Green Gains: The Role of Environmental Initiatives and Intellectual Capital in Enhancing Firm Value in Emerging Markets

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ABSTRACT

This study explores how intellectual capital management and environmental sustainability contribute to enhancing firm value in competitive markets. It addresses a critical knowledge gap by examining the interplay between sustainability, innovation, and firm value in emerging markets, with integrated reporting considered as a moderating variable. Through panel regression analysis of 252 observations within the consumer cyclicals sector from 2021 to 2023, the findings reveal that environmental performance has a significant and positive impact on firm value. In contrast, intellectual capital does not exhibit a direct influence on firm value. Furthermore, integrated reporting weakens the relationship between environmental performance and firm value but does not moderate the link between intellectual capital and firm value. These results provide practical insights for firms seeking to refine their sustainability strategies in competitive markets and contribute to the academic discourse on the role of integrated reporting as a moderating factor in the nexus of sustainability, innovation, and value creation.

Keywords: Firm Value; Environmental Performance; Intellectual Capital; Integrated Reporting; Consumer Cyclicals.

Pertumbuhan Hijau: Bagaimana Upaya Lingkungan dan Modal Intelektual Mendorong Nilai Perusahaan di Pasar Berkembang

ABSTRAK

Bagaimana pengelolaan modal intelektual dan keberlanjutan lingkungan dapat membantu perusahaan meningkatkan nilai di pasar yang kompetitif? Penelitian ini penting karena mengisi kesenjangan pemahaman tentang hubungan antara faktor keberlanjutan, inovasi, dan nilai perusahaan di pasar negara berkembang. Dengan integrated reporting sebagai moderasi, penelitian ini melihat bagaimana firm value dipengaruhi environmental performance dan intellectual capital. Hasil menunjukkan bahwa environmental performance berpengaruh positif yang signifikan terhadap firm value, sedangkan intellectual capital tidak berpengaruh langsung pada firm value. Hasil ini diperoleh dengan menggunakan regresi data panel pada 252 observasi di sektor consumer cyclicals pada periode 2021–2023. Integrated reporting melemahkan hubungan environmental performance dengan firm value, tetapi integrated reporting tidak memoderasi hubungan intellectual capital dengan firm value. Temuan ini menawarkan panduan praktis untuk strategi keberlanjutan dan literatur akademik mengenai moderasi integrated reporting.

Kata Kunci: *Nilai Perusahaan; Kinerja Lingkungan; Modal Intelektual; Pelaporan Terpadu; Siklus Konsumen.*

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INTRODUCTION

In recent years, the emphasis on corporate performance has shifted from purely financial aspects to prioritizing the company's role in promoting environmental sustainability and leveraging intellectual assets to generate long-term value. These two aspects are significant in influencing company value, particularly in the consumer cyclicals sector, which is highly affected by changes in consumer preferences and economic conditions. Based on data, the consumer cyclicals index decreased by 5.50% in 2022 and by 0.76% year-to-date as of early 2023 (Mulyana, 2023).

A total of 42 companies from this sector, representing approximately 27.5% of the total shares listed on the IDX special monitoring securities list, are characterized by poor financial performance, small to medium market capitalization, and vulnerability to economic changes. Despite these challenges, the sector holds opportunities for growth in line with the economic recovery process. As the economy stabilizes, consumer confidence is likely to improve, further supporting sector growth. This potential is reinforced by sector rotation trends, where the consumer cyclicals sector is expected to regain attention as economic conditions stabilize and purchasing power increases. Additionally, demand for consumer goods is anticipated to rise as disposable incomes grow. However, to remain competitive, issuers in this sector must adopt strategic measures, including strengthening firm value, enhancing operational efficiency, and improving financial management. These efforts will enable companies to withstand market volatility and position themselves for long-term success.

Firm Value (FV) is a measure that reflects how effectively a company manages risks and how this impacts its financial performance and stability (Krause & Tse, 2016). The market's assessment of a company's future prospects, including potential earnings, growth, and associated risks, is encapsulated in its firm value (Arifin & Saputra, 2024; Belo et al., 2022; Firdaus et al., 2024; Rahman et al., 2024; Ramadhan et al., 2024; Saputra & Arifin, 2024). Recently, corporate performance evaluation has expanded to encompass contributions to environmental sustainability, which play a vital role in enhancing a company’s market position and stakeholder relations.

Environmental Performance (EP) refers to a company's capacity to manage the environmental impacts of its operations, including compliance with environmental regulations, reduction of harmful emissions, and contributions to overall environmental sustainability (Konar & Cohen, 2001). EP is a key component of corporate responsibility, influencing not only environmental outcomes but also financial performance and corporate reputation (Hassel et al., 2011; Ilinitch et al., 1998).

In addition to EP, another factor influencing FV is Intellectual Capital (IC). According to Pulic (2004), IC represents an organization’s intangible assets, including employee knowledge, skills, and experience, which should be considered as critical as financial and physical capital. IC impacts FV by driving innovation, customer satisfaction, operational efficiency, knowledge management, reputation, and competitive advantage (Ni et al., 2020). By effectively managing and developing IC, companies can create sustainable value and improve their financial performance.

Research on the influence of EP on FV, as studied by Yadav et al. (2015), Prawirasasra (2015), Deswanto & Siregar (2018), and Effendi (2021), found that companies with consistently improving EP tend to enhance FV. Conversely, studies by Septiani et al. (2019), and Rinsman & Prasetyo (2020) reported no significant effect of EP on FV. Research on the effect of IC on FV, conducted by Nuryaman (2015), Septiani et al. (2019), Ni et al. (2020), Lukman & Tanuwijaya (2021), and Appah et al. (2023), found a positive impact. However, studies by Subaida et al. (2018), Putra & Ratnadi (2021), and Saputra et al. (2023) concluded that IC has no significant effect on FV.

The inconsistencies in prior studies highlight the need for a moderation approach; therefore, this research incorporates integrated reporting (IR) as a moderating variable. This study offers a unique contribution by examining the role of IR in the relationships between EP, IC, and FV. In emerging markets, the strategic role of IR as a communication tool has not been extensively studied. IR integrates financial and non-financial information, providing a comprehensive overview of a company's strategy to create long-term value. Consequently, IR has the potential to strengthen or weaken the effects of EP and IC on FV.

This study aims to explore how EP and IC influence FV, as well as how IR moderates these relationships. The findings are expected to contribute to the academic literature and provide practical insights for businesses, particularly in understanding how environmental performance, intellectual capital management, and integrated reporting can enhance firm value.

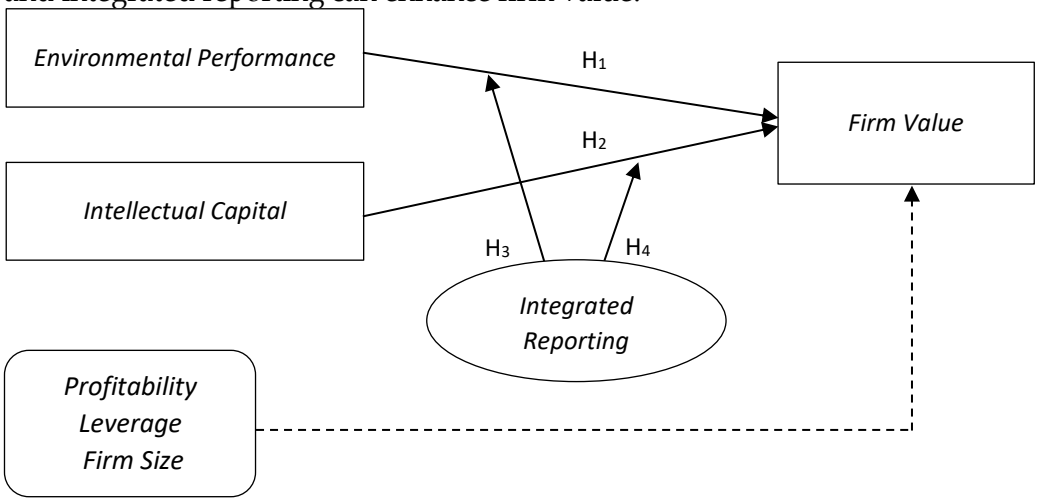


Figure 1. Conseptual Framework

Source: Research Data, 2024

Good environmental performance (EP) reflects a company's commitment to managing the environmental impact of its operations. The influence of EP on firm value (FV) is grounded in stakeholder theory, which posits that organizations prioritizing environmental concerns can enhance their reputation, strengthen market positions, and improve stakeholder relationships (Child & Marcoux, 1999; Septiani et al., 2019). Stakeholder theory emphasizes the importance of considering the interests of all relevant parties in decision-making, extending beyond the traditional focus on shareholders (Child & Marcoux, 1999; Freeman et al., 2021).

According to Yu & Zhao (2015), EP contributes to FV by managing risks, increasing transparency, attracting investors, building reputation, and creating competitive advantages. Investors drawn to companies with sustainable business practices are more likely to overvalue firms implementing environmentally friendly policies. This investor confidence, combined with a positive reputation, directly enhances FV, as stakeholders perceive such companies as more stable and better equipped to address future challenges. Empirical studies by Yadav et al. (2015), Prawirasasra (2015), Deswanto & Siregar (2018), and Effendi (2021) demonstrate that robust EP positively impacts FV by attracting favorable investor expectations and strengthening corporate reputation.

H_1: Environmental Performance has a positive effect on Firm Value.

Intellectual capital (IC) enhances organizational capabilities, operational efficiency, and product innovation, ultimately fostering long-term value creation. Agency theory, which examines the relationship between principals (shareholders) and agents (managers), highlights the role of managers in optimizing resource allocation to maximize shareholder value (Jensen & Meckling, 1976). The effective management of IC is crucial for improving performance, reducing conflicts, and enhancing transparency and accountability through the disclosure of vital information (Appah et al., 2023).

Managers who strategically leverage IC to drive innovation and productivity can create substantial long-term value for their organizations. Prior research by Nuryaman (2015); Septiani et al. (2019); Ni et al. (2020); Lukman & Tanuwijaya (2021); and Appah et al. (2023) consistently shows that IC positively influences FV by contributing to operational excellence and competitive differentiation.

H_2: Intellectual Capital has a positive effect on Firm Value.

Integrated Reporting (IR) combines financial and non-financial information in a single report, providing stakeholders with a comprehensive understanding of how a company creates value over time (Grassmann, 2021; IFRS Foundation, 2013; Vitolla et al., 2019). By communicating a company's commitment to environmental sustainability, IR is expected to enhance the influence of EP on FV. IR enables investors to gain clearer insights into a company's sustainability strategies, fostering greater confidence in its long-term value creation potential.

H_3: Integrated Reporting strengthens the effect of Environmental Performance on Firm Value.

IR also facilitates the communication of how intangible assets, such as knowledge, skills, and innovation, contribute to value creation. Based on agency theory, managers may not always optimize IC management due to its intangible and non-immediate financial impact. This disconnect creates an information asymmetry between companies and investors, potentially limiting the perceived value of IC. In this context, IR plays a critical role in bridging the information gap by increasing transparency and accountability.

Through IR, companies can effectively demonstrate how investments in employee development, operational efficiency, and product innovation translate into long-term FV. By providing a detailed account of IC's role in value creation, IR reduces investor concerns regarding conflicts of interest and helps clarify the

strategic importance of IC. Consequently, IR is anticipated to enhance the relationship between IC and FV.

H_4: Integrated Reporting strengthens the influence of Intellectual Capital on Firm Value.

RESEARCH METHODS

The population for this study comprises 160 consumer cyclicals (CC) companies listed on the Indonesia Stock Exchange (IDX) between 2021 and 2023. This sector was selected due to its relevance in analyzing the impact of Environmental Performance (EP) and Intellectual Capital (IC) on Firm Value (FV), as it is particularly sensitive to shifts in consumer preferences and global economic conditions. The research employs a purposive sampling technique to ensure the selection of companies that meet the study's specific criteria.

Table 1. Sample Determination

Sample Criteria	Total
CC companies listed on the IDX as of July 4, 2024	160
Companies listed 2024	(7)
Companies that don't consistently publish annual reports, sustainability reports, and financial statements consistently during the study period (2021-2023)	(69)
Companies that are sampled	84
Year of Observation (2021-2023)	3
Total Observations	252

Source: Research Data, 2024

Data collection for this study was conducted using the desk research method, which involves analyzing existing and published data rather than gathering data directly from primary sources (Woolley, 1992). The research data were sourced from annual reports, sustainability reports, and financial reports available on the Indonesia Stock Exchange (IDX).

In this study, Firm Value (FV) serves as the dependent variable, representing a market-based measure of a company's value (Tobin, 1969). FV is measured using Tobin's q ratio, which compares a company's market value to the replacement cost of its assets (Dzahabiyya et al., 2020; Firdaus et al., 2024; Lang & Stulz, 1994; Saputra & Arifin, 2024). The formula for Tobin's q is as follows:

$$\text{Tobin's q} = \frac{\text{Market value of Equity+Book Value of Debt}}{\text{Book Value of Assets}} \quad \text{..... (1)}$$

Environmental Performance (EP), the first independent variable, measures a company's effectiveness in managing the environmental impacts of its business activities (Hassel et al., 2011). EP is assessed using a nominal scale, where 0 represents "No disclosure," 1 represents "Disclosure but not complete," 2 represents "Disclosure," and 3 represents "Trends or comparison with the previous year." The indicators for EP are derived from Environmental Key Performance Indicators (DEFRA, 2011) found in annual or sustainability reports. These indicators include emissions to land, emissions to water, emissions to air, and resource use.

Intellectual Capital (IC), the second independent variable, is an intangible asset comprising the knowledge, skills, experience, and innovation of employees,

as well as organizational processes and systems that support value creation (Pulic, 2004). The Value Added Intellectual Coefficient (VAIC™), introduced by Pulic (2004), serves as a proxy for measuring IC and includes a structured ranking mechanism. The calculation of VAIC™ follows the methodology outlined by Ulum (2013).

$VAIC^{TM} = VACA + VAHU + STVA$ ..... (2)

Where:

$VAIC^{TM}$: *Value Added Intellectual Coefficient*
VACA : *Value Added Capital Employed*
VAHU : *Value Added Human Capital*
STVA : *Structural Capital Value Added*

After measuring Intellectual Capital (IC), a ranking is conducted based on the Value Added Intellectual Coefficient (VAIC™) results (Ulum, 2013). The VAIC™ rankings are categorized as follows: Top Performers (VAIC above 3.00), Good Performers (VAIC between 2.00 and 2.99), Common Performers (VAIC between 1.50 and 1.99), and Bad Performers (VAIC below 1.50).

Integrated Reporting (IR) is a comprehensive reporting approach that combines financial and non-financial information into a single document (IFRS Foundation, 2013; Vitolla et al., 2019). Data for IR measurement are obtained from annual reports, sustainability reports, or integrated reports. IR is assessed using a nominal scale, where 0 represents "No disclosure," 1 represents "Disclosure but not complete," 2 represents "Disclosure," and 3 represents "Trends or comparisons with previous years." The IR indicators are based on guidelines provided by the IFRS Foundation (2013), which include the following dimensions: Governance; Strategy and Resource Allocation; Performance; Business Model; Risk and Opportunities; Outlook; Organizational Overview and External Environment; and Basis of Preparation and Presentation.

Profitability (PF) serves as an indicator of a company's financial performance, reflecting its ability to generate profits from its assets and equity (Hall & Weiss, 1967). PF is measured using Return on Assets (ROA), a metric that captures the efficiency of asset utilization in generating profits.

$$ROA = \frac{Net\ Income}{Total\ Assets}\ x\ 100\% \quad \text{..... (3)}$$

Leverage (LV) refers to a company's use of debt within its capital structure to potentially enhance shareholder returns (Myers, 1984). It is typically evaluated using the Debt to Asset Ratio (DAR), which measures the extent to which a company's debt is utilized in relation to its total (Myers, 1984).

$$DAR = \frac{Total\ Debt}{Total\ Assets}\ x\ 100\% \quad \text{..... (4)}$$

Firm Size (FS) is defined as the total assets of the company (Beaver et al., 1970). In this research, FS is measured using a logarithmic transformation due to its distribution being closer to normality and symmetry (Beaver et al., 1970).

$FS = LN\ (Total\ Assets)$ ..... (5)

This research employs panel data regression analysis, which is conducted using Eviews software. The regression model utilized in this research is presented as follows::

$$FV = \alpha + \beta_1 EP + \beta_2 IC + \beta_3 PF + \beta_4 LV + \beta_5 FS + \beta_6 IR + \beta_7 (EP \times IR) + \beta_8 (IC \times IR) \quad \text{..... (6)}$$

Where:
FV : *Firm Value*
EP : *Environmental Performance*
IC : *Intellectual Capital*
PF : *Profitability*
LV : *Leverage*
FS : *Firm Size*
IR : *Integrated Reporting*
α : *Constant*
β : *Regression Coefficient*
e : *Error term*

RESULTS AND DISCUSSION

Descriptive statistics offer a concise and informative summary of the collected data, encompassing measures such as mean, median, variance, and standard deviation. These metrics aid in understanding and interpreting the data effectively (Gujarati & Porter, 2004). The results of the descriptive statistical analysis are presented as follows:

Table 2. Descriptive Statistics Test

	Y	EP	IC	PF	LV	FS
Mean	0.336	0.322	2.619	-0.073	1.841	28.268
Median	0.169	0.273	3.000	0.010	0.581	28.163
Maximum	6.808	1.818	4.000	4.693	117.384	31.773
Minimum	-3.363	0.045	1.000	-9.498	-27.693	22.879
Std. Dev.	1.495	0.197	1.199	0.879	9.337	1.763
Observations	252	252	252	252	252	252

Source: Research Data, 2024

Table 2 presents the summary statistics for the 252 observations included in this study. The Firm Value (FV) variable exhibits a mean of 0.336, a standard deviation of 1.495, a minimum value of -3.363, and a maximum value of 6.808. The Environmental Performance (EP) variable has a mean of 0.322 and a standard deviation of 0.197, with a range from a minimum value of 0.045 to a maximum of 1.818. The Intellectual Capital (IC) variable shows a mean of 2.619 and a standard deviation of 1.199, with values ranging from 1.000 to 4.000. The Profitability (PF) variable has an average of -0.073, a standard deviation of 0.879, a minimum value of -9.498, and a maximum value of 4.693. In contrast, the Leverage (LV) variable shows a mean of 1.841, a standard deviation of 9.337, a minimum value of -27.693, and a maximum value of 117.384. Finally, the Firm Size (FS) variable reports an average of 28.268, a standard deviation of 1.763, a minimum value of 22.879, and a maximum value of 31.773.

The panel data regression analysis includes three key model tests: the Chow Test, the Hausman Test, and the Lagrange Multiplier (LM) Test. If the Chow and Hausman Tests successfully identify the most suitable model among the Random Effect Model (REM), Common Effect Model (CEM), and Fixed Effect Model (FEM), the LM Test is not required. However, if the appropriate model remains undetermined, the LM Test is conducted to resolve the uncertainty (Gujarati & Porter, 2004; Napitupulu et al., 2021). Both FEM and CEM models rely

on the Ordinary Least Squares (OLS) method, which does not require normality testing under the OLS approach.

Table 3. Regression Model Selection

Method	Criteria	Test	Value	The Result
Chou Test	p-value < 0.05	Fixed Effect Vs Common Effect	0.00 < 0.05	FEM
Hausman Test	p-value < 0.05	Fixed Effect Vs Random Effect	0.00 < 0.05	FEM

Source: Resource Data, 2024

The findings of the Chow Test and Hausman Test, as presented in Table 3, confirm that the Fixed Effect Model (FEM) is the most appropriate model for this study. The Chow Test results indicate a significant difference in regression coefficients across groups, suggesting that unobserved fixed effects influence the dependent variable. This finding supports the preference for FEM, as it accounts for group-specific effects that are constant over time (Gujarati & Porter, 2004).

Similarly, the Hausman Test results further validate the selection of FEM, demonstrating a correlation between the fixed effects and the independent variables. This correlation indicates that the assumptions underlying the Random Effect Model (REM) are not satisfied, rendering REM unreliable for this dataset. By contrast, FEM effectively addresses this issue, as it controls for unobserved heterogeneity, reduces estimation bias, and provides a more precise interpretation of the relationships among the variables (Gujarati & Porter, 2004).

Table 4. Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-21.863	6.417	-3.407	0.001
EP	4.937	1.799	2.744	0.007
IC	-0.035	0.313	-0.112	0.911
PF	-0.401	0.216	-1.896	0.060
LV	0.013	0.013	0.957	0.340
FS	0.747	0.227	3.293	0.001
IR	2.022	1.630	1.240	0.217
EP_IR	-8.144	2.757	-2.954	0.004
IC_IR	-0.024	0.413	-0.057	0.955

Source: Resource Data, 2024

In Table 4, the regression analysis equation is as follows:

$$FV = -21.863 + 4.937*EP - 0.035*IC - 0.401*PF + 0.013*LV + 0.747*FS + 2.022*IR - 8.144*EP_IR - 0.024*IC_IR + [CX=F] \quad (7)$$

Multicollinearity is deemed absent when the correlation coefficient between independent variables is below 0.8 (Gujarati & Porter, 2004; Napitupulu et al., 2021). In this study, all independent variables exhibit correlation coefficients less than 0.8, confirming that the variables are free from multicollinearity and can be reliably included in the regression model.

Heteroscedasticity refers to the presence of non-constant error variance in a regression model, where the variance of residuals fluctuates across the values of the independent variables (Gujarati & Porter, 2004). To test for heteroscedasticity, this study employs a residual graph analysis (Napitupulu et al., 2021). The results indicate that residual values remain within the defined range (-500 to 500), signifying that the residual variance is stable. This stability provides evidence that

heteroscedasticity is not present in the model, ensuring the validity of the regression results.

Tabel 5. F Test

F-statistic	3.312
Prob(F-statistic)	0.000

Source: Research Data, 2024

Table 5 shows an F-statistic of 3.312 with a prob(F-statistic) of 0.000 < 0.05, which indicates that EP and IC simultaneously influence FV with PF, LV, and FS as control variables.

Tabel 6. Test Coefficient of Determination (R^2)

R-squared	0.653
Adjusted R-squared	0.456

Source: Resource Data, 2024

With an adjusted R-squared value of 0.4560 (45.60%), as shown in Table 6, the independent variables in this study explain 45.60% of the variation in the dependent variable. The remaining 54.40% is influenced by factors not included in the model.

Table 4 indicates that Environmental Performance (EP) positively affects Firm Value (FV), with a probability of 0.0007 (<0.05). This finding aligns with prior studies by Yadav et al. (2015), Prawirasasra (2015), Deswanto & Siregar (2018), dan Effendi (2021), which highlight the role of EP in enhancing FV. Companies that emphasize environmental responsibility not only demonstrate their commitment to sustainability but also signal a long-term business approach. Investors often value such companies more highly, perceiving them as resilient to future challenges and better equipped to manage environmental and social risks. By prioritizing environmental welfare alongside profit generation, these companies project a holistic value proposition that extends beyond financial gain.

This result supports stakeholder theory, which posits that companies prioritizing environmental sustainability strengthen their reputation among stakeholders (Septiani et al., 2019). EP enhances FV by building trust and credibility with investors who value sustainable business practices. These investors tend to assign higher valuations to companies implementing environmentally friendly policies. The resulting positive reputation and investor confidence directly impact market valuation, as environmentally responsible companies are seen as stable and well-prepared to face future uncertainties.

In contrast, Intellectual Capital (IC) does not significantly affect FV, as evidenced by a coefficient of -0.035160 and a probability of 0.9106 (>0.05). This lack of significance suggests that IC's contribution to financial performance is indirect and often takes time to manifest. While IC includes critical elements such as knowledge, skills, and innovation, its impact on FV is not immediately evident, particularly in the Consumer Cyclicals sector. This sector is highly influenced by dynamic market trends and consumer preferences, leading investors to prioritize factors that deliver immediate returns, such as EP or other external revenue drivers.

IC's long-term benefits, such as improved innovation and process efficiency, typically enhance profitability over time but are not always reflected in short-term financial statements. Agency theory provides additional insight, as it

highlights potential conflicts of interest between managers and shareholders. Managers may not always prioritize IC in ways that align with shareholders' short-term expectations, further diminishing its apparent influence on FV. Furthermore, IC's intangible nature and the lack of standardized reporting make it challenging for investors to assess its value, particularly in volatile sectors like Consumer Cyclicals. These findings are consistent with previous research by Subaida et al. (2018), Putra & Ratnadi (2021), and Saputra et al. (2023), which found no significant effect of IC on FV.

Integrated Reporting (IR) weakens the effect of EP on FV, with a probability of 0.0036 (<0.05) and a moderation coefficient of -8.1437. Contrary to expectations, IR does not amplify the positive influence of EP on FV but instead diminishes it. This outcome can be attributed to IR's inherent transparency, which not only highlights successes but also discloses environmental risks and operational challenges. While designed to enhance stakeholder understanding, this level of transparency may shift investor focus toward the risks associated with achieving sustainability goals, thereby dampening their perception of the company's stability and profitability. Instead of reinforcing the positive aspects of EP, IR may inadvertently reduce investor attractiveness by emphasizing associated costs and uncertainties.

This effect is particularly pronounced in the Consumer Cyclicals sector, where market sentiment and short-term profitability play a significant role. Investors oriented toward short-term returns may perceive the detailed environmental disclosures in IR, such as high mitigation costs or operational risks, as deterrents. These factors can overshadow the company's positive environmental performance, reducing its appeal to such investors.

The study also finds that IR does not moderate the relationship between IC and FV, with a probability of 0.9545 (>0.05). IC focuses primarily on long-term internal improvements, such as employee development, process optimization, and innovation, which are not immediately visible in financial statements or easily quantifiable within IR. Consequently, IR does not effectively communicate the contribution of IC to value creation, leading investors to undervalue its role in increasing FV.

In the Consumer Cyclicals sector, investors tend to prioritize elements that directly impact short-term profitability, such as EP or market-driven factors, over intangible and long-term assets like IC. While IR integrates financial and non-financial data, its broad focus on sustainability and external factors does not sufficiently demonstrate IC's impact on FV. Investors in this sector are more likely to value IC when its outcomes—such as increased profitability or enhanced competitiveness—are clearly observable and directly linked to financial performance.

CONCLUSION

This study examines the impact of Environmental Performance (EP) and Intellectual Capital (IC) on Firm Value (FV), with Integrated Reporting (IR) as a moderating variable. The results indicate that EP has a significant positive effect on FV, while IC does not significantly influence FV. Additionally, IR weakens the relationship between EP and FV and does not moderate the connection between

IC and FV. These findings underscore the critical role of environmental sustainability in enhancing firm value and highlight the need for more effective strategies to leverage intellectual capital for long-term value creation.

However, several limitations of this study should be acknowledged. Variations in the methods used to measure IC across different studies complicate direct comparisons with this research. External factors, such as changes in government policies, market dynamics, and global economic conditions, can also impact the findings and are beyond the researcher's control. Additionally, differences in corporate reporting standards may lead to inconsistent interpretations of the analyzed data. These limitations pose challenges in ensuring the consistency and generalizability of the results across various conditions and industry sectors.

To address these limitations and enhance the applicability of the findings, future research should consider expanding its scope to include a broader range of industry sectors or geographic regions. Such an approach would enable a more diverse analysis and provide deeper insights into sector-specific dynamics. Extending the data collection period would also help capture long-term trends, offering more robust and reliable conclusions about the evolution of firm value over time. Furthermore, incorporating control variables such as profitability, leverage, and firm size could improve the precision of the analysis by isolating the specific effects of the variables under investigation.

By addressing these suggestions, future studies can contribute more comprehensively to the academic discourse on firm value, providing valuable insights for both researchers and practitioners in the field. These efforts will not only deepen our understanding of the factors driving firm value but also inform more effective strategies for managing environmental performance and intellectual capital.

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