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ROLE OF GREEN INTELLECTUAL CAPITAL AND GREEN INNOVATION TO CORPORATE ECONOMIC SUSTAINABILITY

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Abstract

The purpose of this study was to determine the effect of GIC and GI on CES. The research focused on consumer goods sector listed on the IDX for 2018-2022 period with a sample of 42 companies. The research method uses quantitative data analysis with a panel data regression analysis approach. Findings reveal a significant and positive relationship between GIC and CES. GIC enables companies to adopt sustainable business practices, which increases company profitability. GIC provides a competitive advantage in managing environmental risks, meeting customer demands regarding environmental issues, and adapting to changes in regulations related to sustainability. However, the results also show a significant negative impact of GI on CES. GI may lead to a decline in CES in the short term because significant financial resources are required to implement green innovations, which can reduce a company's financial elasticity. This can force companies to abandon profitable production and investment activities.

Keywords: Corporate Economic Sustainability, Green Intellectual Capital, Green Innovation

Abstrak

Tujuan penelitian untuk mengetahui pengaruh GIC dan GI pada CES. Penelitian difokuskan pada sektor barang konsumsi yang terdaftar di BEI periode 2018-2022 dengan sampel sebanyak 42 perusahaan. Metode penelitian menggunakan analisis data kuantitatif dengan pendekatan analisis regresi data panel. Temuan mengungkapkan hubungan yang positif dan signifikan antara GIC dan CES. GIC memungkinkan perusahaan untuk mengadopsi praktik bisnis yang berkelanjutan, yang meningkatkan profitabilitas perusahaan. GIC memberikan keunggulan kompetitif dalam mengelola risiko lingkungan, memenuhi tuntutan pelanggan terkait isu lingkungan, dan beradaptasi dengan perubahan regulasi terkait keberlanjutan. Namun, temuan lain mengungkapkan hubungan negatif dan signifikan GI pada CES. GI dapat menyebabkan penurunan CES dalam jangka pendek karena diperlukan sumber daya keuangan yang signifikan untuk menerapkan inovasi hijau, yang dapat mengurangi elastisitas keuangan perusahaan. Hal ini dapat memaksa perusahaan untuk meninggalkan kegiatan produksi dan investasi yang menguntungkan.

Kata Kunci: Corporate Economic Sustainability, Green Intellectual Capital, Green Innovation

Introduction

Cyber physical systems to era society and digitalization have transformed the manufacturing sector into a supporting factor for Indonesia's economy. Alongside this, the issue of sustainability has become crucial for both the companies themselves and the surrounding environment. The economic benefits derived from business activities can enhance prosperity and have a global impact on living conditions. However, as the economy grows, it also leads to environmental degradation and social inequality, both directly and indirectly, as a result of operational activities by companies (Sullivan et al., 2018). Consequently, the growing awareness of environmental issues has emphasized the importance of adopting green practices (Bombiak & Marciniuk-Kluska, 2018; Shah, et al., 2021).

Among all manufacturing sectors, the consumer goods sector has been identified as one of the main causes of ecological degradation in Indonesia due to its impact on the environment, including water pollution, greenhouse gas emissions, deforestation, and excessive use of natural resources (Arief & Widayati, 2018; Setiawan et al., 2017; Sumarwan & Cahyono, 2020; BPS, 2021). The consumer goods industry sector processes raw materials or semi-finished goods into finished goods that are related to the needs of the society or "non-durable" goods required for daily use. The selection of the consumer goods industry sector is based on its classification as Fast Moving Consumer Goods (FMCG), which means that this sector experiences rapid development over time (bb.binus.ac.id, 2019).

The consumer goods sector often contributes to environmental pollution through the liquid, air, and solid waste generated by their production activities. This pollution can include the release of industrial waste containing hazardous substances into rivers, greenhouse gas emissions causing climate change, and the use of toxic chemicals that harm the environment (Ermawati, 2018; Marliana & Yudianti, 2019). Moreover, the sector tends to use natural resources in large quantities, such as water, energy, and raw materials. Excessive and inefficient use of these resources can lead to depletion and environmental degradation (Pangaribowo & Rosyadi, 2020; Purwanto et al., 2019). Some consumer goods companies may be involved in deforestation practices or the destruction of natural habitats in order to obtain raw materials such as wood, palm oil, or other chemicals. This can result in habitat loss, biodiversity decline, and conflicts with local communities (Hadian et al., 2020; Kusnandar, 2019). Additionally, excessive packaging leads to a large amount of plastic waste. Improperly managed plastic waste can pollute the environment, especially rivers and oceans.

Corporate Economic Sustainability (CES) is the ability of a company or organization to achieve long-term economic growth and create value for stakeholders sustainably (Chaudhry et al., 2022). This concept encompasses various aspects, including operational efficiency, wise resource management, consistent revenue growth, cost control, and efforts to reduce negative impacts on the environment and society (Chaudhry et al., 2022). CES refers to a company's ability to achieve sustainable economic growth and long-term profitability without sacrificing environmental and social factors. This concept integrates economic, environmental, and social aspects into a company's business practices. Companies need to redesign their business models and rethink their innovation capabilities in order to protect themselves from environmental damage (Yusliza et al., 2020). Companies should not only pursue economic gains but also pursue environmental and social goals (Bombiak & Marciniuk-Kluska, 2018). CES involves the efforts of companies to achieve sustainable economic growth while considering their impact on the environment and society. Companies can adopt business strategies that combine operational efficiency, innovation, and risk management to ensure long-term survival and economic sustainability (Elkington, 1997; Porter & Kramer, 2011). CES encourages companies to embrace innovation and improve resource efficiency in their operations. By reducing resource consumption, creating products and services that are more

environmentally friendly, and developing sustainable business models, companies can achieve sustainable economic benefits (Schaltenger & Wagner, 2011; Tukker et al., 2008).

The implementation of Sustainable Development Goals (SDGs) plays a significant role in supporting CES. By adopting SDGs in the business world, it can reduce the potential for conflicts in the company's operational areas while building positive relationships with the local community and government (Sindonews.com, 2019). Through the implementation of SDGs, companies actively seek new innovations and develop solutions to create a greener environment that can be implemented to achieve sustainable business practices. The increasing awareness of green products encourages companies to strive for a greener approach, requiring human capital with insights into green practices that will be applied within the company (Zalfa & Novita, 2021). The implementation of environmental strategies can effectively bridge the company's performance between environmental and economic interests (Agustia et al., 2019). The present study is driven by the necessity to identify factors that can be utilized to generate profits while also protecting the environment. From a resource-based perspective, developing strong intangibles, such as intellectual capital, provides opportunities for organizations to enhance business performance, gain competitive advantage, foster innovation, and ensure organizational sustainability. Specifically, in the context of sustainability and the environment, this study focuses on the concept of GIC (Yusoff et al., 2019).

Green Intellectual Capital (GIC) is defined as the utilization of an organization's knowledge, capabilities, skills, abilities, expertise, and relationships for the purpose of environmental protection (Wang & Juo, 2021). The role of GIC lies in its contribution to driving green innovation, responsible environmental management, and the creation of long-term sustainable value for companies. By having knowledge and skills related to sustainable practices, companies can develop products, processes and technologies that are environmentally friendly, thereby adding to their business value (Wustenhagen et al., 2008; Pujawan et al., 2020). GIC plays a significant role in contributing to CES. Companies with a strong focus on developing and utilizing GIC are more likely to adopt sustainable business practices. By incorporating sustainable practices, companies can reduce operational costs, improve resource efficiency, and create products and services that have a lower environmental impact. These factors can positively influence the CES over the long term (Maas et al., 2020).

According to Chen (2008) introduced the concept of GIC and established its connection with achieving a competitive advantage. GIC is structured around three dimensions, namely green human capital, green relational capital, and green structural capital. The implementation of changes in business processes in response to environmental degradation has enabled companies to enhance their profitability while ensuring the sustainable preservation of ecosystems. Adhering to the principles of GIC allows businesses and processes to have a meaningful impact on environmental sustainability (Chaudhry et al., 2022).

Green Human Capital encompasses the knowledge, skills, and competencies of individuals within the context of sustainability and the environment. It involves individuals' ability to apply sustainable practices, manage the environment, and contribute to green innovation within organizations (Ansari, et al., 2019; Ooi et al., 2020). Green Relational Capital involves the relationships and networks that companies establish with external parties, including business partners, customers, local communities, and other stakeholders related to sustainability. This dimension includes strategic partnerships, collaborations, and cooperation that support companies' efforts in implementing sustainable practices (Li, et al., 2021; Tang, et al., 2020). Green Structural Capital encompasses the organizational structure, systems, and infrastructure that support sustainable practices. It includes the use of green technology, environmentally friendly operational processes, databases, and information systems that facilitate environmental reporting and management (Paco, et al., 2019; Yoo, et al., 2016). (Maaz, et al., 2021) propose that companies should possess a comprehensive range of

intangible assets, including knowledge, competencies, and relationships, among other factors, to address environmental protection and promote green innovation at both individual and organizational levels within the corporation. Therefore, it is crucial for companies to have GIC as it enables them to enhance their competitiveness and overall performance (Muafi, 2021). By developing and utilizing GIC, companies can adopt sustainable business practices, green innovations, and environmentally friendly approaches. These sustainable practices and innovations can help reduce operational costs, improve resource efficiency, and create environmentally friendly products and services. As a result, the company gains a competitive edge in the market. When a company is more competitive, it can attract more customers, expand its market share, and increase its revenue and profitability. The company's economic sustainability improves as it can withstand market challenges, adapt to changing environmental regulations, and meet the demands of environmentally conscious consumers (Chaudhry et al., 2022). Furthermore, according to Haldorai, et al., (2021) and (Yadiati, et al., (2019), GIC has been instrumental in helping businesses comply with stringent international environmental regulations, generate revenue, and meet the heightened customer expectations regarding environmental concerns.

Green Innovation (GI) refers to the development and implementation of sustainable, environmentally-friendly innovations aimed at reducing negative impacts on the environment. This involves the introduction of new products, services, processes and practices that integrate environmental elements and contribute to the transition towards a low-carbon economy. GI includes developing products with better environmental performance, using renewable resources, reducing waste and emissions, and resulting in a lower environmental impact. It involves creative thinking in product design, development and marketing (Zhu et al., 2019; Hsiao et al., 2020). GI also involves developing production processes that are more efficient, reduce energy and resource consumption, and better manage waste and emissions. This process innovation aims to increase operational efficiency and reduce negative environmental impacts (Luthra et al., 2017; Wan et al., 2020). Furthermore, GI includes the development of sustainable business practices, such as the use of renewable energy, effective waste management, and the adoption of green technology. This involves integrating sustainable solutions throughout the company's value chain (Sarkis et al., 2018; Zhu et al., 2021). The relationship between GI and CES is intricate and symbiotic. As companies embrace GI's principles, they position themselves to achieve better CES outcomes. The alignment of eco-friendly practices with economic success underscores the significance of integrating sustainability into core business strategies. The research underscores the direct and positive influence of GI on CES, reinforcing the idea that embracing green innovation is not only a path to environmental stewardship but also to long-term economic prosperity (Zhu et al., 2021).

There is incongruity among empirical studies. For instance, Wang & Lin (2018) analyzed the impact of GIC on GI and CES. Additionally, Ormazabal, et al. (2020) examined the relationship between GIC, GI, and CES in the hotel industry. Using data from hotels in Spain, this research demonstrated that GIC positively contributes to GI and CES. In addition, Mehmood, et al. (2020) investigated the effect of GIC on eco-innovation and CES. Through a survey of manufacturing companies in Pakistan, this study found that GIC positively influences eco-innovation, which in turn improves CES. Research of Junquerra, et al. (2021) through a survey of manufacturing companies in Spain, this study reveals that GIC has a positive effect on GI and CES. In contrast, Tariq, et al. (2021) explores the impact of GIC on GI, environmental sustainability, and economic sustainability. Through a survey of companies in Pakistan, this study shows that GIC makes a positive contribution to GI, environmental sustainability and economic sustainability. In contrast, Zalfa & Novita (2021) found that GIC had a negative influence on CES in their research. The novelty of this research lies in its investigation of the relationship between GIC, GI and CES in the context of manufacturing companies in the

consumer goods sector listed on IDX. While previous studies have examined the impact of GIC and GI on various outcomes, this study focuses specifically on their effect on CES. In addition, the study covers a specific time period (2018-2022) and includes a sample of 42 companies listed on the IDX, providing insight into the Indonesian market. By exploring the influence of GIC and GI on CES, this research contributes to understanding sustainable business practices and their financial implications.

The Resource-Based View (RBV) theory emphasizes the importance of unique and valuable resources in achieving competitive advantage. In this context, GIC serves as a valuable resource consisting of knowledge, skills and capabilities in the context of sustainability. GIC enables companies to identify green innovation opportunities, develop sustainable products and services, and optimize operational efficiency. On the other hand, GI is the outcome of leveraging GIC to create sustainable products, processes, and practices. Together, these aspects can enhance CES by reducing negative environmental impacts, achieving higher efficiency, and opening up new market opportunities (Hart, 1995; Hsu et al., 2019). Several studies have explored GIC and their effect on CES. The research by Chen et al. (2017) found a positive relationship between GIC and CES. Likewise, Zhang et al. (2018) investigated the influence of GIC on CES in the Chinese manufacturing industry and reported a significant and positive relationship. Furthermore, Wang et al. (2020) conducted research on the relationship between GIC and CES, and found a significant positive effect. Considering the insights from these prior studies, the research hypothesis:

H_1 = GIC has an significant effect on CES

The Dynamic Capability theory emphasizes the organizational ability to adapt and evolve in response to environmental changes. GIC plays a role as an intangible asset that enables companies to develop green innovation capabilities. By leveraging GIC, companies can generate GI that allows them to adapt to increasingly sustainable market demands. By continuously strengthening green innovation capabilities, companies can achieve CES by maintaining long-term competitive advantage (Teece et al., 1997; Jabbour et al., 2018). Numerous studies in the field of sustainability has highlighted the pivotal role of GI in driving CES. Previous research provides compelling evidence of the positive impact of GI on CES. For example, the research of Rennings et al. (2018), who underline the correlation between GI and improved financial outcomes. Also the research by Terziovski et al. (2015) underscores how GI fosters the development of sustainable products, processes, and services. These innovations not only attract environmentally conscious consumers but also contribute to long-term economic gains. Considering the insights from these prior studies, the research hypothesis:

H_2 = GI has an significant effect on CES

Methods

The method used in this study employs panel analysis, which involves collecting data from a number of companies observed over a specific period of time. This data is then analyzed to identify the longitudinal relationship between GIC, GI, and CES. Panel analysis allows researchers to account for variations across companies and understand the long-term impact of GIC and GI on CES. The research framework is illustrated in the following figure:

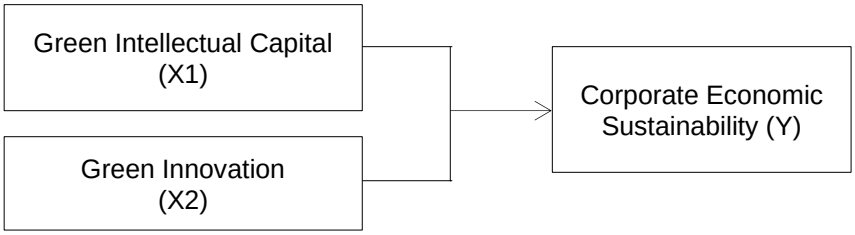

Figure 1. Research Framework

Sample Procedure

The population in this study includes all consumer goods sector manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period of 2018-2022, totaling 53 companies. The sample selection in this study used purposive sampling with the criteria that can be seen in the following Table 1:

Table 1. Research Sampling

Sampling Criteria	Number
Companies that have presented annual reports on the IDX for 5 consecutive years from 2018 to 2022.	45
Companies that publish annual reports on the IDX website using the Indonesian rupiah currency to ensure consistent results unaffected by foreign exchange rates.	44
Companies with a December 31 fiscal year-end and including independent auditor reports.	44
Companies with complete data relevant to the measurement of dependent and independent variables.	44
Companies that disclose social responsibility and corporate governance reports.	42
Total	**42**

Source: Processed by author (2023)

Research Variable

Green Intellectual Capital (GIC) plays a key role in maintaining a company's focus on regulatory mechanisms and initiatives to achieve sustainability goals. GIC significantly contributes to enhancing a company's ability to grow and maintain a sustainable competitive advantage (Augustine & Dwianika, 2019). GIC is calculated using three dimensions: (1) Green Human Capital, consisting of 5 indicators; (2) Green Structural Capital, consisting of 6 indicators; and (3) Green Relational Capital, consisting of 5 indicators. The index is then calculated using the following proxies:

$$\text{Index GIC} = \frac{\text{The total items disclosed in each element}}{\text{The total number of items in each element}} \text{ x } 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Green Innovation (GI) is formed with the aim of reducing the environmental damage by striving for energy efficiency, pollution reduction, waste reduction, and designing green products. This study focuses on the examination conducted by Agustia et al., (2019). This examination utilizes several indicators to assess whether companies engage in green innovation. The dimensions used in this analysis are as follows: (1) Green Process Innovation, consisting of 4 indicators; (2) Green Product Innovation, consisting of 4 indicators. In total, there are 8 indicators. Subsequently, the index is calculated using the following proxies:

$$\text{GI} = \frac{\text{The total items disclosed in each element}}{\text{The total number of items in each element}} \text{ x } 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

There is no single mathematical formula specifically designed to calculate Corporate Economic Sustainability since economic sustainability involves various complex and contextual aspects. However, there are several indicators and factors that can be used to

evaluate the economic sustainability of a company, such as measuring the level of profitability (a crucial factor in assessing economic sustainability). Companies that can maintain and increase profitability can attract investors to company performance, because if a company can maintain stability and increase profits, it reflects that the company's performance is very good (Keni & Pangkey, 2022). Indicators such as annual revenue, net income, and profit margin can be used to assess a company's financial performance. The formula is as follows:

$$\text{Return on Equity (ROE)} = \frac{\text{Earning After Tax (EAT)}}{\text{Equity}} \text{x}100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Results and Discussions

The purpose of testing the classical assumptions in this study is to examine and evaluate the validity of the model used. The testing of classical assumptions in this research includes: Normality test aims to determine whether the disturbance variables or residuals in the regression model follow a normal distribution. In this study, the testing was conducted using the Kolmogorov-Smirnov approach with Asymp. Sig. (2-tailed) for the GIC variable at 0.780, GI variable at 0.530 and for the CES variable at 0.230. Additionally, the unstandardized residual variable has a value of 0.677, which is greater than the alpha level of 0.05. This indicates that each variable follows a normal distribution. Multicollinearity test is used to determine whether there is a strong correlation between independent variables in the regression model. In this study, the independent variable GIC has a Tolerance value > 0.10 and a VIF value < 10. Therefore, there is no multicollinearity issue in the regression model, indicating that the assumption of non-multicollinearity is fulfilled. Heteroskedasticity test is employed to examine whether there is unequal variance of residuals across observations in the regression model. In this study, the Scatter Plot shows that the data points are scattered above and below the zero line on the Y-axis without forming any specific pattern. This indicates that the data variance is identical or homoscedastic, and there is no heteroskedasticity issue in the regression model. Autocorrelation refers to the correlation between residuals of one observation and those of another observation arranged in time order. In this study, the Durbin-Watson (d) statistic is obtained as 2.212. Since the calculated d value falls between dL < d < (4 - dL) = 1,76445 < 2,212 < 2,23555, it can be concluded that there is no autocorrelation in the regression model. Thus, the assumption of non-autocorrelation is satisfied. Therefore, the results of testing the classical assumptions indicate that the regression model in this study satisfies the assumptions of normality, non-multicollinearity, homoscedasticity, and non-autocorrelation.

Table 2. Results of Panel Data Regression Analysis and t Test

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	1,661	,542	3,067	,002
GIC	3,193	1,059	3,015	,003
GI	-5,948	1,089	-5,460	,000

Source: Data Processing Results (SPSS 21.0), 2023

Table 1 shows the regression equation model $\hat{Y}$ = 3.193 - 5.948X which explains that GIC has a positive effect on CES, while GI has a negative effect on CES in the consumer goods sector listed on the IDX for the 2018-2022 period. The partial test results show the coefficient for GIC was estimated at 3,015 and the significance value is 0.003 is lower than 0.05 (0.003 < 0.05), it means that GIC has a positive significant influence on the CES. But the

coefficient for GI was estimated at -5,460 and the significance value is 0.000 is lower than 0.05 (0.000 < 0.05), it means that GI has a negative significant influence on the CES.

Table 3. Simultaneous Test Results (F Test)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99,004	2	49,502	16,018	,000[b]
	Residual	639,712	207	3,090		
	Total	738,716	209			

Source: Data Processing Results (SPSS 21.0), 2023

The results of the simultaneous test results (F test) indicate that the F value is 16,018 with a significance level of 0.000, which is smaller than the alpha value (0.000 < 0.05). This implies that the H_0 is rejected. Therefore, it can be concluded that the variables of GIC and GI simultaneous have a significant impact on the CES.

Table 4. Correlation and Determination Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,366[a]	,134	,126	1,75795	,212

Source: Data Processing Results (SPSS 21.0), 2023

The value of R is 0,366 (36,6%). These conditions indicate a low correlation between the CES and factors such as GIC and GI. The coefficient of determination (R square) is 0,134 (13,.4%). This implies that 13,4% of the CES can be explained by GIC and GI. The remaining 86.6% is attributed to other variables which were not mentioned in this study.

The Effect of Green Intellectual Capital on Corporate Economic Sustainability

The results showed that GIC had a positive and significant effect on CES. GIS is influenced by various factors that can explain the relationship. First, GIC can help companies adopt sustainable business practices and green innovation. Sustainable business practices can reduce operational costs and increase resource efficiency, which in turn can increase company profitability. In addition, by having knowledge, skills and abilities in environmental aspects, companies can differentiate themselves from competitors and create unique value. This unique value can contribute to better CES. In this context, companies with strong GIC are more likely to manage environmental risks, meet the demands of environmentally conscious customers, and adapt to regulatory changes related to sustainability. All of these factors can have a positive impact on the company's CES. However, GIC's contribution to CES may vary across companies and industry sectors. In addition, other factors such as economic conditions, market factors, and government policies can also influence the relationship between GIC and CES. Therefore, deeper analysis and further research are needed to better understand the specific contribution of CIS to CES in a more detailed context.

The results of this study are in line with the research of Chen et al. (2017), Zhang et al. (2018) and Wang et al. (2020) which found that GIC and CES has a significant positive effect of GIC on CES. These findings indicate that the presence and utilization of GIC, such as green knowledge, skills, and abilities, contribute to improving financial performance, especially CES. Overall, GIC's positive and significant impact on CES can be attributed to factors such as enhanced innovation capabilities, increased resource efficiency, effective environmental management practices, and a stronger focus on sustainability goals. These factors enable

companies to create value, reduce costs, attract investors, and maintain a competitive advantage.

The Effect of Green Innovation on Corporate Economic Sustainability

The results showed that GI had a negative and significant effect on CES. In a general context, there are no assumptions or studies to suggest that GI has a negative and significant impact on CES. GI is usually considered as a factor that can improve CES and provide long-term benefits. This is because GI involves developing and implementing innovative eco-friendly solutions that can help companies reduce operational costs, improve resource efficiency and gain competitive advantage. This can contribute positively to revenue, profitability and overall financial performance, including CES. In most cases, GI is considered a positive contributing factor to CES.

However, the findings in this study indicate that GI has a negative and significant effect on CES. Factors that have the potential to contribute to this impact include: 1) High initial costs. Green innovation initiatives often require significant investment in research, development and implementation of green technologies and practices. These up-front costs can reduce immediate profitability and ultimately impact CES in the short term. 2) Market demand and prices. Demand for green products and services may not always be in line with market preferences or premium prices. If the market is unwilling to pay higher prices for eco-friendly offerings, it could limit revenue potential and negatively impact CES. 3) Transition challenges: Implementing green innovation initiatives may require operational changes, process re-engineering and reallocation of resources. These transitional challenges can lead to disruptions in business operations and temporary reductions in efficiency, impacting profitability and CES. 4) Regulatory compliance costs: Compliance with environmental regulations and standards can involve additional costs for companies, such as emission reduction requirements or waste management obligations. These compliance costs can impact profitability and CES. 5) Limited market acceptance: Green innovations may face resistance or slow adoption in certain industries or consumer segments. If the market does not embrace green products or services as expected, it could hinder revenue growth and negatively impact CES.

This is not in line with the hypothesis proposed by the author which states that Green Innovation (GI) has a positive and significant effect on Corporate Economic Sustainability (CES). This indicates that the level of green innovation carried out by the company will cause a decline in CES. According to Xie et al. (2022), GI has a devaluing effect on CES, but this effect only occurs in the short term. GI implemented by companies requires significant financial resources, which can lead to a decrease in the company's financial elasticity. This decline will force companies to abandon some profitable production and investment activities. Green innovations can also generate low value compared to the costs incurred to implement them. This finding is in line with research conducted by Yuliandari et al. (2023), Xie et al, (2022), and Yao et al. (2019), which states that GI has a negative and significant effect on CES.

Conclusion and Suggestion

The purpose of this study is to examine the impact of Green Intellectual Capital (GIC) and Green Innovation (GI) on Corporate Economic Sustainability (CES). The results indicate that GIC has a positive and significant influence on CES. The study demonstrates that the adoption of sustainable business practices and green innovation supported by GIC can enhance company profitability. GIC provides companies with a competitive advantage in managing environmental risks, meeting customer demands regarding environmental issues, and adapting to sustainability-related regulatory changes. On the other hand, Green Innovation (GI) has a negative and significant impact on Corporate Economic Sustainability (CES). The

research shows that GI can lead to a decrease in CES in the short term. The implementation of green innovation requires significant financial resources, which can reduce the financial elasticity of the company. This may force companies to abandon profitable production activities and investments. Additionally, the costs incurred for green innovation may outweigh the generated value, resulting in a disproportionately low return.

The implications of this research, first as an investment in employee development in terms of knowledge, skills and capabilities related to sustainable practices and green innovation. Second assist companies in developing GIC-based strategies to improve CES. Companies can take advantage of the competitive advantages provided by GIC in managing environmental risks, meeting customer expectations regarding environmental issues, and adapting to regulatory changes related to sustainability and third, risk management related to green innovation, this implication emphasizes the importance of identifying and managing risks related to green innovation implementation. Companies need to develop appropriate risk mitigation strategies, including monitoring and evaluating the financial and operational impact of the green innovations adopted.

The suggestions for this research are for companies to increase investments in GIC development by adopting training and development programs focused on knowledge, skills, and capabilities related to sustainable practices. Companies need to ensure the integration of GIC into their business strategies, taking into account environmental, social, and economic aspects. This may include adopting green initiatives, utilizing renewable energy, implementing efficient waste management, and collaborating with external stakeholders committed to sustainability. Furthermore, companies should conduct careful cost-benefit analyses before adopting green innovation. Consider the scale, financial impact, and associated risks of implementing green innovation, and explore alternative solutions that can reduce costs or increase benefits. Companies should identify and manage risks associated with green innovation implementation. This involves implementing appropriate risk mitigation strategies, including continuous monitoring and evaluation of the financial and operational impacts of adopted green innovations.

The limitations in this study only focus on manufacturing companies in the consumer goods sector which are listed on the Indonesia Stock Exchange (IDX). This may limit the generalizability of research results to other industrial sectors or companies outside the stock exchange. The limited research time in the 2018-2022 period may not cover all economic and environmental dynamics. External factors that occur outside of this period may influence the relationship between GIC, GI and CES. The use of quantitative data from IDX financial reports has limitations in measuring more complex variables, such as the qualitative aspects of GIC and GI. It is possible that there are other factors beyond the variables measured in this study that may influence the relationship between GIC, GI and CES. These variables may not be directly measurable within the framework of this study. Although GIC and GI are considered to have important implications, these concepts may have varied interpretations and need to be considered in a wider context.

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