

Intellectual Capital and Profitability Performance: Empirical Evidence on Basic and Chemical Industry Companies on the Indonesia Stock Exchange

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ABSTRACT

Intellectual capital is often not directly recorded on the balance sheet, even though its information is used to create value, competitive advantage, and improve company performance. This study aims to analyze the effect of intellectual capital on profitability performance in basic and chemical industry companies listed on the Indonesia Stock Exchange. Intellectual capital is measured using the Value Added Intellectual Coefficient (VAIC™) approach, which consists of Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STVA), while profitability is proxied by Return on Assets (ROA). With a quantitative approach, this study uses secondary data in the form of company financial reports obtained from the official website of the Indonesia Stock Exchange. The sampling technique used purposive sampling with a sample size of 10 companies over a six-year period, resulting in 60 observations. Data analysis methods using descriptive statistics and multiple linear regression analysis to test the research hypothesis. The results of the study indicate that VAHU, VACA, and STVA partially significantly influence ROA. Furthermore, these three intellectual capital components simultaneously significantly influence company profitability. These findings indicate that effective intellectual capital management plays a crucial role in improving the financial performance of basic and chemical industry companies.

Keywords: Intellectual Capital, Performance, Profitability

INTRODUCTION

Advances in science and technology over the past decade have driven increasingly intense business competition. Companies are required to manage resources effectively and efficiently to maintain their business continuity. Capital is a crucial factor in building, developing, and maintaining a company's existence, as well as serving as an instrument to anticipate the risk of loss and support business expansion (Ekowati et al., 2012). In the context of global competition, capital management is no longer limited to tangible assets, but also encompasses intangible assets that play a strategic role in creating corporate value. The primary goal of every company is to achieve optimal profit. Profit reflects company performance and is an indicator of management's success in managing its resources (Alpi & Gunawan, 2018). One commonly used financial performance measurement tool is the profitability ratio, which describes a company's ability to generate profits from operational and investment activities (Kasmir, 2012). In this study, profitability is proxied by Return on Assets (ROA), a ratio that measures a company's ability to generate profits based on its total assets. A higher ROA indicates a more efficient company in utilizing its assets (Brigham & Houston, 2011). However, achieving profitability is not solely determined by managing tangible assets. In the knowledge-based economy, intellectual capital (IC) is a crucial source of competitive advantage. Intellectual capital is part of intangible assets, encompassing human resources, organizational structure, and a company's ability to create added value (Ulum, 2009). In Indonesia, attention to intangible assets has increased since the issuance of PSAK No. 19 concerning Intangible Assets, which recognizes the importance of non-physical resources in supporting company activities.

The measurement of intellectual capital in this study uses the Value Added Intellectual Coefficient (VAIC™) approach developed by Ante Pulic. This model consists of three main components: Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STVA). VAHU reflects the contribution of investment in human resources in creating added value for the company. VACA describes the efficiency of physical capital use in generating added value, while STVA measures the ability of structural capital to support the value creation process. Theoretically, increasing intellectual capital will drive improved company financial performance, including profitability. However, empirical evidence from companies in the basic and chemical industries listed on the Indonesia Stock Exchange indicates fluctuations in ROA values during the 2016–2021 period. Some companies experienced increases in intellectual capital components, but this was not always accompanied by increases in ROA. This inconsistency between theory and empirical evidence indicates a research gap that requires further study.

The basic and chemical industry sector was chosen for this study because of its strategic role in the national economy and its role as a supporting industry for various other sectors. This industry processes raw materials into intermediate and final products with high added value. Given the capital- and technology-intensive nature of this industry, intellectual capital management is a crucial factor in improving a company's competitiveness and financial performance. Based on this description, this study aims to analyze the influence of intellectual capital on profitability performance in basic and chemical industry companies listed on the Indonesia Stock Exchange. This research is expected to provide an empirical contribution to the development of the literature on intellectual capital and serve as a reference for company management and investors in strategic decision-making.

LITERATURE REVIEW

Resource-Based Theory

Resource-Based Theory (RBT) states that a company's competitive advantage is determined by management's ability to manage valuable, rare, inimitable, and non-substitutable internal resources, thereby creating sustainable profits (Barney & Hesterly, 2015; Peteraf & Barney, 2016). This perspective is increasingly relevant in the modern knowledge-based economy, where these resources are not only in the form of physical assets, but also intangible assets such as intellectual capital, which are the main source of corporate value creation (Ployhart & Moliterno, 2011; Gracia-Meca et al, 2018).

Profitability

Profitability is a ratio that shows the combination of the influence of asset management liquidity and debt on operating results. (Brigham & Huston, 2011). The amount of profitability will greatly affect the company's growth, because the profitability ratio shows the management's ability to generate profits so that profitability is influenced by income, expenses and asset utilization (Hani, 2015). Return on Assets (ROA) is one of the tools to measure the company's ability to generate profits with all funds invested in assets used for company operations (Munawir, 2014), so the higher this ratio, the better the company's condition.

Intellectual Capital

Intellectual capital is seen as a source of value creation that can improve company performance in the long term. Companies that are able to manage intellectual capital optimally will have higher operational efficiency, better innovation, and stronger competitiveness, thus impacting increased profitability. Intellectual capital is a combination of human capital, structural capital, and capital employed that collectively contribute to the creation of corporate

value (Garcia-Meca et al, 2018). Optimal intellectual capital management enables companies to achieve higher operational efficiency, increase innovation capacity, and strengthen competitiveness, thus positively impacting company profitability (Ployhart & Moliterno, 2011; Youndt et al, 2019). To measure the efficiency of value creation based on company financial report data, the VAIC™ model is used through the components of Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STAVA) (Pulic, 2000). Based on this model, it is stated that the higher the VAIC™ value, the more efficient the company is in creating added value from its resources. This efficiency will increase profits relative to the assets used, which is ultimately reflected in an increase in Return on Assets (ROA). (Chen et.al, 2019; Gracia & Santana, 2020)

The Influence of Intellectual Capital on Profitability

Intellectual capital plays a role in the value creation process, which impacts financial performance (Ulum, 2009). Companies that are able to manage intellectual capital effectively will be more efficient in utilizing assets, thus potentially increasing profitability as measured by Return on Assets (ROA). Therefore, the higher the intellectual capital, the higher the company's profitability. Therefore, the hypothesis can be stated as follows:

H1: Intellectual capital has a positive effect on profitability (ROA).

The Influence of Value Added Human Capital (VAHU) on Profitability

Human capital is the core of intellectual capital, reflecting employee competence, expertise, creativity, and innovation. VAHU indicates the amount of value added generated from investments in human resources. The greater the contribution of human capital in creating added value, the higher the potential for increasing company profits. (Ulum, 2009) states that the relationship between value added and human capital indicates the ability of the workforce to create economic value for the company. Investment in human resource development will increase productivity, operational efficiency, and ultimately increase ROA. Thus, the following hypothesis is formulated:

H2 Value Added Human Capital (VAHU) has a positive effect on profitability (ROA).

The Effect of Value Added Capital Employed (VACA) on Profitability

Value Added Capital Employed (VACA) reflects a company's ability to manage physical capital, or capital employed, to generate added value. The efficient use of physical assets and working capital is a crucial factor in generating profit. According to (Kartika & Hatane, 2013), the more effectively a company utilizes capital employed, the greater its contribution to improving financial performance. In the context of ROA, efficient capital management will increase profits relative to total assets. Based on this argument, the following hypothesis is formulated:

H3: Value Added Capital Employed (VACA) has a positive effect on profitability (ROA).

The Influence of Structural Capital Value Added (STVA) on Profitability

Structural capital encompasses systems, procedures, organizational culture, technology, and internal company structures that support employee productivity. Structural capital (STVA) measures the efficiency of structural capital in generating added value. (Sawarjuwono & Kadir, 2003) explain that strong structural capital enables a company to run operational processes optimally. A well-organized system will increase efficiency and reduce operational costs, thus increasing profitability. Therefore, the proposed hypothesis is:

H4: Structural Capital Value Added (STVA) has a positive effect on profitability (ROA).

The Simultaneous Influence of Intellectual Capital Components on Profitability

Overall, the VAIC™ model introduced by Ante Pulic integrates human capital, capital employed, and structural capital as a single unit in creating corporate value. Simultaneous

management of these three components is believed to improve a company's financial performance. Therefore, the following hypothesis is formulated:

H5: VAHU, VACA, and STVA simultaneously have a positive effect on profitability (ROA).

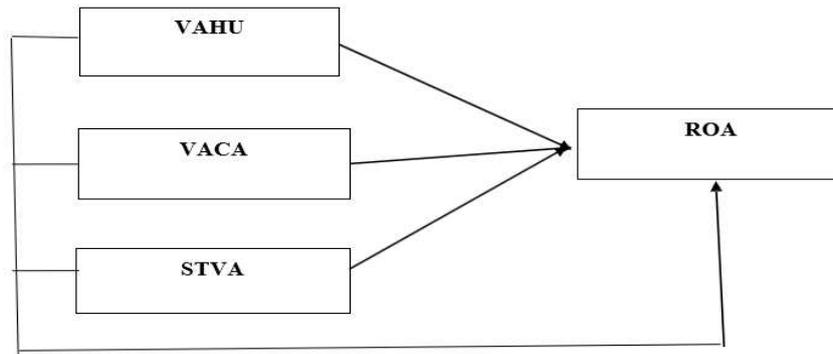


Figure ; Conceptual Framework

METHODE

This research is an associative study with a quantitative approach. This approach aims to test theories or hypotheses with numerical data and statistical analysis, aiming to generalize the results. The research variables consist of the independent variable (X), namely intellectual capital, as measured by Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STVA). Meanwhile, the dependent variable (Y), namely profitability, as measured by Return on Assets (ROA). The population of this study was all 65 Basic and Chemical Industry companies listed on the Indonesia Stock Exchange from 2016 to 2021. However, only 10 companies were selected as samples based on the researcher's predetermined criteria. To analyze the data using the Regression Equation Model, the research model can be formulated mathematically as follows:

$$ROA = \alpha + \beta_1VAHU + \beta_2VACA + \beta_3STVA + \varepsilon$$

Description: α = constant; $\beta_1, \beta_2, \beta_3$ = regression coefficients; ε = error term

Results and Discussion

Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to provide a general overview of the characteristics of the research data, including Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), Structural Capital Value Added (STVA), and Return on Assets (ROA). Based on the results of data processing using SPSS version 22 on 60 observational data (10 companies over 6 years), it was obtained that each variable has a fairly good variation in value. Return on assets has a minimum value of 0.41, a maximum value of 18.26, and a mean of 4.577 with a standard deviation of 3.90. Then, Value Added Capital Employee has a minimum value of 0.02, a maximum value of 0.41, and a mean of 0.123 with a standard deviation of 0.0747. Value Added Human Capital has a minimum value of 1.05, a maximum value of 3.57, and a mean of 1.715 with a standard deviation of 0.491. Meanwhile, Structural Capital Value Added has a minimum value of 0.05, a maximum value of 0.72, and a mean of 0.373 with a standard deviation of 0.163..

This indicates differences in intellectual capital efficiency and profitability between companies in the basic and chemical industries. The average ROA indicates that the sample companies are generally able to generate profits from their assets, despite fluctuations between study periods. Meanwhile, the VAHU, VACA, and STVA variables indicate varying levels of value creation efficiency across companies.

Classical Assumption Test

Before conducting multiple linear regression analysis, classical assumption testing was carried out to ensure that the regression model met the BLUE (Best Linear Unbiased Estimator) criteria.

Normality Test;

The results of the normality test show that the data is normally distributed, as indicated by a significance value above 0.05, and the points follow the diagonal line on the P-Plot graph.

Multicollinearity Test;

The results of the multicollinearity test show that all independent variables have a Tolerance value > 0.10 and VIF < 10, so it can be concluded that there is no multicollinearity between the independent variables.

Heteroscedasticity Test;

The results of the heteroscedasticity test show that there is no particular pattern in the scatterplot graph and the significance value is > 0.05, so the regression model is free from heteroscedasticity problems.

Thus, the regression model used in this study is suitable for hypothesis testing.

Multiple Linear Regression Analysis

The data analysis in this study used multiple regression analysis. In this study, there were three indicators tested from the independent variables.

Table: Results of Multiple Linear Regression Analysis Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-5,828	.793		-7,349	.000
1 Value Added Capital Employee	36,839	2,387	.706	15,434	.000
Value Added Human Capital	3,620	1,029	.456	3,517	.001
Structural Capital Value Added	-.967	3,189	-.041	-.303	.763

Based on the calculations carried out using SPSS 21.0 above, the multiple regression model regression equation will be obtained as follows:

$$ROA = -5,828 + 36,839X1 + 3,620X2 - 0,967X3 + e$$

Regression analysis is conducted to determine the direction of the relationship between the independent variables and the dependent variable, whether the relationship is positive or negative. A negative value indicates an opposite relationship, while a positive value indicates a unidirectional relationship. The regression equation is analyzed as follows:

1. ROA has a constant value of -5.828, meaning that if VAHU, VACA and STVA are considered zero, then ROA has a value of -5.828.
2. VACA has a positive regression value of 36.839, indicating a positive or unidirectional relationship between VACA and ROA. Therefore, when the VACA value increases, ROA will also increase.
3. VAHU has a positive regression value of 3.620, indicating a positive or unidirectional relationship between VAHU and ROA. Therefore, when VAHU increases, ROA will also increase.
4. STVA has a negative regression value of -0.967, indicating a negative or inverse relationship between STVA and ROA. Therefore, when STVA increases, ROA decreases, and vice versa.

Hypothesis Testing

t-test (Partial)

The results of the t-test show that:

1. The significance value of Value Added Capital Employee based on the t_{sig} test is 0.000 (Sig 0.000 < α 0.05) and t_{count} > t_{table} (15.434 > 1.67) thus H₀ is accepted and H_a is rejected. The conclusion: there is a significant influence of Value Added Capital Employee on ROA.
2. The significance value of Value Added Human Capital based on the t_{sig} test was obtained at 0.001 (Sig 0.001 < α 0.05) and t_{count} > t_{table} (3.517 > 1.67) thus H₀ was accepted and H_a was rejected. The conclusion: there is a significant influence of Value Added Human Capital on ROA.
3. The significance value of Structural Capital Value Added based on the t_{sig} test was obtained at 0.763 (Sig 0.763 > α 0.05) and -t_{hitung} < t_{table} (-0.303 < -1.67) thus H₀ was rejected and H_a was accepted. The conclusion: there is no significant influence of Structural Capital Value Added on ROA.

Thus, all partial hypotheses in this study are accepted.

F Test (Simultaneous)

The results of the F test show that VAHU, VACA, and STVA simultaneously have a significant effect on ROA with a significant value of 0.000 (Sig. 0.000 < α 0.05), and F_{count} > F_{table} (189.42 > 2.69) thus H₁ is accepted. The conclusion: There is a significant effect of VAHU, VACA and STVA on ROA. This shows that intellectual capital as a whole has a contribution to increasing the company's profitability.

Coefficient of Determination (R²)

The coefficient of determination (R²) value shows that the VAHU, VACA, and STVA variables are able to explain 91.00% of the variation in ROA, which means they have a strong relationship, while the remaining 9% of ROA is influenced by other variables not examined in this study.

Discussion

The Influence of Value Added Human Capital (VAHU) on ROA

The results of the study show that VAHU significantly influences ROA. This indicates that a company's efficiency in managing human resources, including superior knowledge, skills, and competencies, can increase profitability. This finding aligns with the Resource-Based View theory, which states that human capital is a strategic resource that can create competitive advantage. In the basic and chemical industries, workforce competence in managing production processes, technology, and operational efficiency directly contributes to increased profits.

The Effect of Value Added Capital Employed (VACA) on ROA

VACA has been shown to significantly influence ROA. This indicates that the efficient use of a company's physical capital and assets plays a crucial role in increasing its profit-generating capacity. With proper management and utilization of capital assets, a company can improve its financial performance, growth, and market value. The better a company manages the three components of intellectual capital, the better it manages its assets. This finding aligns with previous research by (Cahyani, 2015) that found VACA significantly influenced ROA. This suggests that companies are more likely to use physical capital, suggesting that the company's capital employed can impact profitability.

The basic and chemical industries are capital-intensive, making effective asset management a key factor in achieving profitability. Companies that maximize the use of their assets will generate greater output without significantly increasing costs.

The influence of Structural Capital Value Added (STVA) on ROA

The results of the study indicate that STVA has a significant effect on ROA. This indicates that the company's organizational system, work procedures, and technology play a role in increasing efficiency and profitability. This finding is inconsistent with previous research conducted by Kuspinta & Husain (2017) which found that Structural Capital Value Added (STVA) has a significant effect on the dependent variable (ROA). This means that a company's ability to manage its structural capital, such as improving its operational system, maintaining its corporate culture, and effectively managing its intellectual property, does not necessarily increase its net profit. Strong structural capital enables companies to maintain operational quality, improve internal coordination, and accelerate decision-making. Thus, the presence of structural capital supports the optimization of human capital and capital employed in creating added value.

Simultaneous Influence of Intellectual Capital on ROA

Simultaneously, VAHU, VACA, and STVA significantly influence ROA. This indicates that intellectual capital is a crucial factor in determining the profitability of basic industry and chemical companies listed on the Indonesia Stock Exchange.

These findings reinforce the view that in the knowledge-based economy era, a company's success is determined not only by physical assets, but also by the ability to manage intellectual assets efficiently.

CONCLUSION

This study aims to analyze the influence of intellectual capital proxied by Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STVA) on profitability proxied by Return on Assets (ROA) in basic and chemical industry sector companies listed on the Indonesia Stock Exchange during the study period.

Based on the results of multiple linear regression analysis and hypothesis testing, it can be concluded that: Value Added Human Capital (VAHU) has a positive and significant effect on ROA. This indicates that effective human resource management in creating added value can improve a company's ability to generate profits. Value Added Capital Employed (VACA) has a positive and significant effect on ROA. This means that the efficiency of using physical and financial capital to create added value also determines a company's level of profitability. Structural Capital Value Added (STVA) has a positive and significant effect on ROA. This finding indicates that good systems, procedures, technology, and organizational structure can support corporate profit creation. Simultaneously, VAHU, VACA, and STVA significantly influence ROA. Thus, integrated intellectual capital management has been shown to be a crucial determinant in improving the profitability of companies in the basic and chemical industries. This finding strengthens the Resource-Based View (RBV) theory which states that effectively managed intangible assets can be a source of competitive advantage and improve a company's financial performance.

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