10.5465/AMBPP.2022.156

A MODEL OF THE DYNAMICS OF SUBGROUP INFLUENCE ON BOARDS

JULIA MORLEY
London School of Economics and Political Science
Department of Accounting, London, WC2A 2AE, United Kingdom

J. MCKENZIE ALEXANDER
London School of Economics and Political Science

INTRODUCTION

Are corporate governance regulations which aim at ensuring the effectiveness of corporate boards sufficient to ensure effective group decision-making? To answer this question, we develop an empirically informed agent-based model which demonstrates how it is possible for a small subgroup on the board to dominate decision-making despite the application of commonly accepted rules of corporate governance regarding board composition and board processes. The assumptions of the agent-based model are based on evidence from an international regulatory board. The findings contribute to a recent stream of literature on the negative consequences board subgroups may generate for board effectiveness (Adair et al., 2017; Bezrukova et al., 2009, 2016; Crucke and Knockaert, 2016; Van Peteghem et al., 2018). More generally, they add to the management literature addressing the implications for board effectiveness of board ties (Westphal, 1999; Westphal and Zhu, 2019), board norms (Minichilli et al, 2012, Nielson et al., 2020), board identity (Golden-Biddle and Rao, 1997), and variations in director characteristics (Rigolini and Huse, 2021).

It is not surprising that board dynamics may be driven by powerful subgroups, as many who have participated in group decision-making can attest. However, the specific mechanisms which enable subgroups to dominate board deliberation have not been a significant focus of current regulation regarding board effectiveness. Our agent-based model shows that this emphasis on composition, rather than dynamics, risks undermining efforts to achieve board effectiveness by identifying specific mechanisms through which small subgroups can influence board deliberation to a disproportionate degree.

Corporate governance regulation identifies *board effectiveness* as the ability of boards to work together to achieve corporate objectives (see, for example, Financial Reporting Council, 2018b; New York Stock Exchange, 2014), focusing on two elements: composition and process. First, regarding board *composition*, it is noted that directors should be competent, independent and possess personal attributes such as "tact" and the "ability to listen" (Financial Reporting Council, 2018a, figure 7, page 24). They should be selected based on their ability "to make a positive contribution" and should have "the right skillsets" to ensure that "a breadth of perspectives are present in the boardroom" (Financial Reporting Council, 2018a, paragraph 87). Board composition should also reflect gender, cultural and ethnic diversity as this "can have a positive effect on the quality of decision-making by reducing the risk of group think" (Financial Reporting Council, 2018a, paragraph 88).[1] Second, regarding board *processes*, it is generally accepted that boards should meet regularly, ensure the quality and timeliness of board papers and allow adequate time for deliberation of all issues (Financial Reporting Council, 2018a, Paragraph 28).

Yet while the FRC notes that it is "crucial" that directors "use their skills, experience and knowledge to drive productive discussions" (Financial Reporting Council, 2018a, paragraph 103),

10.5465/AMBPP.2022.156

and that processes should be in place to ensure effective decision-making, no requirements are made regarding the deliberative dynamics of boards. This omission is significant because it has been shown that the deliberative style of directors, including rhetorical characteristics such as the use of powerful speech and violations of turn-taking, can shape the quality of group deliberation (see Boden, 1983, 1994; Molotch and Boden, 1985). While some researchers note that more work should focus on "issues of group behavior and decision making" (see Carcello et al., 2011, pg. 19), the difficulty in accessing evidence to do so is readily acknowledged (Watson et al., 2020).

Using an agent-based model, we investigated the dynamics of board deliberation, showing how certain types of deliberative processes can influence, and potentially undermine, overall board effectiveness. We show how the existence of subgroup factions, differences in rhetorical effectiveness between board members, and individual willingness to violate social conversational norms jointly combine to yield subgroup influence disproportionate to its size. Each assumption of the agent-based model is motivated by work in social psychology observing that powerful rhetorical style may be more influential over deliberation than the propositional content of the arguments advanced. Such rhetorical strength may result from the use of powerful speech style (Gadzhiyeva and Sager, 2017; Lakoff, 1973; Lev-Ari and Keysar, 2010) and violations of turn-taking (Boden, 1983, 1994; Sacks et al., 1978) . These assumptions are supported empirically by a detailed analysis of the discussion in two board meetings of a major international regulatory agency, the International Accounting Standards Board (IASB).

DESCRIPTION OF THE MODEL AND SIMULATION RESULTS

Assume the board is of size N and that it is partitioned into groups of two types, T_1 and T_2, of size N_1 and N_2 respectively. We assume that $N_1 > N_2 > 0$, so that T_1 is capable of winning a majority vote if all members voted the same. It may be the case that T_1 is sufficiently large that it also constitutes a supermajority. The board partitioning represents the existence of two subgroups of opposing views at the beginning of deliberation.

The board is required to take a binary pro/con decision on an issue based on the outcome of a vote. Each board member has an initial subjective attitude (a "prior") representing their disposition to vote *Pro* or *Con*. At the beginning, board members of type T_1 are primarily disposed to vote *Con* whereas members of type T_2 are primarily disposed to vote *Pro*. However, neither type of board member is wholly opposed (or in favor) of the motion. We assume the prior of T_1-members assigns only a 10% chance of that member voting *Pro*, and the prior of T_2-members assigns a 90% chance of that member voting *Pro*. The priors can be seen as reflecting the individual's beliefs, based either on information or ideology, on the respective merits of the *Pro* and *Con* position. The reason all members of the same subgroup have the *same* prior is that this represents polarization of the board.

We assume a boundedly rational model of group deliberation in which board members adjust their beliefs using reinforcement learning in light of new information received from conversational exchanges.[2] Reinforcement learning is modelled using the classic method of Pólya urns (see Johnson and Kotz, 1977; Mahmoud, 2009). Each individual has an urn containing a mix of red and green balls, where red represents *Con* and green represents *Pro*. The distribution of ball colors in an individual's urn represents their degree of belief for the respective positions. For board members of type T_1, the urn composition is 90% red and 10% green balls; for board members of type T_2, the urn contains 10% red balls and 90% green balls. Reinforcement learning is modelled by an individual adding additional balls of the appropriate color to their urn. Since there are many different

10.5465/AMBPP.2022.156

urn compositions which have the same proportion of red and green balls, the initial composition of the urn represents how much an individual's beliefs initially shift in light of new information.[3]

The deliberational dynamics of the board is modelled as a sequence of discrete pairwise conversational exchanges. At each step in time, a random pair of board members (i, j) is selected from all possible $\binom{N}{2}$ pairings to exchange views. Each member selects which view to advocate by drawing a ball at random from their urn and then advancing a supporting argument. (The ball is returned after the draw, so sampling does not change the composition of the urn.) We do not assume all individuals have equal argumentative strength in articulating and defending their ideas. Each individual i has an *argumentative capability*, modelled as a continuous random variable $\mathcal{A}_i$ over the real line $(-\infty, +\infty)$. When two individuals i and j have an exchange, the observed values of $\mathcal{A}_i$ and $\mathcal{A}_j$ are compared, with the greatest value winning. Because argumentative capability is a continuous random variable, ties occur with probability 0. For simplicity, argumentative capability is assumed to be normally distributed, with members of type T_1 having a $N(0,1)$ distribution and members of type T_2 having a $N(\mu, 1)$ distribution, for some $\mu \geq 0$. Once a conversational exchange has taken place and the winner has been determined, reinforcement learning occurs with all members of the board adding a ball of the appropriate colour to their urn. After reinforcement learning is complete, another pairwise conversational exchange takes place using a new pair selected at random, but with the possibility of selection bias.

Anyone who has experienced a meeting knows that not all individuals participate equally in discussion. This can happen for a variety of reasons: some people may be less eager to speak in public, some may be called upon more often by the chair, and others may be more willing to violate social norms regarding conversational turn-taking by interrupting. We introduce a parameter p_v which represents the probability that the next pairwise conversational exchange is determined by one of the T_2-members through a process of self-selection. When this happens, the next conversational exchange is *not* selected from the full set of $\binom{N}{2}$ possible pairings available on the board; instead, the next pairwise conversational exchange is selected from the restricted set of pairings containing *at least one* T_2-member. This can be seen as a form of self-promotion by a T_2-member, ensuring their subgroup's views are heard more frequently than normal procedures would allow.

We developed a computer simulation to explore the influence of these respective parameters, looking at deliberative interactions between fourteen board members whose engagement is the result of assumptions made regarding an individual's argumentative strength and probability of violating turn-taking. After initializing the model by setting the board size and each member's prior, 1,000 pairwise conversational exchanges, followed by reinforcement learning, were simulated.[4] After all conversational exchanges took place, a board vote was simulated by having each member draw a ball from their respective urn. In the event of a tie occurring, the vote was retaken until one view (*Pro* or *Con*) won. For each combination of parameter settings (N_1, N_2, μ and p_v), 5,000 simulations were run and the number of *Pro* vote wins were tabulated. The value of the μ parameter varied from 0 to 1 in steps of 0.1, and the value of p_v varied from 0 to 0.5 in steps of 0.1, for a total number of 66 different (μ, p_v) combinations. (The reason p_v only ranges between 0 and 0.5 is that higher values would represent a significant failure of the chair to maintain order.) Table 1 illustrates the summary results for four different board compositions, a total of 1,320,000,000 simulated conversational exchanges.

Simulation results show a joint interaction effect between the μ and p_v parameters, enabling the smaller T_2-subgroup to influence the outcome of the board vote far beyond what its size,

10.5465/AMBPP.2022.156

measured in absolute numbers, would suggest. If a simple majority vote was taken at the outset, when $N_2 = 2$, the *Pro* position would win just 0.04% of the time. Yet when $N_2 = 2$, the smaller subgroup is able to influence the board vote 38% of the time under the most extreme combination of parameters favouring its potential to dominate (i.e., when $\mu = 1$ and $p_v = 0.5$). When the two parameter values are slightly lower, with $\mu = 0.5$ and $p_v = 0.3$, the influential ability of the smaller subgroup drops to less than 10%. However, in addition to the joint interaction between the μ and p_v parameters, the *size* of the smaller subgroup is also seen to be crucially significant. Indeed, a "tipping point" regarding the influential power of the smaller subgroup is found to occur when N_2 increases from 3 to 4, as visual inspection of Table 1(b) and Table 1(c) show. Relatively small differences in argumentative capability, combined with a willingness to violate social norms of group deliberation, can result in the viewpoint of a smaller subgroup dominating the overall group decision.

Table 1 about here

EMPIRICAL EVIDENCE FROM THE IASB VALIDATING THE MODEL ASSUMPTIONS

In order to demonstrate the validity of the assumptions made in the agent-based model, evidence of the influence of a subgroup on board dynamics is presented for the international accounting standard setting organization, the IASB. The IASB has strict procedures in place regarding decision-making and has focused on issues of board composition, in particular ensuring representation of members from around the world. The IASB offers a useful case for analyzing the dynamics of deliberation on a board for two reasons. First, its board meetings are recorded which enables a detailed analysis of contributions by board members to the discussion, and second, academic studies have identified the existence of a five-person subgroup on the board of the IASB, whose members were vocal in advocating a particular approach to accounting known as *fair value accounting* (Baudot, 2018; Lennard, 2002; Morley, 2016; Walton, 2009; Whittington, 2008).

Interviews with 12 individuals at the IASB indicated that a subgroup dominated board deliberations. A detailed analysis of the deliberation during two board meetings (46 minutes and 62 minutes respectively) then identified the particular conversational traits used by board members within and outside the subgroup regarding powerful speech style and violations of turn-taking. The analysis of board deliberation reveals differences in the conversational characteristics between the members of the subgroup and those of the other board members, consistent with the assumptions of the model and summarized in Table 2 below.

Table 2 about here

DISCUSSION AND CONCLUSION

The agent-based model developed in this paper demonstrates one possible set of mechanisms by which small groups, such as that subgroup on the IASB board, could exert

10.5465/AMBPP.2022.156

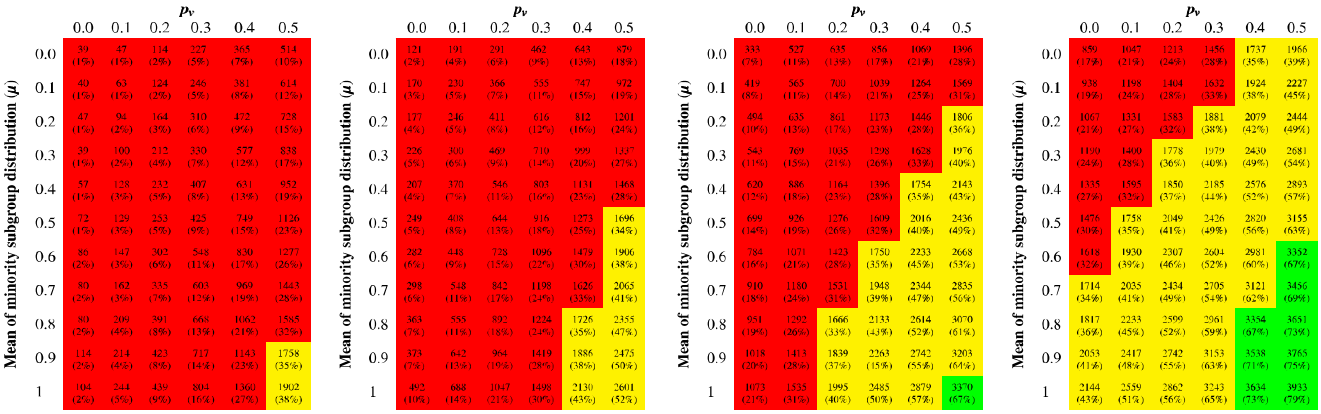
excessive influence, potentially extending to voting outcomes. The empirical evidence provided to validate the assumptions of the model suggests the phenomenon captured by the model could be relatively widespread. There are, for example, many ways that "argumentative capability" and "turn-taking violations" could be realized in the day-to-day practices of real-world boards. In addition, the tipping point at which small subgroups can wield disproportionate influence is surprising small: we have seen that a point of criticality is reached when the small subgroup is no more than 4 out of 14. These findings contribute to a recent stream of literature on the negative effects of subgroups on board effectiveness (Carcello et al., 2011; Adair et al., 2017; Bezrukova et al., 2009, 2016; Crucke and Knockaert, 2016; Golden and Zajac, 2001; Hambrick et al., 2008; Van Peteghem et al., 2018), by demonstrating how such influence is possible. In addition, it provides an analysis of the deliberations in two board meetings which address the lack of empirical evidence highlighted in prior studies (Golden and Zajac, 2001).

There are several ways to interpret the results of the formal model. One interpretation — call this is the *negative* interpretation — is that even if much effort has been spent on ensuring that a board has a diverse representation across the appropriate dimensions of interest (e.g., geographical, qualification, cultural, ethnic, linguistic, religious, and so on), to the extent that the *majority* of the board is so constituted, that may not necessarily result in board decisions which represent the full range of diversity present and hence undermine the board's effectiveness. According to the model, a small subgroup can still be disproportionately influential in determining the outcome. However, a second interpretation — call this the *positive* interpretation — is that even if the board lacks a diverse representation across the appropriate dimensions of interest, to the extent that only a *minority* of board members are so chosen, that could still result in board decisions which disproportionately reflect the interests and preferences of the smaller group. In this case, even a board which does not meet its compositional target regarding diverse representation could still issue decisions very similar to that of a board which did.

The first implication of the findings is that regulators should focus more on deliberational dynamics if they wish to ensure effective deliberation and the maintenance of discursive norms on the board. Second, regulators interested in ensuring demographic representation of certain groups (e.g., geographical representation in the case of the IASB) should be aware that appropriate demographic representation may not translate into the expected degree of political power. Finally, the agent-based model does not make any assumptions about *how* the smaller subgroup is constituted. Given that political alignments continually form and dissipate, the on-going scrutiny of the deliberative dynamics of board decision-making is a necessary component of board effectiveness regulation.

Table 1: Simulation results. Red, yellow and green represent how frequently a *Pro*-vote wins, showing the extent of influence by the smaller subgroup.

10.5465/AMBPP.2022.156



(a) $N_1 = 12$ and $N_2 = 2$. (b) $N_1 = 11$ and $N_2 = 3$. (c) $N_1 = 10$ and $N_2 = 4$. (d) $N_1 = 9$ and $N_2 = 5$.

Table 2: Differences in conversation style between the subgroup and other board members, in particular the use of powerful speech style and violations of deliberation norms.

	Violation of deliberation norms		Rhetorical strength
	Violating turn-taking	Supporting own group	
Subgroup	4	59	32
Other group members	0	7	1

ENDNOTES

1. The FRC Corporate Governance Code in the UK, for example, states that boards should possess "gender, social and ethnic backgrounds, cognitive and personal strengths".

2. Reinforcement learning has long been used as a model of learning in psychology (for seminal early work, see Thorndike, 1911), and has since been widely adopted in a number of different areas (see Foster and Young, 2006; Young, 1998; Skyrms, 2002, 2008, 2010).

3. If the 90%–10% composition is achieved with 9 red balls and 1 green ball, adding a single green ball to the urn amounts to a shift in the degree of belief in the *Pro* position from $1/10 = 10\%$ to $2/11 \approx 18\%$. However, if the 90%–10% composition is achieved with 90 red balls and 10 green balls, adding a single green ball to the urn only results in a shift in degree of belief from $10/100 = 10\%$ to $11/101 \approx 10.9\%$.

4. Although the number of pairwise conversational exchanges exceeds that which one would expect to occur in a real board meeting, this ensures a reasonable degree of convergence towards consensus. In real board meetings, more rapid convergence is possible, but such rapid convergence will be due to informational or psychological factors which are not part of the current model. Including such factors in the present model would increase model complexity, without appropriate empirical justification, for a minimal gain in potential explanatory power.

REFERENCES AVAILABLE FROM THE AUTHORS