BOARD GROUPTHINK

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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 particular aspect of group dynamics, groupthink. Groupthink is described as a mode of thinking by highly cohesive groups where the desire for consensus and agreement by the group members potentially overrides critical thinking and correct judgment. Based on the idea that greater overlap and interaction among group members leads to greater group cohesiveness which, in turn, leads to greater groupthink, we develop and empirically deploy four proxies for groupthink. We hypothesize that (i) groupthink negatively affects firm value, and (ii) groupthink will have a more negative effect on firm value for firms in dynamic, complex industries. While we find varying support for the first prediction, we do find strong results consistent with our second prediction. Our results have implications for the appropriate structure and decision-process design of corporate boards.

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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, they select, monitor, compensate, and fire top management, and they 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. Group dynamics have been extensively studied by social psychologists. Nonetheless, the finance literature contains little evidence on the impact of group dynamics on firm value or policy. In this paper, we focus on one particular aspect of group decision-making, groupthink. Our contribution is to develop measures of board groupthink and assess the empirical importance of this specific group dynamic. In particular, we find that the negative association between board groupthink and firm value is particularly detrimental to firms in more challenging, complex, dynamic environments in which decision-making is likely to demand both consideration of a full set of alternatives and appropriate deliberation and productive dissent. Such industries include those that experience rapid growth, are more innovative, operate in more fluid product markets, or experience higher levels of merger activity.

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 and agreement 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 opinion. Janis (1972) identifies several conditions that

make groupthink more likely. These 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 war in Viet Nam, 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 crises.[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 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. Further research reinforces the idea that groupthink leads to poor group-decision-making. Benabou (2012) develops a model to explain corporate cultures characterized by groupthink and provides several examples of negative consequences associated with groupthink

[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)

(see page 10 of the online appendix). 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. Finally, Adams, Hermalin, and Weisbach (2010), while they do not specifically discuss groupthink, note the paucity of research on board decision-making. They argue that it is important to understand how board decisions are affected by group dynamics, particularly since such decisions have a great impact on firm value. Our work is an attempt to contribute to this gap in the literature.

Our primary point of departure is the proposition that groupthink is not desirable for boards and the firms they oversee. Our first hypothesis (H1) is that firm value will decline with groupthink.

Nonetheless, we acknowledge that it is possible that there are some benefits to groupthink. For example, group decision-making can be more rapid and maneuverable when fewer options are considered and disagreement is suppressed. In addition, consensus can lead to heightened commitment to the decision and, thus, better implementation of the associated plan of action. Of course, these aspects of groupthink apply to both good and bad decisions, with the relative costs of poor decisions being higher under rapid and complete implementation than they would be otherwise. We propose that the relative benefits and costs of groupthink, and the net effect on firm value, will vary with firm and industry characteristics. Specifically, for firms that operate in less complex product and factor markets, both the positive and negative aspects of groupthink are less relevant for value. A simple business environment does not require that the board make any decisions that change substantially firm strategy—the current *status quo* is effective. Operating maneuverability and full implementation, however, still may have value. In complex, uncertain,

dynamic environments the costs of poor decisions will be relatively large compared to the benefits of rapid and full implementation of strategies. Complex, uncertain, 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 second hypothesis (H2): groupthink will have a more negative effect on firm value for firms in dynamic, complex industries.

To test our hypotheses, we construct proxies for groupthink and industry dynamism. We develop four proxies for groupthink, based on the idea that greater interaction among group members leads to greater group cohesiveness, which in turn leads to greater groupthink (Janis, 1971). The first measure, *Overlap*, measures the extent of overlap in directors' service. The idea here is that spending time together over a prolonged period creates cohesiveness, which breeds groupthink. Thus a board where many pairs of directors have substantial overlap in terms of their tenure on the board will have higher groupthink, all else equal. We compute this measure as follows. For a board with *n* directors, for each of the ${}^{n}C_{2} = \binom{n}{2} = n!/2!\,(n-2)!$ pairs, we estimate the number of years that the pair has been together on this board. We then average this overlap across all the ${}^{n}C_{2}$ pairs. The bigger this number, the greater is the board groupthink.

Our second measure of groupthink, *Dirtenure*, is the average of the tenures of all the directors. The third measure, *Fracdir9*, is the fraction of directors that has been on the board for

9 years or more. We choose the cutoff of 9 years since this is the median of director tenure.[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 *Groupthink*— based on the natural logarithm of *Overlap*, the natural logarithm of *Dirtenure*, and *Fracdir9*. The correlation among the three proxies is in the range of 0.82 to 0.89. The correlation between the factor and the individual components is in excess of 0.90.

We construct five 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 an indicator variable that equals one if the average ratio of research and development expenses to assets at the industry level is above the 75th percentile value. We choose the 75th percentile value because more than 60% of firms do not have any R&D. (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 (see, for example, Harford, 2005). The higher this value, the bigger the changes to the industry environment (see, for example, Harford, 2005). (v) Finally, we construct a *Dynamism* index, which is the sum of 4 indicator variables. We start with the industry averages of sales

[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/

growth, R&D to assets, fluidity, and industry mergers. We compute the 50th percentile level of these measures (75th for R&D to assets) for each year across all industries. We define an indicator variable that equals one if the value of the industry average is above the 50th percentile for that year (75th for R&D to assets) across all industries, and equals zero otherwise. *Dynamism* is the sum of the four indicator variables and, thus, varies from 0 to 4. Greater values of this measure indicate more dynamic, challenging, complex industries.

We test our hypotheses using board data for a large cross-section of firms (S&P 1500 firms) for a long time-period (1996-2010). 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.

Univariate comparisons show that *q* is significantly (p = 0.01) lower on average for high-groupthink firms (*q* = 1.86) than low-groupthink firms (*q* = 1.91). Multivariate specifications indicate that this result is driven by the subsample of firms that operate in complex, dynamic industries. If anything, groupthink is positively related to *q* for firms in other industries. Thus, we do not find support for the blanket prediction that groupthink has a negative effect on value for all types of firms (H1). Our interpretation, consistent with (H2), is that firms in simple, less-dynamic industries benefit from rapid decision making and implementation that arise from board cohesion and groupthink.

At the same time, consistent with our second prediction, we find strong evidence that the effect of groupthink on firm value is more negative in dynamic industries. We interpret the result as indicating that for firms in dynamic industries, relative to other firms, the costs of groupthink

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

exceed the benefits. Additional tests show that our results are not driven by director diversity (based on gender or country of origin), governance (CEO and Chairman duality, board co-option, institutional blockholding, and the governance score of Gompers, Ishii, and Metrick (2003)), or firm age, all of which could be correlated with groupthink. We find that the negative effect of groupthink on firm value for dynamic industries is concentrated in firms with smaller boards and in firms that have boards with fewer outside connections. This is consistent with the idea that, holding group cohesion constant, the tendency to suffer from groupthink is harder to overcome in smaller boards and in boards with fewer outside connections.

Our results are also robust if we define industry dynamism based on the time-series rather than on the cross-section. Specifically, for each of our four main dynamism proxies, we define an indicator variable that equals one if the value of the industry average is above the 50^{th} percentile (75^{th} percentile for R&D to assets) across all years for each industry (rather than across all industries within a year), and equals zero otherwise. *Time-series Dynamism* is the sum of the four indicator variables.

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 groupthink and firm value. Second, we use industry-level values of dynamism rather than firm-level values. Regardless, we cannot rule out that endogeneity could be driving our results because we do not have a clean instrument or natural experiment.

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.

We organize the remainder of our paper as follows. In Section I, we discuss the data and present summary statistics. In Section II we present our key results, while in Section III, we consider the robustness of our results to alternative explanations and alternative specifications. Section IV 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 1996-2010. *RiskMetrics* 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. Measures of product market fluidity are from the online data provided by Hoberg and Phillips (http://www.rhsmith.umd.edu/industrydata/). The data provides the fluidity for each firm, which we average across all firms in each industry-year.

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 $5,337 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 groupthink, the average *Overlap* is 5.7, which means that, on average, any pair of directors in our sample has served together on the same board for 5.7 years. Thus, directors appear to spend a lot of time together in common board service. The average director tenure (*Dirtenure*) is 9.3 and the average of *Fracdir9* (i.e., fraction of directors who have served together on a firm's board for more than 9 years) is 39%.

Our three groupthink measures are correlated. To extract the common variation in these variables, we compute the factor score, *Groupthink*, based on the logarithm of *Overlap*, the logarithm of *Dirtenure*, and *Fracdir9*. The table indicates that the factor score (computed separately for each firm-year) has a mean of 0.00 and a standard deviation of 0.94.

Table I also presents our dynamism measures. We define industry based on the 2-digit SIC. The average industry sales growth is 7.8% per year. The average R&D for the firms in the high-R&D industries (not shown in table) is 14.7%. The product market fluidity measure has a mean of 6.82. 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.[7] 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.[8]

[7] To get a better sense for how this variable is derived, refer to the example provided in Appendix 2 of Hoberg et al.
[8] We thank N.R. Prabhala for providing us with more insight into this variable.

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 0.36.

Finally, we form an index variable, *Dynamism*, for each firm-year to capture the combined effect of the above measures. For each year, we first compute the 50th percentile values of average industry sales-growth, average industry fluidity, and average industry mergers, and the 75th percentile for average industry R&D to assets. We then define an indicator variable that equals one if the industry averages for sales growth, fluidity, and industry mergers are greater than the 50th 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 75th percentile values and equals zero otherwise. *Dynamism* is the sum of these four indicator variables and thus, varies from 0 to 1. 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 communications (AT&T, Verizon etc.) in the 1997-2001 period and chemicals & allied products (Alpharma, Abbott Labs etc.) in 2007-2010. Industries that score low on *Dynamism* during our sample period (all years) include textile mill products (Burlington Industries, Fruit of the Loom etc.), paper (International Paper, Georgia Pacific etc.), food (Heinz, Hershey etc.) and lumber (Louisiana-Pacific, Weyerhauser etc.).

Table II reports the correlations between our various proxies for groupthink (Panel A) and the correlations between our proxies for industry dynamism (Panel B). As expected, our variables for groupthink are all highly correlated. The correlation between the natural logarithm of *Overlap*, and the natural logarithm of *Dirtenure* is 0.89, and that between log(*Overlap*) and *Fracdir9* (the

fraction of the board with tenure more than 9 years) is 0.82. *Groupthink*, as expected, is highly positively correlated (correlations>0.90) with all three 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).

II. Main Results

We present below tests of the two predictions of the paper.

A. Impact of Groupthink on *q*: Univariate Evidence

Our first prediction is that firm value will be negatively related to groupthink. Table III reports the results of the test of this prediction. We sort firms into 2 groups based on median values of *Groupthink*. We find that the Tobin's *q* for firms with high *Groupthink* is smaller than for firms with low *Groupthink* (1.86 versus 1.91) and this difference is statistically significant (p = 0.014). These results are consistent with our first prediction. The average of firm-year total assets in the sample is $11.8 billion, so this difference in *q* associated with high groupthink would be an approximate decline in value of $590 million. For reasons specified in what follows, however, the average firm is not particularly relevant.

Our second prediction is that the effect of groupthink on firm value is more negative for firms in dynamic industries. To test this, we also sort firms (independently) into two groups based on median value of *Dynamism*. We find that in firms with high values of *Dynamism*, Tobin's *q* is smaller for firms with high *Groupthink* compared to firms with low *Groupthink* (2.02 versus 2.13,

difference = –0.11). Based on this difference, for a firm in a challenging market setting with average total assets, moving from the low to high groupthink is associated with a decline in firm value of $1.3 billion. This difference is statistically significant ($p<0.01$) as well as economically significant. Interestingly, we do not observe this pattern for firms in industries with low values of *Dynamism*. In such firms, Tobin's *q* is not significantly different across high and low *Groupthink* firms (1.83 for both groups), difference = 0.00, $p = 0.93$). The difference in difference (= –0.11–0 = –0.11) is significant both statistically ($p = 0.01$) and economically (again, about $1.3 billion for a firm with average total assets). These results are consistent with our prediction that, in dynamic industries, groupthink has a more negative effect on firm value.

The inferences are generally similar (from untabulated results) when we use the three individual components underlying the *Groupthink* factor (*Overlap*, *Dirtenure*, and *Fracdir9*) with *Dynamism*. Likewise, when we use the four components underlying the *Dynamism* factor (*Industry Growth*, *Industry R&D*, *Industry Fluidity*, and *Industry Mergers*) in conjunction with *Groupthink*, results follow a similar pattern, except that the results for *Industry Growth* and *Industry R&D* are weaker. Overall, the univariate evidence suggests that, on average, groupthink leads to lower firm value, and this effect is larger for firms in dynamic industries.

B. Impact of Groupthink on *q*: Multivariate Evidence

We now test our hypotheses in a multivariate setting. Again, the dependent variable is Tobin's *q* and our key explanatory variables include the *Groupthink* factor as a proxy for board groupthink, our proxies for industry dynamism, and the interaction of these two variables. All other explanatory variables are as in Coles, Daniel, and Naveen (2008). 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 examine the effect of groupthink on firm value for the full sample of firms. The coefficient on *Groupthink* is 0.014, and this is statistically insignificant (p-value = 0.47). In terms of economic significance, the results indicate that when *Groupthink* increases from the 25th to 75th percentile value (an increase of 1.25 in our data), Tobin's *q* increases by 0.018 (= 1.25 × 0.014). This represents a change of 0.9% relative to the mean *q*, which is equivalent to about $212 million for a firm with average total assets. In economic terms, as well, the result is relatively insignificant. On average, groupthink does not have a strong association with firm value.

We next turn to our prediction that the effect of groupthink on firm value will be more negative in dynamic industries. In column 2, we examine the effect of *Dynamism*, which captures the common variation in growth, innovation, product market fluidity, and merger intensity. The variable of interest is the interaction of *Groupthink* with *Dynamism*. The coefficient on this variable is negative and significant (= –0.032, p-value = 0.02). This shows that as industry dynamism increases, the effect of groupthink on *q* becomes more negative, which is consistent with our prediction (H2).[9]

The coefficient on *Groupthink Factor* is positive and statistically insignificant, but recall that this is the coefficient for firms that have *Dynamism* = 0. Only 15% of our sample firms is in this category. The total effect of groupthink on firm value turns negative when *Dynamism* = 2.2.

[9] In our regressions to this point, we use firm-fixed effects and, therefore, do not include industry dummies. One concern may be that the relation between groupthink and *q* that we document is due to some (omitted) industry-level variable that is correlated with *q*. To address this concern, we also use industry-adjusted *q* (Tobin's *q* of the firm minus the median Tobin's *q* of the industry) as the dependent variable. The results are very similar to our main results.

Dynamism, by construction, can only take 5 possible values: 0, 1, 2, 3, or 4. The distribution of *Dynamism* is as follows: *Dynamism* = 0 for 15% of the firms, ≤ 1 for 44% of firms, ≤ 2 for 76% of firms and ≤ 3 for 96% of firms. Thus, the total effect of groupthink on firm value is negative for about 24% (= 100% – 76%) of the sample.

C. Using Underlying Components of *Groupthink*

In this subsection, we test whether our results hold if we consider the variables used to construct *Groupthink*. Panel A of Table V presents the results. We estimate the same specification as in Column 2 of Table IV, but replace *Groupthink* with log(*Overlap*) in Column 1, log(*Dirtenure*) in Column 2 , and *Fracdir9* in Column 3. In all cases, we use the *Dynamism* index as our measure of industry dynamism. In all cases, for brevity, we show only the results relating to the main variables of interest—the interaction of the groupthink measure with *Dynamism*.

In column 1, we find that the coefficient on the interaction variable is negative and statistically significant (coefficient = –0.053, p-value = 0.04), indicating that, as overall industry dynamism increases, the effect of groupthink (proxied by log(*Overlap*)) on *q* becomes more negative. In Column 2, we use log(*Dirtenure*) as the proxy for groupthink. We continue to find that the interaction term is significantly negative (coefficient = –0.091, p-value < 0.01). Finally, in Column 3, we use *Fracdir9* as our measure of groupthink and find the same result. The coefficient of the interaction of *Fracdir9* with *Dynamism* is negative and significant (coefficient = –0.121, p-value = 0.02).

The coefficient on *Groupthink* is positive in all specifications. This implies that the effect of groupthink on *q* for firms whose *Dynamism* = 0 is positive. As stated earlier, fewer than 15% of firms belong to this category. The total effect of groupthink on firm value turns negative when *Dynamism* equals 2.3, 1.8, and 2.4 for the 3 specifications. Thus, using the distribution of

Dynamism given above, the total effect of groupthink on firm value is negative for 24%, 56%, and 24% of the sample.

D. Using Underlying Components of *Dynamism*

In this subsection, we test whether our results hold if we consider the underlying variables used to construct *Dynamism*. We estimate the same specification as in Column 2 of Table IV, but replace *Dynamism* with each of the four individual dynamism proxies. In all cases, we use the *Groupthink* factor. Panel B of Table V reports the results.

In column 1, we use *Industry Growth* and the interaction of *Groupthink* with *Industry Growth*. We find that the coefficient on the interaction of *Groupthink* with *Industry Growth* is negative (= –0.178) and statistically significant (p-value = 0.03). This is consistent with our prediction that the effect of groupthink on firm value is more negative in high growth industries.

Column 2 of Panel B reports the results using *Industry R&D*. Once again, we see that the coefficient on the interaction term (*Groupthink* × *Industry R&D*) is negative and statistically significant (= –0.080, p-value = 0.06). This indicates that in firms that are in highly innovative industries, the effect of groupthink on firm value is more negative relative to firms that are in less innovative industries. Once again, the results are consistent with our prediction.

In column 3, we use *Industry Fluidity*. The coefficient on the interaction of *Groupthink* with *Industry Fluidity* is negative and significant (= –0.011, p-value = 0.08). Finally, Column 4 reports the results using *Industry Mergers*. As before, the results are consistent with our prediction. The coefficient on the interaction term (*Groupthink* × *Industry Mergers*) is negative and statistically significant (= –0.223, p-value = 0.03). This indicates that in firms that are in more merger-intensive industries, the effect of groupthink on firm value is more negative relative to firms that are in less merger-intensive industries.

The coefficient on *Groupthink* is positive and significant in 3 of the 4 specifications. Recall that this is the effect of groupthink on *q* for firms that have the corresponding dynamism measure = 0. The total effect of groupthink on firm value turns negative at about the 85th, 78th, 75th, and 100th percentile value of *Industry Growth*, *Industry R&D*, *Industry Fluidity*, and *Industry Merger* respectively. Thus, the total effect of groupthink on firm value is negative for 15%, 22%, 25%, and 0% of the sample.

Overall, the results confirm our earlier finding that the effect of groupthink on firm value is negative in industries that are rapidly growing, where the firm needs to be more innovative, where the product markets are rapidly changing, and where the merger intensity is high.

III. Alternative Explanations and Robustness

Having established our main results, we explore in more detail whether alternative explanations are consistent with our results. We also consider the robustness of our results to alternative specifications.

A. Time-series Dynamism

In our results so far, we use the cross-sectional values of *Dynamism*. Thus some industries could have consistently (over time) low values of *Dynamism* while others could have consistently high values. For example, as mentioned earlier, industries like paper, textiles, food etc. have consistently low values of *Dynamism*. These industries, however, could still be subject to shocks in the time-series. To address this, we construct an alternative *Dynamism* measure, which we term as *Time-Series Dynamism*. For each year, we first form the industry levels of sales growth, R&D, fluidity, and mergers as before. For each industry, we then compute the 50th percentile values of average industry sales-growth, average industry fluidity, and average industry mergers, and the

75th percentile for average industry R&D to assets using the time series of these values within that industry. Finally, we define an indicator variable that equals one if the averages of industry growth, industry fluidity, and industry mergers for a given year are greater than the 50th percentile values and equals zero otherwise. For R&D to assets, the indicator variable equals one if the average industry R&D to assets for a given year is greater than the 75th percentile values and equals zero otherwise. *Time-Series Dynamism* is the sum of these four indicator variables and, thus, varies from 0 to 4, with a mean of 1.65 (which is similar to the cross-section *Dynamism* variable).

Table VI reports the results where we replicate Model 2 of Table IV using the 4 proxies for groupthink but with *Time-series Dynamism*. In all cases, as expected, we find the coefficient on the interaction term to be significantly negative at the 5% level or better.

B. Diversity

In this section, we measure diversity along two dimensions: gender (fraction of female directors on the board) as well as based on country of origin (fraction of foreign directors on the board).

One view is that diversity in boards reduces the negative effect of groupthink.[10] The call for greater female representation on boards in several European countries stem 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.

[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).

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.

The rationale for considering diversity along the dimension of director nationality 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. These directors are shown to be weak monitors but good advisors (Masulis, Wang, and Xie, 2012; Daniel, McConnell, and Naveen, 2013), particularly in multi-national corporations. Indeed, Daniel et al. find that these directors are most valuable when their country of origin has a business culture that is very different from that of the U.S. For example, a foreign director from a civil law country would be more valuable to a U.S. firm than one from a common law country because the director's expertise would be particularly valuable to the board. This also suggests that boards that have a greater proportion of foreign directors may have less groupthink because the foreign director would have a different perspective.

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

In our first specification in Table VII, we control for diversity in the regressions and examine whether groupthink still has a negative effect on *q*. We include both diversity measures as additional variables in our baseline specification (Column 2 of Table IV). As before, we only report the results on key variables of interest. The coefficient of the interaction of *Groupthink* and *Dynamism* is significantly negative (= –0.036, p-value < 0.01) indicating that groupthink has a negative effect on firm value even after controlling for board diversity.

Additionally, we sort firms into two groups based on high and low values for each of the two diversity measures and then estimate the baseline regression for each of these groups separately. In untabulated results, the interaction of *Groupthink* with *Dynamism* is significantly negative in the high group for fraction female directors, but is not significant in the low group of fraction female directors. For fraction of foreign directors, we find that the coefficient is not significant in the high group, but is significantly negative in the low group. It appears that inclusion of female directors on the board does not mitigate the problem of groupthink, but inclusion of foreign directors on the board does appear to reduce the harmful effect of groupthink.

C. Governance

In our baseline regression, we use the same set of control variables as in Coles, Daniel, and Naveen (2008). It is possible, however, that an omitted governance variable could be leading to lower *q* as well as higher groupthink. Therefore, we include several additional governance variables in our regression specification. Specifically, we include CEO duality (an indicator variable that equals one if the same individual serves as both CEO and Chairman of the board), board co-option (the fraction of the board comprised of directors with tenure less than the CEO as in Coles, Daniel, and Naveen (2014)), the governance index of Gompers, Ishii, and Metrick (2003), and the number of institutional blockholders.

Column 2 of Table VII reports the results. We find that controlling for additional governance variables does not qualitatively change our results. The coefficient on the interaction of *Groupthink* with *Dynamism* continues to be negative and statistically significant at the 10% level (= –0.027, p–value = 0.06), suggesting that groupthink has a negative effect on firm value for firms in more dynamic industries.

D. Firm Age

It is possible that the results in Table IV arise because firm age drives both value and groupthink. In particular, Tobin's *q* is negatively related to firm age as older firms have fewer growth options. Older firms may also have more groupthink because directors have had a chance to be together for a longer period. We, therefore, include firm age as an additional variable in the baseline regression specification. We find (column 3 of Table VII) that our main results remain. The coefficient on the interaction of *Groupthink* with *Dynamism* is negative and statistically significant (= –0.032, p–value = 0.02).

E. Board Size and Board Connections

In this sub-section, we examine additional implications of our hypotheses. Our proxies for groupthink are based on the idea that directors who spend more time interacting only with one another become more homogeneous and cohesive as a group, so that the desire for consensus and agreement by the group members supersedes critical thinking and correct judgment. The degree to which a board is susceptible to groupthink should depend on the size of that board. It will take longer for groupthink to take root in a larger board (compared to a smaller board) even though both boards may have the same meeting frequency (and may meet for the same amount of time). This is because it will take more time for directors in a larger board to develop cohesiveness (and therefore groupthink), relative to directors in a smaller board. Moreover, holding cohesiveness

constant, quelling dissent and achieving consensus will be easier on a smaller board. Thus, we expect the negative impact of groupthink on firm value in dynamic industries to be weaker in firms with larger boards.

The degree to which the board is vulnerable to groupthink will also depend on the number of outside connections that each board member has. It will take longer for groupthink to take root in a board with greater number of outside connections (compared to a board with fewer outside connections) even though both boards may have the same size. This is because the board with more outside connections will have access to a larger set of viewpoints. Moreover, insulation of the group could lead 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 in dynamic industries to be weaker in firms with more outside connections.

To test these hypotheses, we sort firms into two groups based on the median board size each year and two groups based on the number of outside connections each year. Board connections is computed 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 1 and 2 of Table VIII report the results for the small- and large-board subsamples for our baseline specification (Model 2 of Table IV). The results indicate that the negative effect of groupthink on *q* for firms in dynamic industries is concentrated in the subsample with smaller boards and those with fewer connections: the coefficient on the interaction of *Groupthink* with

Dynamism is negative and significant only for the small-board subsample and low-connections subsample.

Columns 3 and 4 report the results for boards with low- and high-connections subsamples. The results indicate that the negative effect of groupthink on *q* for firms in dynamic industries is concentrated in the subsample with low outside connections. The coefficient on the interaction of *Groupthink* with *Dynamism* is negative and significant only for this subsample, and is insignificant for the high-connections subsample.

Overall, these results are consistent with hypothesis H2 and point to the benefits (in terms of new perspectives) of having larger boards and more connected boards.

IV. Conclusions

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 board processes and social dynamics affect decision-making and firm value. In this study, we examine one aspect of group decision-making—groupthink—and its impact on firm value. 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.

We hypothesize that firms that face challenging, complex environments will suffer relatively more from board groupthink. Such firms require a board to evaluate a full set of potentially risky alternatives and pick the best given the information available. But a board that is subject to groupthink, per Janis (1971), "limits [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."

Our proxies for groupthink are based on the idea that greater cohesiveness is associated with greater groupthink (Janis, 1971). Greater cohesiveness comes from group members being together on the board for a long time. Our measures include board overlap (which is the overlap in tenure for any pair of directors averaged across all possible director pairs on the board), average director tenure, and the fraction of the board than has a tenure greater than the median director tenure of 9 years.

We construct several proxies for industries that face more challenges. These are based on the average industry growth, average industry R&D to assets, average product market fluidity for the industry, and merger intensity of the industry. The fluidity measure is based on Hoberg et al. (2014) measure of fluidity, which is designed to capture changing threats to the firms from rivals.

Overall, univariate designs find that groupthink is negatively related to firm value on average. Multivariate regression designs do not and, moreover, find that for firms operating in less-challenging industries there may even be a positive relation between groupthink and value. Furthermore, our multivariate models indicate that for firms in challenging industries, in which decision-making is likely to demand consideration of a full set of alternatives and appropriate deliberation and dissent, groupthink has a more negative effect on firm value.

Janis (1972, pages 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 larger boards, making sure boards and directors are connected externally, and limiting a drift to homogeneity and cohesiveness by limiting board tenure, all potentially 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.[12] 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." We view our paper as a first step towards assessing the causes and implications of groupthink for companies and towards addressing how costs of groupthink potentially can be avoided.

[12] 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)

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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 1996-2010. *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 board groupthink: (i) *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) *Dirtenure* is the average of all directors' tenure. (iii) *Fracdir9* is the fraction of the directors with tenure of at least 9 years (since 9 is the median director tenure across all our observations). (iv) *Groupthink* is the factor score estimated using log(*Overlap*), log(*Dirtenure*) and *Fracdir9*. We use five 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 an indicator variable that equals one if the average ratio of research and development expenses to assets at the industry level is above the 75th percentile value. (iii) *Industry Fluidity* is given by Hoberg, Phillips and Prabhala (2014) and it measures the extent of competitive threats facing firms in the industry. (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. (v) To compute *Dynamism*, for each year, we first compute the 50th percentile values of industry growth, industry fluidity, and industry mergers, and the 75th percentile for industry R&D to assets. We then 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 varies from zero to four.

	Observations	Mean	Std.	Median	p25	p75
Firm characteristics						
Sales ($M)	18,902	5,337	11,421	1,499	594	4,446
Board Size	18,902	9.6	2.7	9.0	8.0	11.0
Tobin's *q*	18,897	1.88	1.29	1.46	1.14	2.11
Groupthink proxies						
Overlap (years)	18,681	5.7	2.5	5.3	3.9	6.9
Dirtenure (years)	18,689	9.3	3.9	8.8	6.6	11.5
Fracdir9	18,689	0.39	0.23	0.40	0.22	0.56
Groupthink	18,681	0.00	0.94	0.05	-0.60	0.65
Dynamism proxies						
Industry Growth	18,845	0.078	0.114	0.082	0.031	0.125
Industry R&D	18,845	0.227	0.418	0	0	0
Industry Fluidity	17,934	6.82	2.40	6.67	5.08	8.05
Industry Mergers	18,567	0.36	0.28	0.30	0.22	0.44
Dynamism	17,615	1.69	1.07	2	1	2

Table II
Correlations

The table below reports the correlations among the proxies for board groupthink and among the proxies for industry dynamism. We use four proxies for board groupthink: (i) *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) *Dirtenure* is the average of all directors' tenure. (iii) *Fracdir9* is the fraction of the directors with tenure of at least 9 years (since 9 is the median director tenure across all our observations). (iv) *Groupthink* is the factor score estimated using log(*Overlap*), log(*Dirtenure*) and *Fracdir9*. We use five 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 an indicator variable that equals one if the average ratio of research and development expenses to assets at the industry level is above the 75th percentile value. (iii) *Industry Fluidity* is given by Hoberg, Phillips and Prabhala (2014) and it measures the extent of competitive threats facing firms in the industry. (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. (v) To compute *Dynamism*, for each year, we first compute the 50th percentile values of industry growth, industry fluidity, and industry mergers, and the 75th percentile for industry R&D to assets. We then 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 varies from zero to four.

Panel A: Groupthink Proxies

	Log(Overlap)	Log(Dirtenure)	Fracdir9	Groupthink
Log(Overlap)	1.00			
Log(Dirtenure)	0.89	1.00		
Fracdir9	0.82	0.84	1.00	
Groupthink	0.96	0.97	0.90	1.00

Panel B: Dynamism Proxies

	Industry Growth	Industry R&D	Industry Fluidity	Industry Mergers
Industry Growth	1.00			
Industry R&D	-0.002	1.00		
Industry Fluidity	0.06	0.04	1.00	
Industry Mergers	0.05	0.27	0.13	1.00

Table III
Impact of Groupthink on Firm Value: Univariate evidence

The table presents univariate tests of our two hypotheses. We use four proxies for board groupthink: (i) *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) *Dirtenure* is the average of all directors' tenure. (iii) *Fracdir9* is the fraction of the directors with tenure of at least 9 years (since 9 is the median director tenure across all our observations). (iv) *Groupthink* is the factor score estimated using log(*Overlap*), log(*Dirtenure*) and *Fracdir9*. We use five 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 an indicator variable that equals one if the average ratio of research and development expenses to assets at the industry level is above the 75th percentile value. (iii) *Industry Fluidity* is given by Hoberg, Phillips and Prabhala (2014) and it measures the extent of competitive threats facing firms in the industry. (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. (v) To compute *Dynamism*, for each year, we first compute the 50th percentile values of industry growth, industry fluidity, and industry mergers, and the 75th percentile for industry R&D to assets. We then 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 varies from zero to four. First, we sort firms into two groups based on median value of *Groupthink*. Row 1 reports the average Tobin's *q* for the two groups. Second, we independently sort firms into 2 groups based on *Dynamism*. Rows 2 and 3 report the average Tobin's *q* for each of the four groups (high and low *Groupthink* as well as high and low *Dynamism*). Column 3 reports the difference in Tobin's *q* for the high- and low-groupthink firms. The last row reports the p-value for a test of the difference in difference. The first difference is the difference in *q* across high- and low-groupthink firms for each of the 2 subsamples: those in high- and low-dynamic industries. The second difference is the difference in q for the firms in high-dynamism industries minus the difference in q for the firms in low-dynamism industries.

	Tobin's *q* for firms with			
	High Groupthink (1)	Low Groupthink (2)	Difference in Tobin's *q* (3)	p-value for test of (1)=(2)
All firms (N = # observations)	1.86 (9335)	1.91 (9343)	-0.05	*0.01*
High Dynamism (N)	2.02 (1890)	2.13 (2290)	-0.11	*0.01*
Low Dynamism (N)	1.83 (6855)	1.83 (6495)	0.00	*0.93*
p-value for difference-in-difference			*0.01*	

Table IV

Impact of Groupthink 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. We use four proxies for board groupthink: (i) *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) *Dirtenure* is the average of all directors' tenure. (iii) *Fracdir9* is the fraction of the directors with tenure of at least 9 years (since 9 is the median director tenure across all our observations). (iv) *Groupthink* is the factor score estimated using log(*Overlap*), log(*Dirtenure*) and *Fracdir9*. We use five 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 an indicator variable that equals one if the average ratio of research and development expenses to assets at the industry level is above the 75th percentile value. (iii) *Industry Fluidity* is given by Hoberg, Phillips and Prabhala (2014) and it measures the extent of competitive threats facing firms in the industry. (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. (v) To compute *Dynamism*, for each year, we first compute the 50th percentile values of industry growth, industry fluidity, and industry mergers, and the 75th percentile for industry R&D to assets. We then 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 varies from zero to four. *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**
Groupthink × Dynamism		**-0.032****
		(-2.5)
Groupthink	0.014	0.069***
	(0.7)	(2.7)
Dynamism		0.038***
		(2.7)
Log(Board Size)	-0.355***	-0.372***
	(-4.3)	(-4.2)
Fraction Independent	-0.214**	-0.182*
	(-2.0)	(-1.6)
R&D/Assets	3.074***	2.838***
	(2.9)	(2.6)
Segments	0.013	0.013
	(1.0)	(0.9)
Leverage	-1.024***	-1.022***
	(-7.2)	(-6.9)
Firm Size	-0.464***	-0.491***
	(-8.6)	(-8.3)
Risk	92.537***	96.767***
	(5.3)	(5.4)
ROA	5.008***	4.995***
	(17.1)	(16.1)
ROA_{t-1}	0.941***	0.999***
	(4.9)	(4.9)
ROA_{t-2}	0.599***	0.522**
	(2.6)	(2.2)
Intangibles/Assets	0.710***	0.764***
	(3.8)	(3.8)
CEO Ownership	0.004	0.003
	(0.9)	(0.6)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	15,478	14,539
R^2	0.253	0.255

Table V

Impact of Groupthink on Firm Value: Robustness to Groupthink and Dynamism Proxies

The table reports regression results where we re-estimate our baseline specification (Model 2 of Table IV) but by replacing *Groupthink* factor by the individual components of groupthink (Panel A) and by replacing *Dynamism* index by the individual components of dynamism (Panel B). The measures of groupthink are log(*Overlap*), log(*Dirtenure*), and *Fracdir9* and the measures of *Dynamism* are *Industry Growth*, *Industry R&D*, *Industry Fluidity* and *Industry Mergers*. 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. All variables are defined in Table IV. In the interests of brevity, we report the results on only the key independent variables and suppress the results on the control variables (which are the same as in Table IV). 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.

Panel A: Proxies for Groupthink

	Dependent Variable = Tobin's *q*		
	Groupthink Proxy =		
	Log(Overlap)	Log(Dirtenure)	Fracdir9
Groupthink Proxy × Dynamism	**-0.053****	**-0.091*****	**-0.121****
	(-2.1)	**(-3.1)**	**(-2.3)**
Groupthink Proxy	0.122**	0.160***	0.293***
	(2.4)	(2.7)	(3.1)
Dynamism	0.125***	0.232***	0.085***
	(2.7)	(3.4)	(3.2)
Control Variables as in Table IV	Yes	Yes	Yes
Observations	14,539	14,543	14,543
R^2	0.254	0.255	0.255

Panel B: Proxies for Dynamism

	Dependent Variable = Tobin's *q*			
	Dynamism Proxy =			
	Industry Growth	Industry R&D	Industry Fluidity	Industry Mergers
Groupthink × Dynamism Proxy	**-0.178****	**-0.080***	**-0.011***	**-0.223****
	(-2.2)	**(-1.9)**	**(-1.8)**	**(-2.1)**
Groupthink	0.029	0.038**	0.088*	0.096**
	(1.5)	(2.0)	(1.9)	(2.4)
Dynamism Proxy	-0.128*	0.054	0.045***	0.363***
	(-1.7)	(0.9)	(3.4)	(2.9)
Control Variables as in Table IV	Yes	Yes	Yes	Yes
Observations	15,446	15,446	14,803	15,206
R^2	0.255	0.255	0.254	0.257

Table VI

Impact of Groupthink on Firm Value: Time-Series Dynamism

The table reports regression results where we re-estimate our baseline specification (Model 2 of Table IV) for each groupthink proxy but by replacing the cross-sectional version of the *Dynamism* index by the time-series version of the index, which we term *Time-Series Dynamism*. 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. To compute *Time-Series Dynamism*, as before, we first estimate the industry average of sales growth, R&D, fluidity, and mergers for each year. Second, for each industry, we compute the 50th percentile values of industry growth, industry fluidity, industry mergers, and the 75th percentile for industry R&D to assets using the time series of these values within that industry. Third, we define indicator variables that equal one if the industry averages are above than the 50th percentile values for industry growth, fluidity, and mergers and above the 75th percentile values for industry R&D to assets, and equal zero otherwise. *Time-Series Dynamism* is the sum of these four indicator variables and, thus, varies from 0 to 4. All variables are defined in Table IV. In the interests of brevity, we report the results on only the key independent variables and suppress the results on the control variables (which are the same as in Table IV). 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.

	Dependent Variable = Tobin's *q*			
	Groupthink Proxy =			
	Groupthink	Log(Overlap)	Log(Dirtenure)	Fracdir9
Groupthink Proxy × Dynamism	**-0.025*****	**-0.046****	**-0.062*****	**-0.082****
	(-2.7)	**(-2.4)**	**(-3.0)**	**(-2.2)**
Groupthink Proxy	0.057**	0.109**	0.115*	0.227**
	(2.3)	(2.3)	(1.9)	(2.5)
Dynamism	0.011	0.086**	0.144***	0.042**
	(1.1)	(2.5)	(3.0)	(2.2)
Control Variables as in Table IV	Yes	Yes	Yes	Yes
Observations	14,539	14,539	14,543	14,543
R^2	0.254	0.253	0.254	0.253

Table VII
Alternative Explanation

The table reports regression results where we re-estimate our baseline specification (Model 2 of Table IV) but by adding additional control variables. The dependent variable is Tobin's *q*, the sum of market value of equity and the book value of debt, scaled by the book value of assets. In column 1, we report results of the specification that includes two diversity measures: the fraction of female directors on the board and the fraction of foreign directors on the board. In column 2, we report results of the specification that includes additional governance variables: an indicator variable that equals one if the CEO and Chair position belong to the same person, the fraction of the board that comprises of directors who join the firm after the incumbent CEO assumed office, number of institutional blockholders, and the Gompers, Ishii, and Metrick index. In column 3, we report results of the specification that includes *Firm Age*, which is the number of years since the IPO. All other variables are as defined in Table IV. 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.

	Dependent Variable = Tobin's *q*		
	Diversity	Governance	Firm Age
	(1)	(2)	(3)
Groupthink × Dynamism	**-0.036*** **	**-0.027***	**-0.032****
	(-2.7)	**(-1.9)**	**(-2.5)**
Groupthink	0.068***	0.079***	0.070***
	(2.6)	(2.7)	(2.7)
Dynamism	0.035**	0.035**	0.038***
	(2.4)	(2.2)	(2.7)
Control Variables as in Table IV	Yes	Yes	Yes
Observations	13,505	10,634	14,539
R^2	0.250	0.254	0.255

Table VIII

Impact of Groupthink on Firm Value: Influence of Board Size and Connections

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. *Outside Connections* is computed 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. Small and large board subsamples are based on the median board size for each year. Low and high outside connections subsamples are based on the median outside connections for each year. All other variables are as defined in Table IV. 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.

	Dependent Variable = Tobin's *q*			
	Board size		Outside connections	
	Small	Large	Low	High
Groupthink × Dynamism	**-0.037****	**-0.006**	**-0.041****	**-0.022**
	(-2.2)	**(-0.4)**	**(-2.3)**	**(-1.2)**
Groupthink	0.061*	0.043	0.068*	0.056
	(1.8)	(1.1)	(1.8)	(1.5)
Dynamism	0.055***	0.003	0.057***	0.027
	(2.9)	(0.2)	(2.8)	(1.4)
Observations	8,723	5,816	7,181	7,358
R^2	0.231	0.308	0.243	0.291