Director Overlap: Groupthink versus Teamwork

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Abstract

Corporate boards are comprised of individual directors but make decisions as a group. The quality of their decisions affects firm value. In this study, we focus on one aspect of board structure— director overlap—the overlap in service for a given pair of directors in a given firm, averaged across all director pairs in the firm. Greater overlap among directors can lead to negative synergies through groupthink, a mode of thinking by highly cohesive groups where the desire for consensus potentially overrides critical evaluation of all possible alternatives. Alternatively, greater overlap can lead to positive synergies through a reduction in coordination and communication costs, resulting in more effective teamwork. We hypothesize that: (i) director overlap will have a more negative effect on firm value for dynamic firms, which value critical thinking and hence stand to lose more from groupthink; and (ii) director overlap will have a more positive effect on firm value in complex firms, which have higher coordination costs and hence benefit from better teamwork. We find results consistent with our predictions. Our results have implications for the term limits of directors because term limits impose a ceiling on director overlap.

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Director Overlap: Groupthink versus Teamwork

Corporate boards are groups of individuals who, among other things, make strategic decisions on behalf of shareholders. Boards assess, amend, and ratify major strategic decisions and managerial initiatives; select, monitor, compensate, and fire top management; and provide input and advice to the management team. The value of the firm is determined in no small measure by the quality of these decisions being made by directors as a group.

The quality of such decisions is likely to be influenced in large part by group dynamics. While the subject of group dynamics has been extensively studied by social psychologists, the finance literature contains little evidence on its impact on firm value or policy. In this paper, we focus on two aspects of group dynamics—teamwork and groupthink—that arise from the same construct of board structure, what we term as "director overlap." This is the overlap in service for a given pair of directors in a given firm, averaged across all director pairs in the firm, with higher values implying greater time spent together by directors in board service. Greater overlap among directors can lead to better teamwork (positive synergies) or groupthink (negative synergies).

Our contribution is to assess the empirical importance of group dynamics in the context of corporate boards. Adams, Hermalin, and Weisbach (2010) do not specifically discuss teamwork and groupthink, but argue that it is important to understand how group dynamics affects board decisions, particularly since such decisions have a great impact on firm value. Our work is an attempt to contribute to this gap in the literature.

While teamwork is a well-understood concept, groupthink is less so outside of the social psychology literature. Groupthink is described in the pioneering work of Janis (1971, 1972) as a mode of thinking by highly cohesive groups where the desire for consensus by the group members overrides critical thinking and correct judgment. The group attempts to minimize conflict and achieve consensus without critical evaluation of alternative viewpoints and courses of action and by ignoring or discouraging dissenting opinions. Janis (1972) identifies several conditions that make groupthink more likely. These antecedents include group cohesiveness, "structural faults" (such as homogeneity of background and ideology), and context (such as decision complexity and external threats from the environment). Janis (1972) uses several case studies, including the Bay of Pigs invasion, lack of defensive precautions at Pearl Harbor, and escalation of the Vietnam war, to illustrate how a group of smart individuals can still make bad decisions if subject to these antecedents and the resulting group dynamics.[1] By extension, corporate boards, even if they include highly talented individuals, will still make costly mistakes if they suffer from groupthink.

Along these lines, board groupthink has been blamed for failures at Enron and Worldcom as well as for the recent financial crisis.[2] Nobel laureate Robert Shiller attributes the failure of the US Federal Reserve to forecast the financial crises to groupthink.[3] Similarly, focusing on the antecedents at the board level for groupthink, one commentator notes that "many companies have individuals who serve as directors indefinitely, creating a situation where the board can become stale and not open to new ideas and the perspectives of newer members."[4]

Academic studies reinforce the idea that groupthink leads to poor group-decision-making.

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[1] See Esser (1998) for a survey of the literature in social psychology on groupthink.

[2] See "The Death of Groupthink" (Bloomberg Businessweek, 2/5/2008), "Diversity fails to end boardroom groupthink" (Financial Times online, 5/25/2009), "Banks: A better black-swan repellent" (Economist, 2/18/2010), and "Toyota, Accelerating into trouble" (Economist, 2/11/2012).

[3] Challenging the Crowd in Whispers, Not Shouts, New York Times (11/1/2008)

[4] Sarbanes-Oxley 10 Years Later: Boards Are Still the Problem (*Forbes*, 7/29/2012)

Benabou (2012) develops a model to explain corporate cultures characterized by groupthink and provides several examples of negative consequences associated with groupthink (see page 10 of his online appendix). Empirically, case studies of Swissair (Hermann and Rammal, 2010) and Marks and Spencer and British Airways (Eaton, 2001) suggest that groupthink on boards with directors who were homogeneous, insofar as they shared similar background, norms, and values, caused significant damage to these three companies. Schwartz-Ziv and Weisbach (2012), in their study of minutes of board meetings, report evidence of conditions for and symptoms of groupthink, specifically that boards, in their supervisory and monitoring role, are presented with a single option 99% of the time and disagree with the CEO only 2.5% of the time.

Thus director overlap has two offsetting effects: groupthink, which has a negative effect, and teamwork, which has a positive effect. We, therefore, do not have a hypothesis for how overlap affects overall firm value. Our focus instead is to develop hypotheses regarding the types of firms that are hurt more by groupthink and those that benefit more from teamwork.

We focus first on the negative aspects of overlap. We propose that, in dynamic environments, the costs of poor decisions will be relatively large compared to the benefits of rapid and full implementation of strategies that actually are well-chosen and correct. Such dynamic environments are more likely to require that the board consider (or even develop) and critically evaluate multiple alternatives and carefully pick the best of those alternatives given the information available. Moreover, managerial discretion (co-located with information) is greater and matters more in such firms, and thus the role of the board is potentially more important. But boards that are subject to groupthink "limit [their] discussions to a few alternative courses of action (often only two) without an initial survey of all the alternatives that might be worthy of consideration" (Janis, 1971). Thus, greater groupthink should be particularly damaging in such firms. Based on the arguments above, we propose our first hypothesis (H1): overlap will have a more negative effect on firm value for firms in dynamic industries.

We next focus on the positive aspects of director overlap, namely teamwork. Higher director overlap implies that directors have spent more time together on the board. As a result, coordination and communication costs among board members is lower. Coordination and communication costs are likely to be more significant in complex firms, such as firms that are large, and those that operate in different product markets. In such firms, overlap is likely to be more beneficial. For example, Coles, Daniel, and Naveen (2008) argue that more complex firms require greater advice from their boards. Directors have to communicate with each other effectively to decide the best strategy for the firm. Greater overlap helps directors to communicate with each other more effectively. Thus, we propose our second hypothesis (H2): overlap will have a more positive effect on firm value for complex firms.

To test our hypotheses, we construct proxies for overlap, industry dynamism, and firm complexity. We develop four proxies for overlap. The first of these, *All Overlap*, measures the extent of overlap in directors' service. We compute this measure as follows. For a board with *n* directors, for each of the ${}^{n}C_{2}$ pairs, we estimate the number of years that the pair has been together on this board. We then average this overlap across all possible pairs. The bigger this number, the greater is the director overlap. Our second measure, *Majority Overlap*, is the average number of years of overlap estimated using only the longest-serving board members who constitute the majority. For example, if there are 11 members on the board, then the overlap is estimated using only the 6 members with the highest tenure on the board. Our third measure, *Outsider Overlap* is the average number of years of overlap estimated using only the outside directors. Our final measure of overlap, *Director Tenure*, is the average of the tenures of all the directors.[5]

Finally, to extract the common information in all these proxies, we use factor analysis (as in Coles, Daniel, and Naveen, 2008) and form a factor score—termed *Overlap*—based on the natural logarithms of *All Overlap*, *Majority Overlap*, *Outsider Overlap*, and *Director Tenure*. The correlation among the four proxies is in the range of 0.79 to 0.94. The correlation between the factor score and the individual components is in excess of 0.90.

We construct four proxies for more challenging industry environments. For ease of exposition, we term these as our *dynamism* proxies since our measures capture the extent to which industry conditions are changing quickly. Our proxies are: (i) *Industry Growth*, which is the average annual sales growth of all firms in the industry. (ii) *Industry R&D*, which is the average ratio of research and development expenses to assets at the industry level. (iii) *Industry Fluidity*, which is the average (at the industry level) of the fluidity scores of Hoberg, Phillips, and Prabhala (2014). Hoberg et al. develop their fluidity scores based on a text-based search of firms' product descriptions in their 10K filings. They argue that a firm's fluidity score captures changes, threats, and external pressures in the firm's product market due to actions and tactics of competitors. (iv) *Industry Mergers*, which is the number of mergers in the industry scaled by the number of firms in that industry. The higher this value, the bigger the changes to the industry environment (see, for example, Harford, 2005).

Finally, to compute the dynamism index, for each year, we define indicator variables that equal one if the industry averages are above the 50th percentile values for industry growth,

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[5] ISS suggests closer scrutiny of firms with greater average director tenure, arguing that such boards become less independent and lack fresh ideas. See http://www.issgovernance.com/policy-gateway/2014-policy-information/

fluidity, and mergers and above the 75th percentile values for industry R&D to assets, and equals zero otherwise. *Dynamism* is the sum of these four indicator variables, and hence varies from zero to four. Greater values of this measure indicate more dynamic industries.

Our measure of firm complexity is the same as that in Coles, Daniel, and Naveen (2008), and is computed as a factor score based on the natural logarithm of firm sales, number of business segments, and leverage.

We test our hypotheses using board data for a large cross-section of firms (S&P 1500 firms) for a long time-period (1996-2014). In keeping with much of the corporate governance literature, we use Tobin's *q* as a measure of firm value.[6] This is the sum of the market value of equity plus book value of debt divided by the book value of assets.

We find results consistent with our hypotheses. Consistent with our first prediction, we find that the effect of overlap on firm value is more negative in dynamic industries. Consistent with our second prediction, we find that the effect of overlap on firm value is more positive in complex firms.

One potential concern in most studies of corporate finance is endogeneity. We believe that endogeneity is less of a concern in our study for two reasons. First, our inclusion of firm fixed-effects in all the regressions controls for any firm-level omitted variables that are time invariant. Our year fixed effects control for any changes in the macro environment that might affect both director overlap and firm value. Gormley and Matsa (2014) argue that the fixed-effects estimator is consistent and is an effective way to control for unobserved heterogeneity. Second, we use industry-level values of dynamism rather than firm-level values. Regardless, we

[6] See for example, Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990), Hermalin and Weisbach (1991), and Yermack (1996)

cannot rule out that endogeneity could be driving our results because we do not have a clean instrument or natural experiment.[7]

Our study has implications for policies specifying term limits for directors. This issue has been the focus of debate, with many governance advocates calling for term limits. The idea is that groupthink is more likely when the board is overly cohesive, which in turn is more likely when the same set of directors stays on the board for a long time together. Our finding that groupthink is detrimental to firm value suggests that setting term limits for directors may be important, particularly in dynamic industries in which decision making is likely to be more challenging and complex. Overlap does appear to promote better teamwork, however, and may be more desirable in more complex firms.

We organize the remainder of our paper as follows. Section I discusses the data and presents summary statistics. Section II presents our key results, while Section III explores the factors that exacerbate the negative effect of groupthink in dynamic firms and strengthen the positive effect of teamwork in complex firms. Section IV considers the effect of groupthink on monitoring by the board. Section V concludes.

I. Data and Summary Statistics

Our starting point is the *RiskMetrics* database, which covers directors of S&P500, S&P MidCap, and S&P SmallCap firms. We obtain data for the period 1996-2014. *RiskMetrics*

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[7] It is extremely challenging to identify an instrument that affects board groupthink but does not have a direct effect on firm value. Some studies have used the 2002 NYSE and Nasdaq regulations calling for independent boards as an instrument for different aspects of board structure. The problem with this regulation is that it affected, among other variables: board independence, board size, board co-option, the structure of audit, compensation, and nominating committees. Using the instrument to isolate the causal effect of overlap on firm value, therefore, is hard. Director deaths and geographic proximity of directors have also been used as an instrument for board structure in some studies on governance; these suffer from the same limitations.

presents the board data separately for the period 1996-2007 (legacy dataset) and for the period 2008 onwards. We use the procedure described in Coles, Daniel, and Naveen (2014) to merge the two datasets and clean the director data. We obtain accounting data from *Compustat* and stock return data from *CRSP*. We exclude firms incorporated outside the U.S.

Table I presents the summary statistics. The Appendix provides details of all variables used. We winsorize all variables at the 1st and 99th percentile levels in order to minimize the impact of outliers. The average sales for firms in our sample is $5,791 million and the average board has about 10 directors (median = 9). The average Tobin's *q* is 1.88.

In terms of our proxies for overlap, the average of *All Overlap* is 5.8, which implies that, on average, any pair of directors in our sample has served together on the same board for 5.8 years. Thus, directors appear to spend a lot of time together in common board service. When we consider only the high-tenured directors who constitute the majority, the overlap (*Majority Overlap*) is much higher at 10.1. The overlap computed using only the outsiders on the board (*Outsiders Overlap*) is similar to that estimated using all directors (5.6 vs. 5.8). The average director tenure (*Director Tenure*) is 9.5.

To extract the common variation in these variables, we compute the factor score, *Overlap*, based on the natural logarithms of *All Overlap*, *Majority Overlap*, *Outsider Overlap*, and *Director Tenure*. The table indicates that the factor score (computed separately for each firm-year) has a mean of 0.00 and a standard deviation of 0.96.

Table I also presents our dynamism measures. We define industry based on the 2-digit SIC. The average industry sales growth is 7.2% per year. The average R&D is 4.6%, but the median is just 0.9%. Measures of product market fluidity are from the online data provided by Hoberg and Phillips (http://cwis.usc.edu/projects/industrydata/). The data provides the fluidity for each firm, which we average across all firms in each industry-year. The fluidity data are available only from 1997–2013. Thus, we have fewer observations for the regressions that use this variable. The product market fluidity measure has a mean of 6.72. The higher this variable, the higher is the competitive threat from rivals in the industry. This variable is derived from business descriptions in firms' annual 10-K statements obtained using web-crawling scripts. Fluidity reflects tactics by rival firms competing in a firm's product space.[8] Intuitively, fluidity is greater when the words in the firm's business description overlap more with the words of the rivals' business description. Since our fluidity variables are at the industry level, they reflect the aggregate threats faced by the industry.[9]

To estimate *Industry Mergers*, we obtain data from SDC on the number of merger announcements made by US public acquirers in each 2-digit industry, with reported deal value greater than $1 million. We then scale the number of deals by the number of firms in that industry in that year. The average of *Industry Mergers* across industries across years is 0.05.

Finally, we form an index variable, *Dynamism*, for each firm-year to capture the combined effect of the above measures. For each year, we define indicator variables that equal one if the industry averages for sales growth, fluidity, and industry mergers are greater than the 50^{th} percentile values and equals zero otherwise. For R&D to assets, the indicator variable equals one if the average R&D to assets for the industry is greater than the 75^{th} percentile values and equals zero otherwise. *Dynamism* is the sum of these four indicator variables and thus, varies from 0 to 4. The mean in our sample is 1.69 and the median is 2.0.

Industries that score high on *Dynamism* during our sample period include electronic and

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[8] To get a better sense for how this variable is derived, refer to the example provided in Appendix 2 of Hoberg et al.

[9] We thank N.R. Prabhala for providing us with more insight into this variable.

other equipment (Apple, Skyworks Solutions etc.) and business services (Cloud Security, Computer Services Corp, Adobe etc.). Industries that score low on *Dynamism* during our sample period include wholesale trade (Ace Hardware, True Value etc.), transport (Winnebago Industries, Arctic Cat), food (Heinz, Hershey, Kellogg etc.), and apparel (Gap, Footlocker etc.).

As described earlier, complexity is a factor score based on firm size, leverage, and number of business segments as in Coles, Daniel, and Naveen (2008). We term the factor score "*Complex*." The mean is zero and the standard deviation is 0.64.

Table II reports the correlations among our various proxies for overlap (Panel A), industry dynamism (Panel B), and firm complexity (Panel C). There is high correlation among our four measures of overlap, ranging from 0.79 to 0.94. *Overlap*, as expected, is highly positively correlated (correlations > 0.90) with all four measures.

In terms of the proxies for industry dynamism, there appears to be substantially less correlation among the various measures we use (Panel B of Table II). This is not too surprising as our measures here are called "dynamism measures" for ease of exposition, but in fact represent different stages of the industry life-cycle (innovation, growth, greater competitive threats, and greater industry consolidation). Indeed, this is why we construct an index to capture the dynamism, rather than use a factor score as we do to measure director overlap.

In terms of complexity (Panel C), the correlations among the three components are modest: they range from 0.13 to 0.37. The correlations of these variables with the factor score (*Complexity*) are higher, ranging from 0.48 to 0.81.

II. Main Results

First, we present the research design we use to test our two hypotheses. Second, we present univariate tests of the two predictions of the paper. Third, we present multivariate tests of our predictions.

A. Research Design

Our first prediction is that firm value will be negatively related to overlap for firms in highly dynamic industries ("dynamic firms" hereafter). The premise is that dynamic firms stand to lose a lot from groupthink. Conditional on firms being dynamic, we expect that firm value will be lower for firms with high overlap relative to firms with low overlap.

Our second prediction is that firm value will be positively related to overlap for complex firms. The premise is that complex firms stand to gain a lot from synergistic aspects of cohesion, particularly in terms of lower coordination and communication costs. Conditional on firms being complex, we expect that firm value will be higher for firms with high overlap relative to firms with low overlap.

Overall, the sensitivity of overlap to firm value varies and is summarized below.

		Complexity		
		High	Low	Overall
Dynamism	High	Net: Inconclusive (1)	Unambiguously Bad (2)	H1: Bad
	Low	Unambiguously Good (3)	No prediction (4)	No prediction
	Overall	H2: Good	No prediction	

As can be seen above, it is possible that some of the dynamic firms are also highly complex (cell 1). For these firms, hypothesis 1 and hypothesis 2 have opposite predictions and hence the net effect is inconclusive. Similarly, some firms have low dynamism as well as low complexity (cell 4). For these firms, the negative effects of groupthink are less pronounced, but so are the positive effects of better teamwork through more effective co-ordination and communication. Thus, we have no prediction for these and our hypotheses only pertain to firms in cells 2 and 3. Specifically, our H1 is applicable only for firms with high dynamism but with low complexity (cell 2). Similarly, our H2 is applicable only for firms with high complexity but with low dynamism (cell 3).

B. Impact of Overlap on *q*: Univariate Evidence

Our hypothesis is that firm value will be (i) negatively related to director overlap in firms with high dynamism, but low complexity, and (ii) positively related to director overlap in firms with high complexity, but low dynamism. Table III reports the results of the tests of these predictions in a univariate setting.

As a starting point, we first sort firms into two groups based on median values of *Overlap*. We find that the Tobin's *q* for firms with high *Overlap* is slightly smaller than that for firms with low *Overlap* (1.87 versus 1.89) and this difference is statistically insignificant (p-value = 0.12) and economically insignificant (difference in *q* is about 1% of average *q*).

To test our first hypothesis, we sort high-dynamism, low-complexity firms (independently) into two groups based on the overall median value of *Overlap*. We find that Tobin's *q* is smaller for firms with high *Overlap* compared to firms with low *Overlap* (2.31 versus 2.51, difference = –0.20). This difference is statistically significant (p-value < 0.01) as well as economically significant. Based on this difference, for a low complexity firm in a challenging market setting with average total assets, moving from the low to high overlap is associated with a decline in firm value of $260 million.

To test our second hypothesis, we consider high-complexity, low-dynamism firms. This is the group where the positive effects of overlap should dominate. We sort these firms (independently) into two groups based on the overall median value of *Overlap*. We find that Tobin's q is significantly higher in firms with high *Overlap* relative to those with low *Overlap* (1.71 versus 1.65, difference = 0.06, p-value < 0.01). The difference in q translates into an increase in firm value of $894 million given that the average firm is really large in this group, with assets of $14.89 billion (because these are more complex firms).

Overall, the univariate evidence suggests that, on average, in dynamic but less complex firms, the negative effects of overlap dominate, while in more complex firms that operate in less dynamic environments, the positive effects of overlap dominate.

C. Impact of Overlap on *q*: Multivariate Evidence

We next test our hypotheses in a multivariate setting. Our specification is given below.

$$\begin{aligned} q = \beta_0 &+ \beta_1\ High\ Overlap \times High\ Dynamism, Low\ Complexity\ Firms \\ &+ \beta_2\ High\ Overlap \times High\ Complexity, Low\ Dynamism\ Firms \\ &+ \beta_3\ High\ Overlap \times Other\ Firms \\ &+ \beta_4\ High\ Dynamism, Low\ Complexity\ Firms \\ &+ \beta_5\ High\ Complexity, Low\ Dynamism\ Firms\ + Controls + error \end{aligned}$$

The dependent variable is Tobin's q. Key explanatory variables are as follows. *High Overlap* is an indicator variable that equals one when the overlap is above the median value for that year, and equals zero otherwise. *High Dynamism, Low Complexity Firms* equals one when *Dynamism* is above the median value and *Complexity* is below the median value, and equals zero otherwise. *High Complexity, Low Dynamism Firms* equals one when *Complexity* is above the median value and *Dynamism* is below the median value, and equals zero otherwise. *Other Firms* equals one for all firms that do not belong to either of the above two groups, and equals zero otherwise. The sum of the three firm indicator variables (*High Dynamism, Low Complexity Firms* + *High Complexity, Low Dynamism Firms* + *Other Firms*), by definition, equals 1. All other explanatory variables are as in Coles, Daniel, and Naveen (2008). We expect $\beta_1 < 0$ (as per H1) and $\beta_2 > 0$ (as per H2).

All regressions, both here and through the rest of the paper, include firm-fixed effects and year-fixed effects. Also, here and through the rest of the paper, t-statistics are based on standard errors that are adjusted for firm-level clustering. Table IV presents the results.

In the first column of Table IV, we present the results with only *High Overlap* and the other control variables. Though this specification is not designed to test any of our hypotheses, we present it for the interested reader. The coefficient on *High Overlap* is 0.026, and this is statistically insignificant (p-value = 0.20). On average, overlap does not have a strong association with firm value.

Column 2 presents our main results. Consistent with our first prediction, we find that $\beta_1 < 0$. Specifically, the coefficient on *High Overlap* × *High Dynamism, Low Complexity Firms* is significantly negative (= –0.128, p-value = 0.035), implying that for firms that are dynamic with low complexity, *q* is lower by 0.128 for those with high overlap relative to those with low overlap. This difference in *q* is also economically significant given that the mean *q* for this subsample of firms is 2.4 (= 5.3% lower *q*, which translates to $166 million in market value of assets).

Consistent with our second prediction, we find that $\beta_2 > 0$. Specifically, the coefficient on *High Overlap* × *High Complexity, Low Dynamism Firms* is significantly positive (= 0.053, p-value = 0.039), implying that for firms that are complex but not dynamic, *q* is higher by 0.053 for those with high overlap relative to those with low overlap. This difference in *q* is also economically significant given that the mean *q* for this subsample of firms is 1.68 (= 3.1% higher *q*, which translates to $789 million in market value of assets).

III. Factors that Exacerbate Groupthink and Accentuate Teamwork

In this section, we examine additional implications of our hypotheses. We explore some factors that may exacerbate the harmful effect of groupthink or accentuate the positive effect of teamwork.

We first consider board size. Groupthink may be quicker to manifest in a smaller board compared to a larger board even though both boards may have the same meeting frequency (and may meet for the same amount of time). This is because individuals in smaller groups are exposed to a narrower range of perspectives and viewpoints (relative to those in larger groups). Moreover, holding overlap constant, quelling dissent and achieving consensus will be easier on a smaller board. Thus, we expect the negative impact of overlap on firm value documented earlier (for more dynamic, less complex firms) to be more pronounced in firms with smaller boards. On the flip side, coordination and communication costs are likely to be bigger for larger boards. Firms with such boards will benefit more from the reduced coordination costs and improved teamwork that results from higher overlap. We expect, therefore, that the positive effect of overlap on firm value documented earlier (for more complex, less dynamic firms) is likely to be stronger in firms with larger boards.

To test the hypotheses above, we sort firms into two groups each year based on median value of board size. Columns 1 and 2 of Table V report the results for the small- and large-board subsamples for our baseline specification (Model 2 of Table IV). For brevity, we report only the two coefficients of interest. We find that the results are as expected. The negative effect of *Overlap* on *q* (for dynamic but low complexity firms) is concentrated in the subsample with smaller boards. The coefficient on *High Overlap* × *High Dynamism, Low Complexity Firms* (β_1) is negative and significant only for the small-board subsample. The positive effect of *Overlap* (for complex, but less dynamic firms) is only present in the subsample with larger boards. The coefficient on *High Overlap* × *High Complexity, Low Dynamism Firms* (β_2) is positive and significant only for the large-board subsample.

Second, the degree to which the board is vulnerable to groupthink will depend on the number of outside connections that each board member has. Groupthink is likely to develop more quickly in a board with fewer outside connections, compared to a board with more outside connections, even though both boards may have the same overlap. This is because the board with fewer outside connections will have access to a smaller, less diverse, set of viewpoints. Moreover, insulation of the group is one of the antecedents to groupthink (Janis, 1972), and fewer outside connections is likely to be associated with more insulation of the director and the board on which she sits. Thus, we expect the negative impact of groupthink on firm value to be more pronounced in firms with fewer outside connections. In terms of coordination costs, it is likely that boards with more outside connections are busier (the connections arise precisely because at least one director of a given firm also serves on a different board). The positive effects of overlap on firm value are therefore likely to be more pronounced in firms that have boards with more outside connections.

We compute the number of outside connections as in Coles et al. (2012). For each director, we first add up the number of outside directors that he or she is directly connected to by virtue of board service in another firm. We then cumulate this across all directors on the board and get the number of unique outside connections for the entire board. Columns 3 and 4 report the results for boards with low- and high-connections subsamples. The results indicate that the negative effect of overlap on *q* for firms is concentrated in the subsample with fewer connections. Contrary to our expectation, the positive effect of overlap on q is insignificant for both subsamples.

Third, the lack of diversity of the board may amplify the negative effect of groupthink.[10] The call for greater female representation on boards in several European countries stems from this idea that diversity can reduce groupthink. In Norway a new law passed in 2003 required that women should constitute 40% of boards of Norwegian firms. More recently, the UK government appointed a commission, which recommended that women should constitute at least 25% of the boards of FTSE 100 firms.

A contrasting point of view is that diversity does not help reduce groupthink because the board members who represent the minority are frequently too intimidated to criticize other directors.[11] Also, absent regulation, boards would pick the best possible directors for the firm, but faced with constraints in terms of regulations requiring a certain percentage of women or minorities, boards are forced to make choices that may be suboptimal. In support of this latter view, Ahern and Dittmar (2012) examine the effect of the Norwegian regulation requiring greater representation of women on boards. They find that the constraint imposed by the quota caused a significant drop in the stock price at the announcement of the law and a large decline in Tobin's q over the following years. Adams and Ferreira (2009) find that mandating gender quotas for directors can reduce value in well-governed firms. We, therefore, examine the impact of gender diversity on our results.

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[10] See "The Death of Groupthink", Bloomberg Businessweek (2/5/2008) and "Why Directors Should Champion Diversity", by the Managing Partner of Ernst & Young in Director Journal (November 2010).

[11] See "Diversity fails to end boardroom groupthink", FT.com (5/25/2009) and "Why Diversity can Backfire", WSJ.com (6/14/2012).

Our expectation for diversity is that less diverse boards should have more groupthink (holding overlap constant) and, therefore, the negative effect of overlap should be more pronounced in such firms. The positive effect of overlap, on the other hand, should be more pronounced in more diverse boards as these boards may have higher co-ordination costs.

Columns 5 and 6 of Table V report the results for the subsamples with low and high fraction female directors. We find no evidence that the negative effect of groupthink is more pronounced in firms with a smaller fraction of female directors on the board. Further, contrary to our expectations, the positive effect of overlap on *q* is higher in firms that have lower fraction of female directors.[12]

Finally, we consider the fraction of directors on the board that are CEOs of other firms. The idea is that lower-ability directors may be more vulnerable to groupthink. One proxy for director ability is whether the director is CEO of some other firm. Several studies examine the impact of having CEO directors on board. Fich (2005) documents that announcement returns to director appointments are higher when the appointee is CEO of another firm. Fahlenbrach, Low and Stulz (2008), however, find that CEO directors do not have any impact on the appointing firms during their tenure. If CEO directors have higher ability, and if higher ability directors tend to suffer less from groupthink, then we should find that the harmful effect of groupthink should be higher when the fraction of CEO directors is low. CEO directors, however, are likely to be busier, and such boards may have higher co-ordination and communication costs. The

[12] As an additional robustness, in untabulated results, we also consider diversity along the dimension of director nationality. This stems from recent work that discusses the role of foreign directors (country of origin of the directors is outside the U.S.) on the boards of U.S. firms (Masulis, Wang, and Xie, 2012; Daniel, McConnell, and Naveen, 2013), particularly in multi-national corporations. We find that the negative effect of overlap on *q* is higher in firms with fewer foreign directors, suggesting that foreign directors help reduce the impact of groupthink.

positive effect of overlap on firm value may be more pronounced in the subset of firms with more CEO directors.

Columns 7 and 8 report the results for the subsamples with low and high fraction of CEO directors. We find that the coefficient on the interaction of *High Overlap* × *High Dynamism, Low Complexity Firms* is not significant in either of the two subsamples. Consistent with our expectation, the coefficient on the interaction of *High Overlap* × *High Complexity, Low Dynamism*, is significantly positive for the subsample with high fraction of CEO directors.

Overall, the results are largely (though not entirely) consistent with our predictions.

IV. Does Overlap Compromise Board Monitoring?

Thus far, we have established that director overlap could have positive or negative implications depending on the type of firm. We now examine whether overlap affects board monitoring of the CEO. We examine four aspects of board monitoring: CEO turnover-performance sensitivity, CEO pay levels, CEO pay-performance sensitivity, and investment levels. In all four cases, our specifications are based on Coles et al. (2014) who examine the effect of board co-option on monitoring. We include director overlap as an additional independent variable in their baseline specifications. Our variable definitions also follow their paper.

A. CEO Turnover-Performance Sensitivity

If boards monitor effectively, CEOs should be fired for poor performance. We, therefore, examine the effect of overlap on CEO turnover-performance sensitivity. Ideally, we should examine only forced turnovers, and see if the sensitivity of forced turnover to performance varies with overlap. It is hard, however, to distinguish clearly between forced and voluntary turnovers.

We therefore estimate logistic regression of all turnovers. We present logistic regression of (imprecisely estimated) forced turnovers as well, where the latter is defined as in Coles et al. (2014). The results are shown in Panel A of Table VI.

Column 1 presents the results with *Turnover* as the dependent variable. This equals one if there is a change in the CEO of the firm, and equals zero otherwise. As in Coles et al., we find that the coefficient on *Prior Abnormal Returns* is significantly negative, and the coefficient of *Co-option* × *Prior Abnormal Returns* is significantly positive. The coefficient on *Overlap* is significantly negative (= –0.402, p-value < 0.001), indicating that higher director overlap is associated with a lower turnover rate, which might be construed as some evidence of CEO entrenchment increasing with overlap. The interaction of *Overlap* with *Prior Abnormal Returns* is, however, statistically insignificant (= 0.098, p-value = 0.35), indicating that overlap has no effect on the sensitivity of turnover to performance.

We repeat this exercise in Column 2, but use *Forced Turnover*, rather than *Turnover*, as the dependent variable. The results are similar; we continue to find that overlap is associated with lower turnover rate, but has no effect on the sensitivity of turnover to performance.

Since we use firm-fixed effects, we lose a significant fraction of firms that never had a CEO turnover during the sample period. Also, we are unable to cluster the standard errors at the firm level in a firm-fixed effects logistic setting. In untabulated results, we repeat the two logistic regressions without firm-fixed effects, but include industry-fixed effects. We cluster the standard errors at firm level. The results are qualitatively very similar.

B. **CEO Pay Levels**

We next examine the effect of overlap on CEO pay. If boards with higher overlap are weaker monitors, then they should allow the CEO to receive greater pay. The dependent variable is logarithm of annual total CEO pay, as indicated by the Execucomp variable TDC1. Panel B of Table VI presents the results. The results on our control variables, including board co-option, are as in Coles et al. (2014). Importantly, we find that overlap has no effect on CEO pay levels. The coefficient is positive but not statistically significant (= 0.008, p-value = 0.65). Thus overlap does not appear to be associated with higher CEO pay levels.

C. CEO Pay-Performance Sensitivity

We next examine the effect of overlap on CEO delta, or pay-performance sensitivity. If boards with higher overlap are weaker monitors, then they should allow the CEO to receive greater pay with lower pay-performance sensitivity. The dependent variable is CEO delta, defined as the expected dollar change in CEO wealth for a 1% change in stock price. We follow Coles et al. (2014) and Core and Guay (2002) to estimate delta. Panel C of Table VI presents the results. The coefficients on the control variables, including board co-option, are similar to Coles et al. (2014). Importantly, we find that overlap has no effect on CEO delta. The coefficient is negative but not statistically significant (= –109.74, p-value = 0.19). Thus overlap does not appear to be associated with lower CEO delta.

D. Investment

Finally, we examine investment. Coles et al. (2014) argue that higher investment, all else equal, may be a sign of weaker monitoring. They find that co-opted boards are associated with overinvestment. We use their specification, but include overlap as an additional variable. We find, as in Coles et al., that co-option is associated with higher investment. Importantly, the coefficient on *Overlap* is positive and statistically significant (= 0.002, p-value = 0.025), indicating that, controlling for co-option, we find that overlap is also associated with higher investment.

Overall, our results in this section provide some weak evidence of less effective monitoring by boards with greater overlap. Higher overlap is associated with lower turnover rates and over investment, but is not associated with pay levels, pay-performance sensitivity or turnover-performance sensitivity.

V. Conclusion

New research in finance (e.g., Ziv-Schwartz and Weisbach, 2012) is just beginning to address board processes, how boards work as social groups, and how group dynamics affect board decision-making and firm value. In this study, we focus on one aspect of board structure–– director overlap—that influences group dynamics. Director overlap is defined as the overlap in service for a given pair of directors in a given firm, averaged across all director pairs in the firm. Overlap proxies for two features of group dynamics that are particularly relevant in the context of corporate boards: groupthink and teamwork. Greater overlap can create negative synergies, and one manifestation is groupthink. Groupthink is characterized in the literature on social psychology as a mode of thinking in highly cohesive groups, wherein critical thinking is suppressed in the interests of arriving at a unanimous decision. Alternatively, greater overlap among directors can reduce communication costs creating positive synergies, manifesting itself in better teamwork. Thus, greater overlap, by itself, is not unambiguously good or bad for a firm.

We hypothesize that firms that face dynamic industry environments will suffer relatively more from board groupthink. This is because such firms require a board to evaluate a full set of potentially risky alternatives and pick the best given the information available. We also hypothesize that complex firms stand to benefit more from overlap because it reduces coordination and communication costs. We find results consistent with our hypotheses.

Janis (1972, pg. 209-215) proposes potential approaches to preventing groupthink. If groupthink is a significant concern, firms themselves, market institutions (e.g., via listing requirements), market participants (e.g., institutional investors), proxy rating firms, and regulators will be likely to attempt prevention (if they have not already). Our analysis suggests that limiting board tenure would reduce the proclivity of the board to engage in destructive groupthink. Certainly, groupthink is a visible, present concern for investors. PIMCO, one of the largest global investment firms, with nearly $2 trillion in assets under management, goes to great lengths to avoid groupthink in its own decision-making. In its annual meeting, in which the firm attempts to predict secular trends that will drive markets in the future, it specifically invites speakers who are outside the firm and new hires that are not yet influenced by the PIMCO way of thinking, with the stated objective of avoiding groupthink.[13] Proxy advisor Institutional Shareholder Services (ISS) encourages avoidance of groupthink through its governance rating system, which states that "[l]imiting [nonexecutive] director tenure allows new directors to the board to bring fresh perspectives." CALPERS, similarly, announced in 2011 that they were developing a new digital resource devoted to finding "untapped diverse talent to serve on corporate boards" and that this would be "an important step towards challenging groupthink in corporate boardrooms."

[13] In the 2010 Economic Outlook posted on PIMCO's website, Mohamed El-Erian, the CEO of PIMCO writes, "Once again, we were privileged to listen to presentations by four global thought leaders who exposed us to fresh perspectives,…, And, once again, our new class of MBAs and PhDs enlightened us with their views of the world…"(refer http://www.pimco.com/Documents/Secular%20Outlook%20May_10%20WEB.pdf)

References

Adams, R., D. Ferreira, 2009. Women in the boardroom and their impact on governance and performance? *Journal of Financial Economics* 94, 291-309.

Adams, R., B. Hermalin, and M. Weisbach, 2010. The role of boards of directors in corporate governance: a conceptual framework and survey. *Journal of Economic Literature* 48, 58-107.

Ahern, K. R., Ditmar, A. K., 2012. The changing of the boards: the impact on firm valuation of mandated female board representation, *Quarterly Journal of Economics* 127, 137-197.

Benabou, R., 2012. Groupthink: collective delusions in organizations and markets. *Review of Economic Studies*, Forthcoming.

Coles, J., N. Daniel, and L. Naveen, 2008. Boards: does one size fit all? *Journal of Financial Economics* 87, 329-356.

Coles, J., N. Daniel, and L. Naveen, 2012. Board Advising. Working Paper, University of Utah, Drexel University, and Temple University.

Coles, J., N. Daniel, and L. Naveen, 2014. Co-opted boards. *Review of Financial Studies* 27, 1751-1796.

Eaton, J. 2001. Management communication: The threat of groupthink. *Corporate Communication* 6, 183–192.

Esser, J., 1998. Alive and Well after 25 Years: A Review of Groupthink Research. *Organizational Behavior and Human Decision Processes* 73, 116–141.

Harford, J., 2005. What drives merger waves? *Journal of Financial Economics* 77, 529-560.

Hermalin, B., M. Weisbach, 1991. The effects of board composition and direct incentives on firm performance. *Financial Management* 20, 101-112.

Hermann, A., H. Rammal, 2010. The grounding of the "flying bank, *Management Decision* 48 1048 – 1062.

Hoberg, G., G. Phillips, 2010. Product market synergies and competition in mergers and acquisitions: a text-based analysis. *Review of Financial Studies* 23, 3773-3811.

Hoberg, G., G. Phillips, 2014. Text-based network industries and endogenous product differentiation. *Working paper*, University of Southern California and University of Maryland.

Hoberg, G., G. Phillips, and N. Prabhala, 2014. Product Market Threats, Payouts, and Financial Flexibility. *Journal of Finance*, Forthcoming.

Janis, I., 1971. Groupthink. Psychology Today 5, 43-46, 74-76.

Janis, I., 1972. *Victims of Groupthink: a Psychological Study of Foreign-Policy Decisions and Fiascoes*. Boston: Houghton-Mifflin.

Masulis, R., Wang, C., and Xie, F., 2012. Globalizing the boardroom: The effect of foreign directors on corporate governance and firm performance. *Journal of Accounting and Economics*, 53, 527-551.

McConnell, J., N. Daniel, and L. Naveen, 2013. The advisory role of foreign directors in U.S. firms. *Working Paper*, Purdue University, Drexel University, and Temple University.

McConnell, J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial Economics* 27, 595-612.

Morck, R., Shleifer, A., Vishny, R., 1988. Management ownership and market valuation: an empirical analysis. *Journal of Financial Economics* 20, 293-315.

Yermack, D., 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics*, 40, 185-212.

Table I
Descriptive Statistics

The table below provides descriptive statistics for our key variables. The sample consists of all firms on *RiskMetrics* database for the years 1996-2014. *Tobin's q* is the sum of market value of equity and the book value of debt, scaled by the book value of assets. We use four proxies for director overlap: (i) *All Overlap* is the average number of years of overlap among the various board members. For each unique pair of directors on the board, we compute the overlap in their service, which is the minimum of the tenure of the pair of directors. We then average this number across all unique director pairs on the board. (ii) *Majority Overlap* is the average number of years of overlap estimated using only the longest-serving members of the board members who constitute the majority. For example, if there are 11 members on the board, then the overlap is estimated using only the 6 members with the highest tenure on the board. (iii) *Outsider Overlap* is the average number of years of overlap estimated using only the outside directors. (iv) *Director Tenure* is the average of all directors' tenure. *Overlap* is the factor score estimated using the natural logarithm values of the four proxies. We use four proxies for dynamism at the industry (2-digit SIC) level: (i) *Industry Growth* is the average growth rate in sales over the most recent year at the industry level. (ii) *Industry R&D* is the average ratio of research and development expenses to assets at the industry level. (iii) *Industry Fluidity* is given by Hoberg, Phillips and Prabhala (2014) and it measures the extent of competitive threats facing firms in the industry, and is averaged across firms at the industry level. (iv) *Industry Mergers* is the number of mergers undertaken by acquirers in each industry in each year scaled by the number of firms in that industry in that year. To compute the dynamism index, for each year, we define indicator variables that equal one if the industry averages are above the 50th percentile values for industry growth, fluidity, and mergers and above the 75th percentile values for industry R&D to assets, and equals zero otherwise. *Dynamism* is the sum of these four indicator variables, and hence varies from zero to four. We use three proxies for firm complexity: (i) Natural logarithm of Sales, (ii) Number of business segments, and (iii) Leverage, defined as total debt to total assets. *Complexity* is the factor score estimated using the three proxies.

	Observations	Mean	Std.	Median	p25	p75
Firm Characteristics						
Board Size	23,754	9.5	2.6	9.0	8.0	11.0
Tobin's *q*	23,747	1.88	1.24	1.47	14	2.13
Director Overlap Proxies						
All Overlap	23,522	5.8	2.5	5.4	4.1	7.1
Majority Overlap	23,522	10.1	4.5	9.5	7.0	12.5
Outsider Overlap	23,509	5.6	2.5	5.2	3.8	6.9
Director Tenure	23,532	9.5	3.8	9.0	6.8	11.6
Overlap (Factor Score)	23,509	0.00	0.96	0.06	-0.58	0.64
Dynamism Proxies						
Industry Growth	23,672	0.072	0.106	0.074	0.027	0.120
Industry R&D	23,672	0.046	0.065	0.009	0.001	0.082
Industry Fluidity	21,663	6.72	2.39	6.52	4.97	7.92
Industry Mergers	23,672	0.05	0.04	0.05	0.02	0.07
Dynamism (Factor Score)	21,597	1.69	1.05	2.00	1.00	2.00
Complexity Proxies						
Sales	23,749	5,791	12,840	1,577	610	4,746
# Segments	21,021	2.5	1.6	2.0	1.0	3.0
Leverage	23,742	0.22	0.17	0.21	0.07	0.34
Complexity (Factor Score)	21,018	0.00	0.64	-0.03	-0.47	0.42

Table II
Correlations

The table below reports the correlations among the proxies for board overlap (Panel A), dynamism (Panel B) and firm complexity (Panel C). All variables are defined in Table I.

Panel A: Overlap Proxies

	Ln(All Overlap)	Ln(Majority Overlap)	Ln(Outsider Overlap)	Ln(Director Tenure)	Overlap
Ln(All Overlap)	1.00				
Ln(Majority Overlap)	0.91	1.00			
Ln(Outsider Overlap)	0.92	0.82	1.00		
Ln(Director Tenure)	0.89	0.94	0.79	1.00	
Overlap (Factor Score)	0.97	0.95	0.90	0.94	1.00

Panel B: Dynamism Proxies

	Industry Growth	Industry R&D	Industry Fluidity	Industry Mergers
Industry Growth	1.00			
Industry R&D	-0.03	1.00		
Industry Fluidity	0.02	0.02	1.00	
Industry Mergers	0.20	0.18	0.08	1.00

Panel C: Complexity Proxies

	Ln(Sales)	# Segments	Leverage	Complexity
Ln(Sales)	1.00			
# Segments	0.37	1.00		
Leverage	0.21	0.13	1.00	
Complexity (Factor Score)	0.81	0.75	0.48	1.00

Table III
Impact of Overlap on Firm Value: Univariate evidence

The table presents univariate tests of our two hypotheses. First, we sort firms into two groups based on median value of *Overlap*. Row 1 reports the average Tobin's *q* for the two groups. Second, we consider the subsample of firms that are high *Dynamism* and low *Complexity*. Row 2 reports the average Tobin's *q* for this subsample based on whether *Overlap* is high or low. Third, we consider the subsample of firms that are high *Complexity* and low *Dynamism*. Row 3 reports the average Tobin's *q* for this subsample based on whether *Overlap* is high or low. Column 3 reports the difference in *q* across high- and low-*Overlap* firms. The last column reports the p-value for the test of differences in mean *q* across high and low-*Overlap*. *Overlap*, *Dynamism*, and *Complexity* are defined in Table I.

	Tobin's *q* for firms with			
	High Overlap (1)	Low Overlap (2)	Difference in Tobin's *q* (3)	p-value for test of (1) = (2)
All firms	1.87	1.89	–0.02	*0.12*
High Dynamism, Low Complexity firms	2.31	2.51	–0.20	*0.00*
High Complexity, Low Dynamism firms	1.71	1.65	0.06	*0.01*

Table IV

Impact of Overlap on Firm Value: Multivariate Evidence

The table below reports regression results where the dependent variable is Tobin's *q*. This is the sum of market value of equity and the book value of debt, scaled by the book value of assets. *High Overlap* is an indicator variable that equals one when *Overlap* is above the median value for that year, and equals zero otherwise. *High Dynamism, Low Complexity Firms* equals one when *Dynamism* is above the median value and *Complexity* is below the median value, and equals zero otherwise. *High Complexity, Low Dynamism Firms* equals one when *Complexity* is above the median value and *Dynamism* is below the median value, and equals zero otherwise. *Other Firms* equals one for all firms that do not belong to either of the above two groups, and equals zero otherwise. *Overlap, Dynamism*, and *Complexity* are defined in Table I. *Board Size* is the number of directors on the board. *Fraction Independent* is the ratio of the number of independent directors on the board to board size. *R&D/Assets* is the ratio of the firm's R&D to assets. *Segments* is the number of business segments of the firm. *Leverage* is the ratio of total debt to total assets. *Firm Size* is the natural logarithm of sales. *Risk* is the standard deviation of daily returns. *ROA* is EBITDA/Assets. *Intangibles/Assets* equals Assets – Net property, plant, and equipment, scaled by assets. *CEO Ownership* is the percentage share ownership of the CEO. All variables are winsorized at 1st and 99th percentile values. Intercept is included in all regressions but not reported. *t-statistics* given in parentheses are based on standard errors corrected for heteroskedasticity and firm-level clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

	Dependent Variable = Tobin's *q*	
	1	2
High Overlap × High Dynamism, Low Complexity Firms (β_1)		**-0.128****
		(-2.1)
High Overlap × High Complexity, Low Dynamism Firms (β_2)		**0.053****
		(2.1)
High Overlap × Other Firms		0.044
		(1.4)
High Overlap	0.026	
	(1.3)	
High Dynamism, Low Complexity Firms		0.154***
		(2.9)
High Complexity, Low Dynamism Firms		0.011
		(0.4)
Log(Board Size)	-0.313***	-0.332***
	(-4.5)	(-4.4)
Fraction Independent	-0.207**	-0.175
	(-2.1)	(-1.6)
R&D/Assets	3.577***	3.233***
	(3.7)	(3.2)
Segments	0.011	0.011
	(1.1)	(1.0)
Leverage	-0.835***	-0.878***
	(-6.9)	(-6.5)
Firm Size	-0.409***	-0.434***
	(-9.2)	(-8.8)
Risk	105.090***	100.908***
	(6.1)	(5.8)
ROA	5.332***	5.198***
	(20.2)	(18.7)
ROA_{t-1}	0.865***	0.857***
	(5.2)	(4.8)
ROA_{t-2}	0.657***	0.558***
	(3.3)	(2.7)
Intangibles/Assets	0.610***	0.644***
	(3.7)	(3.5)
CEO Ownership	0.001	0.001
	(0.2)	(0.2)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	19,967	18,289
R^2	0.26	0.26

Table V

Factors that Exacerbate the Impact of Groupthink and Amplify the Impact of Teamwork

The table reports regression results where we re-estimate our baseline specification (Model 2 of Table IV) for various subsamples. The dependent variable is Tobin's *q*, which is the sum of market value of equity and the book value of debt, scaled by the book value of assets. *Board Size* is the number of directors on the board. Small and large board subsamples are based on the median board size for each year. We compute *Outside Connections* as follows. For each firm, we compute the number of unique outside directors that each director on that firm is connected to, and then we cumulate this number across all directors for that firm. Low and high outside connections subsamples are based on the median outside connections for each year. *Fraction Females* represents the fraction of female directors on the board. The low and high groups are based on the median *Fraction Females*. *Fraction CEOs* represents the fraction of CEO directors on the board. The low and high groups are based on the median *Fraction CEOs*. . All other variables are as defined in Table I. In the interests of conciseness, we report only the results on the key independent variables. All variables are winsorized at 1st and 99th percentile values. *t-statistics* given in parentheses are based on standard errors corrected for heteroskedasticity and firm-level clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

	Board Size		Outside Connections		Fraction Females		Fraction CEOs	
	Small	Large	Low	High	Low	High	Low	High
High Overlap	-0.126*	-0.080	-0.153**	-0.012	-0.107	-0.143	-0.032	-0.160
× High Dynamism, Low Complexity Firms (β_1)	(-1.8)	(-0.7)	(-2.1)	(-0.1)	(-1.5)	(-1.4)	(-0.4)	(-1.5)
High Overlap	0.055	0.050*	0.072	0.042	0.058*	0.055	0.046	0.083*
× High Complexity, Low Dynamism Firms (β_2)	(1.3)	(1.7)	(1.6)	(1.4)	(1.9)	(1.4)	(1.4)	(1.7)
Controls as in Table IV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,957	7,332	9,005	9,284	9,757	8,472	9,896	6,324
R^2	0.238	0.308	0.242	0.297	0.212	0.313	0.240	0.260

Table VI
Impact of Overlap on Monitoring

The table reports regression results for the effect of groupthink on monitoring. We report the results of logistic regressions, where the dependent variable is *Turnover* (Column 1, Panel A) and *Forced Turnover* (Column 2, Panel A). We report regression results for logarithm of *CEO Pay* (Panel B), for *CEO Delta* (Panel C), and *Investment* (Panel D). *Turnover* equals 1 if the CEO departs, and equals 0 otherwise. *Forced Turnover* equals 1 if the CEO departs and is younger than 60 years of age, and equals 0 otherwise. *CEO Pay* is the total annual pay of the CEO as given by *Execucomp* variable TDC1. *CEO Delta* is the pay-performance sensitivity of the CEO, and is the expected dollar change in CEO wealth for a 1% change in stock price, where components of delta arise from current CEO holdings of own-firm stock and options, per Core and Guay (2002). For regressions of *CEO Pay* and *CEO Delta*, we drop firm-years that had a turnover and require that the CEO's tenure be at least one year. This ensures that we do not consider pay for fractional years. *Investment* is the ratio of capital expenditure to assets. For turnover years, *Prior Abnormal Return* is measured as the annual stock returns in the year leading up to the actual date of CEO turnover minus the value-weighted market returns over that period. For non-turnover years, *Prior Abnormal Return* is measured as the stock returns over the previous fiscal year minus the value-weighted market returns over that period. *Co-option* is the number of directors appointed after the CEO assumed office divided by the board size. t-statistics given in parentheses are based on standard errors corrected for heteroskedasticity and firm-level clustering (except in Panel A). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Panel A: CEO Turnover-Performance Sensitivity

	Dependent variable =	
	Turnover	Forced Turnover
Overlap × Prior Abnormal Return	**0.098**	**-0.420**
	(0.9)	**(-1.6)**
Overlap	-0.402***	-0.410**
	(-4.9)	(-2.5)
Prior Abnormal Return	-1.216***	-2.776***
	(-5.6)	(-5.1)
Co-option × Prior Abnormal Return	1.078***	2.317***
	(3.3)	(2.7)
Co-option	0.132	1.940***
	(0.4)	(2.7)
Fraction Independent	-0.953**	-0.546
	(-2.2)	(-0.5)
Firm Size	-0.305**	-0.454*
	(-2.4)	(-1.7)
CEO Tenure	0.330***	0.095**
	(14.7)	(2.6)
CEO Ownership	-0.045**	-0.113
	(-2.0)	(-1.2)
CEO Duality	-0.027	-0.611*
	(-0.2)	(-1.9)
Outside Director Ownership	-0.014	0.007
	(-1.5)	(0.4)
GIM Index	-0.109*	0.021
	(-1.9)	(0.1)
Board Size	0.080**	0.027
	(2.4)	(0.3)
Female Director	-0.006	-0.288
	(-0.0)	(-0.9)
Fixed effect	Firm, Year	Firm, Year
Observations	8,451	1,763

Panel B: CEO Pay Levels

	Log(CEO Pay)
Overlap	**0.008**
	(0.5)
Co-option	0.238***
	(3.8)
Fraction Independent	0.230***
	(2.6)
Firm Size	0.341***
	(12.6)
Stock Returns	0.118***
	(7.6)
ROA	1.210***
	(7.9)
CEO Tenure	-0.007*
	(-1.9)
CEO Ownership	-0.011**
	(-2.5)
CEO Duality	0.061***
	(2.7)
Outside Director Ownership	-0.001
	(-1.5)
GIM Index	-0.001
	(-0.1)
Board Size	-0.001
	(-0.1)
Female Director	0.008
	(0.3)
Fixed effect	Firm, Year
Observations	14,579
R^2	0.232

Panel C: CEO Pay-Performance Sensitivity

	Pay-performance sensitivity
Overlap	**-109.74**
	(-1.3)
Co-option	-1,781.06**
	(-2.0)
Fraction Independent	-1,243.39**
	(-2.1)
Firm Size	321.65
	(1.1)
Market to book ratio	1,241.08**
	(2.2)
R&D/Assets	-15,330.44*
	(-1.8)
Capex/Assets	-2,639.92
	(-0.9)
Leverage	1,303.15
	(1.2)
Volatility	-168.76**
	(-2.4)
CEO Tenure	203.44***
	(2.9)
CEO Duality	726.63**
	(2.0)
Outside Director Ownership	2.45
	(0.8)
GIM Index	227.91
	(0.9)
Board Size	13.53
	(0.2)
Female Director	167.97
	(1.2)
Fixed effect	Firm, Year
Observations	14,114
R^2	0.032

Panel D: Investment

	Capital Expenditure/Assets
Overlap	**0.002**** **(2.2)**
Co-option	0.008*** (3.3)
Fraction Independent	-0.003 (-1.1)
CEO Delta	0.000 (0.2)
CEO Vega	-0.000 (-1.5)
CEO Tenure	-0.000** (-2.2)
CEO cash compensation	0.000*** (3.0)
Firm Size	0.005*** (10.1)
Cash from operations/Assets	0.000 (0.2)
Sales Growth	0.039*** (6.1)
Leverage	0.004** (2.3)
Stock Returns	-0.018*** (-4.3)
Fixed effect	Firm, Year
Observations	21,220
R^2	0.131