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Competitive Advantage as a Pathway from Intellectual Capital and Innovation Capability to Corporate Sustainable Growth

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Abstract

Sustainable growth is essential for organizations aiming to maintain resilience and competitiveness in a rapidly changing business environment. Within the sustainable development agenda, corporate sustainable growth aligns with SDG 8 (sustainable economic growth), SDG 9 (industry and innovation), and SDG 12 (responsible resource management). This study investigates the effects of Human Capital Efficiency, Relational Capital Efficiency, and Innovation Capability on Corporate Sustainable Growth, with Competitive Advantage serving as a mediating variable, in technology firms listed in Indonesia, Malaysia, and Singapore. By situating corporate sustainable growth within the broader sustainable development agenda, the research clarifies how intellectual capital efficiency and innovation capability contribute to SDG 8, SDG 9, and SDG 12 through sustainable economic performance, innovation-driven competitiveness, and responsible organizational resource management. Using a sample of 94 technology firms listed on the Indonesia Stock Exchange, Bursa Malaysia, and the Singapore Exchange from 2019 to 2023, the study employs multiple regression analysis, path analysis, and Sobel tests. Findings reveal that Human Capital Efficiency exerts a significant negative effect on both Competitive Advantage and Corporate Sustainable Growth, suggesting that inefficient human capital development may impede organizational performance. Conversely, Relational Capital Efficiency and Innovation Capability have significant positive effects on Competitive Advantage. Both factors also positively influence Corporate Sustainable Growth. Mediation analysis using the Sobel test demonstrates that Competitive Advantage negatively mediates the relationship between Human Capital Efficiency and Corporate Sustainable Growth, while positively mediating the relationships between Relational Capital Efficiency and Innovation Capability and Corporate Sustainable Growth. These results advance the sustainable development literature by demonstrating that efficient intellectual capital management and innovation capability enhance competitive advantage and foster sustainable corporate growth in technology firms. The study offers practical recommendations for managers and policymakers to better align corporate resource management, innovation strategies, and long-term sustainability objectives in emerging Southeast Asian markets.

1. Introduction

Sustainable growth encompasses more than a short-term increase in profits; it emphasizes a company's long-term capacity for growth and adaptation. Xu and Wang (2018) [1] emphasize that intellectual capital is a critical driver of wealth creation and financial performance, ultimately resulting in sustainable competitive advantage. Intellectual capital serves as a vital resource for achieving a lasting competitive edge, generating value, and enhancing overall organizational performance and growth.

The emergence of the knowledge economy has positioned knowledge as a crucial asset, gradually replacing physical capital such as machinery and raw materials as the primary driver of corporate competitiveness and sustainable growth [2]. Nevado-Pena et al. (2015) found that intellectual capital has supplanted traditional financial and physical resources within organizations. Firms that effectively gather, utilize, and manage intellectual capital and knowledge assets tend to achieve greater success [3].

Intellectual capital is thus regarded as a primary catalyst for firm performance and enduring business growth, enabling organizations to ensure long-term survival by protecting and cultivating their knowledge resources [4].

In the context of rapid sustainable growth, organizational adaptability and innovation are essential. The capacity to respond promptly to environmental changes is critical for maintaining a competitive advantage. Dynamic capabilities are therefore necessary for firms to adapt to evolving environments and secure a competitive edge. This perspective aligns with the concept of sustainable corporate entrepreneurship [5], which emphasizes integrating sustainability principles into business operations as a foundation for long-term success.

Technological advancements are essential for achieving Sustainable Development Goals (SDGs) by enhancing the efficiency and effectiveness of sustainable development methods [6]. Consequently, sustainability within the technology sector is required to facilitate the creation of new technologies that drive research and foster innovation. Strengthening knowledge sharing and collaboration among stakeholders at national and international levels can further promote these objectives.

Similar trends are evident in ASEAN countries such as Indonesia, Malaysia, and Singapore. These allied nations share a common vision of supporting environmental protection, as demonstrated by their commitment to planning for Sustainable Development Goals (SDGs) [7]. The Indonesian technology sector, represented by IDXTECHNO, experienced significant challenges in 2023, recording the largest sectoral decline at 14.98%. This downturn marks a critical period for local technology companies. For example, PT Envy Technologies Indonesia Tbk faced share suspension and potential delisting due to a substantial cumulative price drop, while PT Anabatic Technologies Tbk also experienced suspension, though resulting from a significant price increase. Administrative issues, such as PT Northcliff Citranusa Indonesia Tbk's suspension for late payment of the annual listing fee, further illustrate the pressures these firms face. Collectively, these events underscore the urgent need for Indonesian technology companies to prioritize sustainable growth to maintain competitive positioning.

These challenges are not limited to Indonesia but reflect broader regional and global trends. In mid-2023, Malaysian technology and semiconductor companies listed on Bursa Malaysia, including major firms such as Inari Amertron Bhd and Unisem (M) Bhd, reported substantial declines in net profit, with some experiencing losses. On a global scale, Sea Limited, a prominent company with ventures such as Shopee and Garena, also experienced a significant decline in stock price. This global downturn is primarily attributed to intense market competition, rising user-acquisition costs, and investor concerns regarding inflated company valuations.

Advanced technology plays a critical role in enhancing a country's global market competitiveness. According to Raghupathi and Raghupathi (2017) [8] identify a direct relationship between a nation's economic development and its level of innovation, as evidenced by patent generation. This innovative capacity enables countries to enter new markets and increase exports, thereby supporting a favorable trade balance. Furthermore, multiple studies indicate that intellectual capital efficiency and competitive

advantage are essential for sustainable corporate growth [9]. Additional research [1], [3] corroborates that intellectual capital significantly contributes to financial performance and long-term sustainable development.

Intellectual capital is widely recognized as a key resource for establishing competitive advantage and promoting corporate sustainability [1]. Effective management of intellectual capital has been shown to positively influence firm financial performance [10]. However, the conflicting results observed in this study indicate a need for further empirical research to deepen understanding of financial management, particularly in relation to corporate sustainable growth.

Research by Imran et al. (2019) [11] demonstrates that innovation capabilities mediate the enhancement of small and medium-sized enterprises (SMEs) ' sustainability during the Industry 4.0 era, establishing a positive correlation between these variables. Separately, Guzman et al. (2018) [12] examined the impact of innovation capabilities on the business performance of SMEs in Aguascalientes, Mexico. Using a quantitative approach with structural equation modeling, their study found that innovations in products, processes, marketing, and management each had a significant, positive effect on the profitability of these Mexican SMEs.

The relevance of corporate sustainable growth extends beyond firm-level financial performance because it is closely connected to the broader sustainable development agenda. In technology sectors, firms are expected not only to achieve long-term growth but also to manage intangible resources, innovation capability, and stakeholder relationships in ways that support sustainable economic development and responsible organizational resource use. Therefore, this study is positioned within the intersection of environmental management, innovation, and the SDGs. It contributes particularly to SDG 8 by addressing sustainable economic growth, SDG 9 by emphasizing innovation capability in technology-driven industries, and SDG 12 by highlighting the importance of efficient and responsible organizational resource management. Although this study does not directly measure environmental performance indicators such as emissions, energy use, or waste reduction, it contributes to sustainability discourse by examining how technology firms manage intellectual capital and innovation capability to achieve long-term sustainable growth. In this regard, environmental management is understood not only as ecological impact control but also as part of broader sustainability-oriented corporate governance, where firms are required to use resources efficiently, strengthen innovation capacity, and maintain competitive resilience without compromising long-term sustainability objectives.

2. Literature Review And Hypothesis

Intellectual Capital Theory

Intellectual capital theory highlights the value an organization derives from the combined knowledge, skills, and abilities of its employees. This intangible asset is seen as essential for gaining a competitive edge and achieving success. Intellectual capital is usually divided into three main types: human capital,

which covers the expertise and qualities that people bring; relational capital, which refers to the relationships and networks a company has with customers, suppliers, and business partners.

The theory examines how organizations create value from intangible resources (Bai, 2024) [13] and underscores the importance of leveraging intellectual capital to boost performance and encourage innovation (Dumay & Garanina, 2013) [14]. A similar idea, called the intellectual capital-based view, is a framework that focuses on using a company's intangible assets to stay ahead of competitors (Alshahrani et al., 2024) [15]. It emphasizes that intellectual capital is a key driver of innovation and long-term growth.

Intellectual capital is important for helping companies gain an advantage and improve their performance. When companies manage their human, and relational capital well, they can encourage employees to be creative and innovative. This leads to new products and services that set them apart from competitors. At the same time, strong customer relationships, which are part of relational capital, build loyalty and satisfaction, making the company stronger in the market.

Managing intellectual capital well also plays a big role in a company's growth. Employee knowledge and continuous learning help both individuals and the whole organization perform better. Strong relational capital enables companies to build broad business networks and a strong reputation, which can lead to new markets and partnerships. Using technology as part of structural capital helps companies quickly adopt new ideas, work more efficiently, and stay competitive as markets change.

The Effect Human Capital Efficiency on Competitive Advantage

Human capital efficiency plays an important role in influencing competitive advantage in organizations. Human capital efficiency allows companies to be more responsive to market and technological changes, and save operational costs. Skilled employees require less supervision and can avoid costly mistakes. Companies with an efficient workforce also reinforce positive cycles that further enhance competitive advantage. This idea is supported by Lu et al. (2021) [16], who highlight that competitive advantage based on talented human capital enables organizations to seize new opportunities and achieve long-term sustainability.

The Effect Relational Capital Efficiency on Competitive Advantage

An organization's external networks and connections, known as relational capital, can be leveraged to transform its intellectual and physical assets into high-level performance [18]. Research shows that relational capital, along with structural capital, has a positive effect on competitive advantage [19]. This research collectively underscores the importance of effective relationships and internal structures for a company to gain a competitive edge.

The Effect Innovation Capability on Competitive Advantage

Research indicates that supply chain agility and innovativeness have a positive impact on a manufacturing firm's competitive advantage. A company's ability to innovate is essential for adapting to its environment and securing a competitive edge. For example, Alshahrani et al. (2024) [15] discovered that innovative capability acts as a complementary partial mediator, helping intellectual capital improve a firm's competitiveness. Likewise, Rehman et al. (2022) [20] highlighted that innovative capabilities are crucial for significantly enhancing innovative performance, which is vital for achieving competitive advantage.

H1a: Human capital efficiency influences competitive advantage

H1b: Relational capital efficiency influences the competitive advantage

H1c: Innovation capability influences competitive advantage

The Effect Human Capital Efficiency on Corporate Sustainable

Multiple studies have highlighted the significance of intellectual capital, including human capital, in driving sustainable growth. Research indicates that intellectual capital helps create a competitive advantage for a firm, boosts its performance, and fosters sustainable development [21]. Companies that focus on improving their internal structural resources and external relational activities are more likely to achieve better performance and sustainable growth. Furthermore, a management strategy that prioritizes human capital can assist employees in developing their unique skills, promoting their professional growth, and contributing to overall sustainable development [22].

The Effect Relational Capital Efficiency on Corporate Sustainable Growth

Research by Xu and Wang (2018) [1] found that intellectual capital, a key dimension of Relational Capital Efficiency, positively impacts both the financial performance and sustainable growth of the Korean manufacturing industry. Similarly, Malik et al. (2020) [25] demonstrated that green intellectual capital, also an aspect of Relational Capital Efficiency, positively influences an organization's sustainable performance. These findings collectively underscore the critical role of a company's intangible assets in achieving long-term business success. The research provides strong evidence that nurturing intellectual resources, including those related to environmental knowledge and practices, is a vital strategy for driving both financial gains and sustainable development.

The Effect Innovation Capability on Corporate Sustainable Growth

According to Forcadell et al. (2019) [26] discussed how innovation affects corporate sustainability in the international banking industry, emphasizing the conversion of innovation initiatives into improved corporate sustainability. A firm's innovation capability positively affects sustainability performance, which highlights the role of innovation in driving sustainable outcomes. This is supported by the research of Maldonado-Guzman et al. (2018) [12], which indicated that innovation in various aspects of the business-including products, processes, marketing, and management-has a positive and significant

effect on business performance. Companies that prioritize innovation are more likely to experience long-term success and sustainable growth.

The Effect Competitive Advantage on Corporate Sustainable Growth

Competitive advantage affects corporate sustainable growth by increasing profitability, expanding market share, and supporting continuous innovation. Wongsansukcharoen & Thaweepaiboonwong (2023) [27] state that competitive advantage mediates the success factors of innovation in human resource practices to increase profitability. In addition, Mashat et al. (2015) [9] and Permatasari et al. (2023) [28] both allude to the idea that a sustainable competitive advantage can ensure the sustainability of company growth. Competitive advantage also contributes to a positive image and reputation, which supports customer loyalty, attracts top talent, and strengthens relationships with business partners.

H2a: Human capital efficiency influences corporate sustainable growth

H2b: Relational capital efficiency influences corporate sustainable growth

H2c: Innovation capability influences corporate sustainable growth

H2d: Competitive advantage influences corporate sustainable growth

The Relationship between Human Capital Efficiency and Corporate Sustainable Growth through the Mediating Role of Competitive Advantage

Investing in a company's intellectual capital can significantly boost its competitive advantage and improve its future financial performance [2], [29]. By focusing on the efficiency of their human capital, organizations can refine their processes, strengthen relationships with customers and suppliers, and drive innovation, all of which are essential for sustainable growth [1]. This strategic investment in intangible assets, like employee knowledge and skills, is crucial because it directly translates into improved productivity and increased customer loyalty. Ultimately, by viewing intellectual capital not as a cost but as a core strategic asset, a company can position itself for long-term resilience and market leadership.

The Relationship between Relational Capital Efficiency and Corporate Sustainable Growth through the Mediating Role of Competitive Advantage

Effective management of relational capital can lead to a competitive advantage by fostering strong relationships with suppliers, creditors, and other stakeholders, thereby contributing to a company’s overall success [25]. This highlights the crucial role that relational capital plays in driving organizational success, on par with physical and human capital. Developing relational capital through robust networks and product innovation can provide a significant market edge. By effectively leveraging these external relationships, firms can better serve employees, customers, suppliers, and other stakeholders, which in

turn leads to increased sales, improved profit margins, and reduced costs, ultimately strengthening their competitive position.

H3a: Competitive Advantage mediates the association between Human Capital Efficiency and Corporate Sustainable Growth

H3b: Competitive Advantage mediates the association between Relational Capital Efficiency and Corporate Sustainable Growth

H3c: Competitive Advantage mediates the association between Innovation Capability and Corporate Sustainable Growth

3. Research Methodology

This research focuses on technology sector companies listed on the Indonesia Stock Exchange, Bursa Malaysia, and Singapore Stock Exchange in 2019-2023. The selection of the technology sector in this study is based on two main factors, namely its rapid growth that drives innovation, efficiency, and job creation, especially for the younger generation and those with digital skills [32]. In addition, the sector exhibits high global competitiveness, which attracts investment and enhances the capabilities of small businesses through digital platforms. A total of 94 companies that met the criteria were selected for this study. The criteria are companies that have complete audited financial statements from 2019 to 2023 and companies whose financial statements and annual reports provide the information and parameters needed to build the research variables. Multiple regression analysis, path analysis, and sobel test were performed on E-views 13 software.

Table 1 Variables Definition

Variables	Definition	Measurement
Corporate Sustainable Growth (Y)	Corporate Sustainable Growth is sustainable profit growth under consistent economic policies and external environment [33].	SGR =
Human Capital Efficiency (X1)	Human capital is the knowledge, talent, skills, competencies, and other invisible attributes of the workforce that can create value for the organization [34].	Human Capital Efficiency = VA/HC HC = total wages and salary cost
Relational Capital Efficiency (X2)	Relational Capital Efficiency refers to a company's ability to effectively manage and improve its relationships with stakeholders to create value and achieve sustainable growth [36].	Relational Capital Efficiency = RC/VA RC = selling, marketing, or advertising expenses
Innovation Capability (X3)	Innovation Capability encompasses the organization's capacity to effectively and efficiently develop new products, services, or processes to meet market demands and stay ahead of competitors [37].	Ln (1 + number of innovation)
Competitive Advantage (Z)	Competitive advantage is superior performance compared to other competitors in the same industry or industry average [38].	

4. Results

Statistic Descriptive Analysis

Table 2
Statistic Descriptive Analysis

Mean	Corporate Sustainable Growth	Human Capital Efficiency	Relational Capital Efficiency	Innovation Capability	Competitive Advantage
	0.234	**4.124**	**0.596**	**-0.782**	**4.490**
Maximum	72.161	397.043	95.449	93.948	1515.513
Minimum	-12.074	-563.977	-73.485	-83.188	-253.583
Std. Dev.	3.633	53.435	10.667	9.568	75.080
Observations	410	410	410	410	410

The descriptive statistics, as presented in the table above, offer an initial overview of the variables utilized in this study, which include Corporate Sustainable Growth, Human Capital Efficiency, Relational

Capital Efficiency, Innovation Capability, and Capital Employed. With 410 observations for each variable, the mean value for Corporate Sustainable Growth is 0.234, indicating a slight positive skew in the distribution of corporate sustainable growth among the observed companies.

In contrast, Innovation Capability presents a mean of -0.782. The negative mean for Innovation Capability, alongside its substantial range from − 83.188 to 93.948, suggests a more varied and potentially volatile performance in intellectual capital among the companies, with some firms experiencing negative intellectual capital values. The wide range and large standard deviations across most variables indicate significant heterogeneity within the sample, pointing to diverse operational and financial characteristics among the observed companies. This initial descriptive analysis underscores the variability in corporate sustainable growth and its related capital components, necessitating further inferential analysis to uncover significant relationships and impacts.

Regression Analysis

Analysis of Hypothesis 1 & 2: Random Effect Model

Tabel 3. Analysis of H1 dan H2

Variabel	Hypothesis 1	Hypothesis 2
Human Capital Efficiency	-0.2585***	-0.0035***
	(0.0079)	(0.0000)
Relational Capital Efficiency	3.0813***	0.0453***
	(0.0039)	(0.0000)
Innovation Capability	2.7126***	0.0298***
	(0.0000)	(0.0000)
Competitive Advantage		0.0469***
		(0.0000)
Note: Significance levels *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$		

Based on Table 3 presents regression results examining the relationships among Human Capital Efficiency, Relational Capital Efficiency, Innovation Capability, and Competitive Advantage. Human Capital Efficiency demonstrates a significant negative effect on Competitive Advantage at the 1% significance level, with a coefficient of -0.2585. This finding aligns with Veselinović et al. (2022) [39], who reported that increases in human capital value may reduce operating efficiency and EBIT margin. These results indicate that excessive emphasis on human capital development, without consideration for efficiency, can adversely affect overall organizational performance, including competitive advantage. In contrast, Relational Capital Efficiency, and Innovation Capability each exhibit significant positive effects

on Competitive Advantage. Vo (2024) highlights that national innovative capacity, as an element of intellectual capital, is crucial in shaping competitive advantage. Ferreira (2018) [40], in a study of 387 Portuguese enterprises, identifies innovation capability as a strategic asset that fosters sustainable competitive advantage and superior performance, thereby supporting sustainable competitive advantage (Liu et al., 2019) [17]. Furthermore, Alshahrani et al. (2024) [15] and Rehman et al. (2022) [20] find that innovation capability serves as a partial, complementary mediator in the relationship between intellectual capital and competitiveness.

Based on Table 3 presents regression results assessing the relationships among Human Capital Efficiency, Relational Capital Efficiency, Innovation Capability, Competitive Advantage, and Corporate Sustainable Growth. Human Capital Efficiency exerts a significant negative effect on Corporate Sustainable Growth at the 1% significance level. This outcome is consistent with Pavlović et al. (2023) [41], who report that crises such as the COVID-19 pandemic can diminish Human Capital Efficiency by reducing value-added output and company performance. In contrast, Relational Capital Efficiency exhibits a significant positive effect on Corporate Sustainable Growth at the 1% significance level. Xu and Wang (2018) [1] also note that intellectual capital, as a component of Relational Capital Efficiency, positively influences financial performance and sustainable growth in the Korean manufacturing sector. Malik et al. (2020) similarly report that green intellectual capital, a dimension of Relational Capital Efficiency, enhances sustainable organizational performance. Zhang and Wang (2022) [30], in their study of Chinese A-share manufacturing companies, further reveal a positive correlation between intellectual capital, sustainable corporate development, and investor confidence.

The analysis of Innovation Capability's effect on Corporate Sustainable Growth also reveals significant positive results. This finding is consistent with Xu and Zhu (2024) [42], who demonstrate that corporate innovation drives growth in financial performance. Firms that prioritize innovation typically achieve notable increases in revenue and profitability. Maldonado-Guzman et al. (2018) [12] further support this conclusion, indicating that innovation across products, processes, marketing, and management positively and significantly influences business performance.

The relationship between Competitive Advantage and Corporate Sustainable Growth also demonstrates a significant positive effect. Kamukama et al. (2011) [43] emphasize that sustainable competitive advantage is essential for enhancing organizational strategic performance. According to Wongsansukcharoen and Thaweepaiboonwong (2023) [27] further note that competitive advantage mediates the influence of innovation-related human resource practices on profitability. Additionally, Mashat et al. (2015) [9] and Permatasari et al. (2023) [28] highlight the direct impact of knowledge management processes on both competitive advantage and sustainable performance. Therefore, competitive advantage not only enables firms to withstand market competition but also supports their sustainable development.

Table 4
Analysis of Hypothesis 3 Sobel Test

Variables	t-count	t-table	Conclusion
Human Capital Efficiency	-2,598	1,96	Significance at 0.05
Relational Capital Efficiency	2,829	1,96	Significance at 0.05
Innovation Capability	7,476	1,96	Significance at 0.05

Based on Table 4 presents the mediating role of Competitive Advantage in the relationships among Human Capital Efficiency, Relational Capital Efficiency, and Innovation Capability and Corporate Sustainable Growth. Based on the results of the Sobel test, the Human Capital Efficiency coefficient is negative and statistically significant at the 5% level, indicating that Competitive Advantage negatively mediates the relationship between Human Capital Efficiency and Corporate Sustainable Growth. In the context of the relationship between human capital efficiency and corporate sustainable growth, competitive advantage plays an important mediating role. It shows that low human capital efficiency can hinder an organization's financial performance and strategic effectiveness, thereby eroding competitive advantage and affecting long-term growth strategies.

The mediating role of Competitive Advantage in the Relational Capital Efficiency relationship is positive and significant. Intellectual capital theory emphasizes the importance of intellectual capital in generating sustainable competitive advantage. This perspective underscores the role of intellectual capital, including relational assets, in providing firms with a sustainable advantage over competitors. Integration of sustainability initiatives with dynamic capabilities not only enhances competitiveness but also ensures long-term sustainability. Efficient management of relational capital within a broader intellectual capital framework is instrumental in enhancing a company's competitive advantage. By fostering strong relationships with stakeholders, an organization can improve performance, achieve sustainable growth, and maintain a competitive advantage.

Competitive advantage, as measured by the Sobel test, shows a significant positive effect on mediating the relationship between innovation capability and Corporate Sustainable Growth, indicating that competitive advantage plays an important role in improving innovation outcomes, thereby driving sustainable growth. A company's innovation capability is highlighted as an important strategic asset that creates a sustainable competitive advantage and leads to better performance outcomes. According to Chen (2016) [44] [31], a firm's sustainable innovation capability comprises knowledge, production, and market innovation capabilities, underscoring the diverse influence of innovation on sustainability. Thus, dynamic capabilities developed through innovation in business models can result in sustainable competitive advantage and corporate sustainability.

The findings offer valuable insights into the relationship between intellectual capital, competitive advantage, and corporate sustainable growth from a Sustainable Development Goals (SDG)-oriented perspective. The observed positive effect of Relational Capital Efficiency on both Competitive Advantage

and Corporate Sustainable Growth demonstrates that robust relationships with stakeholders, customers, partners, and external networks enhance long-term business resilience. This result aligns with SDG 8, as sustainable economic growth depends on firms establishing stable and productive business relationships that foster continuity and value creation.

The positive effect of Innovation Capability on Competitive Advantage and Corporate Sustainable Growth further underscores the relevance of SDG 9. Technology firms exhibiting greater innovation capability are better equipped to respond to market changes, enhance products and services, and reinforce competitiveness. Therefore, innovation capability functions not only as a strategic business asset but also as a critical mechanism for advancing sustainable industrial development.

The significant negative effect of Human Capital Efficiency on Competitive Advantage and Corporate Sustainable Growth warrants careful interpretation. This outcome does not indicate that human capital lacks importance. Instead, it suggests that investments in human capital do not necessarily enhance firm performance unless accompanied by efficiency, productivity, and strategic alignment. In the context of sustainability, this finding relates to SDG 12, as responsible resource management requires firms to ensure that investments in human capital yield proportional value and contribute to long-term organizational sustainability.

The mediating role of Competitive Advantage further demonstrates that intellectual capital and innovation capability contribute to Corporate Sustainable Growth by enhancing strategic competitiveness. The positive mediation effects observed in the relationships involving Relational Capital Efficiency and Innovation Capability indicate that firms can achieve sustainable growth when intangible assets are effectively transformed into competitive advantages. Conversely, the negative mediating effect of Human Capital Efficiency on Corporate Sustainable Growth suggests that firms must improve the efficiency and strategic deployment of human capital to prevent resource inefficiencies that could undermine sustainable growth.

5. Conclusion

This study explores what drives Corporate Sustainable Growth in the technology sectors of Indonesia, Malaysia, and Singapore. We found that human capital efficiency has a negative effect on both competitive advantage and Corporate Sustainable Growth. This means that while human capital is important, it must be managed well or it can actually hurt performance and growth. Relational capital efficiency, and innovation capability all help improve competitive advantage. However, their impact on sustainable growth is different: while Relational Capital Efficiency and Innovation Capability have positive effects.

Competitive advantage plays different roles as a mediator. Competitive Advantage negatively mediates the link between Human Capital Efficiency and Corporate Sustainable Growth, which supports the idea that low human capital efficiency can slow growth, even when considering competitive advantage. On the other hand, Competitive Advantage positively mediates the relationships between Relational Capital

Efficiency and Innovation Capability with Corporate Sustainable Growth. This shows that competitive advantage based on strong relational capital and innovation capability is important for long-term growth.

This research shows that the relationships between intellectual capital, innovation capability, competitive advantage, and sustainable growth are complex. Companies need to invest in intellectual capital but also focus on managing it efficiently, especially when it comes to human capital. Building strong relationships and encouraging innovation are key strategies for gaining a lasting competitive advantage and supporting company growth.

This study provides several implications for sustainable development. First, managers of technology firms should recognize that sustainable growth depends not only on financial performance but also on the efficient management of intellectual capital and innovation capability. Second, firms should strengthen relational capital by building long-term relationships with customers, suppliers, investors, regulators, and other stakeholders. Such relationships can enhance competitive advantage and support SDG 8 by fostering more stable, sustainable economic performance.

Third, innovation capability should be treated as a central element of sustainability-oriented corporate strategy. By strengthening innovation capability, technology firms can improve competitiveness while contributing to SDG 9 through industrial innovation and technological development. Fourth, firms need to evaluate the efficiency of human capital investment. Human capital development should be aligned with productivity, innovation, and strategic value creation to support sustainable growth rather than exacerbate organizational inefficiency.

Finally, the findings suggest that policymakers in Indonesia, Malaysia, and Singapore should support policies that encourage innovation, the development of intellectual capital, and sustainable business practices in technology sectors. Such policies may strengthen regional competitiveness while supporting SDG-oriented corporate transformation.

Declarations

Author Contributions Statement

S., M.R.B.,- Conceptualization, methodology, writing draft. N.I., A.A.N.,- Data curation, review draft. S.., N.I., A.A.N., M.R.B.,- revision, and correction.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval and Consent to participate

Not applicable. This study does not involve human participants or animal subjects.

Consent to publish

Not applicable.

Clinical trial number

Not applicable.

Competing interests

The authors declare no competing interests.

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