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THE INFLUENCE OF INTELLECTUAL CAPITAL DIMENSIONS ON THE PERFORMANCE OF PHARMACEUTICAL COMPANIES LISTED ON THE IDX IN 2021-2023

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ABSTRACT

This study aims to examine the effect of intellectual capital on company performance. The independent variables used in this study are intellectual capital components consisting of HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), and CEE (Capital Employed Efficiency). This study uses secondary data in the form of annual reports collected through the Indonesia Stock Exchange (IDX). This study uses a purposive sampling method consisting of 11 pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) from a population of 33 samples in the 2021-2023 period. The data analysis technique uses multiple regression analysis to test the relationship between the ROA return ratio and IC. The results of the study show that Human Capital Efficiency (HCE) has a positive effect on company performance. However, Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) have a significant negative effect on company performance.

Keywords: Intellectual Capital, Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, Return On Assets

ABSTRAK

Penelitian ini bertujuan untuk menguji pengaruh modal intelektual terhadap kinerja perusahaan. Variabel independen yang digunakan dalam penelitian ini adalah komponen modal intelektual yang terdiri dari HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), dan CEE (Capital Employed Efficiency). Penelitian ini menggunakan data sekunder berupa laporan tahunan yang dikumpulkan melalui Bursa Efek Indonesia (BEI). Penelitian ini menggunakan metode purposive sampling terdiri dari 11 perusahaan farmasi yang terdaftar di Bursa Efek Indonesia (BEI) dari populasi 33 sampel pada periode 2021-2023. Teknik analisis data menggunakan analisis regresi berganda untuk menguji hubungan antara rasio imbal hasil ROA dengan IC. Hasil penelitian menunjukkan bahwa Human Capital Efficiency (HCE) berpengaruh positif terhadap kinerja perusahaan. Namun, Structural Capital Efficiency (SCE) dan Capital Employed Efficiency (CEE) berpengaruh negatif signifikan terhadap kinerja perusahaan.

Kata Kunci: Modal Intelektual, Efisiensi Modal Manusia, Efisiensi Modal Struktural, Efisiensi Modal yang Digunakan, Pengembalian Aset

1. INTRODUCTION

The dynamics of intense business competition encourage companies to continue to increase productivity so that company performance continues to increase amidst rapid and dynamic market changes. To face this challenge, companies need to have the right plan to increase sustainable competitiveness. Competition is created from the development of various types of businesses and similar companies (Melsia and Dewi 2021). Therefore, companies must continue to improve, both through improving managerial performance and innovation, in order to survive in market competition.

Company performance is one of the main benchmarks for assessing success in achieving strategic goals. The company's efforts to improve performance are highly dependent on the utilization of its resources. The company's main resources include not only tangible resources, but also intangible resources that are rare, invaluable, irreplaceable and endless (Lestari 2017). One form of intangible assets that plays an important role is intellectual capital as a competitive advantage that differentiates it from other companies or the company's resources and knowledge that can increase its market value (Alizadeh, Nabavi Chashmi, and Jahani Bahnamiri 2014).

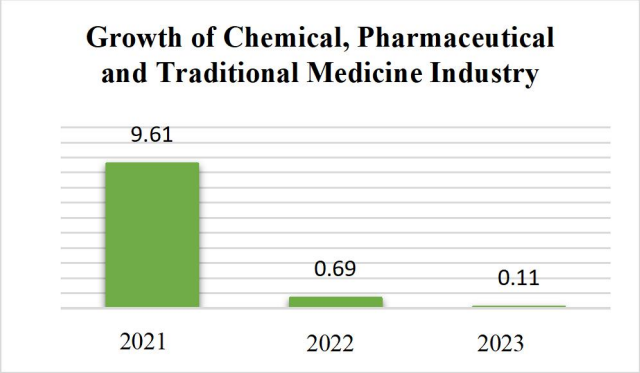
According to Huffman in (Feimianti 2015), Companies that understand the concept of intellectual capital tend to be more successful because intellectual capital includes the company's intellectual property, knowledge, skills and expertise of employees, as well as external partnerships and collaborations that overall contribute to the company's intellectual assets (Halim 2024). (Sawarjuwono, T. 2016) PSAK 19 mentions several examples of intangible assets such as science and technology, intellectual property rights, licenses, trademarks, patents, copyrights and others. All of these components, if managed well, have the potential to improve organizational performance, create added value that drives increased financial performance and thus attracts investor interest (Halim 2024).

Traditional accounting systems do not include intangible assets in financial reports, so that a company's financial reports are unable to reflect their true value (Kasoga 2020) & (Dinu 2022). Therefore, the evaluation of intangible assets becomes very important to increase the informativeness of financial reports in particular. The form of intellectual capital measurement that is often used is the Value Added Intellectual Coefficient (VAIC) method discovered by Pulic in 1998 (Melsia and Dewi 2021). VAIC consists of three components, namely Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE).

Research on Intellectual Capital on company performance has been conducted by previous researchers, but the results are varied and inconsistent, especially Return on Asset (ROA). (Skhvediani et al. 2023) and (Badawi 2018) who analyzed the relationship between intellectual capital and manufacturing company performance found that IC had a significant positive effect on company performance, because optimizing the use of company assets increases the added value of intellectual capital which has a positive impact on ROA. In line with (Nguyen 2024) which reveals that the components of VAIC, HCE, SCE, and CEE are significantly positive for all listed companies in Vietnam and the manufacturing industry. Meanwhile, SCE is significantly negative for the service industry. While stated that the VAIC component is positive and significant to the ROA financial

index, but for HCE and SCE it does not show a significant effect, even negative. Research conducted by (Marbun and Saragih 2019) shows that HCE and SCE do not have a significant effect on company performance. Meanwhile, CEE has a significant positive effect, as well as (Prasojo and Hadinata 2020) which provides research results that Intellectual capital has not had a significant impact on the performance of companies included in the Jakarta Islamic Index (JII). Thus indicating that the efficiency of company resources has not been fully optimized into a company structure that can directly create better company performance.

One of the companies that relies heavily on intellectual capital is a pharmaceutical company, especially human capital (scientific knowledge, technical skills) and structural capital (patents, research processes) which are very important for drug discovery and the development of innovative health technologies so as to provide medical solutions needed by the market. During the peak of the COVID-19 pandemic in 2021, the health industry became one of the most prioritized sectors (Kontan, 2022). This is because health products experienced the highest increase, namely 73.3% (Lidwina, 2020). According to (Ministry of Industry of the Republic of Indonesia, 2021) this increase is supported by the need for medicines, multivitamins, supplements and herbal medicines to increase immunity, so that the pharmaceutical industry has experienced significant growth. However, along with the decline of the pandemic in 2022-2023, the growth of the pharmaceutical industry's performance has begun to slow down as evidenced by the graph below, namely in 2021 it reached a significant peak growth of 9.61%, then there was a drastic decline of 0.69% in 2022, and 0.11 in 2023.



Source : Badan Pusat Statistik, 2024.

Figure 1. Growth Chart of Chemical, Pharmaceutical, and Traditional Medicine Industries

This phenomenon is interesting to study, especially regarding how pharmaceutical companies are able to utilize intellectual capital in facing the challenges of changing market conditions. Intellectual capital plays an important role in maintaining the competitiveness and sustainability of company performance, both during times of crisis and recovery. This study analyzes the effect of intellectual capital on the performance of pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) in the period 2021 to 2023. The results of the study are expected to provide insight for pharmaceutical companies in optimizing intellectual capital management to improve company competitiveness and performance, especially amidst changes in market dynamics post-pandemic.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

Resources-Based View Theory

Barney (1991) in (Agustia et al., 2021) stated that companies have resources that provide competitive advantage and enable companies to achieve good long-term performance. There are three types of resources owned by companies, namely physical resources (such as raw materials, technology, plants, and equipment), human resources (such as training, experience, and knowledge), and organizational resources (such as formal structures). The Resources-based view (RBV) theory considers companies as a combination of these various resources. The way a company manages and combines these resources will differentiate it from other companies, provide a competitive advantage, and enable the company to survive in long-term competition. Every company must manage these resources to create a competitive advantage. A company is considered to have a competitive advantage if it is able to create higher economic value than its competitors (Peteraf and Barney, 2003 in (Agustia et al., 2021)). Furthermore, Barney (1991) explains that in order for a resource to have the potential as a source of competitive advantage, the resource must meet four criteria: valuable, rare, inimitable, and non-substitutable. Based on this theory, it can be indicated that intellectual capital meets the criteria as a unique resource to create competitive advantage and improve company performance so that it is able to create added value that is beneficial for sustainable growth.

Intellectual Capital

The definition of intellectual capital has been explained by various researchers. Research conducted by Engström et al. In 2003 in (Melsia and Dewi 2021) showed that there is no common definition of intellectual capital, the concept of value creation often occurs, thus indicating that intellectual capital is useless unless it produces increased value for the company, most definitions of intellectual capital basically contain the same words, such as: knowledge, know-how, experience, intangible assets, information, processes and value creation. The distinction between human capital, organizational capital, and customer capital is widely accepted.

According to Ulum in (Melsia and Dewi 2021), intellectual capital is generally identified as the difference between the market value of a company (company business) and the book value of the company's assets (financial capital). There are various methods for measuring intellectual capital. According to (Sawarjuwono and Kadir 2003) in (Melsia and Dewi 2021) in general the methods developed are grouped into two groups, namely: non-monetary (non-financial) measurement and monetary (financial) measurement, from the measurement models developed have their own advantages and disadvantages. According to Ulum in his book, no single method is able to meet all the desired objectives in measuring intellectual capital, so one method must be chosen to meet one of the objectives with different situations and participants.

Value Added Intellectual Capital (VAIC)

The VAIC method, introduced by Pulic in 1998, is one of the approaches often used to measure intellectual capital. This method is designed to provide information on the efficiency of value creation from tangible and intangible assets of a company. Several components that form VAIC, namely HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), CEE (Capital Employed Efficiency). According to Pulic, the VAIC model helps companies to measure the efficiency of value creation. The VAIC method is

also designed to provide information on the efficiency of value creation of tangible and intangible assets in a company. According to (Sarmadi 2013), there are four reasons why this method is better in measuring intellectual capital, namely it is very easy and transparent and provides a basis for measurement standards, measurement information is obtained from financial reports and based on performance evaluation and value creation of tangible and intangible assets of a company, and the VAIC model has been used in various studies and research abroad.

The Influence of HCE (Human Capital Efficiency) on Company Performance

According to Bontis (2000) in (Melsia and Dewi 2021), human capital represents a collection of individual knowledge of an organization presented by its employees, including competencies such as skills and knowledge as well as employee attitudes in their work. Bontis (1998) also explains human capital as the collective capability of a company in taking the best solutions from the knowledge of each of its employees so that it becomes a source of innovation and renewal of the company's strategy. The human capital coefficient (HCE) describes the amount of value added generated from investment in employees. The relationship between VA and HCE shows HCE's ability to create value in the company. Pulic (1998) in his book argues that salary burden is an indicator of human capital because the market determines salary as a result of employee performance. Therefore, the success of human capital should be measured by the same criteria, where the relationship between value added and human capital shows HC's ability to create value for the company.

H_1 : HCE has a significant positive effect on company performance

The Influence of SCE (Structural Capital Efficiency) on Company Performance

Structural capital refers to a company's ability to carry out routine processes and build structures that support employee efforts to achieve maximum intellectual performance and improve overall business performance. Structural capital includes non-human knowledge in the company such as databases, organizational charts, manual processes, strategies, routines and anything that is valuable to the company beyond its material value (Bontis, 2000 in (Melsia and Dewi 2021). Companies with strong structural capital (SCE) usually have a culture that encourages employees to try new things, continue learning, and face failure as part of the process. SCE plays an important role because it allows intellectual capital (IC) to be measured at the organizational level of analysis.

H_2 : SCE has a significant positive effect on company performance

The Influence of CEE (Capital Employed Efficiency) on Company Performance

Capital employed is the amount of capital investment required by a company to operate and shows an indication of how the company uses its capital. Capital employed is all material and financial assets owned by the company. Pulic, the inventor of the VAIC method argues that IC resources cannot function without physical capital, therefore the VAIC model is a combination of IC measurements and physical capital resources.

H_3 : CEE has a significant positive effect on company performance

Firm Performance

Company performance is defined as a measurable result of the level of achievement of company goals or work results and the ability of company management to implement established strategies (Anthony, 1998 in Badawi 2018). (Lestari 2017) Company performance evaluation is a step that helps management assess its decisions related to

company performance by selecting indicators, collecting and analyzing data, accessing information related to performance criteria, reporting and communication and periodically reviewing and developing each process. According to Gitman and Zutter (2015) there are 5 categories of company financial ratios used to assess the company's financial performance, (1) Liquidity ratio; (2) Activity ratio; (3) Debt ratio; (4) Profitability ratio; (5) Market ratio.

Return on Assets (ROA)

Return on Assets (ROA) shows how much the company's ability to generate net profit that can be obtained from all assets owned by the company. Return on Assets is a type of ratio that explains how efficient the company is in utilizing or using its available assets to generate profits. The higher the ROA value of a company, the better the company's performance (Gitman and Zutter, 2015). By using the Return on Assets ratio, the company's performance can be evaluated and reflects the level of efficiency in using assets to gain profits.

Based on the hypothesis developed, the conceptual framework is formulated as shown in Figure 2.

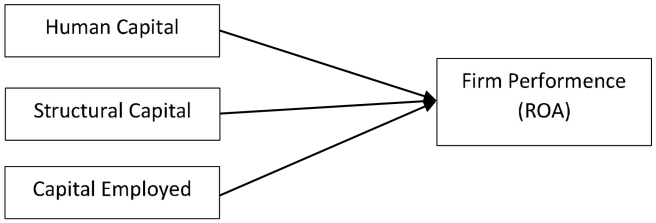


Figure 2. Conceptual Framework

3. RESEARCH METHOD

The research approach used in this research is a meta-analysis approach. **Sample Collection Techniques**

This study uses an explanatory research type with a quantitative approach. The population in this study uses pharmaceutical companies listed on the IDX with a research period of the last 3 years, using the purposive sampling method as the determination of the research sample. The criteria for taking it are as follows :

Table 1. Sampling Criteria

No.	Information	Amount
1.	Registered as a pharmaceutical sub-sector company on the Indonesia Stock Exchange.	11
2.	The company published financial reports for the years 2021-2023	11
Number of samples		11
Total Observation Data (11 × 3 years)		33

Operational Definitions of Variables

This study uses several formulas to determine each research variable. The dependent variable ROA shows the management's ability to use assets to improve company

performance. While the independent variables are the components of intellectual capital consisting of human capital (HCE), structural capital (SCE), and capital used (CEE).

Table 2. Measurement of Variables

Variable	Measurement	Acronym
Dependent Variable		
Y : Return On Assets	Net Profit / Total Aset	ROA
Independent Variable		
X1 : Human Capital Efficiency	VA / VC VA = OUT – IN VA = OP + EC + D + A OP = Operating Profit EC = Employe Cost D = Depreciation A = Amortization HC = Total Salary and Wages	HCE SCE
X2 : Structural Capital Efficiency	SC / VA SC = VA - VC	SCE
X3: Capital Employed Efficiency	VA/CE CE = Net Asset Book Value	CEE
Value Added Intellectual Capital Coefficient	HCE + SCE + CEE	VAIC

Data Analysis Techniques

The analysis method used in this study is multiple linear regression with path analysis to test the hypothesis. This analysis aims to test whether there is a direct or indirect influence between the independent variable and the dependent variable. The data testing tool used is SPSS software. The regression analysis formula according to this study is :

$$ROA = \alpha + \beta 1HCE + \beta 2SCE + \beta 4CEE + \varepsilon$$

Where :

α	=	Constant
$\beta_1, \beta_2, \beta_3$	=	Regression coefficient
ε	=	Eror (other independent variables outside the regression model)
ROA	=	Return on Asset
HCE	=	Human Capital Efficiency
SCE	=	Structural Capital Efficiency
CEE	=	Capital Employed Efficiency

4. DATA ANALYSIS AND DISCUSSION

Data Analysis

Table 3. Multiple Linear Regression Analysis Results

Model		B	Std. Error	Beta	t	Sig.	Information
1	(Constant)	.011	.055		.195	.847	
	HCE	.146	.027	.802	5.489	.000	Accepted
	SCE	-.152	.042	-.420	-3.629	.001	Rejected
	CEE	-.545	.159	-.499	-3.424	.002	Rejected

Source : SPSS output secondary data 2025, processed

Discussion

Human Capital Efficiency and Company Performance

Based on Table.3, it can be seen that the effect of HCE on ROA has a significance value of 0.00 <0.05 and a Beta In value of 0.146, which means that HCE has a significant positive effect on ROA. Therefore, H1 is accepted. These results indicate that the relationship between HCE and ROA is strong enough so that increasing efficiency in human resource management will improve company performance. The direction of the positive relationship is in line with research (Halim 2024) and (Lestari 2017). These findings indicate that pharmaceutical companies rely heavily on the expertise, knowledge, and innovation of the workforce to support research, development, and production of drugs. Efficiency in human resource management, such as through training, competency development, and proper workforce allocation, can increase the contribution of the workforce to the creation of added value. This relevance is further strengthened by the characteristics of pharmaceutical companies which are knowledge and innovation-based industries, where business success is largely determined by the ability of the workforce to develop new products, improve quality, and utilize modern technology. Thus, human resource efficiency has a significant positive impact on company performance as reflected through ROA.

Structural Capital Efficiency and Company Performance

The second hypothesis, which states that Structural Capital has a positive and significant effect on company performance, cannot be accepted. The T-test shows a value of -3.629 and a significance value of 0.01 <0.05. This indicates that Structural Capital has a significant negative effect on company performance. These findings indicate that structural capital in pharmaceutical companies has not been utilized and managed properly to create profits for the company. Companies tend to rely on physical capital and financial capital in achieving company performance. The results of this study are not in accordance with the results of previous studies by (Melsia and Dewi 2021) and (Halim 2024) which stated that Structural capital has a significant positive effect on company performance. However, the results of the study (Marbun and Saragih 2019), and (Lestari 2017) are the same as the results of this study which state that structural capital has a negative effect on company performance. This means that companies need to pay attention and improve Structural Capital.

Capital Employed Efficiency and Company Performance

The results of the study indicate that Capital Employed Efficiency (CEE) has a negative and significant effect on Return on Assets (ROA). This is indicated by a

Vol : 2 No.: 1 No. E- ISSN: 3025-4086

significance value of 0.02, which is smaller than the tolerance limit of 0.05, and the direction of the relationship is negative. In other words, an increase in efficiency in the use of capital (CEE) is actually followed by a significant decrease in financial performance (ROA). This finding indicates that capital management in pharmaceutical companies does not provide optimal results and may cause inefficiencies that have a negative impact on profitability. Therefore, the third hypothesis stating that CEE has a positive and significant effect on ROA is rejected. In theory, good Capital Employed management can indeed increase productivity and financial performance. However, in the results of this study, there is a significant negative effect between CEE and ROA, which is likely a problem in the way the company manages its tangible assets. This study is not in line with the results of previous studies, where CEE has a significant positive effect on the performance of banking companies (Marbun and Saragih 2019), manufacturing companies by (Melsia and Dewi 2021) and (Halim 2024).

5. CONCLUSION & SUGGESTION

Based on the results of the previous research and discussion, the conclusion of this study is that Human Capital Efficiency (HCE) has a significant positive effect on Return on Assets (ROA) which confirms the importance of workforce expertise, knowledge, and innovation in supporting the productivity of pharmaceutical companies. Conversely, Structural Capital (SC) has a significant negative effect on company performance which indicates that structural capital has not been optimally utilized in creating profits. In addition, Capital Employed Efficiency (CEE) also has a significant negative effect on ROA and indicates inefficiency in the management of tangible assets which has a negative impact on profitability. This study has several limitations, first, the sample used is limited to 11 pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) in 2021-2023, because the number of pharmaceutical companies listed in Indonesia is very limited. This reduces the possibility of generalizing the findings, due to the small sample size. Second, this study only focuses on the effect of Intellectual Capital on company performance in the current year and does not take into account its possible impact on future periods. Therefore, this study still has weaknesses that need to be improved for further research development. Some suggestions for future research are to expand the sample size by involving companies from other sectors outside the pharmaceutical industry, extend the observation period to analyze long-term trends, and add other variables that may be more appropriate in explaining the influence of Intellectual Capital on company performance.

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