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ORIGINAL ARTICLE

Director attention and firm value

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Abstract

In this article, we show that exogenous director distraction affects board monitoring intensity and leads to a higher level of inactivity by management. We construct a firm-level director "distraction" measure by exploiting shocks to unrelated industries in which directors have additional directorships. Directors attend significantly fewer board meetings when they are distracted. Firms with distracted board members tend to be inactive and experience a significant decline in firm value. Overall, this article highlights the impact of limited director attention on the effectiveness of corporate governance and the importance of directors in keeping management active.

1 | INTRODUCTION

A board of directors has the critical task of actively monitoring and advising top management to ensure that managers act in the best interest of shareholders. However, a directorship is rarely a full-time job. Most directors have other occupations besides their directorships, and many directors serve on multiple boards. Given that attention is not unlimited for directors, we ask whether directors can perform their job effectively when their other occupations require more of their attention. Consequently, we examine how a firm performs when its directors are distracted.

Understanding the effect of director attention is important to evaluate the role and importance of corporate boards in corporate governance. In this article, we empirically study the impact of limited director attention on firm value by exploiting exogenous variation in board monitoring intensity from time variation in how directors allocate attention across their multiple directorships. We find strong evidence that distracted directors spend less time and energy monitoring and advising managers, which gives managers the freedom to shirk at the expense of shareholders, leading to significant declines in firm value.

We rely on a sample of RiskMetrics firms with at least one outside director with multiple directorships in the Directors database. These directors need to distribute attention among their directorships, which provides a useful setting to study the effect of director attention. As we cannot observe exactly how much time or energy directors spend on each of their directorships, our identification strategy is designed to exploit plausibly exogenous variation in how directors allocate attention across their directorships. The following simple thought experiment illustrates our approach. Consider two otherwise identical companies in a given industry and quarter. Director A sits on the board of Company 1 and on the board of firm "Car" in a totally different industry, namely, the automotive industry. Director B sits on the board of Company 2 and on another firm that is not in the automotive industry. Suppose now that there is an attention-grabbing event in the automotive industry. Assuming limited attention, Director A may shift attention toward firm Car and away from Company 1. The manager at Company 1 consequently receives less monitoring and advice. In contrast, Company 2 is not affected because its director is not related to the automotive industry. Thus, we can identify the impact of variation in director attention on firm value by studying the changes in the value of Company 1 relative to that of Company 2 around the time Director A is distracted. We assign each firm to 1 of the 49 Fama–French industries (provided in Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html) and use unusually high volatility as the main empirical proxy for attention-grabbing events. This identification approach is similar to that of Kempf, Manconi, and Spalt (2017), who study how investor attention matters for corporate actions. We confirm that our results are robust to alternative industry classifications and various definitions of industry shocks.

To obtain insights into whether our measure of director distraction captures director attention, we start by examining board meeting attendance. We show that directors identified by our measure as distracted attend fewer board meetings. We next employ our measure of director distraction to study how director attention affects firm value. By examining Tobin's Q and stock performance, we find that firm value drops significantly when board members are distracted. A deviation from no distraction to the average distraction level is associated with a 3.3% discount in quarterly Tobin's Q, and a stock market underperformance of about 72 basis points per quarter. This effect is particularly strong when the distracted directors sit on an important committee of the board.

Because our tests either include industry × quarter fixed effects or explicitly control for industry-specific shocks, our results are not likely driven by spillovers among industries or by any variable that does not vary across firms within a given industry and quarter, such as the state of the business cycle. Firm-level, time-invariant, unobservable factors cannot drive our findings as we also include firm fixed effects. Even with these fixed effects, a remaining concern relates to the endogeneous nature of director appointments. For instance, Company 1 chooses Director A, who also holds a directorship in the automotive industry, because the business of Company 1 is related to the automotive industry, whereas this is not the case for Company 2. Thus, shocks in the automotive industry spill over to Company 1 but not to Company 2. To alleviate this concern, we provide three pieces of evidence.

First, we argue that the direction of the spillover effect is mostly consistent with the direction of the industry shock. If the automotive industry experiences a positive shock, the effect spilled over to Company 1 is likely also positive and vice versa for negative shocks. We therefore examine distraction from positive and negative industry shocks separately. We show that director distraction from both positive and negative shocks in the other industry affects firm value negatively. Second, because shocks in the oil and gas industry can especially have spillover effects (also in the opposite direction), we modify our distraction measure by removing shocks from oil and gas industries, and we repeat our analysis on a subsample excluding firms operating in those industries. The results remain similar to the baseline results. Third, we ensure that attention shocks come from unrelated industries by excluding shocks from supplier or customer industries, and again we find similar results, which support the validity of our distraction measure in capturing director attention shocks rather than industry relatedness or comovement.

This article is related to a large literature on the busyness of corporate boards. Some studies find that directors with multiple directorships are too busy to effectively monitor management (Core, Holthausen, & Larcker, 1999; Falato, Kadyrzhanova, & Lel, 2014; Fich & Shivdasani, 2006), whereas other researchers find that busyness reflects the quality of directors, which could provide advantages for firms (Ferris, Jagannathan, & Pritchard, 2003; Field, Lowry, & Mkrtchyan, 2013; Gilson, 1990; Kaplan & Reishus, 1990; Shivdasani & Yermack, 1999). Our study disentangles busyness from director ability and provides evidence on the costs of having busy directors.

A noteworthy feature of our identification strategy is that we consider the source of distraction at the industry level rather than at the firm level.[1] A firm-level approach has the crucial disadvantage that firm-level shocks could be driven by the ability of the director. For instance, if we classify Director A as distracted when company Car does poorly (as opposed to the whole automotive industry), this could simply be attributed to the bad performance of Director A.

[1] Stein and Zhao (2016) examine director distraction when the source of distraction is at the firm level.

Director A might be a poor monitor and/or adviser, and as a result, both company Car and Company 1 can underperform at the same time. Considering industry-level shocks mitigates this concern as it is less likely that the ability of one single director affects the performance of the whole industry.

This article particularly relates to Falato et al. (2014), who use 220 sudden deaths of directors at interlocked firms as exogenous shocks to directors' workload, and Hauser (2018), who uses mergers of interlocked firms as exogenous shocks to directors' outside appointments. Loss of outside appointments could not only decrease directors' workload but also reduce potentially valuable business relationships of the director. Director deaths at interlocked firms introduce uncertainty about the effect of director replacement. Our identification scheme studies director attention while isolating the potential confounding effects resulting from changes to directors' appointments or to interlocked firms' boards. Masulis and Zhang (2018) study director attention by examining distraction events such as director illness and winning prestigious awards and finds that these distracting events lower firm value. It is comforting to know that the effects of these specific shocks are in line with the effects of the more general source of director distraction that we study.

We further investigate multiple potential channels to better understand the negative effect of director distraction on firm value. When managers receive less monitoring from distracted directors, two potential agency problems might be exacerbated: (1) managers engage in empire building and make value-destroying investment decisions (Jensen, 1986), or (2) managers become more passive and "enjoy a quiet life" (Bertrand & Mullainathan, 2003). Alternatively, managers might miss important advice or have to delay making important decisions when it is difficult to schedule meetings with distracted directors for discussion and approval. We find that firms with more director distraction invest significantly less and are less likely to announce takeovers. These changes are due to firms with distracted directors being less active rather than the directors postponing their investments. The acquisitions that are still being announced when directors are distracted do not destroy value. Overall, our article addresses the question of which agency problem the board of directors mitigates. Our results suggest that an effective board of directors prevents managers from shirking or enjoying a quiet life at the expense of shareholder value.

Our findings support policies restricting the number of directorships that an individual is allowed to have. Nevertheless, it is important to note that we do not argue that directors with multiple directorships are detrimental to shareholder value per se, as firms could benefit from the knowledge and network of a director who serves on multiple boards (Field et al., 2013). The results in our study provide insights into the trade-off of having busy directors by isolating their busyness from their quality and highlighting that firm value drops when directors are distracted because management becomes less active.

The remainder of the article is organized as follows. Section 2 discusses our data and presents descriptive statistics. Section 3 explains how we construct our director distraction measure. Section 4 presents the main findings, and Section 5 examines alternative explanations. Section 6 concludes.

2 | DATA

We combine data from different sources. Director data are from the RiskMetrics Directors database for 1996–2017. This database contains director-firm-year observations for S&P 1500 firms. We use board affiliation information from RiskMetrics to classify directors who are not employed by the firm as outside directors. We focus on outside directors because distraction by other directorships is less likely for inside directors, given their employment with the firm.[2] We exclude firms that have no outside director with multiple directorships. We match the director data with the Compustat quarterly database to obtain financial reporting data and exclude regulated financial (historical Standard Industrial Classification (SICH) codes 6000–6999) and utility (SICH codes 4900–4999) firms.[3] We obtain stock price data from

[2] Nonetheless, we examine changes in firm value when executive directors are distracted in Section 4.3.

[3] Our results are robust to these exclusions.

the Center for Research in Security Prices (CRSP), merger activity data from the Securities Data Company, and Fama–French 49 industry portfolio returns from Kenneth R. French's data library. We assign each firm to 1 of the 49 Fama–French industries based on its SICH code (Compustat data item SICH). When the SICH code is not available, we follow Fama and French (2008) and use the CRSP Header SIC code (data item HSICCD).

The final director-level data set consists of 71,752 director-firm-year observations, with 5,875 individual outside directors with multiple directorships. The final firm-level data set consists of 75,595 firm-quarter observations, with 2,264 unique firms. Table 1 reports summary statistics for the variables we use in our study. Detailed definitions of these variables are reported in the Appendix. All continuous dependent variables are winsorized at the 1% level at both tails. Our summary statistics are comparable to previous studies using data from RiskMetrics and Compustat (e.g., Masulis & Mobbs, 2014).

3 | MEASURING DIRECTOR DISTRACTION

3.1 | Variable construction

The main variable of interest is a firm-level proxy for how much the board members of a given firm *f* are distracted in a given quarter *t*. The intuition behind the *Distraction* measure is the same as in Kempf et al. (2017), who examine investor distraction. A given director *i* of firm *f* is more likely to be distracted if there is an attention-grabbing event in a different industry in which director *i* has an additional directorship. For each outside director *i* at firm *f* in fiscal quarter *t*, we compute a director-firm-level distraction score D_{ift} as:

$$D_{ift} = \sum_{j \in B_{it} \setminus \{f\}} w_{ijt}^{f} \times 1\left(Ind_{jt} \neq Ind_{ft}\right) \times IS_{t}^{Ind_{jt}}, \tag{1}$$

where $B_{it} \setminus \{f\}$ denotes the set of firms other than firm *f* where director *i* serves on the board in quarter *t*; the weight w_{ijt}^{f} captures how much director *i* cares about firm *j*; $1(Ind_{jt} \neq Ind_{ft})$ indicates whether firm *j* is in the same Fama–French 49 industry as firm *f*, thereby allowing only shocks from industries other than that of firm *f*; and $IS_{t}^{Ind_{jt}}$ captures whether distracting events occur in the industry of firm *j* in quarter *t*. We now explain the construction of w_{ijt}^{f} and $IS_{t}^{Ind_{jt}}$ in more detail.

The construction of the weight w_{ijt}^{f} is motivated by Masulis and Mobbs (2014), who find that directors with multiple directorships distribute their time and energy unequally based on the directorship's relative prestige, which they establish by firms' market value of equity. Consequently, we calculate the weight of each directorship (firm) *j* for director *i* with respect to the focal firm *f* in quarter *t* as:

$$w_{ijt}^{f} = \min\left\{1, \ \frac{mve_{jt}}{mve_{ft}}\right\}, \tag{2}$$

where mve_{jt} and mve_{ft} denote the market value of equity of firm *j* and that of focal firm *f* in fiscal quarter *t*. This weighting scheme accounts for the notion that directors are less likely to be distracted from their relatively more prestigious directorships, as it assigns a lower weight to attention shocks from directorships that are less important than the focal firm (i.e., when $mve_{jt} < mve_{ft}$).

The term $IS_{t}^{Ind_{jt}}$ is used to identify whether the industry of firm *j* is attention grabbing in quarter *t*. Because attention-grabbing industry shocks are mostly associated with extreme returns and more news releases, which result in high volatility, we define $IS_{t}^{Ind_{jt}}$ as an indicator variable equal to 1 if the Fama–French 49 industry of firm *j* has abnormally high volatility relative to the other Fama–French 49 industries in a given quarter *t*. More specifically, in each quarter *t*, we first calculate for each Fama–French 49 industry *I*, its abnormal volatility:

$$\Delta\sigma_{It} = \frac{\sigma_{It} - \widehat{\sigma_{It}}}{\widehat{\sigma_{It}}}, \tag{3}$$

TABLE 1 Summary statistics

Variable	N	Mean	Standard deviation	Minimum	25th Percentile	Median	75th Percentile	Maximum
Dependent variables								
Tobin's Q	75,331	2.08	1.59	0.47	1.26	1.66	2.36	81.28
CAPEX	75,569	0.69	0.18	−1.39	0.59	0.70	0.79	2.37
Acquisition	75,595	0.08	0.27	0.00	0.00	0.00	0.00	1.00
Diversifying merger	75,595	0.04	0.19	0.00	0.00	0.00	0.00	1.00
Main independent variable								
Distraction	75,595	0.07	0.17	0.00	0.00	0.00	0.10	6.00
Distraction (> 0)	26,982	0.21	0.22	0.00	0.08	0.14	0.25	6.00
Alternative measures								
Distraction (positive)	75,595	0.03	0.08	0.00	0.00	0.00	0.00	3.58
Distraction (negative)	75,595	0.03	0.10	0.00	0.00	0.00	0.00	5.00
Control variables								
Total assets ($million)	75,595	8,632.00	26,293.00	124	745	1,927	5,927	347,564
Log(Assets)	75,595	7.71	1.50	2.64	6.61	7.56	8.69	12.06
Cash flow	71,928	0.04	0.03	−0.42	0.02	0.04	0.05	0.17
Board size	75,595	8.17	2.85	1.00	7.00	8.00	10.00	20.00
Board busyness	75,595	0.43	0.25	0.06	0.23	0.40	0.58	1.00
Board independence	75,595	0.74	0.18	0.00	0.67	0.78	0.88	1.00
Institutional ownership	72,031	0.76	0.20	0.00	0.65	0.79	0.90	1.00
Investor distraction	68,690	0.05	0.04	0.00	0.02	0.04	0.08	0.47
Merger deal variables								
CAR(−2, +2)	5,527	0.00	0.06	−0.41	−0.02	0.00	0.03	0.48
Relative deal size	5,529	0.14	0.37	0.00	0.02	0.05	0.13	11.17
Diversifying deal	5,529	0.52	0.60	0.00	0.00	0.00	1.00	1.00
Private target	5,529	0.74	0.44	0.00	0.00	1.00	1.00	1.00
Cross-border	5,529	0.26	0.44	0.00	0.00	0.00	1.00	1.00
Director-level variables								
Attended < 75% board meetings	71,752	0.02	0.13	0.00	0.00	0.00	0.00	1.00
Director distraction	71,752	0.55	0.92	0.00	0.00	0.00	1.00	10.77
Industry shock	71,752	0.23	0.43	0.00	0.00	0.00	0.32	4.00
Director age	71,702	61.88	7.16	28.00	57.00	62.00	67.00	95.00
Log(Director age)	71,702	4.13	0.12	3.37	4.06	4.14	4.22	4.56
Independent	71,752	0.91	0.28	0.00	1.00	1.00	1.00	1.00
Number of directorships	71,752	2.64	0.95	2.00	2.00	2.00	3.00	10.00
Yearly Tobin's Q	68,290	1.91	1.29	0.46	1.18	1.53	2.16	55.73

Notes: This table reports summary statistics for the main sample of firm-quarter observations of RiskMetrics firms with at least one director with multiple directorships from 1996 to 2017. Variables are defined in the Appendix. All continuous dependent variables are winsorized at the 1% level at both tails.

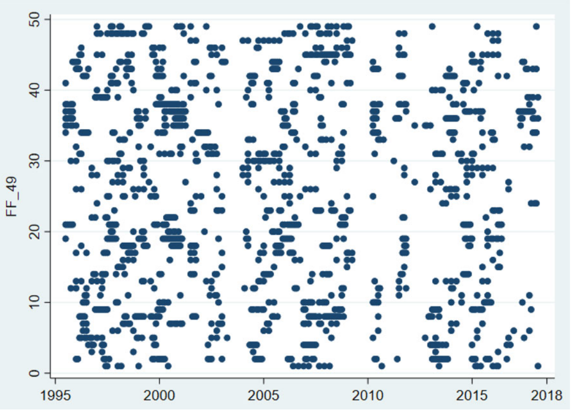

FIGURE 1 Attention-grabbing industries. This figure shows which Fama–French 49 industries (FF_49) (from Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html) are identified as attention grabbing in each quarter from 1996 to 2017 [Color figure can be viewed at wileyonlinelibrary.com]

where σ_{It} is the daily volatility of the Fama–French 49–industry portfolio I in quarter t and $\widehat{\sigma_{It}}$ is the daily volatility of the Fama–French 49–industry portfolio I over the window [−283, −31] relative to the start of quarter t. Then, we sort the 49 abnormal volatilities and consider an industry attention grabbing if its abnormal volatility is positive and in the top 10 (top quintile) across 49 industries. Note that if in a given quarter none of the industries has positive $\Delta\sigma_{It}$, there would be no attention-grabbing industry in that quarter.[4] Figure 1 shows which Fama–French 49 industries are considered attention grabbing over time. For example, information technology (IT)-related industries (Fama–French industries 34–38) are attention grabbing during 2000–2002, and finance-related industries (Fama–French industries 45–48) are attention grabbing during 2008–2010. The dispersed pattern of industry shocks in Figure 1 mitigates the concern that our findings are driven by a small number of industries.

To compute firm-level distraction, we aggregate the director-firm-level distraction scores across all directors with outside directorships. Specifically, for firm f in quarter t, we compute its board distraction level as:

$$Distraction_{ft} = \frac{1}{N_{ft}} \sum_{i \in B_{ft}} D_{ift}, \tag{4}$$

where B_{ft} denotes the set of outside directors with multiple directorships on the board of firm f in quarter t, and N_{ft} denotes the total number of outside directors. However, Ljungqvist and Raff (2018) highlight that directors can strategically substitute or complement codirectors' monitoring effort, which suggests that a larger number of outside directors does not necessarily mitigate the effects of distracted directors. To test whether the scaling is warranted in our setting, in untabulated analysis we confirm that firms in our sample with more outside directors are affected significantly less by individual board member distraction. These results are available upon request from the authors.

An important advantage of $Distraction_{ft}$ is that this firm-level director distraction measure is by construction not related to the fundamentals of the firm of interest (firm f), as only shocks from industries other than that of firm f are used to construct D_{ift}. Thus, $Distraction_{ft}$ is a plausible candidate for identifying exogenous shocks to the attention of firm f's board members. Another advantage of our identification strategy is that we consider the source of distraction at the industry level rather than at the firm level. Exploiting the source of distraction at the firm level has a crucial disadvantage in that firm-level shocks could be driven by the ability of the director. Considering industry-level shocks alleviates this concern as it is less likely that the ability of one single director affects the performance of the whole industry.

[4] Using different estimation windows to compute σ_{It}, or different cut points such as top-five industries (instead of top-10) yield qualitatively similar results. We have also used Fama-French 12 industries and two-digit SIC industries and obtained similar results.

The summary statistics of $Distraction_{ft}$ are presented in Table 1. As is shown, this variable is right-skewed and equals 0 in more than 50% of the sample. Therefore, we also report the distribution of the distraction variable with only positive values. About 36% of the firms in our sample have had distracted directors. Henceforth, we use as the mean distraction level and refer to distraction values above this mean as high distraction, which involve 11% of our sample.

3.2 | Board meeting attendance of distracted directors

To test whether our distraction measure captures director distraction, we study the board attendance rate of directors with multiple directorships in Table 2. The dependent variable is a dummy variable that equals one if a director has attended less than 75% of the board meetings of a particular firm in a given fiscal year. The idea is that directors are less likely to miss board meetings when they allocate more time and effort to the firm. We aggregate the explanatory variables accordingly, as the dummy dependent variable is at the director-firm-year level. Control variables include the directorship's relative ranking, the number of outside directorships, and other director and firm characteristics. Summary statistics of these variables are presented in Table 1.

We start by validating whether our industry shocks can identify attention shocks. In Columns (1) and (2) of Table 2, we test whether directors are less likely to miss board meetings at a firm when its industry experiences abnormally higher volatility. To this end, we aggregate the quarterly industry shocks over fiscal year y as:

$$IS_{ijy} = \sum_{t \in y} IS_t^{Ind_{jt}}, \tag{5}$$

where $IS_t^{Ind_{jt}}$ is defined in Section 3.1. We find that directors are significantly less likely to miss board meetings at firms in shocked industries. The coefficient of *Industry shock* implies that an interquartile increase in director-firm-level distraction (0.32) is associated with a 4.8% (= $-0.003 \times 0.32/0.02$) lower probability that the director attended less than 75% of board meetings. This result provides evidence that our industry shock measure captures attention-grabbing events that could distract directors.

When directors of Company 1 are distracted and shift time and energy to their other directorships, they might miss more board meetings of Company 1. In Columns (3)–(5) of Table 2, we test whether directors miss more meetings at the focal firms when they are distracted according to our measure. We sum up the director-firm-level distraction in (1) over all four quarters in fiscal year y for a particular firm f to obtain a director-firm-year-level measure for director distraction, that is, $\sum_{t \in y} D_{ift}$.

We show in Column (3) of Table 2 that the coefficient of *Director distraction* is both statistically and economically significant. An interquartile increase in director-firm-level distraction is associated with a 10% (= $0.002 \times 1/0.02$) higher probability that the director attended less than 75% of board meetings. The effect remains significant after controlling for director and year fixed effects in Column (4), where we exploit the variation at the director level over time. In Column (5), we further exploit the variation at the firm-year level, which isolates the source of variation that comes from pairwise comparisons of distracted directors versus nondistracted directors within the same firm in the same year. The coefficient of *Director distraction* remains virtually unaffected.

Although our baseline measure captures attention-grabbing industry shocks by means of abnormally higher volatilities, it does not distinguish between the distraction effect of positive and negative shocks. It may be that, conditioning on abnormally high volatility, industries with positive performance shocks demand less director attention than those with negative performance shocks, because directors may face higher pressure when the firm experiences an unfavorable industry shock. We test this possibility in Column (6) of Table 2 by estimating whether negative industry shocks lead directors to miss more board meetings than positive industry shocks do. We interact the yearly director distraction measure with a dummy variable indicating whether at least one of the attention-grabbing industries is hit by a negative shock (i.e., with negative cumulative stock returns). As shown, the baseline director distraction measure remains positive and significant, as does the coefficient on the interaction term. When the attention-grabbing industry experiences

TABLE 2 Director distraction and attendance of board meetings

Variable	Attended <75% board meetings (1)	(2)	(3)	(4)	(5)	(6)	(7)
Industry shock	−0.003***	−0.002*					
	(−2.776)	(−1.656)					
Director distraction			0.002***	0.002**	0.002**	0.001*	0.001*
			(3.022)	(2.300)	(2.166)	(1.896)	(1.742)
Director distraction ×						0.003*	
Negative shock						(1.776)	
Director distraction ×							0.003*
Executive in shocked industry							(1.715)
High-ranked directorship	−0.003**	−0.006***	−0.002*	−0.005***	−0.004**	−0.005***	−0.006***
	(−2.281)	(−4.864)	(−1.866)	(−4.513)	(−2.331)	(−4.175)	(−4.557)
Log(*Director age*)	−0.051***	−0.086	−0.051***	−0.085	−0.023***	−0.085	−0.086
	(−8.048)	(−1.267)	(−8.008)	(−1.261)	(−2.831)	(−1.254)	(−1.277)
Independent	−0.012***	0.005	−0.012***	0.005	−0.005	0.005	0.005
	(−3.766)	(1.446)	(−3.764)	(1.449)	(−1.364)	(1.432)	(1.455)
Number of directorships	0.005***	0.002	0.004***	0.001	0.001	0.001	0.001
	(4.221)	(1.334)	(3.800)	(0.936)	(1.201)	(0.732)	(0.949)
Board size	−0.002***	0.000	−0.002***	0.000	−0.002**	0.000	0.000
	(−5.541)	(1.140)	(−5.410)	(1.248)	(−2.546)	(1.309)	(1.241)
Yearly Tobin's Q	−0.000	−0.000	−0.000	−0.000	−0.001	−0.000	−0.000
	(−0.403)	(−0.574)	(−0.406)	(−0.569)	(−0.255)	(−0.526)	(−0.557)
Observations	68,244	68,244	68,244	68,244	68,244	68,244	68,244
Adj. R^2	0.007	0.092	0.007	0.092	0.053	0.092	0.092
Year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes
Director fixed effects	Yes	Yes	No	No	Yes	Yes	Yes
Firm × year fixed effects	No	No	Yes	No	No	No	No

Notes: This table reports the effect of director distraction on directors' attendance of board meetings. We use director-firm-year level observations from RiskMetrics and consider only directors with more than one board seat in a given year. The dependent variable is a dummy variable indicating whether a director has attended less than 75% of the firm's board meetings in a given year. In Columns (2), (3), (6), and (7), the model is estimated with year fixed effects and firm fixed effects. In Column (5), the model is estimated with firm × year fixed effects. In Column (6), the indicator variable *Negative shock* equals one if at least one of the director's attention-grabbing directorships is hit by a negative industry shock. In Column (7), the indicator variable *Executive in shocked industry* equals one if the director is an executive in one of the attention-grabbing industries. All other variables are defined in the Appendix. In all of the specifications, we cluster the standard errors at the director level. The corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

a negative shock, the affected directors are about 20% (= 0.004 × 1/0.02) more likely to attend less than 75% of board meetings. This finding suggests that although industries with both positive and negative shocks are attention grabbing, industries with negative shocks are significantly more likely to distract directors.

Finally, we show in Column (7) of Table 2 that our finding is driven not only by directors who are executives in the attention-grabbing industries. We interact our baseline director distraction measure with a dummy variable that equals one if the director is an executive in one of the attention-grabbing industries. The positive coefficient on the interaction term falls slightly short of statistical significance ($t = 1.575$) and thus provides only weak evidence that directors are more likely to miss board meetings of the focal firms if they are executives in the shocked industries as opposed to nonexecutives. The coefficient of the baseline measure remains positive and significant, which implies that directors with both executive and nonexecutive positions in attention-grabbing industries are distracted.

A noteworthy limitation of this analysis is that we cannot observe the exact continuous board attendance rate of directors. For example, a meeting attendance drop from 100% to 80% (or from 70% to 20%) is substantial but does not show up in the used binary dependent variable. Because there is relatively little variation in the attendance dummy, we cannot fully exploit the effect of director distraction. Accordingly, we are probably underestimating the effect of distraction on director board meeting attendance. Overall, the results in Table 2 suggest that our measure of distraction adequately captures variation in the attention of directors. Directors attend fewer board meetings when they are distracted, but they are less likely to miss meetings of firms in the attention-grabbing industries, consistent with the notion that distracted directors spend less time and energy monitoring and advising management.

4 | EMPIRICAL FINDINGS

This section presents our main findings. First, we test the effect of director distraction on firm value. Then, we investigate three potential channels through which director attention could affect firm value. We conclude by studying the distraction effect for different groups of directors.

4.1 | Main results

In Table 3, we examine the effect of director distraction on firm value using Tobin's Q as the dependent variable. In Columns (1) and (2), the model is estimated with quarter and firm fixed effects, which exploits variation within firms. In Column (3) and (4), the model is estimated with industry × quarter fixed effects and firm fixed effects, which additionally control for any unobserved time-varying industry heterogeneity. Including the industry × quarter fixed effects also mitigates the concern that our findings simply result from spillovers among industries. In Columns (2) and (4), we also include firm and board characteristics.

The coefficients of *Distraction* in Columns (1)–(4) of Table 3 are between −0.237 and −0.338 (depending on the model specification) and is highly statistically significant, suggesting that firm value decreases significantly when directors are distracted. This negative impact of director distraction is also economically meaningful. A deviation from no distraction to the average distraction level of 0.205 is associated with a 2.3% ($= -0.237 \times 0.205/2.084$) to 3.3% ($= -0.338 \times 0.205/2.084$) discount in Tobin's Q on a quarterly basis.

Figure 2 plots the difference in quarterly Tobin's Q between firms with no director distraction and firms with high director distraction over time. The negative impact of director distraction on firm value is relatively consistent over time.

A potential concern relates to the endogenous nature of director choice. The choice of Company 1 to use Director A, who also holds a directorship in the automotive industry, is endogenous. The possibility exists that the business of Company 1 is more related to the automotive industry than other companies are. Thus, shocks in the automotive industry would spill over and affect Company 1 more than other companies. To address this concern, we test the prediction of this endogeneity story that the direction of the spillover effect is likely consistent with the direction of the industry shock. That is, if the automotive industry experiences a positive shock, the effect spilled over to Company 1 is also expected to be positive, leading to an increase in firm value of Company 1. Conversely, if the automotive industry experiences a negative shock, the effect spilled over to Company 1 should be negative, leading to a decrease in firm value of Company 1.

In Columns (5) and (6) of Table 3, we consider distraction from positive and negative industry shocks separately and reestimate their effect on firm value. *Distraction* (*positive*) uses industries with abnormally high volatility and

TABLE 3 Effects of director distraction on firm value

	Tobin's Q					
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Distraction	−0.338***	−0.250***	−0.271***	−0.237***		
	(−5.654)	(−4.874)	(−5.332)	(−5.387)		
Distraction (*positive*)					−0.230**	
					(−1.965)	
Distraction (*negative*)						−0.316***
						(−3.495)
Log(*Assets*)		−0.372***		−0.380***	−0.380***	−0.380***
		(−9.491)		(−10.849)	(−10.849)	(−10.860)
Board size		0.015		0.010	0.011	0.010
		(1.299)		(0.935)	(0.981)	(0.954)
Board busyness		−0.179		−0.074	−0.098	−0.089
		(−1.571)		(−0.711)	(−0.921)	(−0.862)
Board independence		−0.153		−0.189	−0.187	−0.186
		(−1.126)		(−1.403)	(−1.390)	(−1.386)
Observations	75,331	75,331	75,331	75,331	75,331	75,331
Adj. R^2	0.499	0.516	0.574	0.589	0.589	0.589
Quarter fixed effects	Yes	Yes	No	No	No	No
Industry × quarter fixed effects	No	No	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the effect of director distraction on firm value. The dependent variable is *Tobin's Q*. In Columns (1) and (2), the model is estimated with quarter and firm fixed effects, which exploits variation within firms. In Column (3) and (4), the model is estimated with industry × quarter fixed effects and firm fixed effects. In Columns (5) and (6), we consider distraction from positive and negative industry shocks separately. *Distraction* (*positive*) uses only industries with abnormally high volatility and positive performance as attention-grabbing industries; *Distraction* (*negative*) uses only industries with abnormally high volatility with negative performance as attention-grabbing industries. All other variables are defined in the Appendix. We use the Fama–French 49 industries (from Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). Standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

positive performance as attention-grabbing industries, whereas *Distraction* (*negative*) uses only industries with abnormally high volatility with negative performance as attention-grabbing industries. The results indicate that the coefficients of the distraction measures have the same negative sign as in the other columns. The magnitude and *t*-statistics are smaller than those in the other columns, but this is not surprising as each measure ignores many other attention-grabbing cases and sends many firms with high distraction to the control group of firms with low or no distraction. The stronger effect of negative industry shocks is consistent with the idea that industries with negative shocks demand more director attention because directors may face higher pressure when the firm experiences an unfavorable industry shock. The finding that positive shocks to other industries also affect firm value negatively is consistent with our conjecture of director distraction and mitigates the concern that our results are merely driven by industry spillover effects.

In Table 4, we test whether our results are robust to alternative definitions of industry shocks and alternative industry classifications. Our main director distraction measure is based on stock volatility to measure attention-grabbing events. Instead, we now follow Barber and Odean (2008) and Kempf, Manconi, and Spalt (2017) and consider three alternative ways of capturing salient events in a given industry: extreme positive returns, extreme negative returns,

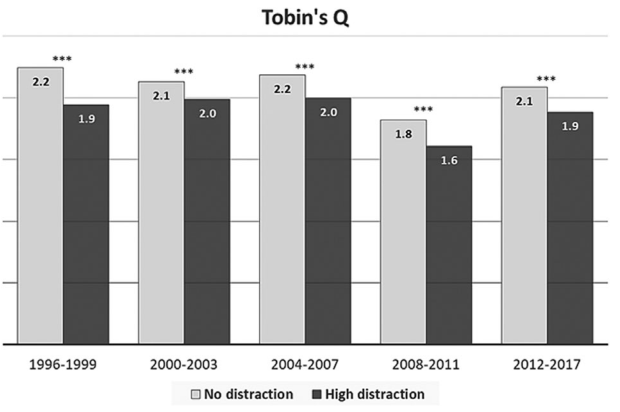

FIGURE 2 Tobin's *Q* and director distraction over time
Notes: This figure plots the average quarterly Tobin's *Q* for the subgroups of no-distraction ($Distraction_{ft} = 0$) and high-distraction ($Distraction_{ft} > 0.205$) firms over time.
***Significant at the 0.01 level.

and trading volume. For extreme positive (negative) returns, we consider the industries with quarterly stock performance in the top (bottom) decile as attention-grabbing industries. For trading volume, we define the attention-grabbing industries as those that have the highest (top decile) abnormal trading volume with respect to the previous three quarters, computed as in Equation (3). We reestimate the specification from Columns (3) and (4) of Table 3 using these three alternative definitions of industry shocks. As shown in Table 4, using these alternative measures of attention-grabbing events produces results qualitatively similar to our results based on stock volatility.

In addition, we consider three alternative industry classifications, namely, the Fama–French 12 industries (provided in Kenneth R. French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html), the SICH two-digit industries, and the Hoberg and Phillips (2016) 10-K text-based 50-industry classifications (FIC-50).[5] For each industry classification, we measure director distraction using our baseline volatility-based definition of industry shocks as well as the three alternative definitions. Table 4 shows that using the alternative industry classifications leads to results qualitatively similar to our results based on the Fama–French 49-industry classification. Overall, the findings in Table 4 indicate that our results are not driven by a particular industry classification and are robust to alternative measures of attention-grabbing events within a given industry.

An alternative way to test the effect of director distraction on firm value is to investigate how director attention directly affects firms' stock returns. To this end, we use monthly stock price data from CRSP and match each month to the corresponding fiscal quarter. Table 5 reports the effect of director distraction on firms' stock market performance. In Columns (1) and (2), the dependent variable is the cumulative excess stock returns ($Ret - R_f$) over each fiscal quarter. We also use two risk-adjusted stock returns as alternative measures in Columns (3)–(6), namely, market-adjusted returns based on the capital asset pricing model (CAPM) and Fama–French risk-adjusted returns based on the four-factor (FF4) model (Carhart, 1997; Fama & French, 1993). To compute the market-adjusted returns, we first estimate the CAPM to obtain the market beta for each stock at the beginning of each fiscal quarter using monthly returns data from the past 36 months and then compute the abnormal return as the excess return over the product of the market beta and the market return in a given fiscal quarter. To compute the Fama–French risk-adjusted returns, we first estimate the FF4 model ($R_{it} - R_{ft} = \alpha + \beta_{i,MKT} MKT_t + \beta_{i,HML} HML_t + \beta_{i,SMB} SMB_t + \beta_{i,UMD} UMD_t + \varepsilon_{it}$) to obtain factor betas for each stock in the beginning of each fiscal quarter using monthly returns data of the past 36 month, and then compute the abnormal return as the excess return over the product of the factor betas and the four risk factors in a given fiscal quarter. In Columns (1), (3), and (5), the model is estimated with quarter fixed effects, and in Columns (2), (4), and

[5] For each two-digit SIC/FIC-50 industry, we construct a value-weighted portfolio using all firms in the CRSP database with a stock price above $5 in that industry.

TABLE 4 Robustness: Alternative industry classifications and definitions of industry shocks

		Firm fixed effects & industry × Quarter fixed effects		Fixed effects with controls	
Industry classification	**Industry shocks**	**Coefficient**	***t*-Statistic**	**Coefficient**	***t*-Statistic**
Baseline					
Fama–French 49	Volatility	−0.271***	(−5.332)	−0.237***	(−5.387)
Alternatives					
Fama–French 49	Extreme positive returns	−0.207***	(−3.340)	−0.167***	(−3.091)
Fama–French 49	Extreme negative returns	−0.346***	(−3.530)	−0.318***	(−3.511)
Fama–French 49	Trading volume	−0.224**	(−2.353)	−0.196**	(−2.197)
Fama–French 12	Volatility	−0.216***	(−3.740)	−0.174***	(−3.118)
Fama–French 12	Extreme positive returns	−0.181***	(−3.583)	−0.223***	(−2.802)
Fama–French 12	Extreme negative returns	−0.273***	(−5.646)	−0.268***	(−4.772)
Fama–French 12	Trading volume	−0.224**	(−2.118)	−0.152	(−1.558)
Two-digit SICH	Volatility	−0.313***	(−6.075)	−0.267***	(−5.259)
Two-digit SICH	Extreme positive returns	−0.247***	(−2.981)	−0.206**	(−2.498)
Two-digit SICH	Extreme negative returns	−0.359***	(−5.405)	−0.199**	(−2.328)
Two-digit SICH	Trading volume	−0.276***	(−3.262)	−0.231***	(−3.188)
FIC-50	Volatility	−0.405***	(−5.739)	−0.334***	(−5.278)
FIC-50	Extreme positive returns	−0.408***	(−5.055)	−0.370***	(−4.630)
FIC-50	Extreme negative returns	−0.422***	(−5.756)	−0.366***	(−5.083)
FIC-50	Trading volume	−0.434***	(−6.166)	−0.367***	(−5.105)

Notes: In this table, we test the robustness of our results using alternative definitions of industry shocks and industry classifications. In addition to our baseline volatility-based distraction measure, we use alternative definitions of industry shocks. Using extreme positive (negative) returns, industries with quarterly stock performance in the top (bottom) decile are defined as attention grabbing. Using trading volume, industries with the highest (top decile) abnormal trading volume relative to the previous three quarters, computed as in Equation (3), are defined as attention grabbing. We use the Fama–French 12 industries (from Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html), the two-digit historical Standard Industrial Classification (SICH) code industries, and the Hoberg and Phillips (2016) 10-K text-based 50 industries (FIC-50) as alternative industry classifications. For each two-digit SICH/FIC-50 industry, we construct a value-weighted portfolio using all Center for Research in Security Prices stocks priced above $5 within that industry. We reestimate the specifications from Columns (3) and (4) of Table 3. For brevity, we only report the coefficient of the distraction variables and suppress those of control variables. Standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

(6), the model is estimated with stock fixed effects. We further include the returns of the Fama–French 49 industry portfolios to control for industry × quarter level trends.

Table 5 shows that firms' stock performance is significantly worse when their directors are distracted. A deviation from no distraction to the average distraction level of 0.205 leads to an underperformance of about 72 basis points (= −0.035 × 0.205) per quarter. The coefficient of *Director distraction* remains statistically significant when using market-adjusted and Fama–French risk-adjusted returns.

4.2 | Potential channels

Our results thus far support the notion that firms have lower valuation when their board members are distracted. Next, we test which underlying mechanism could explain the negative effects of director distraction. When managers receive less monitoring from distracted directors, two potential agency problems might be exacerbated: (1) managers engage

TABLE 5 Effects of director distraction on stock performance

Variable	*Cumulative returns* (1)	(2)	*CAR (CAPM)* (3)	(4)	*CAR (FF4)* (5)	(6)
Distraction	−0.035***	−0.033***	−0.034***	−0.031***	−0.026***	−0.024***
	(−5.262)	(−4.623)	(−5.295)	(−4.646)	(−3.910)	(−3.450)
Log(*Assets*)	0.000	−0.007***	0.000	−0.007***	0.000	−0.007***
	(0.220)	(−4.480)	(0.429)	(−5.015)	(0.414)	(−4.629)
Board size	0.004***	0.004***	0.004***	0.003***	0.004***	0.003***
	(10.320)	(6.464)	(9.254)	(4.446)	(8.641)	(3.986)
Board busyness	−0.022***	−0.022***	−0.015***	−0.016***	−0.011**	−0.009
	(−5.329)	(−3.907)	(−3.615)	(−2.825)	(−2.438)	(−1.528)
Board independence	−0.009*	−0.013	−0.004	0.001	−0.001	0.004
	(−1.663)	(−1.609)	(−0.760)	(0.114)	(−0.157)	(0.485)
Industry returns	0.936***	0.937***	0.401***	0.397***	0.274***	0.269***
	(66.205)	(65.508)	(31.874)	(31.527)	(20.525)	(19.978)
Observations	75,005	75,005	75,005	75,005	75,005	75,005
Adj. R^2	0.295	0.306	0.073	0.092	0.025	0.043
Quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Stock fixed effects	No	Yes	No	Yes	No	Yes

Notes: This table reports the effect of director distraction on firms' stock performance. In Columns (1) and (2), the dependent variable is cumulative excess stock returns ($Ret - R_f$) over each fiscal quarter. We also use two risk-adjusted stock returns as alternative measures in Columns (3)–(6), namely, market-adjusted returns based on the capital asset pricing model (CAPM) and Fama–French risk-adjusted returns based on the four-factor (FF4) model (Carhart, 1997; Fama & French, 1993). To compute the market-adjusted returns, we first estimate the CAPM to obtain the market beta for each stock at the beginning of each fiscal quarter using monthly returns data of the past 36 months, and then compute the abnormal return as the excess return over the product of the market beta and the market returns in a given fiscal quarter. To compute the Fama–French risk-adjusted returns, we first estimate the FF4 model ($R_{it} - R_{ft} = \alpha + \beta_{i,MKT}MKT_t + \beta_{i,HML}HML_t + \beta_{i,SMB}SMB_t + \beta_{i,UMD}UMD_t + \varepsilon_{it}$) to obtain the factor betas for each stock at the beginning of each fiscal quarter using monthly returns data of the past 36 months, and then compute the abnormal return as the excess return over the product of the factor betas and the four risk factors in a given fiscal quarter. All other variables are defined in the Appendix. In Columns (1), (3), and (5), the model is estimated with quarter fixed effects, and in Columns (2), (4), and (6), the model is also estimated with stock fixed effects. Fama–French 49 industry portfolios (from Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html) are included to control for industry × quarter level trends. Standard errors are clustered at the stock level, and the corresponding *t*-statistics are reported in parentheses.
***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

in empire building and make value-destroying investment decisions (Jensen, 1986) or (2) they become more passive and enjoy a quiet life (Bertrand & Mullainathan, 2003). Alternatively, director distraction might not lead to higher agency frictions, but (3) managers might miss important advice or have to delay making important decisions when it is difficult to schedule meetings with distracted directors for discussion and approval.

4.2.1 | Overinvestment

In Table 6, we test whether director distraction leads to managerial empire building by studying firms' capital expenditures to total assets (CAPEX) and merger and acquisition (M&A) activities. In Columns (1)–(6), the model is estimated with industry × quarter fixed effects to control for the effect of industrywide investment shocks such as technology innovations and merger waves. We include standard control variables in investment regressions: firm size, one-quarter lagged Tobin's *Q*, and cash flow, as well as board size, busyness, and independence. In addition, we control

TABLE 6 Effect of director distraction on firm investment

Variable	CAPEX (1)	CAPEX (2)	Acquisition (3)	Acquisition (4)	Diversifying merger (5)	Diversifying merger (6)	CAR(−2, +2) (7)	CAR(−2, +2) (8)
Distraction	−0.021***	−0.018*	−0.019**	−0.005	−0.010*	−0.008*	0.018	0.018
	(−3.026)	(−1.867)	(−2.494)	(−0.705)	(−1.775)	(−1.870)	(1.296)	(1.250)
Log(*Assets*)	−0.012***	0.016***	0.022***	0.016***	0.011***	0.009***	−0.002***	−0.002***
	(−4.387)	(3.453)	(11.538)	(5.268)	(6.527)	(4.244)	(−3.197)	(−3.480)
Lagged Q	−0.004*	−0.001	0.005**	0.007***	0.003*	0.004***	−0.002***	−0.002*
	(−1.801)	(−0.609)	(2.463)	(3.877)	(1.907)	(3.243)	(−2.829)	(−1.975)
Cash flow	0.314***	0.226***	0.237***	0.276***	0.111***	0.116***	0.075	0.066
	(3.367)	(3.318)	(4.628)	(4.941)	(3.298)	(3.635)	(0.996)	(0.963)
Board size	−0.008***	−0.005***	−0.002***	−0.003***	−0.001	−0.001*	−0.000	−0.000
	(−6.052)	(−5.324)	(−2.798)	(−2.706)	(−1.303)	(−1.827)	(−0.489)	(−0.494)
Board busyness	−0.093***	−0.042***	−0.015*	−0.009	0.001	0.005	−0.009	−0.010
	(−7.872)	(−4.497)	(−1.888)	(−0.951)	(0.200)	(0.644)	(−1.218)	(−1.319)
Board independence	−0.056***	−0.019	−0.010	−0.018	0.001	−0.007	−0.002	−0.003
	(−4.221)	(−1.560)	(−1.131)	(−1.463)	(0.214)	(−0.704)	(−0.294)	(−0.464)
Investor distraction	0.058**	0.044**	0.032	0.022	0.001	0.005	−0.011	−0.006
	(2.430)	(2.246)	(0.861)	(0.583)	(0.041)	(0.171)	(−0.336)	(−0.193)
Institutional ownership	0.059***	0.068***	0.021**	0.039***	−0.001	0.012	−0.008	−0.006
	(3.677)	(4.889)	(2.158)	(3.407)	(−0.165)	(1.621)	(−1.232)	(−0.967)
Relative deal size								−0.013***
								(−2.860)
Diversifying deal								0.003
								(1.434)
Private target								0.005*
								(1.903)

(Continues)

TABLE 6 (Continued)

Variable	*CAPEX* (1)	(2)	*Acquisition* (3)	(4)	*Diversifying merger* (5)	(6)	*CAR*(−2, +2) (7)	(8)
Cross-border								0.000
								(0.161)
Observations	65,352	65,352	65,359	65,359	65,359	65,359	5,227	5,227
Adj. R^2	0.156	0.576	0.023	0.112	0.022	0.120	0.120	0.120
Industry × quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	No
Industry × year fixed effects	No	No	No	No	No	No	Yes	Yes

Notes: This table reports the effect of director distraction on firm investment. In Columns (1) and (2), the dependent variables are firms' capital expenditures (*CAPEX*). In Columns (3) and (4), the dependent variable is *Acquisition*, which equals one if the firm announces at least one acquisition in the given quarter. In Columns (5) and (6), the dependent variable is *Diversifying merger*, which equals one if the announced acquisition deal is cross-industry. In all those columns, the model is estimated with industry × quarter fixed effects. Columns (2), (4), and (6) additionally include firm fixed effects. The standard errors are clustered at the firm level. In Columns (7) and (8), the dependent variable is *CAR*(−2, +2), the 5-day cumulative abnormal returns around the merger announcement date. All other variables are defined in the Appendix. In Columns (7) and (8), the model is estimated with industry × year fixed effects, and standard errors are clustered at the industry level. All corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

for institutional ownership and institutional investor distraction as in Kempf et al. (2017), which could affect corporate investment decisions.

As shown in Table 6, we find that firms invest significantly less when directors are distracted. In terms of capital expenditure, a deviation from no distraction to the average distraction level of 0.205 is associated with a drop of 0.6% ($= -0.021 \times 0.205/0.690$) in firms' CAPEX. The effect remains similar and statistically significant when we also control for firm fixed effects.

In addition to capital expenditure, we examine firms' takeover decisions. Acquisitions are sizable and nonroutine investments in which management is heavily involved. Because we observe deal announcement dates, we can also study whether managers decide on the timing of the deal conditional on the monitoring intensity of the board. Moreover, we can compute deal announcement returns to examine how the market reacts to the deal, which allows us to get insights into whether the deal creates or destroys shareholder value.

In Columns (3) and (4) of Table 6, the dependent variable is a dummy variable that equals one if the firm announces at least one acquisition in the given fiscal quarter. The estimation results suggest that when directors are distracted, firms are not more likely to announce an acquisition and build an empire. If anything, they are less likely to announce an acquisition.

To test whether managers pursue private benefits when they receive less monitoring, we test in Columns (5) and (6) of Table 6 whether firms make more diversifying mergers when directors are distracted. Studies have suggested that managers pursuing private benefits tend to make diversifying merger deals because these reduce chief executive officer (CEO) human capital risk and offer a chance to venture into industries that are considered fashionable, glamorous, or reputable (e.g., Amihud & Lev, 1981; Morck, Shleifer, & Vishny, 1990). Interestingly, we find that firms are actually (about 5.7%) less likely to announce diversifying mergers when their directors are distracted.

Even though firms seem to make fewer acquisitions when their directors are distracted, the deals they make might still be value destroying for shareholders. Therefore, we examine deal announcement returns. The dependent variables are the 5-day cumulative abnormal returns (CARs) around the deal announcement date in Columns (7) and (8) of Table 6. We find that the announcement returns are not negative conditional on director distraction.

In sum, when directors are distracted, firms do not seem to engage excessively in empire building or to make more value-destroying investments. On the contrary, firms with high director distraction are significantly less active, have lower capital expenditures, and are less likely to announce an acquisition. Our findings suggest that distracted directors leave room for managers to enjoy a quiet life instead of maximizing shareholder value, which leads to a significant decrease in firm value.

It is also interesting to note that board members seem to play a different role in monitoring the management than institutional investors do. When institutional investors are distracted and reduce monitoring, managers tend to make more value-destroying investments (Kempf et al., 2017). Yet when directors are distracted, managers seem to enjoy a quiet life rather than engage in empire building. This result is sensible, as engaging in empire building when investors are not distracted is likely to lead to activism, whereas a period of relative inactivity is less likely to invoke investor activism.

4.2.2 | "Quiet life" versus "delayed decision making"

Although the results in the prior subsection are more in line with the quiet life hypothesis (Bertrand & Mullainathan, 2003; Giroud & Mueller, 2010) than with empire building, they do not exclude alternative explanations. Most notably, it may be that managers simply cannot make or implement important decisions such as acquisition deals when it is difficult to schedule meetings with distracted directors for discussion and approval. Managers might also miss valuable advice from these distracted directors. Thus, managers might have to delay important decisions until directors are no longer distracted and can spend more time and energy on the firm.

If managers miss important advice, negative announcement effects might be expected for takeover deals, but director distraction might simply lead managers to postpone their investments. To examine this possibility, we compare firms' activities in times with high director distraction to those in subsequent times with no director distraction. The delayed decision-making hypothesis predicts that after a period in which directors are distracted, firms become significantly more active when director attention returns and managers are able to get advice and execute pending decisions.

We construct a subsample of firms that have two consecutive quarters in which director distraction is high ($Distraction_{ft} > 0$) and two subsequent consecutive quarters when there is no director distraction ($Distraction_{ft} = 0$). We refer to the quarters with high director distraction as the "before" period and to the subsequent quarters without distraction as the "after" period. In Table 7, we compare firms' capital expenditure, takeover decisions, and U.S. Securities and Exchange (SEC) filings in the before period to those in the after period. Firms' SEC filings are retrieved from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database. We consider filings of all form types disclosed by the firms in our sample and use the filing dates to match the filing activity to our firm-quarters.

Panel A of Table 7 reports the means of the variables of interest in the before and after periods. The difference between the before and after periods is neither statistically nor economically significant for any of the variables. Panel B uses multivariate regressions, which include additional control variables and time and firm fixed effects. The coefficient on the dummy variable indicating the after period is not significant in any of the specifications.

The evidence in Table 7 is more consistent with the quiet life hypothesis than with the delayed decision-making hypothesis. Nevertheless, our findings do not rule out an effect from managers not being able to make decisions. Managers might miss valuable investment opportunities when they cannot receive approval or advice from distracted directors, and those investment opportunities might have been seized by competitors or have evaporated once director attention returns. Still, it seems unlikely that all investment opportunities would have evaporated the next period. In addition, when managers really want to push a value-increasing investment, there are ways to do this, even when some directors are time constrained. Overall, our findings suggest that the loss in firm value when directors are distracted results mostly from managers enjoying a quiet life when they receive less monitoring from outside directors.

4.3 | Effect from different groups of directors

Not every outside directors is assigned the same task. In this subsection, we examine the impact of distraction from various groups of directors on firm value. Directors can serve on audit, nomination, and/or compensation committees. We obtain information on committee membership from RiskMetrics. In Table 8, the dependent variable is *Tobin's Q*. In Columns (1)–(5), we interact the baseline *Distraction* variable with a dummy variable indicating whether at least one of the distracted directors belongs to the corresponding group.

In Column (1) of Table 8, we show that distraction of committee members destroys firm value more than that of noncommittee members, as the corresponding interaction term is negative and significant. Results in Columns (2)–(4) show that the stronger effect from committee members is mostly driven by distracted compensation committee members. In fact, the distraction of auditor nomination committee members is not more detrimental to firm value than that of noncommittee members. In Column (5), we show that firms do not suffer more if some of the distracted board members are executives in the shocked industries. It is important to note that the *Distraction* variable alone remains negative and highly significantly in all columns. This implies that the reduction in firm value due to distraction is not due to only one type of director; for example, it applies to directors both with and without executive roles in shocked industries.

In the final column of Table 8, we consider executive directors who hold directorships in the attention-grabbing industries. Our baseline analysis excludes executive directors because we assume that attention shocks from other directorships are less likely to distract directors from their primary occupation at the focal firms. However, it is possible that our results are partially driven by those distracted executives. We test this possibility by constructing the distraction of executive directors in the same way as that of outside directors and then estimating the effect of their distraction on firm value. As shown in Column (6), the effect of executive directors' distraction is not statistically significant, and the effect of outside directors' distraction remains virtually identical to the baseline estimate in Table 3. These results are in line with executives at focal firms being less likely to get distracted. Furthermore, they indicate that our baseline results are robust to controlling for the effects of executive directors' distraction.

TABLE 7 Testing the delayed decision-making hypothesis

Panel A. Difference in means

Variable	*N*	Distraction high (before) Mean	Distraction no (after) Mean	Difference After – Before *t*-Statistic
CAPEX	4,366	0.68	0.68	−1.01
Acquisition	4,366	0.06	0.05	−0.97
Log(1 + *Filings*)	3,867	2.04	2.11	1.41

Panel B. Ordinary least squares regressions

	CAPEX (1)	Acquisition (2)	Log(1 + Filings) (3)
After	−0.007	−0.006	0.001
	(−1.384)	(−0.575)	(0.040)
Log(*Assets*)	0.018	0.012	0.109***
	(1.099)	(0.840)	(2.739)
Board size	−0.018***	−0.002	−0.010
	(−3.031)	(−0.320)	(−0.487)
Board busyness	−0.065*	0.020	0.179
	(−1.668)	(0.457)	(1.251)
Board independence	−0.023	0.005	0.280
	(−0.495)	(0.120)	(1.377)
Lagged Q	−0.002	0.018**	0.040
	(−0.142)	(2.252)	(1.633)
Cash flow	0.184	0.067	−0.146
	(0.868)	(0.467)	(−0.287)
Observations	4,028	4,028	3,550
Adj. R^2	0.628	0.083	0.713
Quarter fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes

Notes: In this table, we test the delayed decision-making hypothesis. We construct a subsample of firms that have high director distraction ($Distraction_{ft} > 0$) in two consecutive quarters and no director distraction in the subsequent two consecutive quarters ($Distraction_{ft} = 0$). We refer to the quarters with high director distraction as the "before" period and to the subsequent quarters without distraction as the "after" period. The variables of interests are capital expenditures (*CAPEX*), takeover decisions (*Acquisition*), and the number of U.S. Securities and Exchange Commission filings (*Filings*). Panel A reports the means of the variables of interest in the before and after periods. Panel B reports the results of multivariate regressions including time and firm fixed effects. In all regressions, *After* is a dummy variable indicating the after period. All other variables are defined in the Appendix. Standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.
***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

4.4 | Distraction and directors' career outcomes

Our findings thus far suggest that temporary director distraction leaves room for managers to shirk at the expense of shareholders, which leads to a significant decline in firm value. It is then natural to ask whether shareholders take actions to replace distracted directors.

As our study focuses on temporary distractions, this analysis could add to the evidence in Masulis and Zhang (2018) that permanently distracted directors are replaced. The estimation results indicating whether temporarily distracted

TABLE 8 Effect of different groups of directors

	Tobin's Q					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Distraction	−0.126*	−0.199***	−0.233***	−0.186***	−0.254***	−0.238***
	(−1.935)	(−4.101)	(−4.709)	(−3.336)	(−4.658)	(−5.289)
Distraction × Committee	−0.173*					
	(−1.956)					
Distraction × Audit		−0.104				
		(−1.106)				
Distraction × Nomination			−0.018			
			(−0.200)			
Distraction × Compensation				−0.139*		
				(−1.917)		
Distraction × Executive in Shocked Industry					0.047	
					(0.551)	
Distraction (*Executive directors*)						0.004
						(0.148)
Observations	75,331	75,331	75,331	75,331	75,331	75,331
Adj. R^2	0.589	0.589	0.589	0.589	0.589	0.589
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry × quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports how distraction of different groups of directors affects firm value. The dependent variable is *Tobin's Q*. In all columns, the model is estimated with industry × quarter and firm fixed effects. In Columns (1)–(5), we interact the baseline distraction variable with a dummy variable indicating whether at least one of the distracted directors belongs to the corresponding group. *Committee*, *Audit*, *Nomination*, and *Compensation* are dummy variables that equal to one if one of the distracted directors is in any committee, in the audit committee, in the executive nomination committee, and in the executive compensation committee, respectively. *Executive in Shocked Industry* is a dummy variable that equals to one if one of the distracted directors is an executive in the attention-grabbing industry. In Column (6), we estimate the effect of distracted directors who are executives at the focal firm but hold directorships in the attention-grabbing industries. This distraction measure is computed in the same way as that of outside directors, that is, first indicate whether the executives holds any other directorships in the shocked industries, then aggregate individual executive director's distraction at the firm level, and finally scale by the total number of executives on the board. Variables are defined in the Appendix. In all of the specifications, standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

*Significant at the 0.10 level.

directors are more likely to be replaced in the next year are presented in Table 9, in which the dependent variable equals one when a director is replaced the next year.

The coefficients of *Director distraction* and the interaction effects in Columns (1)–(3) of Table 9 suggest that directors' temporary distraction because of other attention-grabbing industries does not significantly increase the probability of their departure, even if the distraction is associated with lower firm values (Δ*Tobin's Q*), unless the distraction is also associated with board meeting absence. In other words, temporarily distracted directors are replaced only when the distraction leads them to actually miss board meetings. One interpretation of this result is that shareholders take actions to replace distracted directors once they miss board meetings. An alternative interpretation is that distracted directors who attend fewer board meetings resign voluntarily to be able to focus more on other directorships. To obtain insight into these different interpretations, we distinguish between voluntary and forced departures in the

TABLE 9 Effect of distraction on directors' career outcomes

Variable	Replaced in the next year (1)	(2)	(3)	Voluntary (4)	Forced (5)
Director distraction	−0.002	−0.003	−0.003	−0.000	−0.003
	(−1.299)	(−1.328)	(−1.539)	(−0.232)	(−1.585)
Distraction × *´Tobin's Q*		−0.001			
		(−0.300)			
Distraction × *Attended*			0.019*	−0.002	0.022*
< 75% board meetings			(1.698)	(−0.897)	(1.933)
Δ*Tobin's Q*	−0.005***	−0.005**	−0.005***	−0.002*	−0.003*
	(−2.899)	(−2.301)	(−2.903)	(−1.952)	(−1.933)
Attended < 75% board meetings	0.062***	0.062***	0.047***	0.011*	0.036**
	(4.593)	(4.593)	(2.938)	(1.712)	(2.421)
Number of directorships	−0.023***	−0.023***	−0.023***	−0.008***	−0.015***
	(−12.433)	(−12.425)	(−12.519)	(−9.064)	(−8.718)
High-ranked directorship	−0.012***	−0.012***	−0.012***	−0.000	−0.012***
	(−4.873)	(−4.873)	(−4.872)	(−0.335)	(−4.997)
Log(*Director age*)	0.225***	0.225***	0.225***	0.329***	−0.104***
	(14.412)	(14.411)	(14.412)	(30.382)	(−6.443)
Independent	−0.049***	−0.049***	−0.049***	−0.014***	−0.035***
	(−7.873)	(−7.874)	(−7.851)	(−5.120)	(−5.906)
Board size	−0.011***	−0.011***	−0.011***	0.000	−0.011***
	(−17.973)	(−17.968)	(−17.974)	(0.168)	(−18.423)
Observations	59,312	59,312	59,312	59,312	59,312
Adj. R^2	0.016	0.016	0.016	0.055	0.014

Notes: This table reports how distraction affects directors' career outcomes. The dependent variable is a dummy variable that equals one if the director is replaced in the next year. Control variables are the same as those in Table 2. In Columns (4) and (5), we distinguish between whether the departure is voluntary or forced. We classify a departure as voluntary based on an analysis of news sources around turnover announcements (Alexandridis, Doukas, & Mavis, 2018) and/or if the age of the director is 72 or older. The remaining cases are classified as forced departures. Variables are defined in the Appendix. In all of the specifications, standard errors are clustered at the director level, and the corresponding *t*-statistics are reported in parentheses.
***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

last two columns of Table 9. We classify a departure as voluntary if an analysis of news sources around the turnover announcement indicates that the director stepped down voluntarily and/or if the age of the director upon the departure is above 72 years, which corresponds to the most common retirement age cited in the policies of S&P 1500 companies.[6] We consider the remaining cases to be representative of forced departures. Using this classification, the results in Columns (4) and (5) of Table 9 show that missed board meetings due to director distraction are significantly related to forced departures, but not to voluntary departures.

Overall, our findings indicate that shareholders take actions to replace distracted directors once the distraction becomes observable in terms of board meeting absence. These findings add to the literature as our measure of

[6] See Jon Lukomnik, "Board Refreshment Trends at S&P 1500 Firms," Harvard Law School Forum on Corporate Governance and Financial Regulation (February 9, 2017), https://corpgov.law.harvard.edu/2017/02/09/board-refreshment-trends-at-sp-1500-firms. The classification based on news sources follows the Alexandridis, Doukas, and Mavis (2018) analysis of CEO replacements. We thank Christos Mavis for his help with this analysis and for sharing data.

distraction is based on temporary attention-grabbing events in unrelated industries, which are events that shareholders of the focal firm might not easily link to perceived director distraction (as opposed to, e.g., severe health issues of a director). In our setting, shareholders may more easily observe the outcome of distraction rather than the cause.

5 | ALTERNATIVE EXPLANATIONS AND ROBUSTNESS

The results in the previous section are consistent with our conjecture that distracted directors spend less time and energy monitoring and advising managers, which leaves room for managers to shirk and leads to decreases in firm value. In this section, we test and rule out some alternative explanations that could drive our results.

5.1 | Endogeneity of director choice and industry relatedness

An alternative explanation that we explained earlier is related to the endogeneous nature of director choice. Because directors are likely to sit on the boards of firms in related industries, our results could be driven by industry spillover effects (Dass, Kini, Nanda, Onal, & Wang, 2014). Our use of fixed effects and our finding that both positive and negative shocks in a different industry decrease firm value in companies with distracted directors reduce this concern. Nevertheless, one could still argue that a positive shock in one industry can sometimes create a negative shock to another industry, especially when those industries are vertically related. For example, positive oil price shocks are good news for oil producers, but often reduce the profitability of oil consumer industries. In this section, we add two pieces of evidence to alleviate the concern of industry spillovers.

First, as noted, oil and gas industries often experience price shocks that are exogenous to any individual firm and then spillover to other related industries with opposite effects (e.g., Lamont, 1997). To rule out the spillover effects from energy industries, we modify our distraction measure by removing attention shocks from oil and gas industries, and focus instead on a subsample that excludes firms operating in oil and gas industries.[7] In Table 10, we reestimate the baseline specifications in Columns (4)–(6) of Table 3. In addition to *Tobin's Q*, we use *CAPEX* and *Acquisition* as dependent variables. We find that the coefficient estimates of the adjusted director distraction variables are similar to the baseline results. The magnitude and *t*-statistics are smaller for the distraction variable based on positive and negative attention shocks separately, which is not surprising as each measure now ignores some attention-grabbing cases and sends some firms with high distraction to the control group of firms with low or no distraction.

Second, we disregard shocks from supplier and customer industries. We use the three-digit North American Industry Classification System (NAICS) code to classify industries, which allows us to exclude industries that are likely to have supplier and/or customer relationships. We detect possible economic links by using the 2007 U.S. Input–Output Tables from the Bureau of Economic Analysis, which are based on NAICS codes and provide detailed information about the flows of goods and services among industries.[8] We define supplier and customer industries as those that have any flows to or from a given industry.

In Table 10, we use director distraction measures constructed based on NAICS codes and attention shocks from plausibly unrelated industries. The magnitude and *t*-statistic of the coefficient estimates are similar to those in the baseline Tables 3 and 6, suggesting that our distraction measure does indeed capture director attention shocks rather than just industry relatedness and comovement.

[7] Oil and gas industries correspond to Fama–French 49-industry codes 28–31.

[8] We use the 2007 table of commodities by industry valued at purchasers' prices under the Use Tables/After Redefinitions/Purchaser Value (https://www.bea.gov/industry/io_annual.htm).

TABLE 10 Additional tests concerning industry spillovers

Variable	Subsample excluding oil & gas (1)	(2)	(3)	Unrelated NAICS industries (4)	(5)	(6)
Panel A. Tobin's Q						
Distraction	−0.370***			−0.639***		
	(−5.273)			(−3.985)		
Distraction (*positive*)		−0.189**			−0.169*	
		(−2.325)			(−1.781)	
Distraction (*negative*)			−0.283**			−0.876***
			(−2.268)			(−5.783)
Observations	70,722	70,722	70,722	65,359	65,359	65,359
Adj. R^2	0.169	0.168	0.168	0.176	0.176	0.176
Panel B. CAPEX						
Distraction	−0.015*			−0.039**		
	(−1.924)			(−2.441)		
Distraction (*positive*)		−0.024*			−0.031*	
		(−1.733)			(−1.692)	
Distraction (*negative*)			0.008			−0.064***
			(0.702)			(−3.265)
Observations	61,467	61,467	61,467	65,352	65,352	65,352
Adj. R^2	0.156	0.156	0.156	0.076	0.076	0.077
Panel C. Acquisition						
Distraction	−0.019**			−0.031*		
	(−2.495)			(−1.777)		
Distraction (*positive*)		−0.028**			−0.048***	
		(−2.100)			(−2.784)	
Distraction (*negative*)			−0.012			−0.050***
			(−1.067)			(−2.611)
Observations	61,474	61,474	61,474	65,359	65,359	65,359
Adj. R^2	0.024	0.024	0.024	0.013	0.013	0.013

Notes: This table provides evidence mitigating the concern that our results are driven by industry spillover effects. First, we exclude firms operating in oil and gas industries and disregard attention shocks from these industries. Second, we use the three-digit North American Industry Classification System (NAICS) code as industry classification to exclude industries that are likely to have supplier or customer relationships. We reestimate the baseline specifications in Column (4)–(6) from Table 3 with *Tobin's Q*, *CAPEX*, and *Acquisition* as dependent variables in Panels A–C, respectively. In all specifications, the model is estimated with quarter fixed effects and firm fixed effects. Control variables are the same as in Tables 3 and 6 but are suppressed for brevity. Variables are defined in the Appendix. Standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

5.2 | Single-segment firms

Another potential concern is that our results are simply driven by the multisegment structure of conglomerate firms. Because our sample consists of S&P 1500 firms, which are relatively large, many of the firms in our sample operate in multiple industries. If Company 1 in our previous example also operates in the

TABLE 11 Results of single-segment firms

Variable	*Tobin's Q* (1)	*CAR (CAPM)* (2)	*CAPEX* (3)	*Acquisition* (4)	*Diversifying merger* (5)
Distraction	−0.262***	−0.034***	−0.034***	−0.022***	−0.010*
	(−3.868)	(−3.820)	(−3.389)	(−2.657)	(−1.688)
Log(*Assets*)	−0.386***	−0.011***	−0.003	0.020***	0.007***
	(−7.395)	(−4.512)	(−1.120)	(8.382)	(3.523)
Board size	0.015	0.002**	−0.013***	−0.004***	−0.001**
	(0.918)	(2.270)	(−8.164)	(−3.736)	(−2.187)
Board busyness	−0.204	−0.000	−0.093***	−0.022**	0.002
	(−1.294)	(−0.052)	(−6.373)	(−2.322)	(0.400)
Board independence	−0.231	0.003	−0.070***	0.015	0.017**
	(−1.169)	(0.299)	(−4.466)	(1.432)	(2.371)
Lagged Q			0.001	0.008***	0.004**
			(0.509)	(4.200)	(2.209)
Cash flow			0.045	0.054	0.012
			(0.420)	(1.018)	(0.395)
Investor distraction			−0.025	−0.070*	−0.017
			(−1.063)	(−1.812)	(−0.632)
Institutional ownership			0.032	0.030***	0.009
			(1.636)	(2.699)	(1.204)
Observations	54,316	43,188	47,666	47,670	47,670
Adj. R^2	0.526	0.034	0.065	0.012	0.005
Quarter fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes

Notes: This table replicates the main results in Tables 3 and 4 for the subsample of single-segment firms. We identify single-segment firms according to the number of segments reported in Compustat's segment files. In all columns, the model is estimated with quarter fixed effects and firm fixed effects. Control variables are the same as in Tables 3 and 4. Variables are defined in the Appendix. Standard errors are clustered at the firm level, and the corresponding *t*-statistics are reported in parentheses.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

automotive industry, shocks in the automotive industry could directly affect the investment and valuation of Company 1, even though the automotive segment is not the primary segment of Company 1 (Lamont, 1997; Stein, 1997).

To address this concern, we construct a subsample of single-segment firms, based on the number of segments reported in Compustat's segment files and reestimate the regressions in Tables 3, 5, and 6. If our results are driven by subsegments of conglomerate firms, we should find an insignificant effect of director distraction on the investment and valuation of single-segment firms.

As shown in Table 11, the effect of director distraction estimated for single-segment firms is similar to that in Tables 3, 5, and 6. This similarity applies to both the magnitude and the statistical significance of the effects. As such, our findings in Section 4 do not seem to be driven by the internal capital market of conglomerate firms.

TABLE 12 Results of nearest-neighbor and propensity-score matching

Measure	Tobin's Q	*CAR (CAPM)*	*CAPEX*	*Acquisition*	*Diversifying merger*
Panel A. Nearest-Neighbor Matching					
ATE	−0.130***	−0.031***	−0.014***	−0.005	−0.001
S.E.	0.011	0.005	0.003	0.005	0.004
z-Statistic	−11.418	−6.398	−4.852	−0.955	−0.284
N	8,557	7,678	8,571	8,573	8,573
Panel B. (Logistic) Propensity-Score Matching					
ATE	−0.060***	−0.025***	−0.011***	−0.011**	−0.006*
S.E.	0.015	0.005	0.003	0.005	0.003
z-Statistic	−4.101	−5.488	−3.284	−2.354	−1.769
N	8,557	7,678	8,571	8,573	8,573
Panel C. (Probit) Propensity-Score Matching					
ATE	−0.077***	−0.022***	−0.012***	−0.015***	−0.008***
S.E.	0.029	0.005	0.004	0.004	0.003
z-Statistic	−2.659	−4.831	−2.984	−3.457	−2.667
N	8,557	7,678	8,571	8,573	8,573

Notes: This table reports the results from nearest-neighbor and propensity-score-matching estimation. The outcome variables are *Tobin's Q*, *CAR (CAPM)*, capital expenditure (*CAPEX*), acquisition likelihood (*Acquisition*), and diversifying deal likelihood (*Diversifying merger*). Firms with high director distraction ($Distraction_{ft} > 0.205$) are in the treatment group, and firms that have no director distraction ($Distraction_{ft} = 0$) are placed in the control group and are matched to the treated firms along a set of relevant and observable characteristics: firm size (logarithm of total assets), one-quarter lagged Tobin's Q, board size, busy board (ratio), board independence (ratio), fiscal year and quarter, and Fama–French 49 industries (from Kenneth R. French's data library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). Each observation in the treatment group is matched with the nearest observation in the control group. In Panel A, we determine the nearest by using a weighted function of the covariates. In Panels B and C, we determine the nearest by using the propensity scores estimated, respectively, by the logistic treatment model and the probit treatment model. Each panel reports the estimated average treatment effect (ATE) of high director distraction, robust Abadie–Imbens standard error (S.E.), corresponding *z*-statistic, and number of observations in the treatment group.

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

5.3 | Robustness checks: Matching

In addition to ordinary least squares (OLS) estimations, we now use the nearest-neighbor and propensity-score-matching strategies to test the robustness of our results (Abadie & Imbens, 2006). More specifically, firms with high director distraction ($Distraction_{ft} > 0.205$) are in the treatment group, and we construct control groups of firms that have no director distraction ($Distraction_{ft} = 0$) and are matched to the treated firms along a set of relevant and observable characteristics: firm size (logarithm of total assets), one-quarter lagged Tobin's Q, board size, busy board (ratio), board independence (ratio), fiscal year and quarter, and Fama–French 49-industry classification. Each observation in the treatment group is matched with the nearest observation in the control group. Table 12 reports the results of the matching analysis.

In Panel A of Table 12, we determine the nearest match by using a weighted function of the covariates. In Panels B and C, we determine the nearest match by using the propensity scores estimated by a logistic treatment model and probit treatment model, respectively. We find a negative and significant effect of high director distraction on firms' valuation and investment in all specifications, consistent with our baseline results in Section 4. The matching estimates are even larger in economic magnitude and stronger in statistical significance.

6 | CONCLUSION

Boards of directors are tasked with the critical function of actively monitoring and advising top management. By exploiting exogenous shocks to unrelated industries in which directors have additional directorships, we show that director attention affects board monitoring intensity, and thereby firm value, as management becomes less active. Firms with more director distraction invest significantly less and are less likely to announce takeovers. These changes are due to firms with distracted directors being less active rather than postponing their investments. Our results suggest that an effective board of directors prevents manager from shirking or enjoying a quiet life at the expense of shareholder value.

Our results contribute to the important and lively debate on the busyness of directors. Directors holding multiple directorships have to divide their attention, but the reason they are appointed to multiple boards likely reflects their quality. Isolating busyness from ability is therefore a challenging task, as having multiple directorships might reflect both. Our study is able to disentangle busyness from director ability and provides evidence on the costs of having busy directors. As such, our findings render support for policies restricting the number of directorships that an individual is allowed to have. Indeed, according to the Spencer and Stuart U.S. Board Index 2016 Report, 74% of S&P 500 firms now impose some restrictions on their directors' ability to accept other corporate directorships, compared to 27% in 2006.

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APPENDIX: VARIABLE DESCRIPTIONS

Variable	Description
Dependent variables	
Tobin's Q	Book value of assets plus the market value of common equity minus the book value of common equity and deferred taxes divided by total assets: $(atq + (cshoq \times prccq) - ceqq)/atq$
Cumulative returns	Cumulative excess stock returns ($Ret - R_f$) over each fiscal quarter
CAR (CAPM)	Cumulative market-adjusted returns based on the the capital asset pricing model
CAR (FF4)	Cumulative returns adjusted for the four Fama–French risk factors (Carhart, 1997; Fama & French, 1993)
CAPEX	Invested capital divided by lagged total assets: $icaptq/atq_{t-1}$
Acquisition	Dummy variable equal to one if a firm announces a merger and acquisition (M&A) transaction in a given fiscal quarter and zero otherwise. We consider all majority-stake acquisitions recorded in the Securities Data Company database from 1996 to 2014 with a minimum deal value of $10 million.

Variable	Description
Diversifying merger	Dummy variable equal to one if a firm announces a cross-industry M&A transaction in a given fiscal quarter and zero otherwise. A deal is cross-industry if the bidder and target are not in the same Fama–French 49 industries (from Kenneth R. French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).
Explanatory variable	
Distraction	Firm-quarter-level director distraction, computed as described in Section 3
Distraction (*positive*)	Firm-quarter-level director distraction where the attention-grabbing industries not only have abnormally high volatility but also have cumulatively a positive return in that given quarter
Distraction (*negative*)	Firm-quarter-level director distraction where the attention-grabbing industries not only have abnormally high volatility but also have cumulatively a negative return in that given quarter
Control variables	
Total assets ($ million)	Total amount of assets owned by the firm in million dollars: *atq*
Log(*Assets*)	Logarithm of total assets: log(*atq*)
Lagged Q	Previous fiscal quarter's Tobin's *Q*
Cash flow	Previous fiscal quarter's operating income before depreciation divided by lagged total assets: $oibdpq/atq_{t-1}$
Board size	Number of directors
Board busyness	Number of directors sitting on more than one board divided by the number of directors
Board independence	Number of independent directors divided by the number of directors
Institutional ownership	Fraction of the firm's stock owned by institutional investors as reported in the Thomson Reuters 13F database
Investor distraction	Investor distraction computed as in Kempf et al. (2017) with Fama–French 49 industries; attention-grabbing industries are the three best and three worst performing industries
Merger deal-level variables	
CAR(−2, +2)	Five-day cumulative abnormal return around the merger announcement date with estimation window (−280, −31)
Relative deal size	Value of transaction divided by current quarter's total asset
Diversifying deal	Dummy variable equal to one if the acquirer and target are not in the same two-digit Standard Industrial Classification industry
Private target	Dummy variable equal to one if the target firm is private
Cross-border	Dummy variable equal to one if the acquirer and target are not in the same country
Director distraction	Director *i*'s distraction regarding firm *f* in a given fiscal year, computed as summing up D_{ift} from Equation (1) over the four quarters in that fiscal year
Industry shock	Measure of the amount of attention grabbing of a given industry, computed as in Equation (5)
Attended < 75% board meetings	Dummy variable equal to one if a director has attended less than 75% of board meetings in a given year: *attend less 75 pct*
Director age	Age
Log(*Director age*)	Logarithm of director age: log(*Age*)
High-ranked directorship	Dummy variable equal to one if the market cap of the directorship is greater than median of the market cap across all firms where the director serves on the board
Independent	Dummy variable equal to one if a director is classified as independent
Number of directorships	Number of total board seats at public companies: *outside public boards* + 1
Yearly Tobin's Q	Tobin's *Q* at the end of the current fiscal year
Director-level variables (from RiskMetrics).	