Examining the Impact of Intellectual Capital on Corporate Financial Performance: An Empirical Study of LQ-45 Index Listed Companies (2018-2019)

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Abstract

The objective of this study is to evaluate the influence of intellectual capital on the financial performance of corporations. The analysis will specifically concentrate on a sample of 45 businesses that are listed in the LQ-45 index during the years 2018 and 2019. The study utilises the SPSS analysis technique to examine the correlation between intellectual capital and financial results. The findings indicate a positive association, suggesting that intellectual capital plays a substantial role in improving a company's financial performance.

Intellectual capital, which encompasses intangible assets such as knowledge, expertise, and innovative capabilities, plays a crucial role in determining a company's financial performance. This study employs SPSS analysis to clarify the degree to which investments in intellectual capital result in measurable financial benefits. The research examines data from LQ-45 listed firms for a duration of two years, providing insights into the intricate relationship between intellectual capital and profitability measures.

The presence of a positive effect emphasises the crucial significance of fostering and utilising intellectual capital within organisations. In order to maintain financial viability and promote long-term growth, firms must acknowledge and optimise the worth of intangible assets as they navigate more competitive environments. This study enhances the academic comprehension of the importance of intellectual capital and provides practical guidance for managers to make decisions that maximise financial performance in modern markets.

Keywords: Intellectual Capital, financial performance, SPSS

Introduction

In the current highly competitive business world, businesses are consistently seeking to enhance their resources in order to maximise their earnings. This is done throughout the entire corporate environment. Throughout history, tangible assets have been regarded as being of greater significance (Galbreath, 2005; Hall, 1989; Moberly, 2014a, 2014b). On the other hand, as a result of the development of technology, there has been a discernible shift towards intellectual capital as the primary foundation upon which the prosperity of businesses is created. This intellectual capital is mostly comprised of the personnel of a firm, who possess the invaluable components of cognitive capacity and expertise. These components are the core of this intellectual riches. Numerous occupations have been automated as a result of technological advancements, which highlights the necessity for human resources to continually upgrade their abilities in order to maintain their competitive edge (Hsu & Sabherwal, 2012; Inkinen, 2015; Martín-de-Castro et al., 2011).

A paradigm shift that particularly investigates the cognitive assets and knowledge reservoirs that are present within organisations has been the driving force behind the expansion of intellectual capital analysis (Choo & Salleh, 2010; Guthrie, 2001; Petty & Guthrie, 2000). When it comes to capturing the basic character of a company's accomplishments, traditional metrics to evaluate success, such as assets and earnings, are becoming increasingly inadequate. These indicators were previously used to evaluate performance. For this reason, adding an examination of intellectual capital is necessary in order to conduct a comprehensive review that truly reflects the level of intellectual capacity and knowledge.

Especially with the introduction of PSAK number 19 (updated in 2000), which particularly handles intangible assets, there has been a growing interest in the study of intellectual capital in Indonesia. This interest has been fueled by the fact that the PSAK number 19 was amended in 2000 (Mulyadi et al., 2017; Soetanto & Liem, 2019). Through the establishment of this legislative structure, an early awareness of the significance of intellectual capital was achieved. Nevertheless, the challenge is in effectively quantifying intangible assets rather than tangible ones (Brennan & Connell, 2000; Sihotang & Sanjaya, 2014). Despite the fact that there is a growing recognition of the significant part that intellectual capital plays in the process of producing value and gaining a competitive advantage, there is currently no framework that is universally acknowledged for quantifying it.

With this background in mind, the purpose of this research is to investigate the impact that intellectual capital has on the financial performance of firms that are listed on the Indonesia Stock Exchange in the LQ-45 Index category (Nafiroh & Nahumury, 2016; Shalahuddin et al., 2020). This is done with the intention of addressing the considerable gap that has been identified. Through the application of the Pulic Model (VAICTM), the purpose of this investigation is to evaluate the influence that intellectual capital has on return on assets (ROA). According to Tan et al. (2007), the use of ROA as a performance indicator is in compliance with the norms that are generally accepted in the field of information research. The purpose of this empirical investigation is to shed light on the complex relationship that exists between intellectual capital and financial performance, with the end goal of strengthening one's understanding of the dynamics of corporations in the contemporary business environment.

Research methods

The research strategy that was utilized in this investigation was a quantitative approach, which was chosen since it was suitable for the kind of data that was being investigated. It is important to note that the population of interest consists of all 45 companies that were publicly traded and listed on the LQ-45 Index throughout the years 2018 and 2019. For the purpose of this investigation, secondary data functions as the major source of information. This data is derived from the financial reports of the aforementioned companies throughout the specified time period (Babor et al., 2019; Zumitzavan & Michie, 2015). The documentation approach made it easier to acquire secondary data from the internet, more specifically from the official website of the Indonesian Stock Exchange (www.idx.go.id of the Indonesian government). The majority of the quantitative data that was acquired from this source was collected from the financial reports that were released by the companies that were listed. These reports provided in-depth insights into the operational and financial performance of the organisations (Abeysekera & Guthrie, 2005; Harmoko Arifin et al., 2019; Nimtrakoon, 2015).

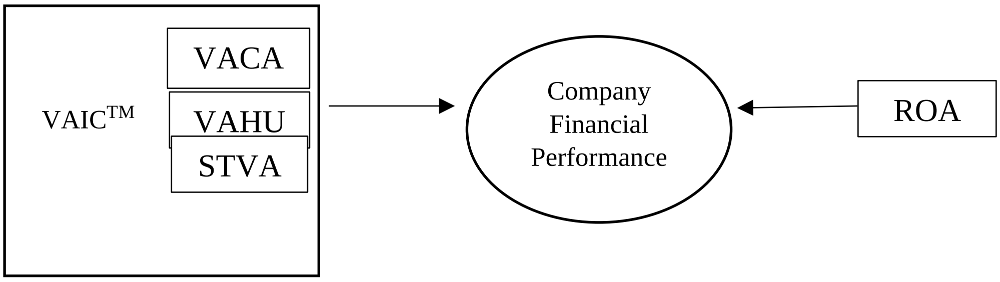
Intellectual capital is the independent variable that is being investigated, and it is being examined through the lens of value added created by physical capital (VACA), human capital (VAHU), and structural capital (STVA). Pulic (1998) is the person responsible for the development of this composite measure, which is referred to as VAICTM. It is the foundation for evaluating intellectual capital. On the other hand, the dependent variable in this study is the financial performance of the companies, which is represented by return on assets (ROA), which is a statistic that is widely accepted for evaluating profitability and efficiency (Iazzolino & Laise, 2013; Ståhle et al., 2011).

With regard to the analytical framework, there are two basic technologies. In the first place, descriptive statistical testing is utilised in order to effectively organise, present, and categorise the data that has been acquired. In order to provide a full overview of the dataset, which is crucial for further studies, this approach is utilised. In the second step of the process, the standard assumption testing is carried out in order to guarantee the validity and dependability of the regression model (Nazari & Herremans, 2007; Xu & Liu, 2020). This approach involves a variety of diagnostic tests, including normality testing, multicollinearity testing, autocorrelation testing, and heteroscedasticity testing. In the regression model, normality testing is used to evaluate the distribution of the data, whereas multicollinearity testing is used to investigate the possibility of correlations between the variables that are independent. The purpose of autocorrelation testing is to determine whether or not there is a connection between error terms in successive periods, whereas the objective of heteroscedasticity testing is to identify differences in the variance of residuals across observations. Individually and together, these stringent criteria help to the establishment of a robust analytical framework, which in turn lays the platform for the interpretation and analysis of the study findings in a meaningful manner (Engle & Manganelli, 2004; Greasley & Oxley, 2010).

Then, multiple regression analysis was carried out with the following equation:

$Y=a+ \beta 1X1+ \beta 2\ X2+\beta 3\ X3+e$

Based on existing theories and previous research, a framework can be created as seen in Figure 1 below.



Results and Discussion

This research focuses on companies listed and publicly traded in the LQ-45 Index during the 2018-2019 period. A total of 45 companies meeting the specified criteria are selected as the sample for this study. To provide insights into the independent variable VAICTM and its constituent components—VACA, VAHU, and STVA—descriptive statistics for the 2018-2019 period are presented in Table 1 below. This analysis aims to offer a comprehensive understanding of the variation and distribution of these variables within the selected timeframe, thereby laying the groundwork for further investigation into their relationships and impacts on company performance and competitiveness.

Table 1. Description of Research Variable

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
VACA	90	-4.1080	.9640	.623289	.5969993
VAHU	90	-5.603	4.840	2.09126	1.290940
STVA	90	.569	81.086	16.00226	11.967446
ROA	90	-.0570	.4460	.083176	.0781836
Valid N (listwise)	90				

Source: Processed Data 2021

Table 1 above shows that the number of observations in the sample (n) is 90, namely 45 companies for the 2018-2019 period. From 90 observations, the average (mean) value of VACA, VAHU, and STVA was respectively 0.623; 2,091; 16.002 with a standard deviation of 0.596; 1,290; 11,967.

The table illustrates that of the three VAICTM components, STVA has the highest value compared to the other two components. This shows that STVA makes the greatest contribution to the creation of company value added where STVA is indicated to come from company capital. In this research, STVA shows a value of 16,002, which means that every Rp. 1 of capital owned can create added value of 16,002 times. For VACA, a value of 0.623 indicates that the assets owned are capable of providing added value of 0.623 times the value of the assets. VAHU shows a value of 2.091, which means that every Rp. 1 salary payment can create added value of 2.091 times.

Table 2. Normality Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		90
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.07653791
Most Extreme Differences	Absolute	.153
	Positive	.153
	Negative	-.122
Kolmogorov-Smirnov Z		1.447
Asymp. Sig. (2-tailed)		.080

a. Test distribution is Normal.

b. Calculated from data.

Source: Processed Data, 2021

According to the findings presented in Table 2, the statistical significance value (Sig.) associated with the regression model is recorded as 0.80. This result suggests that the data within the regression model adhere to the assumption of data normality. In statistical analysis, a Sig. value of 0.80 indicates that there is a high probability that the data is normally distributed, thereby meeting one of the fundamental assumptions required for robust regression analysis. This finding is pivotal as it underscores the reliability of the data utilized in the regression model, affirming the suitability of employing regression techniques to analyze the relationships between variables under investigation. Consequently, these results provide a solid foundation for subsequent interpretations and conclusions drawn from the regression analysis, enhancing the overall validity and credibility of the study's findings.

Table 3. Multicollinearity Test

Model		Collinearity Statistics	
1	(Constant)	Tolerance	VIF
	VACA	.763	1.310
	VAHU	.793	1.260
	STVA	.952	1.050

a. Dependent Variable: ROA
Source: Processed Data, 2021

Based on the findings of the multicollinearity test, it can be concluded that none of the variables displays any major multicollinearity complications. As a first point of interest, the value of the VIF for the VACA variable is 1.310, which is significantly lower than the generally accepted threshold of 10. The fact that this is the case shows that the VACA variable does not exhibit any substantial symptoms of multicollinearity. Similar to the previous example, the value of the VIF for the VAHU variable is 1.260, which indicates that there are no worries with multicollinearity for this variable as well. Last but not least, the value of the VIF calculated for the STVA variable is 1.050, which provides additional evidence that the dataset does not contain any multicollinearity issues. Taking all of these data into consideration, it is possible to draw the conclusion that none of the variables that were investigated exhibit significant multicollinearity. This substantiates the reliability of the regression analysis that was carried out.

Table 4. Autocorrelation Test
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.704[a]	.495	.368	.0778614	1.492

a. Predictors: (Constant), STVA, VAHU, VACA
b. Dependent Variable: ROA

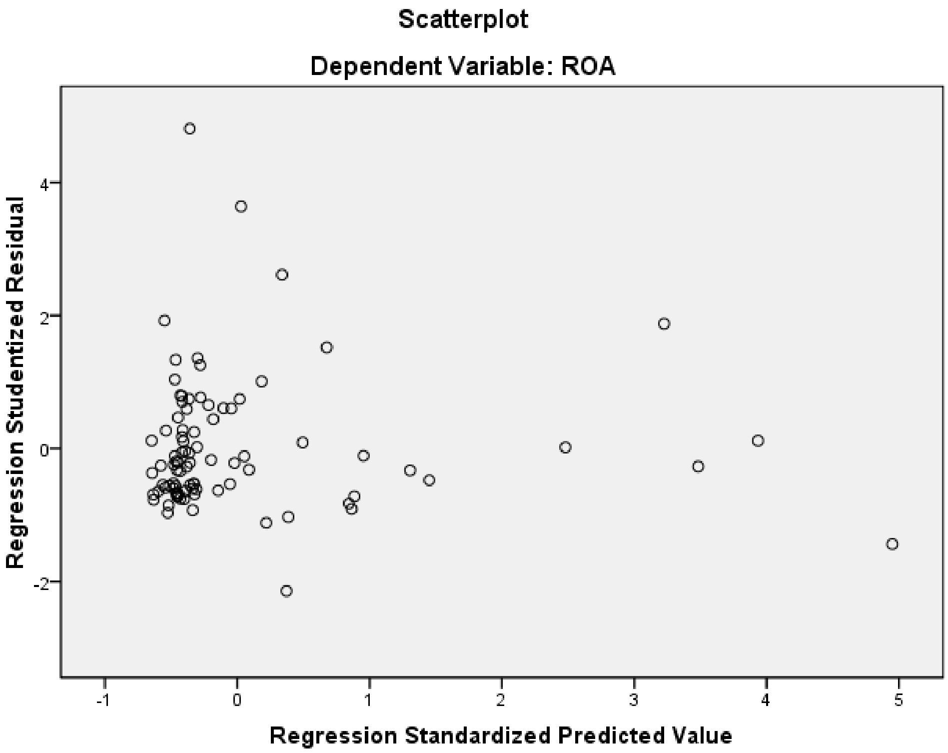
Source: Processed Data, 2020

As a result of the investigation that was carried out, the Durbin-Watson statistic was discovered to be 1.492. A model with three independent variables (k = 3) and a sample size of forty-five (n = forty-five) was taken into consideration, and this value was compared to the critical values that were calculated from the Durbin-Watson table in order to determine the significance of the variable. Both dl = 1.3832 and du = 1.662 were determined to be the crucial values that were obtained as a result.

When the Durbin-Watson value that was acquired is compared to these crucial values, it is found to be within the range that is indicated by dl and du, which indicates that it may provide possible independence from autocorrelation. To be more specific, the relationship is valid: dl is less than dw is less than du, with 1.3832 being less than 1.492 and 1.662 being less than 1.662. Furthermore, it was observed that the Durbin-Watson value is lower than the upper bound of 4 – du (where 4 – 1.662 = 2.338), which further confirms its location between dl and du. This was a significant finding.

Consequently, on the basis of this research, it is possible to draw the conclusion that the results of the test are not considerably influenced by autocorrelation, which in turn strengthens the validity of the statistical findings.

Figure 2. Heteroscedasticity test



The data points appear to be dispersed across the plot in a dispersed way, occupying locations both above and below the reference line of zero on the Y axis, according to the portrayal that is supplied in Figure 2 that is located above. when a result of this discovery, it appears that there is no clear pattern of growing or decreasing variation in the residuals when the projected values change. To put it another way, the regression model that was used for the investigation does not appear to contain any indications of heteroscedasticity.

Heteroscedasticity is a statistical term that describes the scenario in which the variability of the residuals, also known as errors, in a regression model changes in a systematic manner throughout the range of predictor variables. Due to the fact that it violates the premise of continuous variance of errors, this occurrence can provide difficulties in terms of the reliability and accuracy of the predictions made by the statistical model.

It is possible to get the reasonable conclusion that the variability of residuals does not exhibit a consistent trend with changing predictor values based on the visual analysis of the scatterplot in Figure 2, which displays the spread of data points relative to the Y axis. This conclusion can be reached based on the fact that the scatterplot displays the spread of data points. Given that there is no visible pattern in the distribution of points, it can be concluded that heteroscedasticity is not a significant concern within the regression framework that is currently being utilised. Both the validity of the regression analysis and the reliability of its results are strengthened by this interpretation, which lends confidence to both of them.

Table 5. Multiple Linear Regression
Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.073	.010		7.565	.000
	VACA	.116	.016	.123	7.251	.000
	VAHU	.082	.017	.032	4.824	.000
	STVA	.061	.011	.196	5.545	.000

a. Dependent Variable: ROA
Source: Processed Data, 2021

Y(ROA) = 0,116VACA + 0,082VAHU + 0,061STVA + e

Within the context of the investigation, the multiple linear regression equation that was utilised offers extremely helpful insights into the relationship that exists between a number of factors and Return on Assets (ROA). Initially, the value of 0.073 that is represented by the constant term represents the expected value of ROA when the variables VACA, VAHU, and STVA are taken into consideration. The ROA would be about 0.073 if there were no changes in VACA, VAHU, or STVA, according to this constant, which suggests that its value would remain the same.

As we go on to the regression coefficients, it is important to note that they provide information that is essential regarding the influence that each independent variable has on ROA. The first thing to note is that the coefficient for VACA (X1) is positive, and it is now 0.116. In light of this, it can be deduced that the return on assets (ROA) is anticipated to grow by around 0.116 units for every one-unit increase in VACA. Given that this association is positive, it can be deduced that greater values of VACA are related with higher ROA, provided that all other factors remain same.

The coefficient for VAHU (X2) is also positive, with a value of 0.082, as demonstrated by the previous example. Based on this information, it appears that an increase of one unit in VAHU is associated with an increase of around 0.082 units in ROA. When all other factors are held constant, it is possible to draw the conclusion that greater values of VAHU are typically associated with higher ROA.

In conclusion, the coefficient for STVA (X3) is shown to be positive, with a value of 0.061. It may be deduced from this that the return on assets (ROA) is anticipated to grow by approximately 0.061 units for every one-unit increase in the STVA. Given the fact that this coefficient is positive, it can be deduced that higher levels of STVA are likely to result in higher ROA, provided that all other factors remain same.

In a nutshell, the regression analysis sheds light on the connections that exist between the independent variables (VACA, VAHU, and STVA) and the dependent variable (ROA). Within the context of the dataset that was investigated, it sheds light on how changes in these independent variables have an effect on ROA, hence offering useful insights that can be used for decision-making and further analysis.

Table 6. Coefficient of Determination Test (R2)
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.704[a]	.495	.368	.0778614

a. Predictors: (Constant), STVA, VAHU, VACA
Source: Processed Data, 2021

The R Square value, which is shown in the table above as 0.495, which is equivalent to 49.5%, is an important metric that is utilised in the process of comprehending the connection that exists between the independent variables and the dependent variables. Specifically, it demonstrates that around 49.5% of the variability that is seen in the dependent variable may be explained by the independent variable that is being investigated. Having said that, it is of the utmost importance to acknowledge that the remaining fifty-five percent of the variation can be attributed to other factors that are not taken into consideration within the parameters of this particular regression model. The result of this is that it exposes the possible influence of factors that have not been researched and emphasises the complexity of the relationship that exists between the variables that are being investigated.

The findings of this study allow for the inference that the variables VACA, VAHU, and STVA jointly contribute to roughly 49.5% of the observed variation in the dependent variable, ROA (Return on Assets). This is the conclusion that can be drawn from the existing research. The degree to which these variables are significant in explaining a large percentage of the variability in ROA is plainly significant. Nevertheless, it is of the utmost importance to admit that there are additional factors that are beyond the scope of this study that exert impact upon ROA. These factors contribute to the element that cannot be explained, which amounts to fifty-five percent. This awareness highlights the importance for further investigation and examination of other variables that may effect ROA, which will ultimately provide a more thorough knowledge of the dynamics that are at play within the context that is being explored.

Table 7. Simultaneous Test Results (F Test)

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.023	3	.341	5.683	.000[a]
	Residual	.521	86	.006		
	Total	1.544	89			

a. Predictors: (Constant), STVA, VAHU, VACA

b. Dependent Variable: ROA

Source: Processed Data, 2021

Taking into consideration the outcomes acquired from the table that was shown earlier, the F value that was computed is 5.683. The significance level (Sig) that corresponds to this value is 0.000, which indicates that the statistical significance is at a level of $p < 0.0005$. In light of this, it appears that the null hypothesis (Ho) has been significantly altered. In light of the fact that the computed F value is more than the critical F value (5.683 is greater than 2.6100), we are able to reject the null hypothesis and accept the alternative hypothesis (Ha). As a consequence of this, it is possible to draw the conclusion that the variables VACA, VAHU, and STVA collectively have a visible impact on the financial performance model, more specifically Return on Assets (ROA).

Considering the significance of the discovered variables—VACA, VAHU, and STVA—in the formation of the ROA model, these findings shed light on their importance. According to the findings of the statistical research, these variables provide a significant contribution to the variation that is evident in the financial performance indicators. The fact that the study found evidence to support the hypothesis that these factors play a significant influence in determining ROA is demonstrated by the fact that the null hypothesis was rejected. In light of the fact that VACA, VAHU, and STVA emerge as major drivers within the model, it is imperative that organisations and analysts pay attention to these characteristics when analysing and forecasting financial performance.

Table 8. Partial Test Result (Uji t)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.073	.010		7.565	.000
	VACA	.116	.016	.123	7.251	.000
	VAHU	.082	.017	.032	4.824	.000
	STVA	.061	.011	.196	5.545	.000

a. Dependent Variable: ROA

Source: Processed Data, 2021

A beneficial influence of Intellectual Capital (VAIC™) on the financial performance (ROA) of the company is hypothesized to exist for both the present and the future, according to the hypothesis that was proposed in this scientific investigation. The critical value that was acquired from the t-table is greater than the t-value that was calculated for VAIC™, which is 17.62. This means that the t-value is greater than 7.565. Furthermore, the significance value (Sig) for all variables is 0.000, which is lower than the standard threshold of 0.05. This, in turn, indicates that there is a statistically significant and positive association between VAIC™ and financial performance (ROA).

On the basis of the findings of the hypothesis testing, it is possible to draw the conclusion that Intellectual Capital (VAIC™) does, in fact, have a positive and significant impact on the financial performance of the organisation. These results are presented in Table 4.8, where the regression coefficient is 17.62 and the significance level (ρ-value) is 0.00. This value is significantly lower than the threshold of 0.05, which is the threshold for statistical significance. In light of the fact that this level of significance is lower than the conventional $\alpha = 0.05$, it can be concluded that the first hypothesis is accepted. Therefore, the findings of this research provide empirical evidence that intellectual capital plays a substantial role in determining the financial success of a corporation through its influence.

Conclusion

This study utilises a quantitative research approach to examine the correlation between intellectual capital (IC) and the financial performance of companies. Intellectual capital is represented by the value added components created by physical capital (VACA), human capital (VAHU), and structural capital (STVA). The financial performance is measured by the return on assets (ROA) of the companies. The population under consideration consists of the entire set of 45 publicly traded companies that were listed on the LQ-45 Index throughout the years 2018 and 2019. The primary source of information is the official website of the Indonesian Stock Exchange, where secondary data from the financial reports of these companies can be accessible.

The independent variable being examined is intellectual capital, which is conceptualised by Pulic through the development of the VAICTM measure. ROA is commonly recognised as the dependent variable and is often used to evaluate profitability and efficiency. The study employs an analytical framework that incorporates two primary approaches. At first, descriptive statistical testing is used to efficiently organise and classify the collected data, giving a thorough summary for subsequent analysis. Afterwards, typical assumption testing is performed to verify the accuracy and dependability of the regression model.

This testing involves a range of diagnostic procedures, such as testing for normalcy, testing for multicollinearity, testing for autocorrelation, and testing for heteroscedasticity. Normality testing assesses the distribution of data, whereas multicollinearity testing examines the correlations among independent variables. Autocorrelation testing examines the existence of relationships between error terms in consecutive time periods, while heteroscedasticity testing detects differences in residual variances among observations. The study develops a strong analytical framework by following certain standards, which helps in interpreting and analysing the findings in a relevant way. This paradigm emphasises the importance of intellectual capital in impacting financial performance, confirming the stated premise and highlighting its relevance in modern corporate contexts, especially in information-driven businesses in the global market.

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