

Consensus in Diverse Corporate Boards

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Questions

How board composition affects its decisions:

- How important is it to have outsiders (tradeoff between information brought by insiders and their conflicts of interest)
- Effect of penalties imposed on directors for failing to act in the interest of the firm
- Is more information always beneficial?

Outline:

- Literature
- Model of board decision-making: definition and properties of consensus.
- Examples that address the above questions

Results (normative focus without apologies)

- We propose a new solution concept, which we call *Consensus*, which is an alternative to the Nash Bargaining Solution. We present a number of properties of consensus and argue that it gives a reasonable way of modelling group decision-making based on discussion with a fall-back on voting.
- Directors with extreme preferences have limited influence on the consensus. There is a trade-off between a new director's impact on voting and information brought to the board. Similarly, a conflicted director may be better than a strictly independent director if the conflicted director brings information to the board.

Results (continued)

- A simple majority of outsiders may not be good enough if insiders have more bargaining power or are more focused.
- Stricter fiduciary duties can do net damage, especially if the measure is imperfect.
- A majority may use new information to implement a policy that damages the minority, and in particular the manager may not want to share information.

Literature

- Models of boards:
 - Hermalin and Weisbach (1998)
interaction between percentage of insiders on the board and board's decisions on CEO turnover and compensation
 - Harris and Raviv (2004)
number of insiders and outsiders and directors' incentives to gather and share information
 - Unlike these papers, our paper can handle diverse types of agents because we do not consider complicated information incentives
- Political science models:
 - Baron (1991)
not directly applicable to boards, but useful framework

Model

- Board has N directors
- The board chooses action $a \in \mathfrak{R}^M$
- Director n has information I_n
- Director n has concave differentiable utility $u_n(a)$ defined on the action space \mathfrak{R}^M
- Director n 's bargaining power is $b_n > 0$

Definition of Consensus

Action a is a *consensus* if and only if there exist unit vectors z_n such that

$$\sum_{n=1}^N b_n z_n = 0,$$

where each $z_n \in e_n(a)$, defined by

$$e_n(a) \equiv \begin{cases} \{u'_n(a)/\|u'_n(a)\|\} & \text{if } u'_n(a) \neq 0 \\ \{\varepsilon \mid \|\varepsilon\| \leq 1\} & \text{otherwise} \end{cases}$$

Model (cont)

- We assume quadratic utility around an ideal y_n :

$$u_n(a) = -E[(y_n - a)'(y_n - a)|I_n]$$

- $u_n(a)$ can be decomposed into the error in forecasting y_n and the distance to a conditional target (bliss point)

$$t_n = E[y_n|I_n]$$

- Implications:

z_n are unit vectors pointing towards t_n

a^* is a consensus iff setting $a = a^*$ minimizes

$$\sum_n b_n \|t_n - a\|$$

Properties of Consensus

1. Consensus always exists.
2. Consensus is unique unless the targets are collinear.
3. Consensus is Pareto optimal.
4. When targets are collinear, consensus is the weighted median voter.
5. If there is a majority by weights with the same preferences, the consensus is the majority's target.

1. Directors with Extreme Preferences

We build an example that shows:

- A director with extreme preferences has a limited influence on the consensus
- There is a tradeoff between the new information a new director brings to the board and a distortion of the consensus caused by the new director's bargaining power

1. Directors with Extreme Preferences

- Action space is \mathfrak{R}^3 ; $N_0 \geq 2$ directors with

- $b_n = 1$ for $n = 1, \dots, N_0$
- Ideals on a circle with radius $r > 0$:

$$y_n = (\lambda + \varepsilon)\bar{y} + (0, \sin(2\pi n/N_0), \cos(2\pi n/N_0))r,$$

where $\lambda \sim \mathcal{N}(1, \sigma_\lambda^2)$ and $\varepsilon \sim \mathcal{N}(0, \sigma_\varepsilon^2)$ are independent.

- Directors know neither λ nor ε
- New director $N_0 + 1$ joins with
 - b_{N_0+1}
 - Ideal: $y_{N_0+1} = \bar{y}(\lambda + \varepsilon) + (h, 0, 0)$, where $h > 0$ measures idiosyncrasy.
 - knowledge of λ but not ε
- The new director is assumed to share the knowledge of λ with the other directors.

1. Directors with Extreme Preferences

For the initial N_0 directors, the consensus is

$$a_0^* = \bar{y}.$$

With the new director:

if $b_{N_0+1} \geq \sum_{n=1}^{N_0} b_n = N_0$, the consensus is

$$a^* = t_{N_0+1};$$

if $b_{N_0+1} < \sum_{n=1}^{N_0} b_n = N_0$, the consensus is

$$a^* = \bar{y}\lambda + (h_0, 0, 0),$$

where

$$h_0 = \min \left(h, \frac{rb_{N_0+1}}{\sqrt{N_0^2 - b_{N_0+1}^2}} \right)$$

1. Directors with Extreme Preferences

After the new director joins, the original directors' utilities change by

$$u_n(a^*) - u_n(a_0^*) = \|\bar{y}\|^2 \sigma_\lambda^2 - h_0^2.$$

- $\|\bar{y}\|^2 \sigma_\lambda^2$ is the value of the new information
- h_0^2 is the cost of the distortion from the new director's bargaining power.

2. Director Independence

Regulation:

- Regulation of board composition has been largely delegated to Self-Regulatory Organizations such as the NYSE and NASD
- Both NYSE and NASD have recently adopted rules requiring a majority of the board to be composed of independent directors
- Definition of independence excludes employees, high-paid consultants, close relatives of executives, and executives of a customer or supplier

2. Director Independence

Our Results:

- A conflicted director may be better than a strictly independent director if the conflicted director also brings information to the board.
 - the distortion of consensus is smaller if the new director's conflict is different from that of the insiders
- A simple majority of outsiders may not be good enough if
 - insiders have more bargaining power (for example, insiders can dictate the agenda)
 - insiders have similar preferences while independent directors do not

2. Director Independence

- Action space is \mathfrak{R}^5 ;
- $N_o \geq 2$ outsiders and N_i insiders. All directors have $b_n = 1$.
- Outside directors $n = 1, \dots, N_o$ have ideals on a circle with radius $r > 0$:
$$y_n = (0, 0, r \sin(2\pi n/N_o), r \cos(2\pi n/N_o), \lambda + \varepsilon),$$
where $\lambda \sim \mathcal{N}(1, \sigma_\lambda^2)$ and $\varepsilon \sim \mathcal{N}(0, \sigma_\varepsilon^2)$ are independent.
- inside directors $n = N_o + 1, \dots, N_o + N_i$ have ideals
$$y_n = (\delta, 0, 0, 0, \lambda + \varepsilon),$$
for some $\delta > 0$
- None of the directors know λ and ε

2. Director Independence

Two candidates for the vacancy:

- C_1 is strictly independent and wants to maximize firm value but brings no information; C_1 's ideal is

$$y_{N_o+N_i+1}^1 = (0, 0, 0, 0, \lambda + \varepsilon).$$

- C_2 is somewhat conflicted but brings information (say, part owner and an executive of a major supplier); C_2 's ideal is

$$y_{N_o+N_i+1}^2 = (g_1, g_2, 0, 0, \lambda + \varepsilon),$$

with $g_1 g_2 \neq 0$.

2. Director Independence

Ineffective Majority of Independent Directors:

adding any new director, including the strictly independent candidate C_1 , preserves the consensus at the insiders' target if

$$\frac{(N_i^2 - 1)\sqrt{1 + r^2/\delta^2}}{2N_o} - \frac{N_o}{2\sqrt{1 + r^2/\delta^2}} \geq 1.$$

Satisfied if

- N_i is large and N_o is small
- ratio dispersion of outsiders to insiders' idiosyncrasy r^2/δ^2 is large
- importantly, may still hold if $N_o \geq N_i$

3. Fiduciary Duties

Regulation:

- Directors are generally protected by the business judgment rule
- Stricter standards are applied when apparent conflicts of interest are present
- Primarily due to Sarbanes-Oxley, in the recent years the penalties for corporate wrongdoing have increased

We argue: strict penalties are not desirable when performance is difficult to measure (as in Holmstrom and Milgrom (1991))

3. Fiduciary Duties

- Model by assuming that directors' preferences have two parts:
 - deviation from the ideal y_n
 - penalty for deviation from some possibly random action a_0

$$u_n = -E[(y_n - a)'(y_n - a) - \beta_n(a_{0n} - a)'(a_{0n} - a)|I_n]$$

- Given preferences with the penalty, the target is

$$t_n = \frac{E[y_n|I_n] + \beta_n E[a_{0n}|I_n]}{1 + \beta_n}.$$

3. Fiduciary Duties

- Consider a board with N directors.
 - N_0 directors have the same target t in the absence of penalties.
 - These N_0 directors face the same penalty $\beta(a_0 - a)'(a_0 - a)$
 - These N_0 directors have more bargaining power than the rest of the board: $\sum_{n=1}^{N_0} b_n > \sum_{n=N_0+1}^N b_n$.
- The penalty minimizes the expected squared deviation of the consensus a^* from the value maximizing action a_{fv} if it shifts the expected target of N_0 directors to $E[a_{fv}]$:

$$E[t_n] = E[a_{fv}] \quad (1)$$

and solves

$$\min_{a_0, \beta} V \left(a_{fv} - \frac{t + E[a_0|I_n]}{1 + \beta} \right) \quad (2)$$

4. Information Sharing

- Intuition: a majority may use new information to implement a policy that damages the minority.
- Sharing private information with the rest of the board may not be in the director's interest

4. Information Sharing

Example: board with an odd number of directors:

- $b_n = 1$
- ideals in \mathfrak{R} : $y_n = (\lambda + \varepsilon)\beta_n$,

$$\beta_1 \leq \beta_2 \leq \dots \leq \beta_N$$

$\lambda \sim \mathcal{N}(0, \sigma_\lambda^2)$ and $\varepsilon \sim \mathcal{N}(0, \sigma_\varepsilon^2)$ are independent

- directors do not know ε

4. Information Sharing

- If the directors do not know λ , then
 - all directors have the same target $t_n = 0$
 - the consensus is $a_0^* = 0$
 - director n 's utility is

$$u(a_0^*) = -(\sigma_\lambda^2 + \sigma_\varepsilon^2)\beta_n^2.$$

- If the directors know λ , then
 - the new consensus is $a^* = \lambda\beta_{N_0}$
 - director n 's utility is

$$u(a^*) = -\sigma_\varepsilon^2\beta_n^2 - \lambda^2(\beta_n - \beta_{N_0})^2.$$

- Director n 's utility decreases when the board learns λ if the director's target is closer to zero than to the median voter's target ($\beta_n/\beta_{N_0} < 1/2$)

Some Empirical Implications

- Adding a new director has more impact in diverse boards.
- Outside directors with diverse interests are less effective.
- A supermajority is required for outsiders to be effective.
- Adding an informed director whose conflict is opposed to the conflicts of existing directors is better than adding a neutral uninformed director.
- Large boards may be less effective if, as boards grow, outsiders are diverse and insiders remain concentrated.

Conclusion

- Consensus, a new bargaining solution concept, is introduced and applied to corporate board decisions
- Trade-off between a director's information and conflict
- Super-majority better, especially if outsiders are diverse
- New information can be used for or against minority, shareholders
- Stricter fiduciary duty can help or hurt