The Board Matrix: The (ESG) Value of Well-Connected Directors

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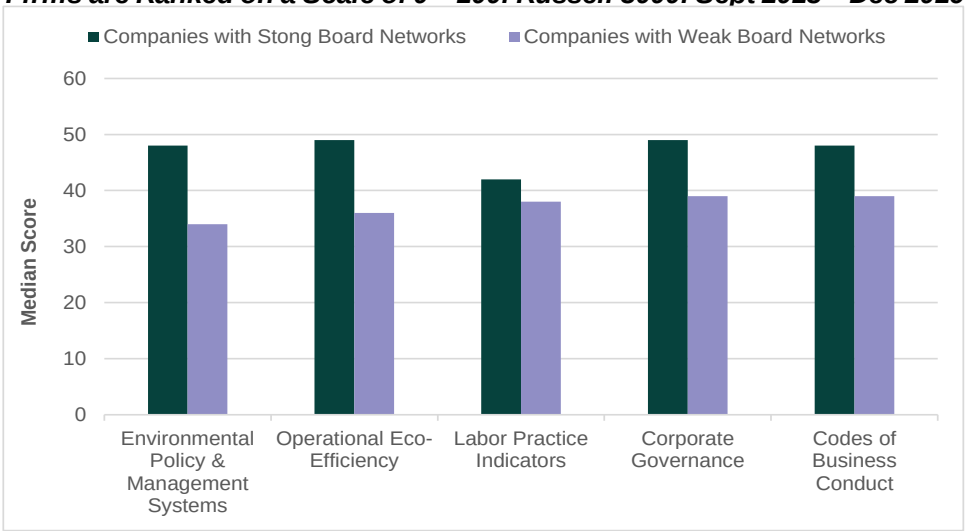
Corporate boards are responsible for shaping and overseeing environmental, social and governance (ESG) policies for their organizations. This report examines the relationship between companies connected through shared board members and ESG performance. It finds that companies with strong board networks (companies with directors who serve on more than one corporate board or are well-connected) have better certain ESG outcomes than firms with weak board networks.[1] Well-connected directors can utilize their network for information on emerging ESG trends/best practices and share this knowledge with their companies. Given their roles on multiple boards, well-connected directors are also better informed about the needs of different stakeholders (governments, communities, ESG activists) than directors with little or no network. This awareness of stakeholder management translates to better ESG performance for companies with well-connected directors.

- **Companies with strong(weak) board networks are more (less) proactive about addressing gender diversity issues at both the C-Suite and board level**. Firms with strong board networks are twice as likely to have female CEOs compared to firms with weak board networks. Also, 16% of directors on companies with strong board networks are women, compared to 12% for firms with weak board networks, Table 1.

- **Companies with strong board networks score better than companies with weak board networks on ESG issues such as codes of business conduct, operational eco-efficiency (environmental waste) and labor practices, Figure 1.** Companies with well-connected directors have fewer incidents of bribery/corruption cases, generate less environmental waste, and have greater gender diversity in senior management than companies with less connected directors.

Figure 1: Median Scores for Companies with Strong and Weak Board Networks Firms are Ranked on a Scale of 0 – 100: Russell 3000: Sept 2013 – Dec 2019



Source: S&P Global Market Intelligence Quantamental Research. Data as at 06/30/2021

[1] The number of boards that all directors serve on is aggregated to compute a company's connected score, see methodology.

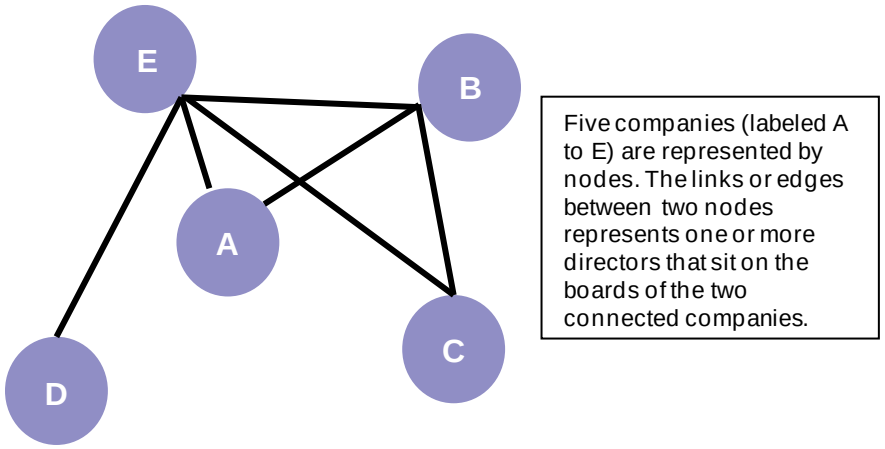
1. Introduction

Forty-five percent of directors surveyed by PricewaterhouseCoopers (PwC) in 2020 stated that ESG topics are now regularly part of board discussions, up by 11 points from thirty-four percent in 2019.[2] This increase in board engagement on ESG issues reflects the growing importance of ESG to companies and their stakeholders. Since directors play a critical role in ESG supervision, it is important that they have access to the expertise and knowledge required for this oversight. One source for directors to acquire information on ESG trends is through a board network, which is created when companies share the same board members.

Figure 2 shows a hypothetical board network for a universe of five companies. The circles or nodes represent the five companies (labeled A to E), and the link or edge between two companies represents one or more directors that sit on the boards of the two connected firms. The number of connections for each company, also called ***degree***, is the measure used in this analysis to determine the strength of a company's board network.[3] Company E has the strongest board network in this example because it has the highest number of connections (4), while company D has the weakest board network (only 1 connection). Although there are concerns around director overcommitments, this analysis is based on a company's aggregate number of connections. For example, the four connections for company E could be from four different individuals, rather than just one individual.[4]

Firms with directors that sit on multiple boards are well positioned to benefit from the information flow within the boardroom network. For example, a director who sits on the boards of two companies can share techniques that were successful in improving ESG outcomes at one company with the other company.

Figure 2: Hypothetical Boardroom Network for Five Companies



Source: S&P Global Market Intelligence Quantamental Research. Data as at 06/30/2021

[2] "PWC's 2020 Annual Corporate Directors Survey", https://www.pwc.com/us/en/services/governance-insights-center/library/annual-corporate-directors-survey.html
[3] Readers interested in graph theory fundamentals should refer to Branching Out: Graph Theory Fundamentals
[4] It is important to point out this distinction considering governance related concerns around directors serving on too many boards.

2. Degree

All the companies in the Russell 3000 universe were ranked by degree into five bins or quintiles at the end of each month (2009 – 2019). Companies with the highest degree (quintile 1) have strong board networks, while those with the lowest values (quintile 5) have weak board networks. Female CEO/board representation and ESG ranks were then determined for each quintile by taking the average or median values for all the companies in that quintile.

Degree is correlated to market capitalization as large cap companies tend to have more directors than small cap companies.[5] Well-connected directors would also most likely prefer to serve on the boards of large cap companies (higher profile, larger remuneration, etc.). For these reasons, all degree values were adjusted for market capitalization using the process detailed in Appendix A.

2.1. Degree and Gender Diversity

While the number of female CEOs and board members has risen over the last decade, women are still underrepresented at both the CEO and corporate board levels.[6] Well-connected directors can recommend strategies that have been successful in attracting female CEOs and board members at one company to another firm. This information transfer boosts women representation at the C-suite and board levels for companies with well-connected directors. The results in Table 1 indicate that companies with strong board networks have more female CEOs and women board members than companies with weak board networks.

Table 1: **Percentage of Female CEOs and Female Board Members in Quintiles 1 and 5 Russell 3000: Jan 2009 - Dec 2019**

	Strong Board Networks: Companies with Largest Degree Centrality Values (Quintile 1)	Weak Board Networks: Companies with Smallest Degree Centrality Values (Quintile 5)	Difference (Quintile 1 - Quintile 5)
CEOs	6.01%	2.73%	3.28%***
Board Members	16.14%	12.09%	4.05%***

*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.
Source: S&P Global Market Intelligence Quantamental Research. Data as at 06/30/2021.

Overall, about 6% of companies with strong board networks have female CEOs, more than twice the ratio for companies with weak board networks (2.73%), and the difference of 3.28% is statistically significant at the 1% level. The proportion of women directors for companies with strong board networks is also 4% higher than companies with weak board networks, 16.14% vs 12.09%.

[5] The average rank correlation between degree and market capitalization is 0.50 between Jan 2019 and Dec 2019.
[6] The proportion of female CEOs and board members as at December 2019 was 6% and 22% respectively, up from 3% and 10% in January 2009. See Appendix B on how gender was determined.

2.2. Degree and ESG Outcomes

Issues, such as climate change, supply chain risk, and corporate governance that are important to stakeholders, are also used to determine a company's overall ESG score. Companies that address the needs of their stakeholders should therefore have better ESG scores than those that do not. Directors are a crucial part of a company's stakeholder management strategy. According to the PwC survey, 58% percent of directors stated that a member of the board (other than the CEO) was involved in stakeholder engagement in 2020, up by 16% from the 42% recoded in 2019.

Given the many opportunities that well-connected directors have to engage with different stakeholders, they should be more aware of ESG issues than directors who are less connected. The results in Table 2 support this view, as companies with strong board networks have better scores than companies with weak board networks across all the ESG outcomes considered.[7] For example, the median ESG composite rank for companies with strong board networks is 19 points higher than the median rank of firms with weak board networks (51 vs 32).[8]

This difference in scores between companies with strong and weak board networks is present across the three ESG dimensions (environmental, social, economic & governance), and the criteria that roll into these dimensions. Corporations with well-connected directors tend to have lower occurrences of corruption and bribery cases (codes of business conduct criteria) than corporations with directors who are less connected. Companies with strong board networks also have lower supply chain risk profiles (supply chain management criteria), and stronger risk & crisis management policies than firms with weak board networks.

Table 2: Median Scores for Companies in Quintile 1 and Quintile 5: Russell 3000 (Sept 2013 - Dec 2019)[9]

	Strong Board Networks: Companies with Largest Degree Values (Quintile 1)	Weak Board Networks: Companies with Smallest Degree Values (Quintile 5)	Difference (Quintile 1 - Quintile 5)
S&P Global ESG Score	51	32	19***
Environmental Dimension	55	32	23***
Operational Eco-Efficiency Criteria	49	36	13***
Environmental Policy & Management Systems Criteria	48	34	14***
Social Dimension	32	19	13***
Labor Practice Indicators Criteria	42	38	4***
Economic & Governance Dimension	45	36	9***
Corporate Governance Criteria	49	39	10***
Codes of Business Conduct Criteria	48	39	9***
Risk & Crisis Management Criteria	46	37	9***
Supply Chain Management Criteria	46	35	11***

*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.[10]
Source: S&P Global Market Intelligence Quantamental Research. Data as at 06/30/2021.

[7] See Appendix C for definition of metrics
[8] See Appendix D for adjustments made to the metrics before they were used for this analysis
[9] ESG data coverage in the Russell 3000 was around 600 on average during the 2013-2019 test window.
[10] A permutation test also supports the statistical conclusions in this table

3. Data

The S&P Global Professionals dataset was the source for director data used to construct the board network. This dataset highlights over 4.5 million professionals with current and prior board/company affiliations worldwide. Data history begins in 1992, but is robust from 2006. Data includes biographies, standardized job functions, titles, education, compensation (salary, options, shares) for each fiscal period, and full committee memberships.

The S&P Global ESG Scores provide company level, dimension level, and criteria level scores based on the S&P Global Corporate Sustainability Assessment (CSA) process, which is an annual evaluation of companies' sustainability practices. The dataset provides scores, that have an impact on a company's business value drivers, including growth, profitability, capital efficiency, and risk exposure of 2,000 companies. History is available from 2013.

4. Conclusion

With the growing importance of environmental, social and governance (ESG) issues to stakeholders, an emerging focus for corporate boards is shaping ESG policies for their organizations. Companies with strong board networks have access to information (via the network of their well-connected directors) that may not be available to firms with weak board networks. Well-connected directors can transfer strategies or ideas that were successful in improving ESG outcomes from one board to another. This knowledge transfer can boost the ESG scores of companies with well-connected directors.

The analysis in this report finds that companies with strong board networks have better ESG outcomes than firms with weak board networks. Specifically, companies with strong board networks are more likely to have more female CEOs, greater gender diversity at the board level, and higher environmental, social and governance scores than companies with weak board networks.

APPENDIX A

Degree centrality values were adjusted using the equation below to remove any size bias

$$DGV_{i,t} = \alpha + \beta_1 logmarketcap_{i,t} + \varepsilon_{i,t} \quad \text{Equation 1}$$

Where DGV is the degree centrality value; logmarketcap is the log of market capitalization and ε is the regression residual; i is the index for company; and t is the index for time.

Companies were subsequently ranked by the residuals into five quintiles (within the 11 GICS sectors).

APPENDIX B

Gender assignments were made by two methods.

1. Included within the Professionals database is a field labeled 'prefix'. When the prefix field was equal to 'Mr.', 'Sir', 'Count', 'Father', 'Sheikh', 'Bishop', 'Lord', 'Hafiz', 'Baron', or 'Janab' then the executive was assumed to be male. When the prefix field was equal to 'Mrs.', 'Miss', 'Ms.', 'Sister', 'Lady', 'Madam', 'Countess', 'Baroness', or 'First Lady' then the executive was assumed to be female. For all other prefixes (such as 'Dr.', 'Professor', 'Lieutenant', etc.) the gender was assigned 'ambiguous' for this method.

2. The biographies of each executive were parsed for the presence of gender related pronouns ("he", "him", "his", "she", "her", "hers"). If a minimum of 90% of the pronouns in the biography were specific to one gender, that gender was assumed for the executive; otherwise, the gender was assigned 'ambiguous' for this method.

After the 2 steps were completed for each director, the gender assignments were compared for agreement, ignoring ambiguous results.

APPENDIX C

Corporate Governance: Board effectiveness, composition of board and related committees, executive compensation / share ownership

Codes of Business Conduct: Organization's codes of conduct and reporting of breaches, bribery and anti-competitive practices

Risk & Crises Management: Internal controls, risk governance, and risk culture.

Supply Chain Management: Identify companies with lower supply chain risks and companies using sustainable supply chain management.

Economic & Governance Dimension: Assesses companies on multiple topics including corporate governance, codes of business conduct, risk & crises management, supply chain

management, tax strategy, privacy policy, cybersecurity and customer relationship management.

Environmental Policy & Management Systems (EPMS): Management of a company's environmental programs. Organizational structure, planning and resources to develop EMS

Operational Eco-Efficiency: The key focus of this criterion is on the inputs and outputs of business operations. It assesses trends in natural resource consumption and the production of environmental waste products specific to each industry.

Environmental Dimension: Assesses companies on multiple topics including environmental reporting transparency, climate strategy, EPMS and greenhouse gas emission activity.

Social Dimension: Assesses companies on multiple topics including human rights, human capital development, occupational health and safety, and labor practices.

Labor Practice Indicators: The key focus of the criterion is on gender diversity in management, equal remuneration, and freedom of association.

S&P Global ESG Score: A blended composite of the environmental, social, and economic & governance dimensions.

APPENDIX D

The metrics used for the ESG analysis were adjusted for the following biases:

- Size: Large cap companies tend to have higher ESG scores than small cap companies.
- Corporate Sustainability Assessment (CSA): Companies who complete the CSA questionnaire tend to have higher scores than companies who do not complete the CSA
- Sector: There are differences in averages across sectors.

The following steps were used for the adjustment:

1. Regress out market capitalization from ranks

$$\text{metric}_{i,t} = \alpha + \beta_1 logmarketcap_{i,t} + \varepsilon_{i,t} \qquad \text{Equation 2}$$

Where metric is the ESG composite, pillar or topic score; logmarketcap is the log of market capitalization and ε is the regression residual; i is the index for company; and t is the index for time.

2. Calculate z-scores at the sector level using residuals from step above
3. Re-rank within CSA completed / CSA not completed cohorts

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Our Recent Research

August 2021: Technology Momentum: Peer Networks from Patents

Companies with similar patent portfolios exhibit peer group momentum. A strategy that buys (sells) stocks of focal companies in the Russell 3000 with outperforming (underperforming) technology peers produces an annualized risk-adjusted return of 5.23% in a historical backtest. The strategy returns are more pronounced for smaller companies. In the Russell 2000, the strategy demonstrates more efficacy with annualized long-short return of 7.32%. The strategy is distinct from sector momentum strategies. After controlling for sector momentum, 3.60% excess return in the Russell 3000 can be attributed to technology peer group momentum.

July 2021: Branching Out: Graph Theory Fundamentals

Investment analysis has evolved beyond financial data to non-financial, or alternative data. Typically, the focus has been on using alternative datasets that are purely time-series and tabular. Graph networks meanwhile offer investors the ability to gain deeper insights into the connections between economies, industries, and individual corporations.

May 2021: U.S Filings: No News is Good News

Company annual filings are a vital but often under-analyzed source of information for investors. Market moving content is buried within an ever-growing body of text that on average is equivalent to a 240-page novel. The filings contain subtle revisions making a computational linguistic approach imperative. Faced with this voluminous amount of text and the minute number of changes, investors have historically overlooked the newly embedded information and the implications of those additions

March 2021: Hiding in Plain Sight – Risks That Are Overlooked

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The Business Roundtable, an association of CEOs of America's leading companies, published a new statement on corporate responsibility in August 2019. The statement identifies five important corporate stakeholders: customers, employees, suppliers, communities and shareholders.1 This report highlights four key types of executive policy that drive value creation for stakeholders: profitability vs. growth decisions, mergers & acquisitions policy,

return of cash to shareholders, and insider stock ownership. In it, we demonstrate empirically those practices that increase corporate value over time, thereby rewarding shareholders, employees, and other stakeholders. These practices also form a scorecard by which stakeholders can evaluate whether or not management is undertaking actions likely to increase corporate prosperity.

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August 2020: The Analyst Matrix: Profiting from Sell-Side Analysts' Coverage Networks
Sell-side analyst coverage data provides a new and rich source of establishing connections between firms, as analysts (given their industry expertise) are likely to cover fundamentally related firms. This report uses sell-side analysts' coverage data to build a connected-firm network (CFN) - a portfolio of companies that are covered by analyst(s) that follow a focal firm. This network has three broad applications: measuring the "strength" of economic relationships between companies; forecasting fundamentals of companies in the network; and as a stock selection signal.

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