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# The Power of Connections: Analyzing Director's Networks and ESG Performance in Malaysian Corporations

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## ABSTRACT

This study examines how directors' network structures influence corporate Environmental, Social, and Governance (ESG) performance. Drawing upon social network analysis, four centrality measures—degree, eigenvector, closeness, and betweenness—are employed to capture the social capital embedded within board interconnections. The analysis focuses on the 100 largest publicly listed companies in Malaysia for the year 2022, comprising a network of 1,012 unique directors. The findings reveal that network centrality enhances the diffusion of strategic information and resources, enabling companies to respond to stakeholder expectations more effectively and to improve ESG performance. However, excessive direct connections may lead to information redundancy and governance inefficiency, suggesting that the quality of network ties is as important as their quantity. The study is limited by its cross-sectional design and geographical focus, which may constrain causal inference and generalizability. Future research should consider longitudinal or multi-country approaches to provide deeper insights. Practically, the results underscore the importance for companies and regulators to design board structures that balance interconnectedness with diversity, ensuring optimal information flow and oversight. The study contributes to corporate governance literature by integrating Social Network Theory with Resource Dependency and Stakeholder perspectives, offering a comprehensive understanding of how directors' relational positions can both facilitate and constrain sustainable governance practices.

**Keywords**: Director Networks, ESG, Company Performance, Board of Directors, Sustainability Practices.

## INTRODUCTION

In recent years, the concept of Environmental, Social, and Governance (ESG) practices has attracted growing global attention as investors, regulators, and other stakeholders demand higher levels of corporate transparency and accountability. Companies are increasingly expected to embed sustainability principles within their operations, not only to safeguard environmental resources but also to promote social equity and sound governance. These expectations have reshaped corporate strategies, influencing both financial outcomes and reputational standing (Kotsantonis & Serafeim, 2023; Eccles & Klimenko, 2022). In Malaysia, the momentum toward ESG adoption has intensified as market regulators and institutional investors advocate for sustainable practices. The Securities Commission Malaysia (2023) reports a steady rise in ESG-related disclosures among public-listed companies, reflecting national progress toward responsible corporate behavior. Nonetheless, the uneven pace of ESG integration across industries underscores the need to better understand the internal and external factors that shape corporate sustainability practices (Yusoff & Mohamad, 2023).

Recent Malaysian studies have also highlighted the growing influence of corporate governance mechanisms on sustainability-related disclosures. For instance, Adenan, Said, and Joseph (2024) found that board composition, independence, and audit mechanisms significantly affect sustainable supply chain management disclosure among Malaysian firms. While such studies underscore the relevance of governance structures, the relational dynamics of board directors—their interlocking networks—remain underexplored in shaping sustainability outcomes. This study builds upon that foundation by examining how directors' network centrality influences ESG performance within the Malaysian corporate landscape.

Among these determinants, the role of directors' networks has gained scholarly interest as a subtle yet powerful influence on corporate outcomes. Previous research suggests that directors with broad and well-connected networks can mobilize valuable social and informational capital, which facilitates the diffusion of governance knowledge and sustainability-oriented practices (Larcker, So, & Wang, 2013). Well-networked directors are also positioned to leverage their relational capital to advocate for ethical conduct and improved environmental stewardship within the organizations they serve (Engelberg, Gao, & Parsons, 2013; Horton & Serafeim, 2012). Traditional governance studies have often emphasized board composition attributes such as gender diversity (Mateos de Cabo et al., 2021), independence (Kim & Lu, 2011; Sharma, 2014), and expertise. However, the relational dimension of boards—the patterns of interlocking connections among directors—remains underexplored, particularly in Southeast Asian contexts where business and political ties are deeply intertwined.

Boards of directors play a central role in ensuring effective governance and maintaining investor confidence in Malaysia and Indonesia. Yet, while structural characteristics of boards have been widely examined, the governance implications of directors' networks remain less understood. These networks represent an intangible but critical element of board dynamics that can influence decision-making, monitoring effectiveness, and ultimately, sustainability outcomes. Much of the existing research focuses on dyadic relationships, such as those between executives and CEOs in setting compensation (Engelberg et al., 2013; Horton et al., 2012), or between analysts and directors in shaping market information flows.

However, the broader macro-level effects of director interlocks on ESG outcomes have yet to be empirically established. Board appointments often create ripple effects within the corporate landscape, as nominations are influenced by existing professional and social ties. Well-connected directors can transfer governance practices across companies, potentially leading to a convergence of norms that may either enhance or undermine corporate value (Bouwman, 2011). Historical corporate collapses such as Enron and WorldCom in the United States (Fich & Shivdasani, 2006) and Transmile Group Berhad or Megan Media Holdings Berhad in Malaysia (Mahmud et al., 2009; Norwani et al., 2011) illustrate how weak governance networks can magnify systemic risk and erode public trust.

A recent systematic review by Said, Joseph, and Adenan (2024) synthesized existing evidence on how corporate governance mechanisms influence sustainable supply chain management and found that most studies concentrate on traditional governance attributes—such as board size, independence, and audit quality. However, relational aspects of governance, particularly the network structures that connect directors across firms, remain largely underexplored. This study extends that line of inquiry by examining how directors' network centrality contributes to ESG performance, thereby addressing an emerging gap in the governance–sustainability literature.

While the board's influence on financial performance has been extensively studied, limited attention has been paid to how directors' network structures affect broader performance dimensions such as ESG. This study seeks to fill this empirical void by examining the relationship between the structural configuration of directors' networks and corporate ESG outcomes in Malaysia. Using social network analysis (SNA), the research constructs inter-director networks across the 100 largest publicly listed companies to assess how various centrality measures—degree, eigenvector, closeness, and betweenness—relate to companies' ESG scores. Specifically, the study investigates whether directors' centrality positions facilitate access to strategic information that enhances sustainability performance.

The research also explores whether directors' demographic and sociocultural diversity—encompassing ethnicity, gender, religion, and education—modifies these relationships. Such diversity is particularly relevant in Malaysia's pluralistic setting, where governance outcomes may be shaped by distinct social and institutional dynamics. Moreover, the study extends prior work on political connections (Jomo, 1998; Johnson & Mitton, 2003), examining how these linkages intersect with directors' networks to influence governance and ESG practices. By addressing these dimensions, the study aims to contribute both theoretically and empirically to the understanding of networked governance in emerging markets.

The objectives of this research are threefold: (1) to map and describe the structural characteristics of directors' networks among Malaysian public-listed companies, (2) to examine how these networks influence ESG performance, and (3) to identify key network attributes that drive sustainable governance outcomes. The article proceeds as follows: the next section reviews relevant literature on ESG practices and board interlocks; this is followed by the research design and methodology; the subsequent sections present and discuss the empirical findings; and the paper concludes by outlining implications for theory, policy, and corporate governance practice. Through this inquiry, the study aims to deepen understanding of how directors' relational structures function as a strategic governance mechanism that shapes corporate sustainability in Malaysia's evolving economic landscape. Given Malaysian unique business culture and institutional environment, examining director networks provides insights into how relational and cultural dynamics interact with formal governance structures.

## PRIOR STUDIES

Network centrality within the board of directors has emerged as a critical lens for understanding how ESG practices are shaped and executed within corporations. As an indicator of a director's prominence within a network, centrality captures the scope of influence and the extent of connectivity a board member possesses, both within and beyond the firm. Scholars increasingly acknowledge that directors who occupy central positions in professional networks can leverage their relational capital to secure information, resources, and opportunities that strengthen ESG initiatives. Companies with well-connected boards are often equipped with richer social capital, enabling them to align corporate strategy with sustainability objectives and enhance governance outcomes (Harjoto et al., 2020).

The theoretical foundation linking network centrality and ESG performance draws primarily from Social Capital Theory and Social Network Theory, both of which emphasize how relationships serve as conduits for resource mobilization and influence. Well-connected directors are typically more capable of engaging diverse stakeholders and coordinating collective action—skills that are indispensable for implementing ESG-related strategies. Empirical evidence by Lei et al. (2022) reinforces this view, demonstrating that board network configurations substantially influence the degree to which companies embed sustainability principles within their operations.

Within the Malaysian context, the adoption of ESG practices has gained considerable traction. The Malaysian Code on Corporate Governance (MCCG) continues to drive transparency and sustainability reporting among listed companies, fostering a gradual shift toward responsible business conduct. Despite these advancements, ESG integration remains uneven across sectors, suggesting that the composition and connectivity of board members may partially explain such disparities (Hassan et al., 2023). Recent studies focusing on Malaysian companies indicate that directors who hold multiple directorships or maintain extensive external linkages are more inclined to champion ESG initiatives. This advantage arises from their exposure to broader perspectives and the transfer of best practices across companies (Rashid et al., 2022). Furthermore, the visibility of well-networked directors often signals a firm's commitment to ethical and sustainable governance, strengthening investor confidence and corporate reputation (Yap et al., 2023).

Consistent with the MCCG's principles, governance quality has been identified as a major determinant of corporate sustainability disclosure. Adenan et. al., (2024) demonstrated that internal governance mechanisms, such as board independence and audit oversight, play a crucial role in enhancing sustainable supply chain management transparency. Their findings highlight that effective governance structures strengthen firms' commitment to sustainability, suggesting that directors' influence extends beyond compliance toward shaping ethical and responsible corporate conduct. Building on this evidence, the present study shifts focus from structural mechanisms to relational ones—specifically, how directors' network centrality contributes to ESG performance through information diffusion and social capital formation.

Despite these contributions, notable research gaps persist, especially concerning how board networks function within the Malaysian institutional environment. Much of the extant scholarship originates from Western economies, which differ significantly in governance structures, cultural norms, and regulatory oversight. Addressing this gap, the present study investigates how network centrality influences ESG outcomes by focusing on the structural characteristics of Malaysian board interlocks and their implications for sustainability integration.

Empirical findings on the relationship between directors' networks and firm performance remain mixed. While several studies report significant effects, others reveal weak or inconsistent associations (Abdul Wahab et al., 2020; Fracassi & Tate, 2012). Earlier research explored how social networks shape decision-making, monitoring, and overall corporate performance, recognizing that effective governance is closely tied to the strength of directors' professional relationships. Networks have been linked to a variety of organizational outcomes, including executive compensation, policy choices, and political affiliations (Jamaludin & Hashim, 2017; Dicko & Breton, 2011; Horton et al., 2009; Kim, 2005; Larcker et al., 2005, 2012; Nicholson et al., 2004; Smith, 2009). They also play a vital role in providing strategic information and advisory support, thereby enhancing board effectiveness (Carpenter & Westphal, 2001; Chenhall et al., 2010; Durbach & Parker, 2009; Stuart & Yim, 2010).

Nevertheless, empirical studies exploring the consequences of internal corporate networks remain limited (Kleinbaum & Stuart, 2014). Prior research suggests that both internal and external director networks influence firm performance and governance effectiveness (Brass et al., 2004; Mehra et al., 2006; Tsai, 2001; Tsai & Ghoshal, 1998). Directors who maintain broad connections contribute to the accumulation of social capital, fostering innovation, collaboration, and long-term value creation. Yet, the strength of these effects depends on the directors' ability to transform relationships into actionable resources and strategic knowledge (Berberich & Niu, 2011; Field et al., 2013; Westphal & Stern, 2006).

This study adopts an integrative theoretical approach that combines Social Network Theory, Resource Dependency Theory (RDT), Stakeholder Theory, and Agency Theory. Social Network Theory underscores the importance of structural positioning, arguing that directors who occupy central or bridging roles have superior access to information and influence (Burt, 2004). Empirical evidence indicates a comprehensive relationship: while degree centrality—representing direct links—may sometimes correlate negatively with ESG outcomes due to information overload and managerial distraction, eigenvector centrality—denoting connections to other influential actors—often yields positive effects by facilitating access to strategic resources and elite information channels.

From the perspective of RDT, directors serve as boundary spanners who connect the firm with external stakeholders and resources (Pfeffer & Salancik, 1978). Excessive networking, as captured by degree centrality, can generate inefficiencies and reduce governance quality by stretching directors' capacity to monitor effectively. Conversely, higher eigenvector centrality enhances the firm's ability to acquire critical knowledge and institutional support, thereby improving ESG performance.

Stakeholder and Agency theories further enrich this framework by highlighting the tension between directors' external affiliations and their monitoring responsibilities. Agency Theory warns that extensive directorships may dilute oversight and exacerbate conflicts of interest (Jensen & Meckling, 1976). In contrast, Stakeholder Theory posits that directors embedded in diverse networks can foster stronger stakeholder engagement and ethical accountability (Freeman, 1984). The combined theoretical insights suggest that optimal ESG outcomes arise when boards maintain a balance between connectivity and control, ensuring that network capital is strategically leveraged without undermining governance integrity.

Collectively, these perspectives reveal that board networks are neither universally beneficial nor detrimental. Their effectiveness depends on how directors utilize their connections to enhance governance processes, align stakeholder interests, and support long-term sustainability. Understanding these comprehensive relationships provides the theoretical foundation for this study's empirical investigation of how directors' network centrality influences ESG performance within Malaysian public-listed companies.

# METHODOLOGY

This study adopts a quantitative research design to examine how the network centrality of board directors influences ESG practices among public listed companies in Malaysia. Framed as a cross-sectional analysis, the research captures data at a single point in time to evaluate the relationship between directors' network structures and corporate sustainability outcomes. Such a design enables a focused assessment of the existing state of ESG implementation and its linkages to board connectivity and influence (Hsu & Wu, 2022; Wang & Xu, 2023). Although the study adopts a cross-sectional approach which is appropriate to examine current director's relational structures, it does not capture changes in director networks or ESG outcomes over time. Therefore, future research could adopt a longitudinal approach to determine the causality between the dynamics of director networks and sustainability performance.

The target population comprises the 100 largest companies listed on Bursa Malaysia, ranked by market capitalization. This purposive sampling strategy is intended to capture companies with substantial market presence, mature governance mechanisms, and well-developed board structures. Concentrating on leading companies ensures the representativeness of organizations most actively engaged in ESG disclosure and provides a meaningful context for evaluating complex board networks (Kumar & Mian, 2022). The selection of top 100 companies in Malaysia provides a relevant setting for analyzing established governance structures, this focus may be due to established companies with most likely have more formalized ESG approach. Therefore, results may not reflect the dynamics of smaller or emerging companies, where informal or family networks may exert greater influence.

Multiple data sources were used to enhance validity and completeness. Information on board interlocks and directors' affiliations was obtained from annual reports, official company websites, and verified professional networking platforms such as LinkedIn (Smith et al., 2023). Variables included the number of concurrent directorships, interlocking board memberships, and external professional associations. ESG performance data were extracted from sustainability and CSR reports, complemented by third-party ratings from agencies such as MSCI and Sustainalytics (Johnson & Lee, 2023). Although third-party ESG ratings namely MSCI and Sustainalytics provide standardized and comparable data, differences in rating methodologies may introduce measurement bias. To mitigate this, cross-verification with Thomson Reuters ASSET4® scores was conducted to ensure consistency in relative ESG rankings (Thompson & Garcia, 2023). Financial indicators, including firm size, revenue, and market capitalization, were gathered from company financial statements and commercial databases such as Bloomberg and Thomson Reuters (Davis & Thompson, 2023).

The analysis combines descriptive and inferential statistical methods. Descriptive statistics are used to summarize sample characteristics and illustrate distributions of ESG scores and network measures (Harrison & Lin, 2023). Pearson correlation analysis assesses the strength and direction of bivariate relationships between centrality metrics and ESG indicators (Nguyen & Sim, 2022). Subsequently, multiple regression models evaluate the influence of directors' network centrality on ESG performance while controlling for company-specific variables such as firm size, industry classification, and profitability (Lee & Carter, 2023).

To visualize and quantify inter-director relationships, the study employs social network analysis (SNA). Measures of degree, betweenness, closeness, and eigenvector centrality are computed to capture different dimensions of network prominence and influence (Zhang & Wang, 2022). The sample excludes financial institutions, companies classified under PN17, and companies lacking 2022 annual reports. These four centrality network measures were chosen because they capture distinct yet complementary aspects of board influence: Degree reflects direct relational density; Eigenvector captures relational quality and prestige; Closeness indicates communication efficiency; and Betweenness measures brokerage potential. Together, they offer a comprehensive lens for evaluating how both direct and indirect board ties shape ESG performance, consistent with prior governance network studies (Larcker et al., 2013; Gao & Wang, 2023). After applying these criteria, 100 companies and 1,012 directors were retained for analysis. Directors' information was hand-collected. All network computations were conducted using UCInet software (Harris & Zhu, 2022).

To uphold data integrity, independent researchers performed data entry, screening, and verification, resolving

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discrepancies through consensus (Robinson & Hill, 2023). The study applies four recognized measures of centrality: degree (both direct and indirect), eigenvector, betweenness, and closeness (Jackson, 2023). Degree centrality reflects the number of direct board linkages a director maintains, denoting influence derived from immediate relationships (Freeman, 1978; Bonacich, 1987). Eigenvector centrality evaluates the extent to which a director is connected to other influential peers, emphasizing indirect influence within the network (Bonacich & Lloyd, 2015). Betweenness centrality identifies directors occupying intermediary positions, capable of brokering or filtering information between otherwise disconnected clusters (Freeman, 1978; Barnea & Guedj, 2006). Closeness centrality measures a director's efficiency in reaching others in the network, capturing the speed and effectiveness of communication and coordination (Horton et al., 2012; Nicholson, Alexander, & Kiel, 2004).

Each of these metrics was computed at both the individual and firm levels, with aggregated measures reflecting the collective influence of directors within a given company (Horton et al., 2012). By integrating data from multiple verified sources and applying robust statistical and network analysis techniques, this study aims to provide rigorous empirical evidence on how board networks function as a mechanism of corporate governance and sustainability (Gao & Wang, 2023).

## FINDINGS

Figure 1 presents the graphical configuration of directors' interlocking relationships across the sampled Malaysian public-listed companies. The overall Network Centrality Index (NCI) of 0.72 signifies a low-density structure, suggesting that connections among directors are relatively sparse. The visualization reveals a large, interconnected cluster—represented by blue nodes—comprising directors who maintain multiple shared board memberships. Surrounding this main component are several smaller, loosely connected clusters, indicating limited cross-board interactions among other directors.

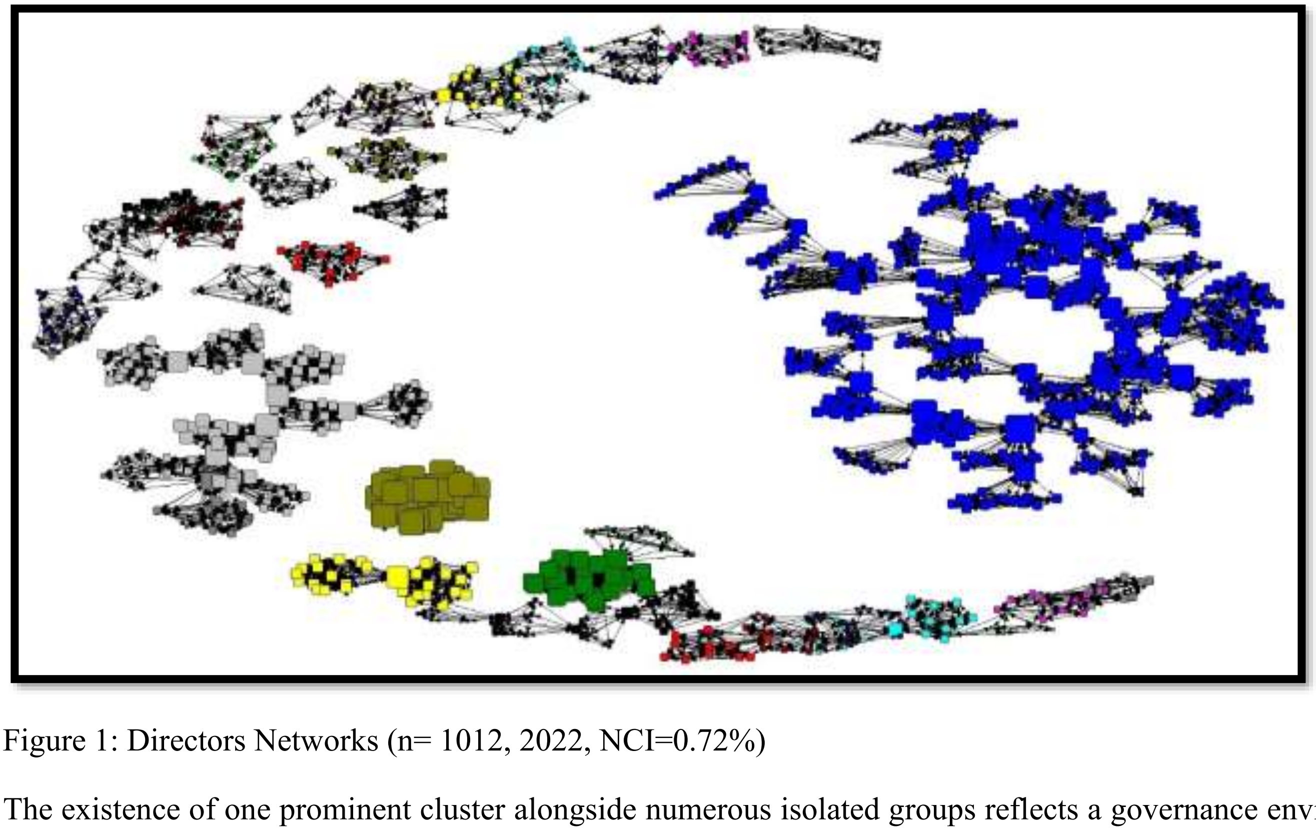

Figure 1: Directors Networks (n= 1012, 2022, NCI=0.72%)

The existence of one prominent cluster alongside numerous isolated groups reflects a governance environment characterized by localized connectivity rather than broad network integration. Although some directors occupy structurally advantageous positions within their respective clusters, the network lacks a dominant or centrally controlling individual. This dispersed configuration implies that influence and information flow are moderately diffused, minimizing the likelihood of network dominance or resource monopolization. The relatively low density further suggests that collaboration and knowledge exchange occur within selective circles, potentially constraining the diffusion of sustainability-related insights across companies.

Overall, the network structure depicted in Figure 1 demonstrates a fragmented but functional governance network, where limited inter-cluster linkages may restrict the collective advancement of Environmental, Social, and Governance (ESG) practices, despite the presence of several well-connected directors.

Figure 2 depicts the inter-organizational network formed through shared directorships among the top 100 publicly listed companies in Malaysia. The connections between companies are constructed based on directors who hold multiple board positions, thereby linking companies through overlapping governance ties. The overall Network Centrality Index (NCI) of 0.006 (or 0.6%) indicates a low-density network, implying limited interconnectivity across companies. Similar to the director-level structure illustrated in Figure 1, the company-level network reveals an absence of a dominant firm capable of exerting broad influence over the network.

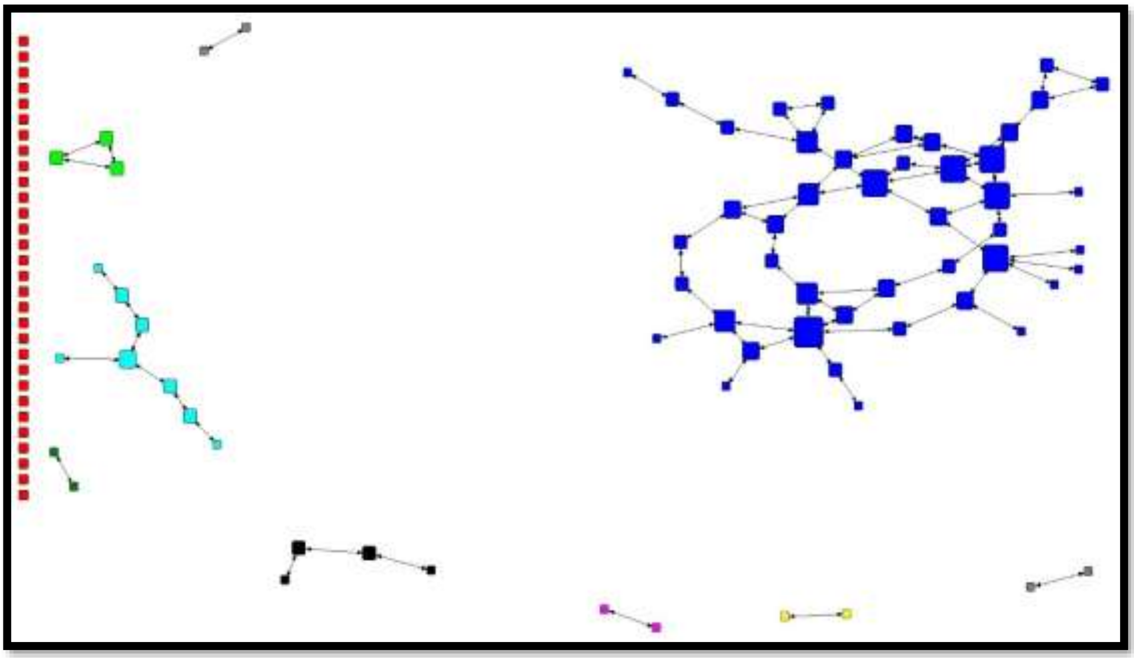

Figure 2: Figure 2: Company's Networks (n=100, 2022, NCI=0.6%)

The visualization shows that approximately 30 companies remain isolated, signifying the absence of any shared directors with other companies. The remaining companies form small, localized clusters, with one relatively prominent component—represented by larger blue nodes—indicating a group of companies that are more closely connected through multiple shared directorships. This cluster reflects a core governance circle, where companies potentially share strategic knowledge, governance norms, and market information through interlocking boards.

Despite this cluster, the overall network configuration suggests a fragmented governance landscape. The sparse connectivity limits opportunities for collective learning, coordinated ESG initiatives, or widespread diffusion of governance innovations. While central companies may benefit from enhanced access to shared expertise, the majority operate independently, reflecting a dispersed governance ecosystem in Malaysia's corporate sector.

Table 1: Descriptive statistics- Company's Level (n=100, 2022)

| | Degree | Closeness | Betweenness | Eigenvector | ESG |
|---|---|---|---|---|---|
| Mean | 1.576 | 1.486 | 0.747 | 6.125 | 57.52 |
| Std Dev | 1.480 | 0.336 | 1.437 | 12.747 | 0.435 |
| Minimum | 0.000 | 1.010 | 0.000 | -0.000 | 27.15 |
| Maximum | 6.061 | 1.754 | 7.659 | 61.209 | 90.01 |

| | | | | | |
|---|---|---|---|---|---|
| NCI | 0.6% | 9.08% | 6.98% | 1.59% | - |
| N of Obs. | 100 | 70 | 100 | 100 | 100 |

Table 1 summarizes the descriptive statistics for network centrality measures and ESG performance among the 100 largest publicly listed companies in Malaysia. The average Degree centrality of 1.576 indicates that, on average, each firm maintains direct links with approximately one to two other companies. This moderate level of interconnectivity suggests that while some companies are moderately embedded in the governance network, many remain relatively independent. The minimum value of 0.000 reflects the presence of completely isolated companies with no shared directors, whereas the maximum value of 6.061 indicates that certain companies maintain interlocks with up to six other companies, reflecting a higher level of engagement and potential for information exchange. The average Eigenvector centrality of 6.125 highlights the presence of companies connected to other influential actors in the network, emphasizing relational quality rather than mere quantity of connections. The maximum Eigenvector score of 61.209 suggests the existence of a few companies occupying highly influential positions, capable of bridging key governance and information channels. In contrast, companies with low Eigenvector scores are positioned on the periphery, with limited access to influential peers or decision-making networks.

The mean Betweenness centrality value of 0.747 demonstrates that certain companies play intermediary roles by connecting otherwise unlinked companies. The maximum score of 7.659 implies that some companies occupy strategic brokerage positions, enabling them to mediate information flows and potentially shape governance practices across multiple entities. Closeness centrality, averaging 1.486, indicates moderate efficiency in reaching other companies within the network. Companies with higher Closeness scores can disseminate information more rapidly, which may enhance responsiveness to governance or sustainability challenges.

Finally, the average ESG performance score of 57.52percent reveals a moderate level of sustainability integration among Malaysian listed companies. The broad range of ESG scores—from 27.15percent to 90.01 percent—suggests significant heterogeneity in sustainability adoption and reporting practices across sectors. Collectively, the descriptive results reflect a fragmented but evolving corporate network, where a small subset of companies demonstrate strong inter-firm linkages and high ESG engagement, while the majority operate in relative isolation.

Table 2: Correlations

| | Degree | Closeness | Betweenness | Eigenvector | ESG |
|---|---|---|---|---|---|
| Degree | | **0.724**** | **0.836**** | **0.768**** | **0.189*** |
| Closeness | **0.487**** | | **0.770**** | **0.894**** | 0.159 |
| Betweenness | **0.778**** | **0.490**** | | **0.699**** | 0.133 |
| Eigenvector | **0.671**** | **0.463**** | **0.616**** | | **0.197*** |
| ESG | 0.142 | 0.107 | 0.099 | **0.182*** | |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | | |

Table 2 reports the correlation coefficients between the four network centrality measures—Degree, Closeness, Betweenness, and Eigenvector—and companies' ESG performance. The results reveal consistently strong and positive interrelationships among the network variables, with correlation coefficients exceeding 0.50 and all significant at the 1 percent level. This pattern indicates that the different centrality dimensions capture related, yet distinct, aspects of board connectivity. The high correlations suggest that companies with directors who hold

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more interlocks (Degree) also tend to have shorter paths to other companies (Closeness) and greater influence within the broader network (Eigenvector).

Among the network metrics, Eigenvector centrality exhibits a positive and statistically significant correlation with ESG performance ($r = 0.197$, $p < 0.05$). This finding implies that companies whose directors are connected to other influential actors tend to demonstrate stronger ESG outcomes, supporting the argument that relational quality and access to elite networks enhance sustainability integration. Likewise, Degree centrality shows a weaker but still significant positive relationship with ESG performance under Spearman's rank correlation, indicating that a higher number of interlocks modestly improves ESG engagement through increased exposure to governance knowledge and best practices.

The intercorrelations between the network measures are notably high, particularly between Closeness and Eigenvector centrality ($r = 0.894$, $p < 0.01$), reflecting strong convergence between direct and indirect measures of influence. The significant positive correlations across all network dimensions reinforce the internal consistency and robustness of the social network indicators used in this study. Overall, the results provide preliminary empirical support for the view that director connectivity—especially through influential and well-positioned networks—plays a meaningful role in shaping corporate ESG performance.

Table 3: Regression (n=100, 2022)

| Variables | ESG |
|---|---|
| C | **0.795**** |
| | **3.254** |
| Degree | **-0.105*** |
| | **-1.539** |
| Closeness | 0.110 |
| | 0.666 |
| Betweenness | 0.023 |
| | 0.475 |
| Eigenvector | **0.008**** |
| | **1.718** |
| Adjusted $R^2$ | 0.010 |
| Std. Error | 0.390 |
| VIF | 2.410 |
| F-stats | **1.168*** |
| Obs. | 100 |
| **. Correlation is significant at the 0.01 level (2-tailed). | |
| *. Correlation is significant at the 0.05 level (2-tailed). | |

Table 3 reports the results of the regression analysis examining the effects of directors' network centrality on companies' ESG performance. The findings reveal a negative and statistically significant coefficient for Degree centrality ($\beta = -0.105$, $p < 0.05$), suggesting that directors with numerous direct interlocks are associated with weaker ESG performance. In contrast, Eigenvector centrality exhibits a positive and significant relationship ($\beta = 0.008$, $p < 0.01$), implying that indirect or second-level connections—links to other highly influential directors—enhance ESG outcomes. The coefficients for Closeness and Betweenness centrality are positive but statistically insignificant, indicating that while proximity and brokerage roles contribute positively to ESG initiatives, their effects are not sufficiently strong to reach statistical significance.

These results collectively highlight a comprehensive dynamic between direct and indirect board connections. The negative influence of Degree centrality aligns with prior studies suggesting that excessive directorships may create board busyness, reducing the time and attention directors can devote to governance and sustainability oversight (Andres et al., 2013; Ferris et al., 2003; Larcker et al., 2013). Moreover, directors embedded in dense networks may experience conformity pressures or reciprocal loyalties that compromise their independence, resulting in weaker ESG monitoring (Mizruchi, 1996). The findings also indicate that highly interconnected directors may inadvertently facilitate information redundancy or groupthink, diluting the quality of sustainability-related decisions (Omer et al., 2014).

Conversely, the positive association between Eigenvector centrality and ESG performance underscores the value of influence-based connections. Directors linked to other well-connected peers may access diverse information, expertise, and institutional knowledge, enabling more effective strategic responses to stakeholder expectations. This suggests that network quality—rather than sheer size—drives the positive governance effects of interlocking directorships.

In summary, the regression results reinforce the premise that not all connections yield governance benefits. While dense, overlapping board memberships can constrain decision quality, strategically positioned indirect ties appear to foster knowledge exchange and accountability that strengthen ESG outcomes. This finding supports the theoretical view that balanced network structures—those combining informational reach with autonomy—are most conducive to sustainable governance performance.

## DISCUSSION

This study set out to investigate the influence of board directors' network centrality on Environmental, Social, and Governance (ESG) practices among the largest publicly listed companies in Malaysia. By analyzing four key measures of centrality—Degree, Eigenvector, Closeness, and Betweenness—the research provides empirical insights into how board connectivity shapes corporate sustainability outcomes. The findings reveal that network centrality plays a significant role in influencing ESG performance, supporting the notion that directors with broader and more influential networks are instrumental in advancing sustainability practices. This outcome underscores the growing importance of board composition and relational structure in achieving corporate sustainability objectives, aligning with recent evidence that well-connected directors foster stronger ESG engagement (Smith et al., 2023).

Based on the cross-sectional analysis for this study, the findings provide preliminary consequences from the director's connection relationship. Directors' network structures and ESG outcomes may influence each other reciprocally, suggesting a need for time-series or panel-data analysis. The study contributes to corporate governance literature by deepening the understanding of Social Network Theory within the ESG context. It demonstrates that the effect of director centrality extends beyond the number of ties to include the quality and influence embedded in those connections. Integrating insights from RDT and Stakeholder Theory, the findings suggest that director networks can serve as strategic channels for accessing resources, information, and legitimacy. However, these same networks may also constrain oversight effectiveness if they generate overcommitment or social conformity. The results therefore refine theoretical perspectives by showing that network centrality can both enhance and impair ESG performance, depending on how directors manage their relational capital.

Empirical results indicate that Degree centrality has a negative and significant association with ESG performance, implying that directors who hold numerous direct links may suffer from overextension and reduced monitoring capacity. In contrast, Eigenvector centrality is positively related to ESG outcomes, highlighting the benefits of connections with other influential and resourceful directors. These findings mirror prior research suggesting that while excessive networking can lead to board busyness and diluted governance quality (Andres et al., 2013; Ferris et al., 2003; Larcker et al., 2013), strategic second-level connections facilitate access to expertise and information that strengthen corporate sustainability initiatives (Burt, 2004). The absence of significant relationships for Closeness and Betweenness centrality indicates that indirect and intermediary roles may not directly translate into measurable ESG improvements, consistent with earlier studies by Larcker et al. (2013).

The observed pattern is consistent with prior Malaysian research that underscores the importance of governance mechanisms in advancing corporate sustainability. Adenan et. al., (2024) similarly found that robust governance structures foster more transparent sustainability disclosures, particularly in supply chain management. This convergence suggests that both formal governance mechanisms such as board oversight and informal relational mechanisms such as director networks serve complementary roles in shaping ESG outcomes within emerging markets.

From a practical standpoint, the study provides guidance for companies and policymakers. Companies should critically assess the network profiles of potential directors when designing their boards. Overly interconnected directors may appear advantageous but can reduce governance independence and effectiveness. In contrast, appointing directors with strong second-level connections can yield strategic benefits by improving access to valuable knowledge and external resources. For regulators and policymakers, the findings emphasize the need to encourage diversity and well-balanced board interconnections, which can enhance governance efficiency and support broader ESG goals. Furthermore, the results highlight the value of limiting excessive directorships to mitigate board fatigue and improve oversight quality (Bonacich, 1987; Bonacich & Lloyd, 2015).

This study enriches the theoretical discourse on corporate governance and sustainability by advancing the understanding of how board network structures influence ESG performance. First, the findings extend Social Network Theory by demonstrating that the influence of board connectivity depends not merely on the number of interlocks but on the quality and strategic position of those connections. The positive role of Eigenvector centrality underscores that indirect connections to influential peers—rather than direct interlocks alone—enhance access to critical information and resources that support sustainable decision-making. This contributes to a more refined understanding of how embedded social capital within board networks facilitates strategic outcomes beyond traditional governance metrics.

Second, the results integrate RDT by showing that directors' network positions determine their effectiveness in acquiring and mobilizing external resources. High Eigenvector centrality indicates access to elite information channels, aligning with RDT's premise that well-connected boards can mitigate environmental uncertainty and improve corporate adaptability. However, the negative association between Degree centrality and ESG performance challenges the assumption that more connections always translate to better governance outcomes. This finding introduces a paradox of connectivity within governance theory, suggesting diminishing returns when excessive ties dilute directors' attention or create information overload.

Third, this research broadens Stakeholder Theory by revealing that network-embedded directors enhance stakeholder responsiveness through increased legitimacy and inter-organizational trust. Finally, by incorporating insights from Agency Theory, the results demonstrate that overly dense networks may exacerbate managerial entrenchment or conflict of interest, emphasizing the importance of balancing relational capital with effective oversight. Collectively, these contributions position director network centrality as a multidimensional construct that bridges structural, behavioral, and institutional elements of corporate governance.

While Said et al. (2024) consolidated prior research linking governance mechanisms to sustainable supply chain practices, their review also underscored the need for broader theoretical models that capture relational and social dimensions of governance. Responding to that call, the present study integrates Social Network Theory with

RDT and Stakeholder perspectives to explain how directors' network embeddedness operates as an informal governance mechanism that enhances ESG outcomes.

As Malaysia's corporate landscape is shaped by unique cultural and institutional factors, including strong government-linked ownership, ethnicity diversity, and collectivist norms that emphasize relationship-based governance. These characteristics may influence how director networks operate, commonly through interlocks which may arise from trust-based affiliations or political patronage rather than purely strategic motives. Incorporating these cultural dimensions enriches understanding of how social embeddedness mediates governance outcomes in emerging markets.

From a practical standpoint, the findings carry important implications for boards, policymakers, and regulators seeking to enhance ESG integration and governance quality. For boards of directors, the results suggest that strategic composition should focus not only on demographic or professional diversity but also on the network quality of members. Companies should prioritize directors who possess meaningful, well-positioned connections rather than those holding numerous overlapping directorships. Excessive direct interlocks may lead to governance fatigue and reduced independence, whereas indirect, influential connections can strengthen strategic collaboration and sustainability oversight.

For corporate governance regulators, the study offers empirical evidence supporting policies that promote balanced board networks. Initiatives such as limiting the number of directorships, encouraging cross-industry representation, and mandating transparent disclosures of interlocking directorships could mitigate excessive concentration of power and improve information flow across companies. Investors and stakeholders can also leverage these insights to evaluate governance quality more holistically, considering not just board characteristics but also relational embeddedness as a proxy for network influence and information access.

In general, the findings encourage Malaysian regulators and institutional investors to continue fostering interconnected yet diverse boards, aligned with the objectives of the MCCG**.** Strengthening relational diversity and promoting strategic interlocks among ethical and sustainability-oriented directors could accelerate the diffusion of ESG best practices across sectors. By recognizing the strategic value of relational capital, companies can design governance systems that balance connectivity, accountability, and sustainable value creation.

## CONCLUSIONS

This study examined the relationship between board directors' network centrality and ESG performance among 100 of Malaysia's largest publicly listed companies, encompassing 1,012 directors. The findings suggest that not all network connections yield beneficial outcomes. Degree centrality, which represents direct board interlocks, negatively affects ESG performance, while Eigenvector centrality, capturing connections to influential peers, positively influences it. Closeness and Betweenness centrality show no significant effects, suggesting that indirect network positions or intermediary roles do not necessarily enhance ESG outcomes. Collectively, these results demonstrate that while extensive networking may create information redundancy and governance inefficiencies, strategic and high-quality indirect ties contribute to better sustainability performance.

The study advances theoretical understanding by integrating Social Network, RDT, Stakeholder, and Agency theories. It shows that directors' positions within network structures can either facilitate or hinder corporate sustainability depending on the balance between resource access and oversight independence. Practically, these insights reinforce the importance of considering network attributes when forming or evaluating boards. Companies should avoid excessive concentration of direct interlocks and instead foster broader, high-quality linkages that strengthen ESG governance and performance.

Several limitations warrant attention. The sample is limited to Malaysia's largest companies, which may not represent smaller or privately held companies. The cross-sectional design restricts causal inference, and the use of aggregated ESG scores may obscure variations across environmental, social, and governance dimensions. Future research could employ longitudinal or panel data to examine how director networks evolve over time and influence specific ESG pillars. Comparative studies across industries and countries would help test the generalizability of these findings, while qualitative analyses could further elucidate how directors' relationships shape ESG decision-making dynamics (Hsu & Wu, 2022; Ali & Hasan, 2023; Lee & Carter, 2023).

Future research could broaden the sample to include other category of company such as middle size or newly listed companies to capture how director's networks work in less formalized corporate environments. As ESG scores depend on rating agency methodologies, they may reflect disclosure quality rather than true sustainability performance. Future studies could employ manual content analysis or integrate qualitative sustainability indicators to validate these measures. An inherent limitation concerns potential endogeneity between network centrality and ESG performance where companies with greater sustainability initiatives may attract more connected directors, creating reverse causality. Therefore, this study suggest for future studies could apply instrumental variable regression, two-stage least squares (2SLS), or panel-based methods to mitigate this concern and establish directionality. Future work may adopt panel-data research designs, with the inclusion of smaller companies, employ multi-source ESG measurements, and incorporate relevant institutional variables to capture Malaysia's cultural embeddedness. Such extensions would enhance causal inference and contextual generalizability.

In conclusion, this study highlights the dual nature of board networks in corporate governance. While extensive direct ties may constrain effective monitoring, strategically connected and influential directors can enhance ESG performance by facilitating resource exchange, stakeholder collaboration, and informed decision-making. Understanding this balance provides valuable insights for scholars, practitioners, and policymakers seeking to design governance structures that foster both accountability and sustainable value creation.

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