original sample. Nevertheless, we find results that are similar to those previously reported when we repeat our tests using this sample. Overall, we conclude that the surge in nominating committee adoption does not affect our results or the conclusions from our tests.

Perhaps more importantly, the increased adoption of the nominating committee provides us with the opportunity to test our hypotheses from another perspective.¹⁹ As shown in Table 1, approximately 60% of our sample has a nominating committee prior to 2002. By 2004, 97% have one. This change coincides with the adoption of listing requirements by the major stock exchanges that mandated the establishment of a nominating committee and broadened its oversight responsibilities.²⁰ Thus, for firms without a nominating committee prior to 2002, establishing one during 2002–2004 amounts to an exogenous increase in board monitoring that potentially detracts directors from strategic advising. The implication is clear: If our hypotheses are correct, boards that did not add new members when they established the nominating committee during this period should have less time for advising after the change and thus suffer value losses.

We test this by first identifying firms that did not have a nominating committee prior to 2002 but established one by 2004. There are 312 such firms. We then estimate our firm value regressions for these firms over 2004–2006, controlling for average performance during the pre-2002 period. Our primary variable of interest is a dummy variable that equals one when the board added no new director (on a net basis) during this period relative to average board size prior to 2002, zero otherwise. As a robustness check, we also utilize a continuous variable that equals the change in board size from the pre-2002 average to each year during 2004–2006. We present results in Table 10.

As shown in column 1, the indicator variable is negative and statistically significant at the 5% level. Its coefficient suggests that firms that added no new directors after establishing the nominating committee suffer a 14.9 percentage point loss in firm value. Column 2 shows similar results when we replace the indicator variable with the change in board size. Thus, firm value suffers when the board's monitoring duties increase without a corresponding increase in the number of directors to maintain or enhance the board's advising capacity.

Nevertheless, it is possible that some boards added new members to fulfill SOX requirements for directors with financial expertise rather than to maintain the board's advising functions, which would confound our tests. Therefore, we construct new variables that exclude newly appointed directors with financial expertise, i.e., those with direct accounting experience as in Hoitash,

¹⁹ We thank Laura Field (the referee) for suggesting these tests.

²⁰ NYSE and Nasdaq submitted their governance reform proposals to the Securities and Exchange Commission (SEC) in August 2002 and October 2002, respectively. The proposals were approved in November 2003.

¹⁸ We do not tabulate these results due to space considerations but they are available upon request.

Table 10

Increased monitoring and firm value.

The dependent variable is Tobin's q , i.e., total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. Each regression is estimated for 2004–2006 over the 312 firms that did not have a nominating committee before 2002 but established one by 2004. No net addition equals one when the board added no new director (on a net basis) after establishing the nominating committee, zero otherwise. No net addition excluding financial experts equals one when the board added no new non-financial-expert director (on a net basis) after establishing the nominating committee, zero otherwise. Δ Board size is number of directors before the nominating committee was established less number of directors after. Δ Board size excluding financial experts is number of directors before the nominating committee was established minus number of directors after the committee was established net of new financial-expert directors. These variables are measured relative to the average board size over 1998–2001. New financial experts is the number of new directors with direct accounting experience. Externally busy board equals one when a majority of independent directors serve on three or more corporate boards, zero otherwise. Board size is the natural log of the number of directors. Board independence is the percentage of directors who are unaffiliated with the firm beyond their directorship. Firm size is the natural log of the market value of equity. ROA is operating income before depreciation divided by total assets. ROA_{t-1} and ROA_{t-2} are the one- and two-year lag values of ROA. Historical Tobin's q is average Tobin's q over 1998–2001. Corporate diversification is the sum of reported geographical and business segments. Investment opportunities is the ratio of capital expenditures to sales. Board ownership is the proportion of outstanding shares owned by all directors. Each regression includes year and two-digit SIC code dummies. Numbers in parentheses are p -values based on robust standard errors clustered at the firm level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Dependent variable: Firm value (Tobin's q)					
	(1)	(2)	(3)	(4)	(5)	(6)
No net addition	-0.149** (0.046)	-	-	-	-0.153** (0.045)	-
Δ Board size	-	-0.073*** (0.003)	-	-	-	-0.071*** (0.006)
No net addition excluding financial experts	-	-	-0.155** (0.032)	-	-	-
Δ Board size excluding financial experts	-	-	-	-0.062*** (0.008)	-	-
New financial experts	-	-	-	-	0.010 (0.818)	0.006 (0.880)
Externally busy board	0.011 (0.917)	0.021 (0.839)	0.014 (0.895)	0.023 (0.825)	0.014 (0.890)	0.022 (0.830)
Board size	-0.759*** (0.000)	-0.877*** (0.000)	-0.771*** (0.000)	-0.832*** (0.000)	-0.780*** (0.000)	-0.878*** (0.000)
Board independence	0.314 (0.241)	0.311 (0.241)	0.309 (0.261)	0.315 (0.251)	0.294 (0.288)	0.294 (0.284)
Firm size	0.220*** (0.000)	0.221*** (0.000)	0.222*** (0.000)	0.224*** (0.000)	0.222*** (0.000)	0.222*** (0.000)
ROA	5.127*** (0.000)	5.184*** (0.000)	5.141*** (0.000)	5.194*** (0.000)	5.159*** (0.000)	5.220*** (0.000)
ROA_{t-1}	1.839*** (0.001)	1.778*** (0.002)	1.928*** (0.001)	1.852*** (0.002)	1.930*** (0.001)	1.828*** (0.002)
ROA_{t-2}	-1.325* (0.064)	-1.303* (0.065)	-1.419* (0.051)	-1.405* (0.052)	-1.432** (0.047)	-1.382* (0.054)
Historical Tobin's q	0.213*** (0.000)	0.209*** (0.000)	0.216*** (0.000)	0.212*** (0.000)	0.216*** (0.000)	0.212*** (0.000)
Corporate diversification	-0.005 (0.600)	-0.005 (0.556)	-0.005 (0.574)	-0.006 (0.527)	-0.005 (0.591)	-0.006 (0.540)
Investment opportunities	-1.032 (0.101)	-0.962 (0.103)	-1.034 (0.109)	-0.943 (0.119)	-1.016 (0.115)	-0.957 (0.114)
Insider ownership	0.408 (0.210)	0.390 (0.228)	0.412 (0.217)	0.402 (0.227)	0.434 (0.193)	0.419 (0.206)
Sample size	792	792	747	747	747	747
Adjusted R-squared	0.653	0.658	0.655	0.658	0.654	0.659

Hoitash, and Bedard (2009). Mean and median number of these directors are 0.2 and 0.0, respectively, and 18% of the sample appointed at least one such director.

As columns 3 and 4 of Table 10 show, our results remain unchanged. Results also remain unchanged in columns 5 and 6, where we include the number of new directors with financial expertise as an additional control variable. In unreported regressions, we also define analogous board change variables where the change is measured relative to the 2001 board rather than relative to the 1998–2001 average. Still, we obtain results that are quite similar to those in Table 10.

Next, we test whether complex firms are more likely to add new directors after establishing the nominating committee since these firms have greater advising needs.²¹ Consistent with this, we find that 58% of high advice firms add at least one new director, compared with 49% of low advice firms. On average, high advice firms add

²¹ For these tests, we define high advice firms based on median scores on the complexity factor because of the small sample size. Results are in the same direction but with less statistical significance when we use third and first quartile factor scores to define high and low advice firms, respectively.

0.5 net new directors, with a median of 0.7. In contrast, low advice firms add 0.2 net new directors on average, with a median of 0.0. All differences are significant at the 5% level. We also perform additional tests to examine if the value loss from failing to appoint new directors after establishing the nominating committee is greater for high advice firms. We find mildly consistent evidence. Specifically, the coefficient of the indicator variable that equals one when the board added no new directors is -0.093 in the regression for low advice firms, compared with -0.130 in the regression for high advice firms, which suggests that high advice firms suffer a greater value loss. However, perhaps because of a lack of power due to the small sample sizes, the coefficients are not statistically significant at conventional levels.

These results corroborate and extend our earlier findings. When the board's monitoring duties increase, companies in need of greater advising are more likely to appoint additional directors, which suggests that boards are cognizant of the tradeoff between their monitoring and advising responsibilities. Still, the fact that we find significant results in our firm value regressions suggests that firms are constrained from speedily and fully adjusting their board structures as circumstances evolve. Thus, increased board oversight is not always desirable, especially when the firm is unable or unwilling to enlarge its board. Rather, the desire for more intense monitoring must be balanced against the need for directors to advise management and the benefits of a supportive board that reduces managerial myopia and risk aversion.

8. Summary and conclusion

This paper studies the impact of the intensity of board monitoring on the effectiveness of directors in performing their monitoring and advising duties. The push for greater independent director involvement in corporate governance has meant that many of these directors serve on several committees devoted to oversight duties. We argue that this creates a conflict between directors' responsibility to monitor management and their duty to provide top-level strategic counsel. While committing independent directors to oversight duties can improve monitoring quality, the economics and sociology of board service suggest a concomitant deterioration in advising quality and possibly overall board effectiveness.

We study these issues using the sample of S&P 1500 firms over 1998–2006. Focusing on CEO turnover, executive compensation, and earnings management, we show that monitoring quality improves when a majority of independent directors are predominantly assigned to oversight duties. Next, we examine the advising impact of this phenomenon, finding worse acquisition performance and reduced innovation. We also find a negative effect on firm value and that the reduction in value is greater for firms in industries where acquisitions or corporate innovation are significant value drivers or when the firm's operations are complex.

These results highlight the importance of the tradeoffs a board faces as it seeks to optimally distribute its workload among directors. Two recent developments make our

findings particularly relevant. The first is the requirement that the principal monitoring committees be entirely staffed with independent directors, while the second is the trend toward smaller board sizes (Spencer Stuart, 2008). As our results demonstrate, the confluence of these two forces has significant ramifications for board effectiveness. We hope that our results will promote public policy that encourages firms to allocate board responsibilities in such a manner as to not over-focus independent directors on only one dimension of their duties.

References

- Adams, R.B., Ferreira, D., 2007. A theory of friendly boards. *Journal of Finance* 62, 217–250.
- Adams, R.B., 2009. Asking directors about their dual roles. Unpublished Working Paper, University of Queensland.
- Asquith, P., Bruner, R., Mullins, D., 1983. The gains to bidding firms from merger. *Journal of Financial Economics* 11, 121–139.
- Atanassov, J., 2008. Quiet life or managerial myopia: Is the threat of hostile takeovers beneficial for technological innovation? Unpublished Working Paper, University of Oregon.
- Bebchuk, L.A., Cohen, A., 2005. The costs of entrenched boards. *Journal of Financial Economics* 78, 409–433.
- Bebchuk, L.A., Fried, J., 2004. *Pay without Performance: The Unfulfilled Promise of Executive Compensation*. Harvard University Press, Cambridge, MA.
- Berger, P.G., Ofek, E., 1995. Diversification's effect on firm value. *Journal of Financial Economics* 37, 39–65.
- Bhagat, S., Black, B., 2002. The non-correlation between board independence and long term firm performance. *Journal of Corporation Law* 27, 231–274.
- Boone, A.L., Field, L.C., Karpoff, J.M., Raheja, C.G., 2007. The determinants of corporate board size and composition: an empirical analysis. *Journal of Financial Economics* 85, 66–101.
- Borokhovich, K.A., Parrino, R., Trapani, R., 1996. Outside directors and CEO selection. *Journal of Financial and Quantitative Analysis* 31, 337–355.
- Brickley, J., James, C., 1987. The takeover market, corporate board composition, and ownership structure: the case of banking. *Journal of Law & Economics* 30, 161–181.
- Business Roundtable, 1990. Corporate governance and American competitiveness: a statement of the Business Roundtable. *Business Lawyer* 46, 241–252.
- Byrd, J.W., Hickman, K.A., 1992. Do outside directors monitor managers? Evidence from tender offer bids. *Journal of Financial Economics* 32, 195–221.
- Chang, S., 1998. Takeovers of privately held targets, methods of payment, and bidder returns. *Journal of Finance* 53, 773–784.
- Cheng, S., 2008. Board size and the variability of corporate performance. *Journal of Financial Economics* 87, 157–176.
- Coles, J., Daniel, N., Naveen, L., 2008. Boards: does one size fit all? *Journal of Financial Economics* 87, 329–356.
- Colquitt, J.A., Conlon, D.E., Wesson, M.J., Porter, C.O., Ng, K.Y., 2001. Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology* 86, 425–445.
- Core, J.E., Holthausen, R.W., Larcker, D.F., 1999. Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51, 371–406.
- Coughlan, A.T., Schmidt, R.M., 1985. Executive compensation, management turnover, and firm performance: an empirical investigation. *Journal of Accounting and Economics* 7, 43–66.
- Dechow, P.M., Sloan, R., Sweeney, A., 1995. Detecting earnings management. *The Accounting Review* 70, 193–225.
- DeFond, M.L., Jiambalvo, J., 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17, 145–176.
- Demsetz, H., Lehn, K., 1985. The structure of corporate ownership: causes and consequences. *Journal of Political Economy* 93, 1155–1177.
- Denis, D.J., Denis, D.K., Sarin, A., 1997. Ownership structure and top executive turnover. *Journal of Financial Economics* 45, 193–221.
- Faleye, O., 2007. Classified boards, firm value, and managerial entrenchment. *Journal of Financial Economics* 83, 501–529.

- Faleye, O., 2009. Classified boards, stability, and strategic risk taking. *Financial Analysts Journal* 65, 54–65.
- Faleye, O. CEO directors, executive incentives, and corporate strategic initiatives. *Journal of Financial Research*, forthcoming, doi:10.1111/j.1475-6803.2011.01290.x.
- Fee, C.E., Thomas, S., 2004. Sources of gains in horizontal mergers: evidence from customer, supplier, and rival firms. *Journal of Financial Economics* 74, 423–460.
- Ferris, S.P., Jagannathan, M., Pritchard, A.C., 2003. Too busy to mind the business? Monitoring by directors with multiple board appointments. *Journal of Finance* 58, 1087–1111.
- Fich, E.M., Shivdasani, A., 2006. Are busy boards effective monitors. *Journal of Finance* 61, 689–724.
- Gompers, P., Ishii, J., Metrick, A., 2003. Corporate governance and equity prices. *Quarterly Journal of Economics* 118, 107–155.
- Goyal, V.K., Park, C.W., 2002. Board leadership structure and CEO turnover. *Journal of Corporate Finance* 8, 49–66.
- Hall, B., Jaffe, A., Trajtenberg, M., 2001. The NBER patent citations data file: lessons, insights and methodological tools. NBER Working Paper 8498.
- Hall, B., Jaffe, A., Trajtenberg, M., 2005. Market value and patent citations. *RAND Journal of Economics* 32, 101–128.
- Hallock, K.F., 1997. Reciprocally interlocking boards of directors and executive compensation. *Journal of Financial and Quantitative Analysis* 32, 331–344.
- Harford, J., 1999. Corporate cash reserves and acquisitions. *Journal of Finance* 54, 1969–1997.
- Heidrick & Struggles, 2007. 10th Annual Corporate Board Effectiveness Study. Heidrick & Struggles and USC/Center for Effective Organizations, Los Angeles, California.
- Hermalin, B.E., 2005. Trends in corporate governance. *Journal of Finance* 60, 2351–2384.
- Hoitash, U., Hoitash, R., Bedard, J.C., 2009. Corporate governance and internal control over financial reporting: a comparison of regulatory regimes. *The Accounting Review* 84, 839–867.
- Holmstrom, B., 2005. Pay without performance and the managerial power hypothesis: a comment. *Journal of Corporation Law* 30, 703–713.
- Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* 48, 831–880.
- Jensen, M.C., Murphy, K.J., 1990. Performance pay and top-management incentives. *Journal of Political Economy* 98, 225–264.
- Jones, J., 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29, 193–228.
- Klausner, M., Black, B., Cheffins, B., 2005. Outside directors' liability: have WorldCom and Enron changed the rules? *Stanford Lawyer* 71, 36–39.
- Klein, A., 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33, 375–400.
- Kothari, S.P., Leone, A.J., Wasley, C.E., 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39, 163–197.
- Li, K., Prabhala, N.R., 2007. Self-selection models in corporate finance. In: Eckbo, B.E. (Ed.), *Handbook of Corporate Finance*, vol. 1: Empirical Corporate Finance. North-Holland, Amsterdam, pp. 37–86.
- Larcker, D.F., Richardson, S.A., Tuna, I., 2007. Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review* 82, 963–1008.
- Lambert, R., Larcker, D., Weigelt, K., 1993. The structure of organizational incentives. *Administrative Science Quarterly* 38, 438–461.
- Leventhal, G.S., 1976. Fairness in social relationships. In: Thibaut, J.W., Spence, J.T., Carson, R.C. (Eds.), *Contemporary Topics in Social Psychology*. General Learning Press, Morristown, NJ.
- Linck, J., Netter, J., Yang, T., 2008. The determinants of board structure. *Journal of Financial Economics* 87, 308–328.
- Maloney, M.T., McCormick, R.E., Mitchell, M.L., 1993. Managerial decision making and capital structure. *Journal of Business* 66, 189–217.
- Masulis, R., Wang, C., Xie, F., 2007. Corporate governance and acquirer returns. *Journal of Finance* 62, 1851–1889.
- McNichols, M.F., 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy* 19, 313–345.
- Moeller, S.M., Schlingemann, F., Stulz, R., 2004. Firm size and the gains from acquisitions. *Journal of Financial Economics* 73, 201–228.
- Morck, R., Shleifer, A., Vishny, R., 1988. Management ownership and market valuation: an empirical analysis. *Journal of Financial Economics* 20, 293–315.
- Morck, R., Shleifer, A., Vishny, R., 1990. Do managerial objectives drive bad acquisitions? *Journal of Finance* 45, 31–48.
- Norton, E.C., Wang, H., Ai, C., 2004. Computing interaction effects and standard errors in logit and probit models. *The Stata Journal* 4, 154–167.
- Rosen, S., 1982. Authority, control and the distribution of earnings. *Bell Journal of Economics* 13, 311–323.
- Rosenstein, S., Wyatt, J., 1990. Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics* 26, 175–192.
- Song, F., Thakor, A., 2006. Information control, career concerns, and corporate governance. *Journal of Finance* 61, 1845–1896.
- Spencer Stuart, 2008. Spencer Stuart Board Index. Available on the internet at <http://content.spencerstuart.com/sswebsite/pdf/lib/SSBI_08.pdf>.
- Trajtenberg, M., 1990. A penny for your quotes: patent citations and the value of information. *RAND Journal of Economics* 21, 325–342.
- Travlos, N., 1987. Corporate takeover bids, method of payment, and bidding firm's stock returns. *Journal of Finance* 52, 943–963.
- Vafeas, N., 2005. Audit committees, boards, and the quality of reported earnings. *Contemporary Accounting Research* 22, 1093–1122.
- Weisbach, M.S., 1988. Outside directors and CEO turnover. *Journal of Financial Economics* 20, 431–460.
- Xie, B., Davidson III, W.N., DaDalt, P.J., 2003. Earnings management and corporate governance: the roles of the board and the audit committee. *Journal of Corporate Finance* 9, 295–316.
- Yermack, D., 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40, 185–213.