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Analysis of The Intellectual Capital, ESG Score, and Firm Performance: The Moderating Effect of Auditor Characteristics

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Abstract: This study examined the impact of intellectual capital (IC) through its three proxies (human capital, structural capital, and relational capital) and environmental, social, and governance (ESG) scores on firm performance in companies listed on the Indonesia Stock Exchange (IDX). Additionally, the research investigated the role of auditor characteristics (Big-N and non-Big-N auditors) in moderating the influence of intellectual capital and environmental, social, and governance on firm performance. A total of 146 data points were obtained from 73 business entity in the industry listed on the IDX from 2021 to 2022. Fixed effects regression analysis was employed to mitigate endogeneity issues. The sample was divided based on clients audited by Big-4 and non-Big-4 firms to test the moderating effect of auditor characteristics empirically. This study shows that intellectual capital (IC) proxied by human capital, structural capital and capital employe efficiency is not proven to significantly improve company performance. The environmental, social, and governance (ESG) score was found to have no significant effect on firm performance, and auditor characteristics did not mediate the relationship between IC, ESG scores, and firm performance.

Keywords: Intellectual Capital; ESG Score; Auditor Characteristics.

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A. INTRODUCTION

In later a long time, intellectual capital (IC) has risen as a unmistakable investigate point in back and bookkeeping. In developing economies, IC is considered a overwhelming asset basic to creating firm execution [1]–[7] and controlling competitive advantage [8], [9]. Thus, organizations must contribute in intellectual capital and utilize it productively to improve company performance. The Resource-Based View (RBV) theory is a strategic management framework that emphasizes the role of a firm's internal resources in achieving and sustaining competitive advantage. According to RBV, rather than focusing solely on external market conditions, a company's success depends on its ability to leverage unique resources that are valuable, rare, inimitable, and organized. RBV hypothesis concentrates on physical and intangible resources that are unfaltering, extraordinary, and heterogeneous inside the firm, Nadeem et al. [11]. Earlier writing pointed out that administration and change of information assets decide the victory of any organization [12]–[14]. Within the setting of RBV, intellectual capital is one of the assets that meets the characteristics of VRIN (important, uncommon, supreme, and non-substitutable), so it plays a pivotal part in making and keeping up the company's vital advantage.

Intellectual capital (IC) represents an ideal example of the above resources. Competitors

do not easily duplicate intangible assets such as knowledge, innovation, and business networks [15]. Therefore, these assets can be crucial for a company to gain a competitive edge. The specialized expertise and knowledge possessed by a company's employees are often unique and challenging to find in other companies. Effective talent management can help companies create product and service innovations that differentiate them from competitors and improve operational efficiency. Internally developed knowledge infrastructures and systems, including a solid and innovative organizational culture, can be significant barriers to competitors attempting to replicate the same strategies or processes. This makes structural capital a crucial component of a company's competitive advantage. On the other hand, strong relationships with customers, suppliers, and business partners yield benefits in the form of loyalty and reputation and provide strategic information and opportunities that are difficult for other companies to replace.

Intellectual capital plays a significant part as a basic key asset that drives the supportability and development of companies [16]. In Indonesia, where the advertise is getting to be progressively competitive with quick innovative appropriation and rising request for advancement, companies that effectively oversee their intellectual capital will pick up a critical advantage. The part of intellectual capital inside companies is getting to be indeed more basic within the period of the knowledge-based economy. Companies with significant intellectual capital, especially human and basic capital, are way better prepared to drive advancement [17], [18]. Companies can persistently make modern and made strides items, administrations, and forms with competent human assets and vigorous bolster frameworks. For occurrence, innovation companies such as PT Telekomunikasi Indonesia (Telkom) have effectively utilized intellectual capital to create inventive advanced administrations, which, in turn, reinforces their showcase position.

Intellectual capital is considered an intangible asset that makes a difference a firm deliver financial incomes and build competitive focal points together with unmistakable resources [19]–[23]. Within the present day information age, physical and money related resources are slowly supplanted with intangible resources in a trade work [23]. Intellectual capital combines a set of intangible resources, and through its legitimate utilization, firms can get a competitive advantage and budgetary execution [7], [20], [24]–[26]. Maaloul and Zeghal [27] detailed that Intellectual capital venture has expanded and come to a tall level within the dynamic world.

The concept of esteem creation and its affect on monetary execution and company efficiency related to the mobilization of intellectual has earned critical consideration. Numerous studies have been conducted to explore this phenomenon. However, empirical research on the relationship between intellectual capital and corporate financial performance still reveals gaps and inconsistent findings, necessitating further investigation. In Indonesia's economy, which is continuously encouraged to progress through economic transformation, further investment in intangible resources, particularly IC in the industrial sector, is required. This raises several research questions: Does IC enhance firm performance in Indonesia? Is IC linked to firm performance in Indonesia's industrial sector? These issues are addressed in this study to fill the research gap.

This consider investigate the affect of intellectual capital (IC) and its three components

(human capital, structural capital, and relational capital) on firm performance inside the Indonesian industry. Moreover, it explored reviewer characteristics, particularly Big-N and non-Big-N evaluators, in a directing part to evaluate the relationship between intellectual capital and firm performance. Understanding whether reviewer characteristics affected the flow of intellectual capital and firm execution was pivotal, as inspectors served as basic on-screen characters in corporate administration, acting as middle people who given inspecting and affirmation administrations to outside financial specialists and other partners with restricted information of company administration [28]. Chase & Lulseged [29] contended that Big-N and non-Big-N have inalienable contrasts. For illustration, Big-N evaluators got to ensure their notoriety [30] and have way better preparing and advances to distinguish monetary articulation inconsistencies than non-Big-N inspectors, who are impossible to have successful firm-level quality control frameworks [31].

Following Soewarno & Tjahjadi [32], Dalwai & Salehi [33], and Chowdhury et al. [34], the value-added intellectual coefficient (VAIC) model is applied to measure IC efficiency while firm performance measured by return on assets (ROA), return on equity (ROE), and asset turnover (ATO). Following Xu & Liu [25] and Liu et al. [35] used the ML random effect and modified VAIC (MVAIC) models to test the robustness of the results. The findings indicated that in the Indonesian industry, IC is significantly and positively correlated with company (financial) performance (such as profitability and productivity), in which physical and financial assets (capital employed) play significant roles. Then, related to the use of ESG score as an independent variable in predicting company performance, it needs to be done. ESG score was a estimation apparatus for creating data revelation on the affect of natural, social, and administration hones executed by companies [40]. Previous research by Annisawanti et al (67) stated that partially Environmental performance and social performance do not affect financial performance, while governance performance affects financial performance. The results of this study are not consistent with other studies, so it is worth conducting further testing. Currently, there is no previous research examining reviewer characteristics (both Big-N and non-Big-N inspectors) as a guiding element in analyzing the relationship between intellectual capital, ESG performance, and firm performance. Therefore, research linking the relationship between intellectual capital, ESG performance and company performance is worth conducting.

Particularly in an period where innovation is progressively modern, advancements that must be prioritized are not machines but human assets that continue to improve within the future [41]. One of the markers of intangible resources is intellectual capital (IC), an resource that incorporates encounter, human assets, information, and frameworks that can increment firm execution and employee productivity within the company [42]. Intellectual capital contains a vitally or basic part in making strides execution since of the mindfulness that mental property is the premise for an organization or company to ended up predominant and can create to gotten to be more competitive [43]. In any case, the consider of intellectual capital in Indonesia is still moderately modern within the trade world, and intellectual capital hones are not however far reaching in Indonesia [44], [45].

We propose the below hypotheses based on the theoretical foundations of the constructs and the conceptual model: H1: Human capital (HC) has a positive effect on firm performance; H2: Structural capital (SC) has a positive effect on firm performance; H3: Capital employee efficiency has a positive effect on firm performance; H4: ESG score has a positive effect on firm performance; H5: Auditor characteristics mediate between intellectual capital (HC) and firm performance; and H6: Auditor characteristics mediate between ESG score and firm performance.

B. METHOD

This study employed a quantitative approach by testing and analyzing the hypothesis using the collected data. The data used in this study were secondary data sourced from financial reports and annual reports of companies listed on the Indonesia Stock Exchange (IDX). The Population for this study consisted of companies listed on the IDX, and the samples selected met the criteria determined by the researcher through purposive sampling. First, only companies listed on the IDX in 2021-2022 that had published financial reports were included. Second, the companies had ESG scores provided by ESG Data from Bloomberg Professional Services. 146 samples were identified, which is calculated as 73 companies multiplied by 2. The study covered nine industrial sectors: agriculture, mining, primary chemical industry, miscellaneous industries, consumer goods industry, property and real estate building construction, infrastructure and utility transportation, financial and trade services, and investment, as shown in Table 1.

Table 1. Sample Criteria

No	Description	Amount
1	Companies listed on the Indonesia Stock Exchange (IDX) in 2021-2022	825
2	Companies that do not issue annual reports in 2021-2022	(236)
3	Companies that do not have data related to research, namely ESG Reporting in 2021-2022	(516)
5	Companies that meet the research sample criteria	73
6	Total samples used for research for 2 periods (73 x 2)	146

Dependent variables following Chowdhury et al. [34] measured firm performance in two aspects: profitability (ROA and ROE) and productivity (ATO). ROA is the earnings before interest and tax ratio divided by the total assets [46]–[51]. ROE is the net income ratio divided by the equity book value [52], [53]. ATO is measured as the ratio of total revenue divided by average total assets [47], [54]. Pandya & Rao [55] suggested that management researchers prefer to use various accounting measures (ROA and ROE) to measure firm performance. They argued that using ROA and ROE can help management evaluate managerial performance. For example, how well is a firm's management using the assets to generate accounting returns per dollar of investment, assets, or sales? This argument is proved by Bram Handkar et al. [56]. They found that the first (ROA) is the most universally reported figure, revealing fewer gaps in the data set. Chowdhury et al. [34] introduced a third financial ratio comprising the firm performance. Average Turnover (ATO) provides insight into the financial performance in revenue terms as it divides total revenue by the total

book value of the firm.

In this study, the independent variable, intellectual capital, was measured through Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE) (Soewarno & Tjahjadi., 2020). HCE assessed how efficiently human capital was utilized to generate added value for the company. Human capital encompasses the skills, knowledge, and competencies of employees. This efficiency indicates that employees contribute not only their labor and time but also significantly to the value-creation process. SCE evaluated the efficiency of the company's structural capital in creating added value. Structural capital includes systems, business processes, organizational culture, technology, and infrastructure that support employees in working more productively. In other words, SCE reflects how non-human elements (intangible assets other than humans) contribute to value creation. CEE measured how efficiently the capital employed, in the form of physical and financial assets, was used to generate added value. Capital employed included fixed assets such as plants, equipment, and other financial investments. CEE illustrated the company's ability to maximize the use of its tangible assets to generate revenue. These three components (HCE, SCE, and CEE) provided a comprehensive view of how the company utilized its intellectual and physical capital to create value (Soewarno & Tjahjadi., 2020)

Additionally, the following independent variable of environmental, social, and governance (ESG) was proxied by the ESG score. A high ESG score in this study represented a company with significant ESG risks. The ESG scores were categorized as follows: 0-10 (negligible), 10-20 (low), 20-30 (medium), 30-40 (high), and greater than 40 (severe) [57]. This information can be obtained through Bloomberg Professional Services, annual reports, sustainability reports, financial statements, company websites, external data providers, and other resources. In this study, the method of determining and calculating the proxies for the above variables was presented through the variable measurement Table 2.

Table 2. Variable Measurement

Variables	**Measurement**	**References**
Dependent Variables		
ROA	Net income ÷ Average total assets	Chowdhury et al. [34]
ROE	Net income ÷ Average total equity	Chowdhury et al. [34]
ATO	Total revenue ÷ Average total assets	Chowdhury et al. [34]
Independent Variables		
VAIC	HCE + SCE + CEE	Soewarno & Tjahjadi [32]
HCE	VA ÷ HC	Soewarno & Tjahjadi [32]
SCE	SC ÷ VA	Soewarno & Tjahjadi [32]
CEE	VA ÷ CE	Soewarno & Tjahjadi [32]
ESG Score	ESG Data Bloomberg Professional Services	Setiani [58]
Moderator Variable		
AC	Indicator variable that equals 1 for a Big 4 auditor; otherwise, 0	Rahman & Zheng [59]

The regression model following Annisawanti et al [35], Dalwai & Salehi [36], and Chowdhury et al. [37] determined the relationships between the VAIC components and ESG Score to the three financial indexes using three linear regression models and then proceeds to

test the moderation effect of companies that have been audited through Big N and Non-Big N.

C. RESULTS AND DISCUSSION

1. Results

The following are the results of empirical tests carried out in this study, which examined the determination of intellectual and ESG models on firm performance with the characteristics of auditors as moderators, as shown in Table 3.

Table 3. Reports the descriptive statistics of the HCE, SCE, CEE, ESG score, ROA, ROE, and ATO.

Variable	N	Minimum	Maximum	Mean	Std. Deviation
HCE	146	-4.62	46.74	2.5235	4.68396
SCE	146	-3.29	1.66	.4398	.42713
CEE	146	-.13	.24	.0336	.02893
ESG Score	146	25.06	73.87	42.6473	10.66858
ROA	146	-.09	.12	.0303	.03578
ROE	146	-.15	.65	.0705	.09143
ATO	146	.00	.88	.0571	.10673
Valid N (listwise)	146				

Based on the descriptive statistical test results, the average HCE and SCE values of 2.5235 and 0.4398 indicate that, in general, human capital (workforce) and structural capital (such as business processes, systems, and infrastructure) in the companies within the sample are being used efficiently enough to generate added value. On the other hand, the low average CEE value of 0.0336 suggests that the efficiency of physical and financial capital utilization in creating added value is relatively small in this sample of companies. Meanwhile, the average ESG Score of 42.6473 indicates that, overall, firm performance related to environmental, social, and governance (ESG) issues is at a medium level. However, the relatively large standard deviation (10.66858) indicates significant variation in ESG scores across the companies in the sample. Additionally, the average values of financial performance (ROA, ROE, and ATO) show a reasonably varied return on assets and equity (ROA and ROE) of 3 percent and 7 percent, respectively, as well as a relatively low asset turnover (ATO) of 5.7 percent, as shown in Table 4.

Table 4. Fixed Effect Model Regression Results

Variables	Model 1 ROA	Model 2 ROE	Model 3 ATO
Constant	0.025	0.128	,116
HCE	0.001**	0.002**	-,001**
SCE	0.004**	0.000**	,024**
CEE	-0.176**	-0.367**	-,036**
ESG Score	0.000**	-0.001**	-,002**
R-squared	0.023	0.028	0.032
F-test	0.813	1.018	1.148
Prob > F	0.519	0.400	0.336

Notes : ** Not Significant, *Significant

Based on the results of the fixed effect model regression test, intellectual capital (IC) proxied by Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) do not have a significant effect on financial performance. The ESG value factor also does not have a significant effect on financial performance. The table above also shows that the R^2 value of all models tested for the three financial performance proxies (ROA, ROE, and ATO) is relatively low, at 0.023, 0.028, and 0.032. This indicates that the independent ability variables in explaining the performance phenomenon in each model are low. Statistically, an R Square value of this size is actually not good enough in a study, even in some literature it is necessary to test the theory of thinking and the logical relationship of a hypothesis.

Table 5. Moderating Effect of Auditors Characteristics Big N Clients Only

Variables	Model 1 ROA	Model 2 ROE	Model 3 ATO
Constant	0.065	0.065	0.032
HCE	1.066**	0.000**	0.000**
SCE	-0.074**	-0.020**	0.000**
CEE	-0.250**	-0.475**	-0.213**
ESG Score	-0.043**	-0.001**	0.001**
Big4	-0.056**	-0.071**	-0.531**
HCE*Big4	-1.301**	0.490**	-2.548**
SCE*Big4	0.143**	0.141**	0.225**
CEE*Big4	-0.027**	0.161**	-0.206**
ESG Score*Big4	-0.143**	0.145**	0.141**
R-squared	0.154	0.173	0.006
F-test	1.589	0.235	0.096
Prob > F	0.188	0.918	0.983

Notes : ** Not Significant, *Significant

Table 5 presents the regression test for BigN auditors related to the moderating effect of auditor characteristics. The main variables of interest, HCE*Big4, SCE*Big4, CEE*Big4, and ESG Score*Big,4 show negative and positive coefficient figures but do not have a significant effect on company performance.

Table 6. Moderating Effect of Auditors Characteristics Non-Big N Clients Only

Variables	Model 1 ROA	Model 2 ROE	Model 3 ATO
Constant	0.128	0.146	0,065
HCE	0.127**	0.302**	0.175**
SCE	-0.072**	-0.072**	0.096**
CEE	-0.221**	-0.188**	-0.021**
ESG Score	0.033**	-0.077**	-0.193**
Non-Big4	-0.019**	-0.159**	-0.093**
HCE*Non-Big4	0.071**	-0.118**	0.186**
SCE*Non-Big4	0.283**	0.266**	-0.223**
CEE*Non-Big4	-0.078**	0.175**	0.114**
ESG Score*Non-Big4	0.118**	-0.190**	0.135**
R-squared	0.092	0.018	0.114
F-test	0.033	0.030	0.247
Prob > F	0.215	0.476	0.302

Notes : ** Not Significant, *Significant

Table 6 presents the regressions test for non-BigN auditors. The main variables of interest, HCE*non-Big4, SCE*non-Big4, CEE*non-Big4, and ESG Score*non-Big,4 do not significantly impact firm performance.

2. Discussions

a. Human capital (HC) and firm performance (FP)

Conceptually, human capital is the combination of employees' knowledge [67], skills [68], attitudes [69], competencies [70], innovativeness [24], commitment [34], wisdom [26], and experiences that cannot be easily imitated and applied by other firms. Soewarjono and Tjahjadi [67] proves that structural capital in the form of innovation, which is part of intangible assets, can generate higher profitability as stated by the theory of organization and innovation. Abidin [68] States that companies in Indonesia will be able to compete if they use competitive advantages that are obtained through creative innovations generated by the company's intellectual capital. This will encourage the creation of products that are increasingly favorable in the eyes of consumers. So human capital is crucial to producing new products, improving functioning and managerial efficiency, and increasing productivity and quality.

According to the result of this study, human capital (HC) did not have a positive association with firm performance, so H1 was rejected. These results did not support H1 in this study but were similar to previous findings [34]. Thus, in the Indonesian industry, the use of human capital to gain benefits may not be paid much attention, and companies in this industry need to improve the utilization and promotion of human resources, especially their knowledge and skills [60], to significantly improve the firm performance. In some cases, investments in human capital do not always translate into better performance, as the skills possessed by employees may not align with the demands of a dynamic industry. For instance, a company may invest heavily in training, but if the skills taught are outdated or do not match technological developments, their impact on productivity and performance could be minimal. In some traditional sectors in Indonesia, such as manufacturing or agriculture, the added value generated from human capital may be limited by the available infrastructure and technology. This means that even if a company has skilled employees if the physical infrastructure or technology is not supportive, the positive impact of human capital on company performance may be constrained.

b. Structural capital (SC) and firm performance (FP)

Saryanti [73] structural capital (SC) is a supporting infrastructure for human capital (HC) as a means and infrastructure to support employee performance owned by a company in meeting market needs, namely technology systems, company operational systems, patents, trademarks, and training courses, so that employee capabilities can produce intellectual capital. Structural capital exemplifies unique approaches to performing tasks and activities, which are highly difficult for competitors to imitate [75]. Firms can improve their work procedures by investing in structural capital, thus increasing their production and service quality, facilitating communication, and

efficiently and effectively solving problems [76]. Along with the development of science and technology, business processes have also developed from labor-based businesses to knowledge-based businesses, so that the main characteristics of a company become knowledge-based companies [74]. Therefore, employee and firm ability to do the right thing at the right time and the right way gradually improves, and in turn, helps a firm attain success through lower cost and higher quality [76]. Additionally, in value creation, structural capital provides guidelines for avoiding unnecessary efforts, which helps a firm attain desired employee productivity and revenue growth [77].

According to the result of this study, Structural Capital (SC) did not have a positive association with firm performance, so H2 has been rejected. Thus, the results did not support H2 but were also similar to previous findings [20], [32], [72]. The possible reason is that the Indonesian industry may not pay much attention to structural capital or recognize its benefits to firm performance. As such, the industry does not pay sufficient investment or utilization of structural capital. Some companies in Indonesia still face challenges in adopting new technologies and digitalization, such as department stores and shoe distributors that have closed in recent times. Substantial structural capital, such as information technology and modern management systems, requires significant investment and the ability to adapt, which may be difficult for companies in smaller markets or less digitally advanced industries. The researcher argued that the data testing conducted was the period 2021-2022, which at that time was the period after the Covid-19 pandemic, where the company's performance was experiencing fluctuations and uncertainty. Maybe this could affect the results of this study.

c. Capital employed efficiency (CEE) and firm performance (FP)

The result of this study, capital employed efficiency (CEE) did not have a positive association with firm performance, so H3 has been rejected. The results did not support H3 and were not consistent with findings in banking firms in Indonesia [32]. This study suggests that managers need to verify the roles of intellectual capital in their companies, including its measurements. In the era of knowledge-based economy, managers need to deeply understand the critical role of intellectual capital on financial performance enhancement. As a component of Pulic's [79] VAIC model, capital employed efficiency (CEE) refers to all necessary funds and physical capital. Several prior studies found a positive relationship between CEE and firms' profitability and productivity [6], [80]–[82]. Similarly, Xu & Wang [5] found a positive relationship between CEE and firms' profitability and productivity in agricultural enterprises. Using commercial banks as the sample, Oppong Pattanayak [23] found CEE positively and significantly related to ATO and employee productivity (EP). The researcher argued that the data testing conducted was the period 2021-2022, which at that time was the period after the Covid-19 pandemic, where the company's performance was experiencing fluctuations and uncertainty. Maybe this could affect the results of this study.

d. ESG score and firm performance

The fourth hypothesis states that ESG scoring is positive and not significantly related to firm performance. The statistical test results indicate that H4 has been rejected at a significance level of 5%. The results of this study were not in line with research conducted by Duque-Grisales & Aguilera-Caracuel [83], which examined whether ESG disclosure is associated with firm performance in Latin American business. The results suggest that the relationship between ESG disclosure and firm performance is statistically negative. Research from Saygili, Arslan, and Birkan [84] also showed that environmental disclosure hurts corporate financial performance, but governance disclosure substantially affects corporate financial performance. Information related to ESG is expected to encourage investors to make ESG-based investments. Investors pay attention to financial aspects and environmental, social, and governance factors as non-financial factors when making investment decisions.

Environmental, social, and governance (ESG) is expected to have a positive impact on company performance. However, in Indonesia, several factors, such as the lack of integration of ESG into business strategy, high implementation costs, loose measurement standards, and low market sensitivity to ESG, may result in ESG scores not being directly correlated with financial performance. Companies may use insufficiently stringent indicators to measure environmental, social, and governance (ESG), and due to the absence of a strict assessment system across sectors, they can obtain higher scores without making significant operational changes. This weakens or biases the relationship between ESG scores and company performance. On the other hand, companies may focus on ESG aspects that are less directly related to short-term profitability. For example, companies focusing on philanthropic or socially-oriented corporate social responsibility (CSR) activities may not see immediate productivity or cost reduction benefits. Companies that genuinely integrate environmental aspects (such as energy efficiency) or strong governance (such as financial transparency) may be more likely to improve their performance directly. researchers argue that in a number of sectors like manufacturing or energy, environmentally friendly initiatives can incur substantial costs without yielding immediate benefits to profitability, so that it does not impact financial performance, it can even reduce financial performance in the short term.

e. The moderating effect of auditor characteristics

According to the result of this study, auditor characteristics had no moderator between intellectual capital (HC) on firm performance, so H5 has been rejected, and auditor characteristics have no moderator between ESG score on firm performance, so H6 has been rejected. Concurring to Watts & Zimmerman [87], examining could be a way to decrease organization struggle and upgrade the validity of the data unveiled. Azizkhani et al. [88] contended that compared to non-Big-4 review firms, Huge N review firms give higher quality reviews, and value markets esteem this. DeFond Zhang [89] proposed that companies with tall office costs will request higher review quality from a high-quality examining company. Hakim & Omri [90] found

that compared to non-Big-N auditors, Big-N auditors have more assets to supply a better quality of reviewing and confirmation benefit. Barako et al. [91] contended that Big-N inspectors are more free, which empowered them to impact corporate budgetary reports to fulfill the outside clients "needs for reports since their esteem as inspectors, in portion, depends on how clients of yearly reports see the auditors" report. Therefore, it is argued that external auditing (Big-4 vs. non-Big-4) is crucial in monitoring by motivating client firms to acquire more IC. Big-4 auditors have a significant influence in ensuring that financial and non-financial reports (such as sustainability reports) reflect the quality of a company's intellectual capital. The researcher argued that the data testing conducted was the period 2021-2022, which at that time was the period after the Covid-19 pandemic, where the company's performance was experiencing fluctuations and uncertainty. Maybe this could affect the results of this study.

D. CONCLUSIONS

This study examined the relationships between intellectual capital (IC) and ESG scores on firm performance in the Indonesia Stock Exchange (IDX) industry. Additionally, it investigated auditor characteristics as a moderating factor in the relationship between intellectual capital, score of environmental, social, and governance and firm performance. The components of intellectual capital (IC), including Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE), ESG score measured from Data Bloomberg Professional Services which shows performance and risk levels in managing environmental, social and governance issues, while financial indexes such as Return on Assets (ROA), Return on Equity (ROE), and Asset Turnover (ATO) represented firm performance. Three fixed-effects regression models were applied to the data from the financial statements of 146 companies in the IDX industry from 2021 to 2022. The results indicated that the intellectual capital components did not positively and significantly impact the financial indexes (ROA, ROE, and ATO), and the ESG score also did not show a positive and significant effect on these financial measures. This study also found that auditor characteristics did not mediate the relationship between intellectual capital (IC) and ESG scores on firm performance.

As discussed, human capital was a critical component of intellectual capital, and employees could leverage structural capital to generate benefits for their companies. Thus, companies in the IDX industry should have emphasized these two components in the future to improve their performance. Conversely, ESG appeared to lack implications for financial performance based on the significance thresholds from the empirical test results. Some companies in Indonesia may have implemented ESG aspects merely as regulatory compliance rather than integrating them into their core business strategies. Implementing ESG initiatives that were merely "cosmetic" or symbolic—intended to enhance the company's image without making substantial operational changes—resulted in a relatively high ESG score that did not positively affect firm performance. Therefore, companies listed on the IDX needed to consider the meaningful implementation of ESG principles.

Several limitations were noted in this study. First, similar to domestic and international research, the sample size was limited, potentially affecting the results based on the nature and characteristics of the Indonesian industry, geographical location, and the selected period. Second, this study had regional limitations, focusing primarily on Indonesia without extending the concept to other countries. Third, only a few variables, such as Return on Assets (ROA), Return on Equity (ROE), and Asset Turnover (ATO) were examined to represent firm performance, alongside the components human capital, structural capital, and relational capital to measure intellectual capital (IC), and using ESG values in their entirety without breaking them down into environmental, social and governance value components. Fourth, the study relied mainly on financial statement data, which imposed certain limitations on the future application and development of IC and enterprise performance improvements. Fifth, there was a need to develop a new model, as the empirical test results from the model proposed in this study were still limited. Future research should aim to expand the sample size by selecting relevant companies to identify more accurate and representative relationships between intellectual capital and corporate performance in the Indonesian industry. Other industries and firms in different countries or regions could also be examined. Additional variables, such as Net Profit Margin (NPM) and Earnings Per Share (EPS), may further represent corporate performance. Finally, examining research trends or making comparisons could be a viable method to understand better the future implications and development of intellectual capital, implementation of ESG principles and their impact on company performance.

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