

# **The Effect Of Intellectual Capital On Firms Performance In The Manufacture Companies In Indonesia**

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**Abstract:**

**Background:**

*This study aims to analyze the effect of Intellectual Capital on firm performance with financial performance in manufacturing companies listed on the Indonesia Stock Exchange (BEI) in 2021 using adjusted Value-Added Intellectual Coefficient (AVAIC) model.*

**Materials and Methods:**

*The population in this study were low technology and high technology manufacturing companies in Indonesia. Using purposive sampling, as many as 112 data are derived from the publicly listed manufacture firms on the Indonesia Stock Exchange. The multiple regression analysis is employed to test the hypotheses studied.*

**Results:**

*This study provides the results that of the four research variables, only human capital has a significant positive effect on firm performance. While intellectual capital, capital employed and innovation capital do not have a significant effect on firm performance*

**Key Word:** *Intellectual capital; Financial Performance; Human capital efficiency, Innovation capital efficiency, Capital employed efficiency*

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## **I. Introduction**

In the era of modern knowledge-based business (knowledge-based business) when the company's main resources are no longer physical assets but intangible assets. Companies that want to survive in the competition change the basis of their business from a business based on labor (labor-based business) to a knowledge-based business (Clarke, 2011). Companies that apply the principle of labor-based business will make workers the main factor that determines production, meaning that the more employees a company has, the more output it will produce. Meanwhile, companies that implement knowledge-based business will create a way to manage the knowledge possessed by employees and the company as a means to achieve company goals. Knowledge as a form of intangible asset is a new source of financial performance and competitive advantage (Soewarno et al., 2020).

One of the intangible assets that has been widely discussed and researched by academics is intellectual capital. Research on intellectual capital finds that intangible assets are one of the factors that determine a company's competitive advantage in competition (Chen et al., 2005). In Indonesia, the implementation of recording and reporting of intangible assets in financial statements is not yet significant, even though PSAK No. 19 (revised 2000) has alluded to intellectual capital indirectly which proves concern about intellectual capital disclosure. According to Abidin (2000) in Ulum (2016), companies in Indonesia tend to use conventional based in building their business so that the products they produce are still poor in technological content. In addition, these companies have not paid more attention to human capital, structural capital, and customer capital as evidenced in their financial reporting. companies in Indonesia will be able to compete if they use the competitive advantages obtained through creative innovations produced by the company's intellectual capital.

The relationship between the effect of intellectual capital on financial performance has been tested empirically by many researchers with mixed results. Firer and Williams (2003a) conducted research in South Africa and found that physical capital has the most significant influence compared to intellectual capital on the financial performance of companies in South Africa. Lev (2000) in Chen et al. (2005) noted that during 1977 – 2001 in the US Standard and Poor's(S&P) 500, the ratio of market value to book value of companies increased from 1 to 5. This means that indirectly about 80% of the market value of companies is not reflected in the financial statements. Edvinsson and Malone (1997) in Chen et al. (2005) revealed that the difference between the market value and the company's book value is a hidden value. Tan et al. (2007) conducted research on the effect of intellectual capital on financial performance and future company performance in 150 companies listed on the

Singapore Stock Exchange. The results of his research show that intellectual capital is positively related to financial performance and company performance.

Research on intellectual capital in Indonesia has been carried out by Solikhah et al, (2015) who examined the effect of intellectual capital on the financial performance of manufacturing companies in Indonesia. Found that the higher the value of the company's intellectual capital will improve financial performance. This means that companies that can optimally manage their intellectual resources are able to create added value and competitive advantage which will lead to an increase in the company's financial performance. Pratama (2016) examined the effect of intellectual capital on the performance and market value of technology companies listed on the stock exchange for the 2008-2014 period. Resulting in findings that intellectual empowerment will make companies have better financial performance, but found no relationship between intellectual capital and market value. Utami (2018) who examined companies listed on LQ45 for the 2012-2015 period found that intellectual capital had no effect on market value and company performance.

Results of Sofian et al. (2020) who examined the effect of intellectual capital on the performance of non-financial companies (main sector, manufacturing sector and service sector) in Indonesia during 2013-2017 found that intellectual capital had a positive effect on all market performance and financial performance in manufacturing sector companies and service sector companies. These results indicate that intellectual capital is an important asset for manufacturing sector companies and service sector companies to carry out innovation, efficiency and effectiveness in business processes, which can improve market performance and financial performance. Soewarna and Tjahjadi (2020) found different results where there was no significant effect between intellectual capital and return on equity for banking companies in Indonesia.

This study aims to measure the effect of intellectual capital which in this case is proxied by AVAIC on the financial performance of companies in the manufacturing sector in Indonesia. This is because there is still little research using the AVAIC method in calculating the effect of intellectual capital on company performance, especially in the manufacturing industry. In addition, the selection of the manufacturing industry sector as an industrial sample is because the manufacturing industry is a sector that contributes the most to the Indonesian economy (Laksani et al., 2012).

## **II. Literature Review**

Stakeholder theory explains the relationship between company managers and their stakeholders. The definition of stakeholder theory according to Freeman in Fountaine et al. (2006) are groups or people who can influence or be influenced by the company (Freeman, 1984) and the existence of these groups is important for the continuity of the company (Freeman, 2004). According to the viewpoint of Stakeholder Theory, company managers will try to obtain added value which will then be redistributed to all stakeholders (Belkaoui, 2003). Therefore, stakeholders will act as controlling managers in the context of using and managing company resources including intellectual resources in order to achieve the interests of the stakeholders themselves. Value creation can only be done if managers as managers of the company can maximize the potential of the company's resources, both tangible and intangible (Fountaine et al., 2006; Ulum, 2017). One way to maximize the potential of intangible resources is by calculating intellectual capital, because by doing this calculation managers will be able to find out how much value is created by the company in terms of intangible assets. Moreover, the position of intellectual capital as a part of the company's strategic assets can ensure competitive advantage and better performance for the company (Miller and Shamsie, 1996 in Kehelwalatenna and Premaratene, 2012).

Resources Based Theory (RBT) is an approach in designing a strategy to achieve competitive advantage by using the company's internal resources. RBT explains the relationship between company resources, company capabilities, and competitive advantage. RBT discusses the resources owned by the company and how the company can process and utilize the resources it has (Wernerfelt, 1984). According to Hart (1995) RBT takes the point of view that valuable company resources, expensive to imitate and unique company capabilities are the main sources of sustainable competitive advantage. Grant (1991) in Bharadwaj (2000) classifies company resources and capabilities into tangible, intangible, and personnel-based resources. Das and Teng (2000) and Gibbert (2006) in Kehelwalatenna and Premaratene (2012) resources with valuable, rare, expensive to imitate and irreplaceable features can be categorized as strategic assets. Based on this, intellectual capital can be categorized as a strategic asset because it is included in firm specific knowledge-related assets (Stewart, 1997) with characteristics that are rare, uncommon or exclusive, irreplaceable and unobservable (Riaksi-Belkaoui, 2003). Intellectual capital as a unique and superior resource cannot be easily replaced, and therefore is a source of competitive advantage (Xu & Wang, 2018; Kweh et al., 2019; Soewarno et al., 2020).

Intellectual capital according to Stewart (1997) in Bontis (2000) is all intellectual material such as knowledge, information, intellectual property and experience that can be used to create wealth. Meanwhile, according to Marr and Schiuma (2001), intellectual capital is defined as a group of knowledge assets related to the organization and contributes most significantly to the competitive position of the organization by adding value to key stakeholders. Kianto et al., (2013) in Nadeem et al., (2018) stated that intellectual capital resources

contribute significantly to company performance and form the basis of sustainable competitive advantage. It is assumed that good management of intellectual capital as a competitive advantage can improve company performance (Huang et al., 2020). Research on the relationship between intellectual capital and company performance has been carried out by several previous researchers in various corporate industries with results showing that intellectual capital has a positive effect on company financial performance (Smriti et al., 2018; Kweh et al., 2019; Nadeem et al., 2019; Bayraktaroglu et al., 2019; and Sofian et al., 2020).

Soewarno et al, (2020) state human capital as individual knowledge represented by employees. Human Capital Efficiency (HCE) is a major component of IC efficiency and helps organizations maintain their competitive advantage (Duho & Onumah, 2019). HCE according to Bayraktaroglu et al., (2019), can be described as the total of all knowledge, skills, abilities, expertise and experience of individuals in an institution, which can be utilized to achieve company goals. HCE generates innovations for new products and services that can have an impact on improving business processes and improving company financial performance (Ozkan et al., 2017; Kweh et al., 2019; Nadeem et al., 2018). Several previous studies have shown positive results between HCE and company performance such as research in Indonesia by Suwarno et al., (2020), Jetmiko, J. (2018), in India by Smriti & Das (2018) and in Malaysia Kweh et al., (2019). This shows that human resources with high skills and competence are a competitive advantage for the company. If the company can properly utilize and manage the potential of its employees, this will increase employee productivity and company performance.

Good capital employed management can increase the return on assets because it contributes to the ability to generate income. Efficiently used capital will drive income and affect the increase in return on assets (Soewarno et al., 2020). Research by Soetanto & Liem (2019) on 127 non-financial companies in Indonesia found that capital employed efficiency plays a significant role in value creation and company financial performance. This is in line with previous studies which show that capital employed plays a significant role in improving company performance (Chen et al., 2005; Clarke et al., 2011, Nadeem et al., 2017 Ozkan et al., 2017; Smriti et al., 2018). Firer and Williams (2003b) argue that in developing countries the role of physical/financial capital is still the main contributor in creating corporate value.

According to Soewarno et al., (2020) structural capital includes rare and unique resources because each company has an organizational culture, management philosophy and operating system that is different from other companies. According to Alsam and Haron (2020) SCE is the result of human capital performance in the form of organizational structures, databases, operational standards, routines and company strategies. If management ignores the unique characteristics that drive value, this will result in reduced company value and will affect company earnings. Research in Indonesia conducted by Jetmiko (2018) found that SCE has a significant effect on company performance, this is in line with the research by Smriti et al., (2018) and Kweh et al., (2019). Nadeem et al., (2017) in his research found that structural capital proxied through innovation capital efficiency had a positive impact on productivity (ROA) and market value, while research conducted by Soewarno et al., (2019) found that there was no relationship between innovation capital and company performance.

### III. Research Method

In order to facilitate research replication, a standard technology level classification of manufacturing companies based on UNIDO (United Nations Industrial Development Organization) was used. The grouping is based on ISIC Rev 4 with slight adjustments for application in developing countries. In this study, the UNIDO 2019 classification criteria used were only Medium-High technology and Low Technology. According to Xu et al., (2019) who conducted research on manufacturing companies in China, there is still little research on the effect of intellectual capital on company performance based on the level of technology applied. Whereas research by Ghaffar et al., (2014) in Pakistan, Usman et al., (2017) in developing countries (G-7) and Pratama et al., (2019) in Indonesia, Malaysia, Singapore, and the Philippines showed a positive effect from the level of technology to the company's financial performance.

The data analyses used in this research include classical assumption test, multiple linear regression analysis, F test, and t-test. Observations were made on the Manufacturing Firms of the Indonesian Stock Exchange (IDX) and samples in this study was taken using purposive sampling with the following criteria:

**Tabel 1. Sample selection criteria**

No	Criteria	Total
1	All Manufacturing Companies included in UNIDO's Medium High and Low Technology categories.	270
2	Manufacturing Companies with Negative Income in 2021	(87)
3	Manufacturing companies that do not include R&D, License and Copyright values in their financial statements.	(67)
4	Manufacturing Companies that have extreme values.	(4)
5	Total Manufacturing Companies in the study.	112

The observations of this study consist of 112 manufacturing firms (Medium High Technology and Low Technology)

Data on this research were analyzed using multiple linear regressions with the regression model as follow:

$$1) \text{ PERF} = \beta_0 + \beta_1 \text{ AVAIC} + \beta_2 \text{ SIZE} + \beta_3 \text{ LEV} + \varepsilon$$

$$2) \text{ PERF} = \beta_0 + \beta_1 \text{ HCE} + \beta_2 \text{ INVCE} + \beta_3 \text{ CEE} + \beta_4 \text{ SIZE} + \beta_5 \text{ LEV} + \varepsilon$$

Where:

PERF = Company performance proxied by ROA

$\alpha$  = Constant

$\beta_{1-5}$  = Regression coefficient

$\varepsilon$  = Errors

AVAIC = Adjusted Value Added Intellectual Capital

HCE = Human Capital Efficiency

INVCE = Innovation Capital Efficiency

CEE = Capital Employed Efficiency

SIZE = Firm size control variable

LEV = Leverage control variable

The independent variable in this study is intellectual capital, namely the performance of intellectual capital as measured by the value added created by Human Capital Efficiency (HCE), Innovation Capital Efficiency (INVCE) and Capital Employed Efficiency (CEE). The combination of the three value added is symbolized by the name AVAIC (Nadeem et al., 2018). The dependent variable in this study is financial performance (PERF) as measured by Return on Assets (ROA). Financial Performance is an analysis used by companies to find out how to increase financial performance in each period. ROA is a type of profitability ratio that is able to assess a company's ability to earn profits from various assets owned by the company. The selection of these performance indicators refers to previous research (Tan et al., 2007; Firer and William, 2003; Ozkan et al., 2017; Nadeem et al., 2018). The control variables used in this study are company size (SIZE) and leverage (LEV) based on previous research. The larger the size of the company, the easier it will be to obtain funding sources for the company's operational activities so that it will improve the company's performance. The Leverage Ratio is used to measure a company's ability to manage short-term and long-term debt to pay off the company's debt. SIZE is measured by Ln of Total Sales (Smriti et al., 2018) while LEV is measured by Total Debt divided by Total Assets (Sofian et al., 2020; Soewarno et al., 2020).

There are two regression models that will be tested in this study. Model 1 examines the relationship between financial performance measures (PERF) and AVAIC. Model 2 examines the relationship between PERF and the AVAIC components (HCE, INVCE, and CEE). The control variables SIZE and LEV are also included in both models.

#### IV. Result

This study wants to analyze the effect of intellectual capital on firm performance. The firm performance is measured by Return on Assets (ROA). Data was analyzed using SPSS version 25 (SPSS Inc., Chicago, IL). The level  $P < 0.05$  was considered as the cutoff value or significance.

**Tabel 2. Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
<b>ROA</b>	112	0,01050	0,51348	0,08632	0,07769	0,006
<b>AVAIC</b>	112	3,35190	22,46262	8,34854	3,31132	10,965
<b>HCE</b>	112	1,00826	8,30442	1,29599	0,76821	0,590
<b>INVCE</b>	112	0,81231	11,39310	5,59061	2,42848	5,897
<b>CEE</b>	112	0,06310	12,49910	1,46195	1,54693	2,393
<b>LEV</b>	112	0,00682	0,90668	0,41862	0,20828	0,043
<b>SIZE</b>	112	18,89035	32,22963	28,47260	2,02241	4,090
<b>Valid N (listwise)</b>	112					

Table 2 shows the descriptive statistics in this study. The descriptive statistics consist of mean, standard deviation, minimum, and maximum. The mean of the ROA for manufacture firms was 0.08632 and indicated that the net income was 8.63% of total assets. The mean of the AVAIC for manufacture firms was 8,34854 with the standard deviation is 3,31132 meaning that the manufacture firms' AVAIC has a bigger variation. The mean of the HCE for manufacture firms was 1,29599 with the standard deviation is 0,76821 meaning that the manufacture firms' HCE has a smaller variation. The mean of the INVCE for manufacture firms was 5,59061 with the standard deviation is 2,42848 meaning that the manufacture firms' INVCE has a bigger variation. The mean of the CEE for manufacture firms was 1,46195 with the standard deviation is 1,54693 meaning that the manufacture firms' CEE has a bigger variation. The mean of the LEV for manufacture firms was 0,41862 with the standard deviation is 0,20828 meaning that the manufacture firms' leverage has a smaller variation. The mean of the SIZE for manufacture firms was 28,47260 and it means that the mean of the total sales for manufacture firms was 2,320,032 million rupiahs.

The classical assumption test is a statistical requirement that must be met in a Multiple Regression Analysis (Ordinary Least Square (OLS)-based). In this study, classical assumption tests will be carried out, namely the normality test, multicollinearity test and heteroscedasticity test. Because the data used in this research is cross-sectional data where all variables are measured simultaneously, there is no need to do an autocorrelation test.

**Table 3. One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual Model 1	Unstandardized Residual Model 2
<b>N</b>		112	112
<b>Normal Parameters<sup>a,b</sup></b>	Mean	0,00000	0,00000
	Std. Deviation	1,91046	1,96318
<b>Most Extreme Differences</b>	Absolute	0,097	0,113
	Positive	0,081	0,078
	Negative	-0,097	-0,113
<b>Test Statistic</b>		1,263	1,301
<b>Asymp. Sig. (2-tailed)</b>		.082 <sup>c</sup>	.068 <sup>c</sup>
<b>a. Test distribution is Normal.</b>			

Based on Table 4.2 above by looking at the Asymp value. Sig. (2-tailed) generated for Regression Model 1 (0.082) and Regression Model 2 (0.068) which means greater than 0.05. It was concluded that each variable to be used in the regression research model is normally distributed.

**Table 4. Regression Model 1 Multicollinearity Test**

Model 1		Collinearity Statistics	
		Tolerance	VIF
<b>1</b>	(Constant)		
	AVAIC	0,985	1,015
	LEV	0,892	1,122
	SIZE	0,884	1,131
<b>a. Dependent Variable: ROA</b>			

**Table 5. Regression Model 2 Multicollinearity Test**

Model 2		Collinearity Statistics	
		Tolerance	VIF
<b>1</b>	(Constant)		
	HCE	0,666	1,500
	INVCE	0,601	1,665
	CEE	0,565	1,769
	LEV	0,717	1,394
	SIZE	0,870	1,150
<b>a. Dependent Variable: ROA</b>			

From Table 4 and Table 5 above it can be seen that each variable in this study has a VIF value of less than 10 so this indicates that the model does not have symptoms of multicollinearity.

**Tabel 6. Glejser Test Model 1**

Model Regresi 1		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5,097	4,079		1,250	0,214
	AVAIC	0,013	0,029	0,042	0,445	0,657
	LEV	0,017	0,090	0,239	1,412	0,218
	SIZE	-1,262	1,201	-0,105	-1,051	0,296
<b>a. Dependent Variable: Abs_Res1</b>						

**Tabel 7. Glejser Test Model 2**

Model Regresi 2		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,426	3,771		0,908	0,366
	HCE	0,239	0,273	0,142	0,173	0,203
	INVCE	-0,007	0,033	-0,023	-0,199	0,843
	CEE	0,278	0,101	0,331	1,140	0,107
	LEV	0,109	0,092	0,128	1,192	0,236
	SIZE	-0,828	1,108	-0,073	-0,748	0,456
<b>a. Dependent Variable: Abs_Res2</b>						

From Tables 6 and 7 above, the probability values (sig.) of each variable in this study are greater than the required alpha value of 0.05 so it can be concluded that all independent variables in this study do not experience heteroscedasticity problems.

**Table 8 Summary of Multiple Linear Regression Results Model 1**

Variable	Coefficient	t	Sig
(Constant)	-8,271	-1,394	0,166
AVAIC	-0,027	-0,641	0,523
LEV	-0,455	-3,473	0,001
SIZE	1,504	0,861	0,391
F-statistic		4,121	.008 <sup>b</sup>
R Square		0,103	
Adjusted R Square		0,078	
Durbin-Watson		1,903	
N		111	
Sumber Data: Ouput SPSS 25			

Based on Table 8 above, it can be seen that the calculated F value is 4.121 with a significance value of 0.008 which is smaller than  $\alpha = 5\%$ . This means that the multiple regression model is feasible to use. It is known that the R2 value of 0.103 indicates that company performance (ROA) can be explained by the variables in the regression model of 10.3% while the remaining 89.7% is explained by other variables outside the research model. Based on Table 4.10, it is known that the constant value is -8.271, meaning that if there is no change in the value of intellectual capital, leverage and size, then the value of financial performance proxied by ROA is negative. It is known that the AVAIC regression coefficient is -0.027, Leverage is -0.455 and Size is 1.504 meaning that an increase or decrease in each variable by 1 unit will cause a change according to the coefficient value. Based on Table 4.10, it is known that the significance t values for each variable in the regression model are AVAIC (t sig 0.523), LEV (t sig 0.001) and SIZE (t sig 0.391). Of the research model variables, only LEV has a t sig smaller than  $\alpha=5\%$ . This means that the LEV variable has a significant influence on the financial performance of manufacturing companies. Meanwhile, the AVAIC and SIZE variables do not have a significant effect on the financial performance of manufacturing companies as a proxy for ROA.

**Tabel 9. Summary of Multiple Linear Regression Results Model 2**

Variable	Coefficient	t	Sig
(Constant)	-8,456	-1,466	0,146
HCE	1,304	3,122	0,002
INVCE	-0,007	-0,130	0,897
CEE	0,264	1,699	0,092
LEV	-0,389	-2,769	0,007
SIZE	1,463	0,863	0,390
F-statistic		4,803	.001 <sup>b</sup>
R Square		0,185	
Adjusted R Square		0,146	
Durbin-Watson		1,888	
N		111	
Sumber Data: Ouput SPSS 25			

Based on Table 9 above, it can be seen that the calculated F value is 4.803 with a significance value of 0.001 which is smaller than  $\alpha = 5\%$ . This means that the multiple regression model is feasible to use. It is known that the R2 value of 0.185 indicates that company performance (ROA) can be explained by the variables in the regression model of 18.5% while the remaining 81.5% is explained by other variables outside the research model. Based on Table 4.11, it is known that the constant value is -8.456, meaning that if there is no change in the value of HCE, INVCE, SCE, Leverage and Size, then the value of financial performance proxied by ROA is negative. It is known that the HCE regression coefficient is 1.304, INVCE is -0.007, CEE is 0.264, leverage is 0.140 and SIZE is 1.695 meaning that an increase or decrease in each variable by 1 unit will cause a change according to the coefficient value. Based on Table 4.11, it is known that the significance t values for each variable in the regression model are HCE (t sig 0.002), INVCE (t sig 0.897), CEE (t sig 0.092), LEV (t sig 0.007) and Size (t sig 0.390). Of the research model variables, only HCE and LEV have a t sig smaller than  $\alpha=5\%$ . This means that only the HCE and LEV variables have a significant influence on the financial performance of manufacturing companies. Meanwhile, the AVAIC and SIZE variables do not have a significant effect on the financial performance of manufacturing companies as a proxy for ROA.

## V. Discussion

Based on Table 8 it is concluded that AVAIC does not have a significant influence on company performance proxied by ROA. The regression results show that investment in IC for high and low technology manufacturing companies in Indonesia does not affect the company's performance as measured by ROA. These results support the research of Joshi et al. (2013) that Intellectual Capital has no effect on company performance. Soetanto & Lim (2019) argue that this is influenced by PSAK which prohibits some intangible assets from being displayed in the financial statements, besides that the lack of R&D investment and well-targeted physical assets also affects the significance of AVAIC on company performance. Manufacturing companies must change their mindset and place IC as a strategic asset in order to be able to take advantage of the investment costs that have been incurred as one of the supports for the company's performance.

Table 9 shows that HCE has a significant positive effect on company performance proxied by ROA. These results indicate that the investment of manufacturing companies in human resources has a positive effect on company performance as measured by ROA. Manufacturing companies are aware that the greater the company's investment in employee costs, the higher the company's performance. These results support the research of Ozkan et al. (2017), Kweh et al. (2019), Nadeem et al. (2018) and Xu et al. (2019) that HCE has a significant positive effect on company performance. These results indicate that manufacturing companies have implemented salary, wage and pension programs well. Manufacturing companies are also advised to recruit competent employees, improve incentive systems, and build the best work environment so that the influence of HC becomes more significant on company performance. Regression result shows that CEE and INVCE does not have a significant effect on company performance as a proxy for ROA. The results of this study are the same as those of Ozkan (2017) and Xu et al. (2019) who found that CEE had no significant effect on the company's financial performance. Whereas CEE (physical capital or financial capital) has great potential in creating added value because it consists of all cash, securities, receivables, inventory, land, buildings, machinery, equipment and vehicles used as support in production. The results of this study indicate that in general manufacturing companies in Indonesia have not been able to properly manage physical and financial capital assets so that the company's efficiency value in creating added value is low. The results of this research show that structural capital (invoation capital) in manufacturing companies has not been utilized and managed properly. Manufacturing companies in

general have not considered it important and optimized the company's R&D to increase value added and company performance. These results support the research by Clarke et al. (2011), Ozkan et al. (2017) and Bayraktaroglu (2019) who found that INVCE had no effect on ROA. Joshi et al. (2013) stated that SC has no statistical significance on company performance.

## VI. Conclusion

Based on the results of regression tests and data analysis regarding the effect of Adjusted Value-Added Intellectual Capital (AVAIC), Human Capital Efficiency (HCE), Capital Employed Efficiency (CEE), Innovation Capital Efficiency (INVCE) on the financial performance of high and low technology manufacturing companies proxied by ROA through Multiple Regression Analysis. Based on the results of regression tests and data analysis regarding the effect of Adjusted Value-Added Intellectual Capital (AVAIC), Human Capital Efficiency (HCE), Capital Employed Efficiency (CEE), Innovation Capital Efficiency (INVCE) on the financial performance of high and low technology manufacturing companies proxied by ROA through Multiple Regression Analysis. It can be concluded that from the four research variables, only HCE has a significant positive effect on ROA. While AVAIC, CEE and INVCE do not have a significant effect on ROA. This means that high and low technology manufacturing companies in Indonesia have not maximized the potential of their Intellectual Capital to achieve the company's competitive advantage. Manufacturing companies only maximize the potential for wages and salaries (human capital), but have not maximized the potential for structural capital (research and development) and physical capital (physical assets). Even though the manufacturing industry sector is a driving sector and one of the sectors that contributes greatly to the Indonesian economy.

Manufacturing companies must pay more attention to the management of Intellectual Capital, especially Employed Capital and Structural Capital (Innovation Capital) in order to maximize the company's potential competitive advantage so as to achieve the desired company performance. This can be done by maximizing the company's Capital Employed, namely managing physical and financial capital according to the company's core needs, while for structural capital (innovation capital) or by utilizing databases, manual processes, strategies, routines, and organizational charts as well as Research & Development. more optimal company in accordance with the company's strategy to support increased performance.

Future researchers are advised to extend the research observation period and consider the lag effect in their research because some researchers consider that new intellectual capital is beneficial over time. Adding the number of samples from other sectors outside the manufacturing sector, or adding other variables for further research. The use of intellectual capital calculation methods other than AVAIC such as VAIC, Modified-VAIC, and Extended-VAIC as comparisons is also recommended. The inconsistency of AVAIC results and their constituent elements with respect to ROA also emphasizes the need for a new measurement method with more accurate and consistent results.

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