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CORPORATE GOVERNANCE AS A CATALYST IN THE NEXUS BETWEEN GREEN INTELLECTUAL CAPITAL AND ORGANIZATIONAL SUSTAINABILITY: A CONCEPTUAL INSIGHT

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ABSTRACT

Sustainability is an important strategic goal that businesses are factoring in, as its implementation guarantees long-term competitiveness and positive societal impacts. In emerging economies, sustainability is of greater importance as environmental pressures, resource limitations, and stakeholder demands pose an increasing threat to industries. In this context, this study demonstrates how corporate governance mechanisms improve and strengthen the association between Green Intellectual Capital (GIC) and organizational sustainability (OS) by drawing on the Natural Resource-Based View (NRBV) and Stakeholder Theory. To the best of our knowledge, this is the unique study to conceptualize corporate governance mechanisms as a driving force that strengthens the association between GIC and OS within the context of emerging economies. The outcome of this study will help both government and industry decision-makers strengthen governance structures that support the effective use of environmental knowledge and responsible management practices. Furthermore, the study will serve as a conceptual foundation for future empirical investigations and encourages further examination of governance-driven sustainability transformations in emerging-market contexts.

Keywords: *Green Intellectual Capital, Organization Sustainability, Corporate Governance Mechanisms.*

1. INTRODUCTION

Over the past few years, sustainability has become a core strategic interest among business organisations worldwide, especially in emerging economies, where rapid industrialisation has escalated resource exploitation, environmental degradation, and social insecurity (Wang et al., 2023; Zafarullah and Mehnaz, 2025). The necessity of making business go beyond maximising profit and adopting strategies that ensure ecological balance, social responsibility, and long-term economic sustainability is increasingly a must (Ogunbukola, 2024). Sustainability does not just matter to address the global issues in the form of environmental degradation, the prevention of pollution, and social injustice (Wijayanto et al., 2025),

but also to maintain organisational legitimacy, competitive positioning, and continuity in the fast-changing market environment (Rasche et al., 2023; World Economic Forum, 2022). In the modern, highly competitive, and changing world, business organisations are under increasing pressure to integrate sustainability into their corporate strategy to enhance sustainability, growth, and financial performance (Sanoran, 2023). Nevertheless, those Firms that do not consider sustainability as part of their strategic decision-making suffer reputational losses, regulatory burden, and loss of trust among stakeholders, a factor that threatens their survival (Abdellattif et al., 2025).

Green Intellectual Capital (GIC) is being developed as a vital intangible resource that enables businesses to embed environmentally friendly practices into their core operations (Suengkamolpisut et al., 2025). GIC (green human, structural, and relational capital) can assist business organisations in adopting and implementing environmentally responsible strategies by providing them with the knowledge, routines, technology, and stakeholder relationships they need (Li et al., 2023). The higher the GIC levels are, the better businesses can create green, efficient processes, less waste, green products and technologies, and a culture of sustainability that fosters learning and problem-solving (Benevene et al., 2021; Chen, 2008). Consequently, GIC is a major driver of an organisation's sustainability, which can also enable business organisations to pursue environmental stewardship alongside a competitive market advantage (Suki et al., 2022; Turi et al., 2023; Ullah et al., 2021; Umar et al., 2024; Wang and Juo, 2021). Thus, Green intellectual capital is a phenomenon in the modern globalised economy that has enhanced a business's survivability and can conserve the surrounding environment to realise sustainable performance (Walkomaroh et al., 2025).

Although the researchers have determined that there is a positive association between organisational sustainability and the GIC attributes that constitute green human capital (GHC), green structural capital (GSC), and green relational capital (GRC), these associations differ in nature across settings. For example, Yusliza et al. (2020) found positive, meaningful influences of GIC on the sustainable performance of Malaysian manufacturing enterprises across social, environmental, and economic dimensions. Still, the study treated GIC as a single dimension. In contrast, Mansoor et al. (2021) also found that GHC and GRC are positively correlated with the performance of Pakistani manufacturing organisations in terms of environmental sustainability. Likewise, Yong et al. (2022) found that the two aspects of GIC also improve sustainable performance in Malaysian manufacturing enterprises, except for green structural capital. On the contrary, as Gharib et al. (2023) note, GSC has a significant impact on environmental sustainability, but other factors, GHC and GRC, do not. Also, Mohamed (2023) noted that GIC directly affects business sustainability, yet failed to distinguish among its dimensions (economic, social, and environmental). Also, Yulfiswandi and Alvin (2024) demonstrated that GSC and GRC contribute significantly to the sustainable performance of MSMEs, and green human capital does not. This lapse highlights the importance of conducting empirical studies to examine the role of GIC in sustainability-oriented practices, thereby strengthening the environmental, economic, and social dimensions of sustainability.

Some academicians argue that GIC's scale is insufficient to drive the sustainability performance of firms with low levels of shared ownership and weak governance systems. For this purpose, it is essential to consider other facilitating factors (Anggraini et al., 2024; Khotimah et al., 2024; Walkomaroh et al., 2025). The literature suggests that GIC can fail to deliver its advantages without proper supervision, strategy, and accountability systems; the sustainability-based knowledge contained in GIC can go unexploited; and that corporate governance mechanisms (CGMs) play a vital enabling role (Gangi et al., 2019). The alignment, monitoring, and strategic integration needed to achieve the goal of ensuring that sustainability goals are embedded in the managerial decision-making and organizational priorities are offered by effective governance structures, such as board environmental expertise, board gender diversity, sustainability committees, transparent reporting practices, and stakeholder-engagement frameworks (Alta'any et al., 2024; Safdie, 2023; Tariq et al., 2025; Yang, 2023). In the same vein, other literature supports that Corporate governance mechanisms (CGMs) such as board structure, ownership concentration, gendered boards, sustainability committees, and transparency augment the favourable influence of GIC on sustainability performance (Abreu et al., 2023; Hussain et al., 2018; Oyewo et al., 2023). Empirical evidence indicates the potential strengthening of the positive impact of the GICs on the sustainability performance by robust corporate governance, growth options, and publicly owned ownership (Khotimah et al., 2024; Walkomaroh et al., 2025), yet this moderating effect is not always observed, and the underlying pathways remain unclear. Additionally, the literature

shows that the interaction between CG and GIC is significant in emerging economies, where regulatory systems tend to be weaker and stakeholder pressure is rapidly changing (Asni and Agustia, 2022; Srouji et al., 2025). Thus, CGMs serve as an agent of enhanced connection between GIC and organisational sustainability, as they offer strategic orientation, resource allocation, and performance tracking (Lastanti and Augustine, 2022).

Nevertheless, the bulk of the available literature focuses on developed economies or specific sectors, while the distinctive institutional, regulatory, and cultural issues of emerging markets remain under-researched. Moreover, there are no detailed frameworks for how CG mechanisms bring about the GIC-sustainability relationship. The institutional regulations and systems of sustainability enforcement in emerging economies are evolving (Walkomaroh et al., 2025; Wati et al., 2024). So, in such economies, the role of CG is particularly crucial. This paper, therefore, proposes a theoretical framework that explains how corporate governance mechanisms maximise and strengthen the viability of GIC in facilitating organisational sustainability. Thus, this study has led managers and policymakers in emerging economies to lack clear guidance on how to structure governance systems and intellectual capital strategies that will effectively ensure sustainability. Based on the description provided above, the purpose of the research is to examine the following research questions:

RQ-1: What is the impact of Green Intellectual Capital (Green Human Capital, Green Relational Capital, and Green Structural Capital) on the sustainability of organisations?

RQ-2: To what extent do the Corporate Governance Mechanisms (Board Size, Board Independence, Board Gender Diversity, and Green Board Committee) ameliorate the relationship between Green Intellectual Capital and Organisational Sustainability?

2. LITERATURE REVIEW

2.1. Green Intellectual Capital and Organizational Sustainability

In today's competitive, environmentally sensitive corporate context, success is determined not just by an organization's financial performance but also by how effectively it integrates sustainability into its core strategies. GIC provides the basis for this integration as it stands for an organization's collective knowledge, skills, competencies, and relational assets that are oriented toward green practices and sustainable outcomes (Ahlawat et al., 2023; Benevene et al., 2021;Wang and Juo, 2021; Yusoff et al., 2019). Chen (2008) and Yusliza et al. (2020) note that GIC is a strategic tool that enables companies to align their activities with global sustainability requirements and to be resilient and competitive in the long term. Therefore, GIC's impact as one of the most significant enablers of sustainable performance is one of its greatest contributions. It comprises Green Relational Capital (relations with stakeholders), Green Structural Capital (environmental databases, environmental management systems), and, most significantly, Green Human Capital (knowledge and skills of personnel) (Sheikh, 2021). By mobilizing GHC, GSC, and GRC, Organizations can enhance the outcomes across the three aspects of sustainability in the triple bottom line. Ahlawat et al. (2023) and Yusliza et al. (2020) claim that GIC promotes operational efficiency, reduces waste, and optimizes resource use, thereby lowering costs and minimizing environmental impact. In addition to the ecological performance, GIC also underlines the social sustainability by encouraging safety, equity, and community welfare in the workplace, which increases the validity of organizational activities (Damaianti, 2022; Jiao et al., 2022; Mohamed, 2023; Syahidun and Nawangsari, 2022; Turi et al., 2023; Yusliza et al., 2020).

An extension of the traditional Resource-Based View (RBV) is the Natural Resource-Based View (Hart, 1995)**,** which asserts that future competitive advantage will be derived from capacities that support an ecologically sustainable economy. Therefore, NRBV theory focuses on the internal resources that enable a company to address environmental concerns effectively. It utilizes GIC as a strategic resource that is precious, scarce, inimitable, and non-substitutable, and assists organizations in developing sustainable business approaches and enhancing the environmental impact of operations (Wang and Juo, 2021). Firms that invest in GICs are better able to develop eco-innovative products, improve ecological efficiency, enhance resource productivity, and align operations with sustainability goals. Empirical studies also show that firms with

strong GIC exhibit better long-term economic stability and environmental sustainability (Asiaei et al., 2022; Li et al., 2023; Mohamed, 2023; Shehzad et al., 2023; Ullah et al., 2023). According to Omar et al. (2019), GIC promotes ecologically conscious innovations along with sustainable practices. The creation of GICs improves environmental performance and helps attain a competitive edge (Becea and Borza, 2022). Furthermore, Rehman et al. (2021) found that green intellectual capital is an essential intangible asset and a dynamic competence that helps business organizations enhance environmental sustainability and gain a competitive edge. The importance of GIC as a strategic resource for improving sustainable performance was also examined by Suengkamolpisut et al. (2025). Many studies also implied that the green intellectual capital and business sustainability are positively correlated (Damaianti, 2022; Jiao et al., 2022; Mohamed, 2023; Surono et al., 2024; Syahidun and Nawangsari, 2022; Turi et al., 2023; Ullah et al., 2021; Yusliza et al., 2020). Accordingly, the study's first hypothesis is delineated as follows:

H1: Green Intellectual Capital has a significant positive impact on Organizational Sustainability.

2.2. Green Human and Organizational Sustainability

GHC refers to employees' intangible assets, which include Knowledge, professional expertise, aptitudes, innovative thinking, and commitments (Kim and Li, 2021; Yusliza et al., 2020). It is crucial to understand the importance of human capital in environmental operations, as sustainability has become a global business concern. However, research on the specific impact of green human capital (GHC) on sustainability outcomes remains limited and inconsistent. For example, according to Omar et al. (2019) and Yusoff et al. (2019) found a significant association between corporate sustainability and GSC and GRC, but not with GHC. Similarly, Jermsittiparsert (2021) reported that GSC and GRC significantly influence sustainability, while GHC does not. In contrast, Mansoor et al. (2021) showed a positive association between environmental performance and GRC, along with GHC. Furthermore, Agyabeng-Mensah and Tang (2021) indicates that GHC significantly impacts financial performance, but not on social performance, a crucial knowledge gap regarding the intricate role of GHC in organizational sustainability, necessitating further research to guide strategic decisions and address contemporary environmental challenges. Accordingly, the following hypothesis is formulated:

H1a: Green Human Capital has a significant positive impact on Organizational Sustainability.

2.3 Green Relational Capital and Organizational Sustainability

Green Relational Capital (GRC) is a significant intangible resource intended to cultivate and sustain positive associations with stakeholders, which may significantly affect a company's reputation and performance in a diverse, constantly evolving environment (Sabbir and Raziuddin, 2021). Empirical research on GRC's impact on sustainability outcomes remains limited and inconsistent, despite its importance in fostering sustainability initiatives. For instance, Astuti et al. (2023) found GRC positively related to economic development but not to environmental or social sustainability. According to Sabir et al. (2021), only GHC influenced social sustainability when mediated by organizational learning capability, whereas green relational capital (GRC) did not. In a similar vein, Turi et al. (2023) discovered that GHC and GSC significantly influence project sustainability, while GRC has no discernible impact. Such contradictory findings underscore the need for further empirical research to understand the intricate relationship between GRC and organizational sustainability fully. Consequently, we assert the following hypothesis:

H1b: Green Relational Capital has a significant positive impact on Organizational Sustainability.

2.4 Green Structural Capital and Organizational Sustainability

Green Structural Capital (GSC) refers to the organizational resources created primarily to support environmental management, environmentally friendly technologies, and the sustainable development of organizations. (Ali et al., 2021; Jiang et al., 2024; Wang and Juo, 2021; Yusoff et al., 2019). It is among the three elements that make up Green Intellectual Capital. GSC has a positive impact on the company's economic, environmental, and financial performance (Jiao et al., 2022; Surono et al., 2024; Ullah et al., 2021; Yusliza et al., 2020). It also facilitates and supports organizational sustainable practices and provides it a competitive edge (Damaianti, 2022b; Mohamed, 2023). Although structural capital is known to foster sustainability, research on the precise effects of green structural capital (GSC) on organizational sustainability remains scarce. According to Syahidun & Nawangsari (2022), GSC indirectly influences sustainability through green environmental management, rather than having a direct effect. Furthermore, Al Issa et al. (2023) discovered that whereas green human and relational capitals were predictors of performance outcomes, GSC did not significantly correlate with economic or green performance. In a similar vein, Lastanti and Augustine (2022) observed no significant impact of GSC on firm performance. The results demonstrate a lack of understanding of GSC's unique role in sustainability, underscoring the need for further empirical research on the complex relationship between GSC and organizational sustainability. The above discussion gives rise to the following hypothesis:

H1c: Green Structural Capital has a significant positive impact on Organizational Sustainability.

2.5 Moderating effect of Corporate Governance mechanisms in the relationship between Green intellectual capital and Organizational Sustainability

GIC is a unique resource that enables businesses to fulfill customer demand for eco-friendly goods, comply with laws, improve overall sustainable performance, and achieve a competitive edge. To recognize, optimize, and preserve these resources, corporate governance is essential. The framework and oversight required for businesses to create and utilize their GIC are provided by effective corporate governance. Moreover, effective governance can ensure GIC remains a valuable asset and, when leveraged to its full potential, positively impact OS. According to stakeholder theory, organizations must take into account the concerns and interests of every associated stakeholder when making decisions, including the community, suppliers, consumers, and employees (Freeman, 1984). This theory also suggests that organizations with high levels of green intellectual capital are more likely to engage in sustainable business practices. Furthermore, the impact of green intellectual capital on green competitive edge and performance of business organizations is strengthened by sound corporate governance (Lastanti and Augustine, 2022). Many researchers are increasingly interested in corporate governance because it can boost investor confidence and improve businesses' financial performance (Shahwan and Habib, 2020). According to Michelon and Parbonetti (2012), good CG promotes corporate sustainability by improving firm-stakeholder interactions. In contrast, Hammadi and Nobanee (2019) suggest that corporate governance mechanisms such as stakeholder engagement and board oversight are necessary for companies to have an impact on society and the environment. Several studies have found that corporate governance mechanisms influence intellectual capital (Nassirzadeh et al., 2023; Rajabalizadeh & Oradi, 2022; Tran & Vo, 2020). According to Tran et al. (2020), CG and intellectual capital in Vietnam are significantly correlated. Furthermore, it amplifies the benefits of GIC on firm performance. According to Naciti (2019), sustainability performance declines when the percentage of independent directors rises. Despite its advantages, good corporate governance is unable to moderate the impacts of GSC on firm financial performance and the effects of GHC on green competitive edge (Lastanti & Augustine, 2022). Wati et al. (2024) employed good corporate governance as a moderating factor in the association between GIC and financial performance. They found that it strengthens the impact of GIC on a company's economic outcomes. In contrast, Riyanti and Murwaningsari (2023) found that corporate governance mechanisms do not moderate the effects of GHC, GSC, GRC, and green accounting on the implementation of sustainable finance in a study of banks listed on the Indonesia Stock Exchange. Although earlier researchers have studied the GIC dimensions and their relationship with organizational sustainability,

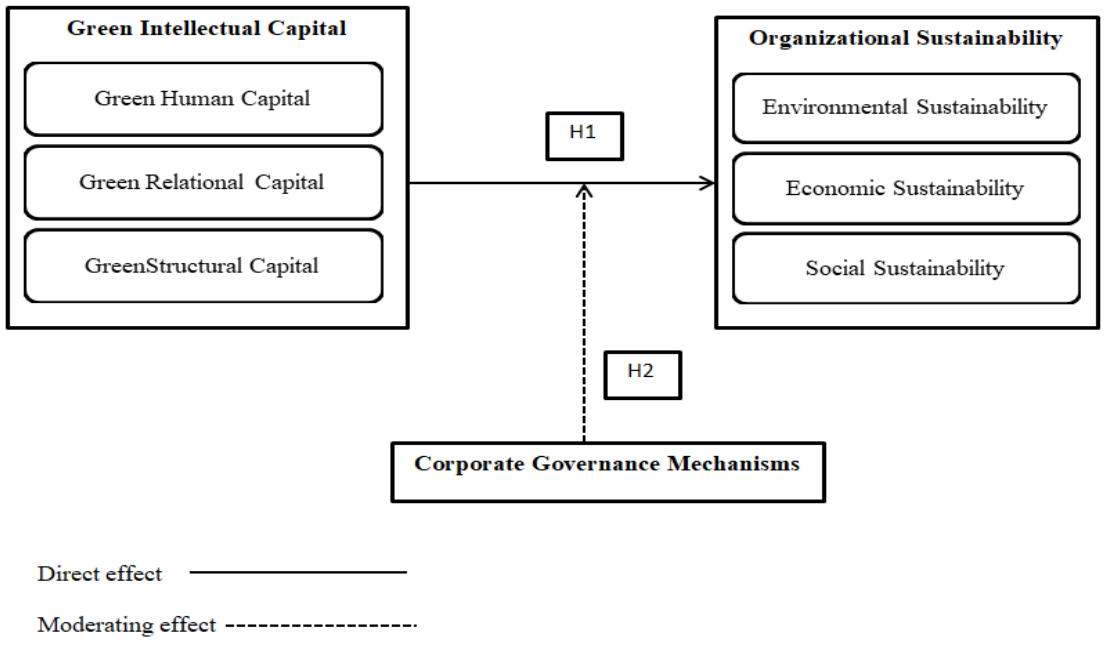
there has been a lack of studies that explicitly explore how corporate governance mechanisms, such as board size, independent directors, board gender diversity, and green board committees, influence the effectiveness of GIC in driving sustainability outcomes. Accordingly, the following hypothesis is formulated:

H2: Corporate Governance Mechanisms (board size, independent directors, board gender diversity, and green board committees) positively moderate the relationship between Green Intellectual Capital and Organizational Sustainability.

3. METHODOLOGY

Grounded in NRBV and Stakeholder Theory, this study proposes a framework in which corporate governance enhances GIC's impact on organisational sustainability. The direct and indirect relationships between the dependent and independent variables are depicted in the framework. The direct association demonstrates the effects of GIC on OS. GIC comprises three aspects: green human, structural, and relational capital. The elements of organizational sustainability include environmental, economic, and social sustainability. Hypothesis H1 (H1a to H1c) will be examined within the framework to determine the direct link between green intellectual capital and organizational sustainability. This framework also demonstrates the indirect effects on the dependent variable, i.e., the moderating effect of corporate governance mechanisms such as the size of the board, independent directors, board gender diversity, and the green board committees on the relationship between green intellectual capital and organizational sustainability, which will be tested by hypothesis H2. Figure 1 depicts the conceptual framework of this study as follows:

Figure 1
The relationship among green intellectual capital and organizational sustainability, moderated by corporate governance mechanisms.



4. FINDINGS AND DISCUSSION

In today's competitive market, sustainability is crucial to continued existence, and setting sustainability as a top priority for business organizations facilitates greater productivity, talent acquisition, regulatory compliance, investor expectations, and customer desires. GIC supplies organizations with sustainability-oriented knowledge and capabilities, but effective governance ensures these resources are strategically utilized, openly monitored, and matched with stakeholder expectations. This study demonstrates the importance of corporate governance in improving the efficiency of Green Intellectual Capital (GIC) to ensure organizational sustainability. This work also highlights the association between GIC, OS, and CGMs in emerging economies. It argues that the critical sustainability knowledge and capability offered by GIC are essential, but effective governance mechanisms are needed to ensure these assets are managed strategically and transparently. The results are relevant to the increasing demands from stakeholders and the growing environmental pressures. Nevertheless, limitations of the study with respect to generalizability are becoming apparent. The research recommends that future scholars investigate the proposed framework empirically across other industries and regions, focus on mediating variables such as green innovation, and examine the development of GIC at the digital and climate transition levels.

5. CONCLUSION

[This study advances sustainability literature by conceptually positioning corporate governance mechanisms as a critical catalyst that strengthens the relationship between Green Intellectual Capital and organizational sustainability in emerging economies. Grounded in the Natural Resource-Based View and Stakeholder Theory, the proposed framework explains how governance structures—such as board composition, independence, gender diversity, and green committees—enable firms to strategically mobilize green human, structural, and relational capital toward sustainable outcomes. The study offers theoretical clarity amid mixed empirical findings and provides practical guidance for managers and policymakers. Future research should empirically validate the framework across sectors and explore mediating pathways such as green innovation and digital transformation.]

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7. CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in the paper.

8. AUTHOR CONTRIBUTION STATEMENT

Author Rabaya Zaman & Nahariah binti Jaafar 1-contributed to the conceptualization, research design, and writing of the original draft.
Author Md. Tofael Hossain Majumber 2-was responsible for data collection, analysis, and validation of the results.
Author Wan Fadzilah Wan Yusoff 3 -provided supervision, critical review, and editing of the final manuscript.
All authors have read and approved the final version of the manuscript.

9. ETHICS STATEMENT

This research was conducted in accordance with the ethical standards of Universiti Putra Malaysia and adhered to the principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the [**Institutional Ethics Committee/Review Board**] under reference number [**Approval Number, if applicable**]. All participants were informed about the purpose of the study and provided written informed consent prior to participation. Participants' privacy and confidentiality were strictly maintained, and data collected were used solely for academic purposes.

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