ANALYSIS THE INFLUENCE OF INTELLECTUAL CAPITAL ON THE PERFORMANCE OF INDONESIAN COMPANIES

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ABSTRACT

This study was conducted with the aim of determining the relationship between intellectual capital (IC), categorized in five subconstructions- namely, relational capital (RC), process capital (PrC), human capital (HC), technological capital , innovation capital (Innc), and business performance in the manufacturing industry. The sample from this study is a manufacturing company of the consumer goods industry sector registered with IDX. The findings of this study explain that there are three variables, namely HC, RC, and technological capital, which have no effect on company performance while the other two variables, namely InnC and PrC, have a significant positive influence on company performance. Data resource constraints are the main limitations in the process of making this research, because some companies do not fully explain their financial statements, moreover, the study is limited to manufacturers in the consumer goods sector, and it spans only five years.

Keywords : Intellectual capital; manufacturing; technological capital consumer goods; firm performance

ABSTRAK

Penelitian ini dilakukan dengan tujuan untuk mengetahui hubungan antara modal intelektual (IC), dikategorikan dalam lima subkonstruk- yaitu, modal relasional, modal teknologi, modal inovasi, modal proses, modal manusia dan kinerja usaha diindustri manufaktur. Sampel dari penelitian ini adalah perusahaan manufaktur sektor industri barang konsumsi yang terdaftar di IDX. Selanjutnya pengelolahan data sampel ini akan memanfaatkan software stata 13. Temuan dari penelitian ini menjelaskan bahwa ada tiga variabel yaitu HC, RC, dan technological capital tidak berpengaruh terhadap kinerja perusahaa sedangkan untuk dua variabel lainnya yaitu InnC dan PrC memiliki pengaruh yang signifikan positif terhadap kinerja perusahaan. Kendala sumber daya data adalah Batasan utama dalam proses pembuatan penelitian ini, dikarenakan beberapa perusahaan tidak menjelaskan secara lengkap mengenai laporan keuangan mereka, penelitian ini juga terbatas di perusahaan manufaktur sektor industri barang konsumsi serta periode yang diteliti hanya sebatas lima tahun.

Kata kunci : Intellectual capital; manufacturing; technological capital; consumer goods; firm performance

INTRODUCTION

Today's business people don't only need tangible assets, but also the competitiveness of intangible assets such as information systems, human resources, organizational management innovation, and technology, as well as high creativity in doing business to increase their competitiveness against other competitors. In the past,

physical assets such as equipment, building and machinery were considered to be the most important assets of a business. As a result, it is no longer relevant to the knowledge-based economy (KBE) or today's economy, where knowledge-based capital (KBC) has replaced intangible assets as sources of business value creation and productivity. For example, organizations know how to use company-specific skills, designs, patent and software.

Economic growth is achieved through the use of process, technology resources, and skills (Asian Develospment Bank, 2014). According to Ginesti *et al.*, (2018)there are several general terms used to indicate an increase in awareness of knowledge resources in the international business community, and the term currently known is intellectual capital.

Indonesia manufacturing industry contributed to economic growth of 7.07% in the second quarter of 2021, growing growing 6.91% despite the COVID-19 pandemic. Meanwhile, the manufacturing sector grew by 3.68% in third quarter of 2021, contributing 0.75% to Indonesia's economic growth. This resilience proves that the direction of industrial sector growth remains in accordance with the plan and is expected to be a driving force to boost the national economy with the target of contributing more than 20% to the Gross Domestic Product (GDP) by 2024. Manufacturing contributed 17.34% to GDP in the second quarter of 2021, according to the Ministry of Industry. There are two major sectors of the manufacturing industry: chemical, pharmaceutical, and traditional medicine (1.96%) and food and beverage (6.66%). With a contribution to the total GDP of the two industries of 8.62% (*BKPM*, 2022).

In Indonesia, the phenomenon of intellectual capital is codified in PSAK No. 19 (amended in 2000) on intangible assets. The PSAK 19 defines intangible assets as non-monetary assets that cannot be moved and possess no physical form, however, they can be used to provide goods, produce, lease or manage them for other parties of a company, which will result in economic benefits in the future. (Ikatan Akuntan Indonesia). The study of intellectual capital in Indonesia is still relatively new in the business world, and the practice of intellectual capital has not been widespread in Indonesia. Intellectual capital is the driving force and the most powerful factor for the success of the company. (Sirinuch, 2015).

This study combines the variables used in the study (Ni *et al*., 2020) and (Scafarto *et al*., 2016). Research in this study was based on consumer goods companies listed on the Indonesian Stock Exchange from 2016 to 2021. The reason for choosing a consumer goods industry sector company is because the consumer goods industry in Indonesia which was listed on the IDX in 2016 has increased until 2021.

It can be seen from the picture above that the industrial development of the consumer goods sector has increased from 2016 where the number is 43 companies and in 2021 it has increased to 61 companies. By increasing the number of companies causes the level of competition between companies to be high. Faced with fierce competition, companies need to maximize their intellectual capital, which certainly has an impact on their financial performance. Sufficient intellectual capital of an enterprise allows the company to compete with other enterprises. Utilizing and managing intellectual capital effectively can also improve a company's financial performance.

It is believed that enterprises in the knowledge economy can achieve superior performance and competitive advantage through the use of Intellectual Capital (IC), which is dedicated to creating enterprise value. ICs are also considered value-added physical and financial assets. According to (Xu *et al*., 2019), by incorporating technological innovations into their manufacturing processes, manufacturers can improve their productivity and performance. Technology innovation determines a company's performance and its existence or destruction. Product innovation can help manufacturing companies differentiate their products, reduce production costs, and shorten production cycles.

Based on this introduction, the research was conducted with the aim of knowing the effect of intellectual capital on firm performance with the influenced by the variable of Innovation Capital (InnC), Human Capital (HC), Process Capital (PrC) , Relational Capital (RC), and Technological Capital.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Resources Based Theory

Resource-based theory was first introduced by Wernerfeld (1984) in an important article entitled "A Resource-Based View of the Firm". Resource-based theory states that a company's resources are resources that can be used as a competitive advantage and can lead the company to good long-term results. This theory talks about the resources

available to the organization and how the organization can realize and use the available resources. The resources owned by a company can create added value for the company in taking advantage of opportunities and facing threats, so that the company has a different competitive advantage from other companies to dominate the market.

A resource is classified into three types according to Wijayani, (2017): physical, human, and organizational capital. A company's Intellectual Capital is a unique resource for improving its financial performance and gaining a competitive advantage. Resource-based theory predicts that a company must have excellent resources to achieve excellence. By creating and maintaining a competitive advantage, businesses can develop valuable, irreplaceable, reliable, and differentiated resources from the rest. This makes intellectual capital the key to creating added value for the company.

Human Capital (HC)

Human Capital (HC) or in research (Scafarto *et al*., 2016) mentions that HC is an experience of togetherness, creativity, case-solving skills, leadership, entrepreneurship, and management skills that are embodied in people in an organization. In the study conducted by (Scafarto *et al*., 2016) mentioned that HC is the only component of intellectual capital not linked to any performance measure, and there mentions that HC may have an indirect effect on company performance where researchers decided to make HC a moderation to test whether HC has an effect on other IC components and on organizational capabilities. And the results of the study explain that HC positively moderates the interaction between human capital (HC) and organizational capabilities.

In Hesniati & Erlen, (2021) study, it was demonstrated that human capital was positively correlated with organization/company performance. Entrepreneurs or company leaders can use this information to better understand the importance of intangible capital to gain a competitive edge in the marketplace. A company's productivity is increased by knowledge and innovation. This study states that HC has a relevant positive effect on organizational capabilities and the results are identical to those of the study (Ni *et al*., 2020), (Kengatharan, 2019).

Xu & Li, (2020) mentions that HC deals with employee competence, attitude, and intelligence. According to the results of this study, HC is positive in terms of profitability but negatively in terms of income and productivity. The reason for this can be attributed to the fact that registered manufacturing companies do not fully utilize

their employees' potential. As a result, employee potential is less utilized because the company places greater emphasis on seniority and employee education than employee competencies.

Bayraktaroglu *et al*., (2019) describe human capital as all the knowledge, skills, abilities, expertise and experience an institution possesses that can contribute to its success. Because it mostly relies on creativity, entrepreneurship, education, experience, risk awareness, problem-solving skills, leadership and motivation. It is considered the most valuable component of the IC. Where in this research HC has a significant positive impact on the ability of the organization.

H_1 : A firm's performance is significantly influenced by HC

Relation Capital (RC)

Torre *et al*., (2020) mention that through the activation of innovation solutions, relational capital can be used to guarantee prompt responses to user requests. As a matter of fact, relational capital can impact activities including information sharing between social actors, organizational effectiveness and interactions between internal and external firms.

Scafarto *et al*., (2016), argue that the essence of RC is insights inherent in external ties to industry, such as insights pegged to consumers, agents, executors of needs, countries, or related industrial alliances. A company's core is comprised of the most internal components, but RC is the most external component of the IC and therefore the most difficult to develop. The study shows that RC is concretely correlated and relevant to the ROE, ROI, and ROA ratios. This study matches the one reviewed by (Fernandez-Olmos *et al*., 2021), (Tran & Vo, 2020), (Mohammad & Bujang, 2019).

H_2 : A firm's performance is significantly influenced by RC

Innovation Capital (InnC)

Scafarto *et al*., (2016) the ability to initiate, develop, and advance new products, services, and solutions is referred to as innovation capital (InnC). The main elements of the InnC are represented by R&D. But in this study mentioned that ATO, ROE, ROA, ROI show significant negative effects caused by InnC. Due to InnC long-term R&D investments, the return on investment takes a long time.

Ni *et al*., (2020) mentioned that the focus on Innovation encourages companies to explore new territories and pursue long-term competitive advantages and sustainable

growth. In general, innovation capital directly affects the productivity of the enterprise and has a constraint effect on profitability, so an increase in R&D costs leads to an increase in profitability. This research states that InnC has a concrete impact relevantly on the ability of the industry. The results of this study are the same as those studied by (Soewarno & Tjahjadi, 2020).

H_3 : A firm's performance is significantly influenced by InnC

Process Capital (PrC)

Scafarto *et al*., (2016) show that PrC is a strategy, scheme, and method that institutions apply in order to achieve technical rankings and operational appropriateness. Customer satisfaction and improved customer relationships result from improvements in PrC. Therefore, PrC is a leading IC element, which can affect the efficiency of the company's business by reducing operational costs as well as improving customer efficiency. The results of this study state that PrC has a concrete coefficient and is relevant to industrial capabilities (Ni *et al*., 2020).

H_4 : A firm's performance is significantly influenced by PrC

Technological Capital

A high level of technological innovation can lead to significant improvements in company performance and perform better, according to the researchers. A significant positive impact of technological capital on a company's performance has been demonstrated in this study (Xu *et al.*, 2019).

According to Hesniati & Erlen, (2021), technological capital is regarded as the organization's primary innovation. As technology has advanced and improved, it is able to provide better support to customers and have a competitive advantage over its competitors. The reason for this is that technological capital can provide conveniences like integrating company systems to be capable of responding to business needs more quickly and creating competitive innovations more quickly. The results of this study state that technological capital has a concrete impact on industrial capabilities. The results of this study are in the same direction as those reviewed by (Khalique *et al*., 2018), (Torre *et al*., 2020), dan (Khalique *et al*., 2020).

Alazzawi *et al*., (2018) demonstrate that technological capital affects companies financial performance in general. With more technology inputs can improve the service

performance of the company's products to get higher profits. However, the results of this study show that technological capital indirectly affects the company's profit.

H_5 : A firm's performance is significantly influenced by its technological capital.

RESEARCH METHOD

This research was conducted with the aim of determining whether intellectual capital or intangible assets have a great effect on the company's performance. According to the book (Cooper & Schindler, 2014), this research is also a reporting study and summarises the data, often reordering the data for a better understanding or to generate statistics for comparison. In this study, relation capital, process capital, innovation capital, human capital, and technological capital are independent or affecting dependents. While the dependent variable is organizational performance.

The population that the researchers use is a manufacturing company that already exists on the Indonesian stock exchange. The researcher sets out some of the criteria used for the study:

1. Companies that have published financial statements and are listed on the Indonesian stock exchange since 2016 and are still operating until 2021.
2. The Company reports financial statements ending on December 31.
3. Have complete data to calculate innovation capital, human capital, technological capital, process capital, and relation capital.
4. Companies listed in IDX that manufacture consumer goods.

Three types of variables are used in this study, namely dependent, independent, and control variables. Performance of the company is used as the dependent variable in this study. HC, RC, InnC, PrC, and Technological Capital are the independent variables in this study. While the control variable that is used are Firm Size and Leverage Ratio (Lev). An explanation of the variables used in this study are described in Table 1.

RESULT AND DISCUSSION

Using secondary data from the IDX, we use the consumer goods sector listed as an object for the 2016-2021 period. The sample data used from the overall number of enterprises is presented in Table 2.

Descriptive Statistics

In descriptive statistics, the minimum, maximum, average, and standard deviation values of a data set are calculated, as well as the standard deviation between the

observed values. In this study, the author wrote descriptive statistics based on the variables used. Descriptive statistical data regarding the variables used are presented in Table 3.

Chow Test

By using the Chow test, we can determine which model we will use in further research: the fixed effect model or the common effect model. The decision to choose a model was to focus on the probability criteria of cross-section chi-square. If the probability value > 0.05, the preferred model will be a common-effect model, and if it is < 0.05, the most appropriate model will be a fixed-effect model. Table 4 shows the result of chow test.

Hausman Test

Hausman testing will only be performed if the chow test result is fixed effect model. It is used to determine whether a fixed effect model or a random effect model will be used in the study by using the Hausman test. The decision in the selection of the model is to pay attention to the criteria of cross-section random. The Fixed Effect Model is the most suitable model if the probability value is below the value of 0.05. However, if the probability value is above the value of 0.05, the Random Effect Model is the most suitable model. Table 5 shows the result of chow test.

f Test

Using the f test, independent variables and dependent variables were analyzed simultaneously. Prob(F-statistic) shows the results of the f test. F tests indicate that the independent variables do not significantly affect the dependent variable when the probability value is greater than 0.05. However, if the probability value of the f test was less than 0.05, it meant that the independent variables were significant as a whole. Table 6 shows independent variables having a significant effect on dependent variables.

t Test

Using the t-test, independent variables were tested for their influence on dependent variables. The result of the t-test is expressed as the probability value of each independent variable. To indicate that the independent variable has no significant impact on the dependent variable, the probability value should exceed 0.05. If the prob value is <0.05, the independent variable is significant. The results of this study can be

seen in Table 7. The magnitude of the interaction between independent variables and dependent variables can be seen in this table.

Hypothesis Analysis

H_1 : A firm's performance is significantly influenced by HC

Based on the results of the t test, the HC variable does not significantly affect ROA. This is seen from the coefficient value and probability where the result of the value is -0.097 and 0.167. Where the result of probabilities is above the number 0.05 so it can be said that HC does not have a significant influence on its dependent variables. These results are contrary to the research conducted by (Suzan & Devi, 2021), (Yulaeli, 2021), (Vo & Tran, 2021), (Pigola *et al*., 2021), (Soewarno & Tjahjadi, 2020), (Xu & Li, 2020) and (Torre *et al.*, 2020). **That mean H_1 hypothesis is rejected**

H_2 : A firm's performance is significantly influenced by RC

The results obtained for the RC variable did not have a significant influence on the ROA variable. This was seen from the prob value of the RC variable, which is 0.280 which if the prob is above 0.05 then the variable does not have a significant influence on ROA. This result is in line with research conducted by (Sirinuch, 2015), mentioning that RC is the last component that can improve company performance through ROA, he explained that the most influential on company performance is Human Capital. Soetanto, (2018) also mentioned that RC is not significant on the grounds that companies in Indonesia are still more dependent on physical / financial capital than structural capital. **That mean H_2 hypothesis is rejected.**

H_3 : A firm's performance is significantly influenced by InnC

The results obtained for the InnC variable have a significant influence on ROA. This can be seen from the coefficient and probability values where the results are 2.631 and 0.013. Since the probability value is below 0.05 and the coefficient level is positive, the variable has a significant impact on the company's performance. It shows that the InnC variable significantly affects performance. The reason is that company manufacture consumer goods must definitely do and try various kinds of things that can be used as the latest innovations of their products, because the products they produce will be continuously used in everyday life so that if they do not make the latest innovations in the products they produce, there will be a possibility that consumers will move to other products. This study confirms the findings of previous research

conducted by several researchers, including: (Ramírez *et al.*, 2021), (Hayaeian *et al.*, 2021), (Pigola *et al.*, 2021), (Tiwari, 2017), and (Melani, 2016). **That mean H_3 hypothesis is accepted.**

H_4 : A firm's performance is significantly influenced by PrC

The results obtained for the PrC variable turned out to have a significant influence on ROA. This can be seen from the coefficient value and probability which are at 0.024 and 0.027. This probability level is still below 0.05, which indicates that the variable has a significant influence on the performance of the company. For the coefficient level it is at a positive number which can be interpreted as significantly positive. This result is similar to the research that has been carried out by (Ni *et al.*, 2020), which states that the higher the turnover ratio of current assets can increase profits and increase the value of the company simultaneously. **That mean H_4 hypothesis is accepted.**

H_5 : A firm's performance is significantly influenced by its technological capital

The results obtained for the technological capital variable turned out to have no influence on ROA. Based on the probability value of the variable being estimated at 0.343, which is above 0.05, we can conclude that the variable does not affect the company's performance. This study's findings differ from the research carried out by (Hesniati & Erlen, 2021), (Torre et al., 2020), (Alazzawi *et al.*, 2018), and (Khalique *et al.*, 2015). **That mean H_5 hypothesis is rejected.**

CONCLUSION

The conclusions obtained after conducting this study are as follows:

1. Human capital does not appear to be significantly correlated with company performance. This result is contrary to the research conducted by (Vo & Tran, 2021), (Pigola *et al.*, 2021), (Soewarno & Tjahjadi, 2020), (Xu & Li, 2020) and (Torre *et al.*, 2020).
2. The performance of the company is not significantly influenced by Relation Capital. These results are in line with research (Soetanto, 2018) and (Sirinuch, 2015).
3. A significant positive effect of Innovation Capital was seen in the company's performance. This result is in line with (Ramírez et al., 2021), (Hayaeian *et al.*, 2021), (Pigola *et al.*, 2021), (Tiwari, 2017), and (Melani, 2016).

4. Company's performance is positively influenced by Process Capital. This result is similar to research that has been carried out by (Ni *et al*., 2020), which states that the higher the turnover ratio of current assets can increase profits and increase the value of the company simultaneously.
5. Technology capital does not significantly affect a company's performance. This study's results are not consistent with previous research (Hesniati & Erlen, 2021), (Torre et al., 2020), (Alazzawi *et al*., 2018), and (Khalique *et al*., 2015).

There is a suggestion to be conveyed, namely that It is recommended for subsequent research to add the object of study. Researchers should not limit their research to companies in the consumer goods industry so that the results can be applied to all companies to predict their value and performance. The period used for research should be more than 5 years and use more companies so as to create more accurate results.

The research carried out cannot be separated from limitations including 1) Data collection takes place over only 5 years, which is relatively short given that longer timeframes can reveal different dynamic relationships between intellectual capital and company success. The model could provide better results if it were studied over a longer period of time. 2) The author of this study focuses exclusively on IDX sector for consumer goods, in order to enrich the results of subsequent research, further research is hoped to expand the research sector.

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FIGURES AND TABLES

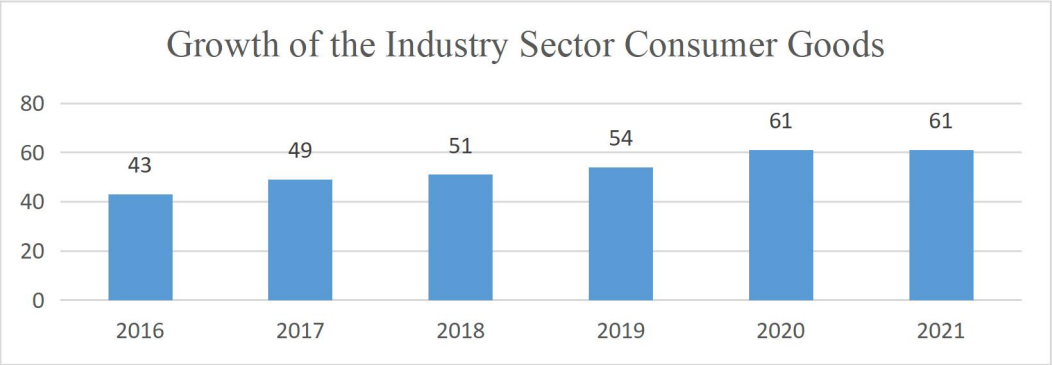

Figure 1 Growth of the Industry Sector Consumer Goods
Source : (Daftar Perusahaan Manufaktur Di BEI Terbaru - Invesnesia.Com, 2022)

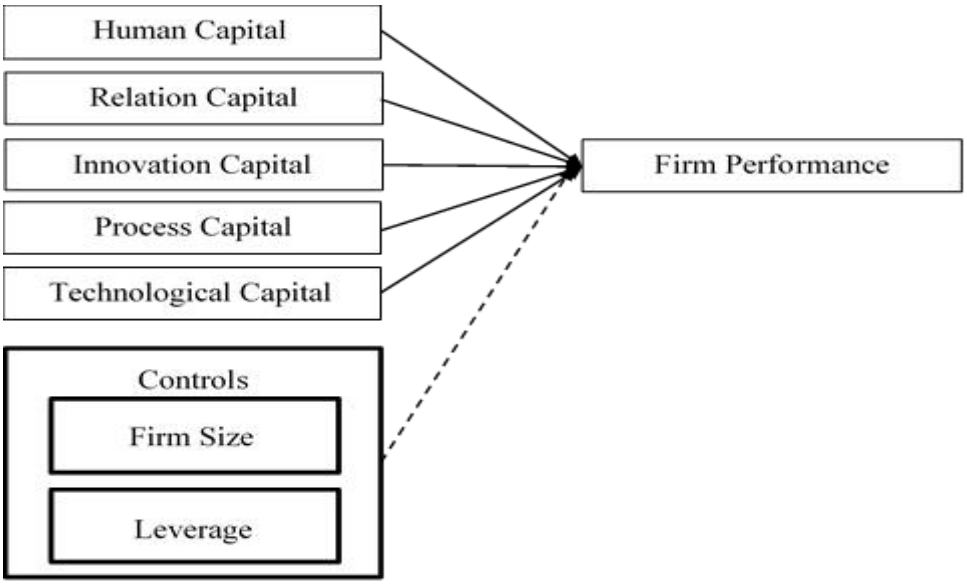

Figure 2 Conceptual Model

Table 1. Formulation Of Research Operational Variables

Variable Type	Variable	Formulation	Caption
Dependent Variable	Return On Assets (ROA)	Net Income /Average Total Assets	
Independent Variable	Human Capital (HC)	Labour & Related Expense / Total Assets	Labour & Related Expenses Including wages and salaries, social security, pension costs, sharing benefits and other labour compensation packages
	Relational Capital (RC)	Selling, general and administrative expense / Total Assets	Selling, general and administrative expenses Include costs that are not directly attributed in the production process, but are related to sales, general and administrative functions

	Innovation Capital (InnC)	Research & Development Expenses / Total Assets	Research & development expense Includes all direct and indirect costs associated with the creation and development of new processes, techniques, applications, and products with marketing possibilities
	Process Capital (PrC)	Net Sales / Fixed Assets	Net sales is Annual Net Sales Fixed assets is Average Fixed Assets
	Technological Capital	Journal Of Research And Development Expenditure	Journal Of Research And Development Expenditure
Control Variable	Firm Size	Natural Logarithm Of Total Sales	
	Leverage Ratio (Lev)	Ratio Of Total Debt To Total Assets	

Source: Secondary data processed (2022)

Table 2. Number of Companies Sampled

Caption	Amount
Industry listed on IDX 2016-2021	759 companies
Industrial sector of consumer goods industry	48 companies
Industries that do not meet the criteria	(33 companies)
Sampled industries	15 companies
Total samples over a 5-year period	75 sample

Source: Secondary data processed (2022).

Table 3. Descriptive Statistical Test Results

Variable	*Min.*	*Max.*	*Mean*	*Std. Deviation*
Return on asset	-0.932	1.103	0.126	0.213
Human capital	0.014	0.321	0.102	0.060
Relational capital	0.046	0.772	0.318	0.174
Innovation capital	0.000	0.165	0.013	0.033
Process capital	0.806	14.645	3.833	3.127
Technological capital (Millions of Rupiah)	113	2,761,497	192,981.11	631,435.453
Leverage	0.157	2.900	0.456	0.455
Firm size (Millions of Rupiah)	216,951	106,741,891	13,487,833.73	25,637,052.104

Source: Secondary data processed Using IBM SPSS (2022).

Table 4. Chow Test Results

F (14, 53) = 2.57	Prob > F= 0.007

Source: Secondary data processed using Stata (2022).

Table 5. Hausman Test Results

Chi2(7) = (b-B) ' [(V_b-V_B)^(-1)] (b-B) = 29.62	Prob > chi2 = 0.001

Source: Secondary data processed using Stata (2022).

Table 6. F Result Test

Test Summary	*Prob.*
Prob(F-statistic)	0.007

Source : Secondary data processed using Stata (2022).

Table 7. T Result Test

Variable	*Coefficient*	*Prob*	Conclusion
Human capital	-0.927	0.167	Not Significant
Relational capital	-0.114	0.467	Not Significant
Innovation capital	2.631	0.013	Significant Positive
Process capital	0.024	0.027	Significant Positive
Technological capital	0.035	0.343	Not Significant

Source: Secondary data processed using Stata (2022).

Table 8. Panel Regression results

	-1 ROA	-2 ROA	-3 ROA	-4 ROA	-5 ROA	-6 ROA	-7 ROA
HC	-0.502*	-1.147**	0.383	-0.109	-0.118	-0.967	-0.927
	(-2.16)	(-3.82)	(1.05)	(-0.38)	(-0.42)	(-1.53)	(-1.40)
RC		0.328*	-0.375*	-0.186	-0.184	-0.066	-0.114
		(2.31)	(-1.94)	(-1.03)	(-1.05)	(-0.52)	(-0.73)
InnC			3.292**	2.647**	2.724**	1.883**	2.630*
			(5.08)	(4.68)	(2.90)	(2.70)	(2.55)
PrC				0.014**	0.015**	0.027*	0.024*
				(3.54)	(3.99)	(2.65)	(2.26)
Tech_C					-0.004	0.059	0.035
					(-0.11)	(1.32)	(0.96)
FirmSize						-0.058	-0.052
						(-1.32)	(-1.16)
Lev							-0.118
							(-0.81)
Constant	0.177**	0.139**	0.164**	0.107*	0.144	1.223	1.134
	3.98	2.70	3.18	1.73	0.38	1.18	1.26
Adj. R-square	0.006	0.033	0.102	0.132	0.120	0.141	0.191
Obs.	75	75	75	75	75	75	75

Source: Secondary data processed using Stata (2022).