
Does Intellectual Capital Affect Insurance Company Profitability? Insight from Indonesia

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Abstract

The objective of this paper is to gather empirical information on the impact of intellectual capital consisting of human capital, structural capital, and relational capital on profitability. This research is expected to be able to contribute ideas about the relationship between intellectual capital and profitability. The observed population in this study is all conventional general insurance companies and sharia general insurance companies listed in the OJK Insurance Directory from 2017 to 2022, with samples drawn using a purposive sampling method. The sampling method obtains 216 observation data analyzed using panel data linear regression analysis. The findings show that intellectual capital components simultaneously affect a firm's profitability. Human capital and relational capital have a partial positive impact on profitability, while structural capital has no effect on the profitability of general insurance companies. Firm size negatively affects profitability, while the interest rate variable does not. The implication of this research is able to be an input for companies, especially the insurance sector to consider intellectual capital as a factor that can affect profitability. The model robustness test conducted indicates that the core regression model has sensitivity to different proxies or measures. This study has limitations on the completeness of the data used because there are samples that do not fulfill the criteria, such as the absence of publication of financial statements.

Keywords: Intellectual Capital, Profitability, General Insurance

1. Introduction

1.1 The Problems

The general insurance sector is essential in supporting a country's economic growth because it provides more efficient risk management for individuals or business entities (Morara & Sibindi, 2021). This sector grew 5.4% in 2022, placing Indonesia higher than Thailand (4.6%) and Singapore (2.6%) in general insurance growth. Figure 1 shows the positive financial performance of conventional general insurance with an average recorded profit of IDR 6.9 trillion annually in 2016-2020. This growth is also observed in its total assets, which grew by 24% post-COVID (Q2 2020 - Q3 2021) compared to pre-pandemic time (Q1 2017 – Q1 2022). Per February 2023,

conventional general insurance booked a premium income of IDR 23.79 trillion or increasing 27.56% yoy (Bank BJB, 2023).



Figure 1. Financial Performance of Conventional General Insurance 2016-2020

Given the fact that Muslim represents the vast majority of the Indonesian population, the sharia segment of general insurance has also expanded in Indonesia alongside the conventional segment. Therefore, sharia general insurance based on sharia principles can be applied to its full potential (Rizwan et al., 2021). The operating profit generated by this segment in 2019 was IDR 514 billion, significantly decreasing until January 2020 to IDR 83 billion (Indonesia Sharia Insurance Association, 2021). The total assets of sharia general insurance grew by IDR 7.757 billion at the end of January 2023 compared to the previous period. Growth was also observed in total investment with IDR 5.374, while in 2022, IDR 5.353 (Financial Service Authority (OJK), 2023).

Since how crucial the general insurance sector is to the company's long-term sustainability and operational success of the company, it is a fascinating issue to examine. Financial performance also measures the firm's business success (Kristiana, 2014). Firms need to evaluate their financial performance to assess their financial condition, for example, by measuring profitability as a metric to define a firm's profit (Muslih & Aqmalia, 2020). A firm's future growth and productivity can be predicted from its profitability, which correlates with its willingness to compete more effectively and expand its business (Yudhanti & Shanti, 2012). The financial performance stability of the general insurance sector is essential, considering the sector's role in supporting economic growth at the macro level. Intangible assets have equal importance as tangible assets in stimulating the success of a firm's performance. As a firm's intangible assets, human, structural, and relational capital initially contribute to intellectual capital (Hermawan et al., 2019). Intellectual capital can generate profit by facilitating access to funds, reducing transaction costs, and strengthening the firm's image (Castro et al., 2021).

This research intends to understand if intellectual capital as an independent variable affects a firm's profitability. This study is undertaken since the previous investigations provide diverse findings. Tangngisalu (2022) finds that human, structural, and relational capital all have an impact on profitability. As a comparison, Asyik (2021) finds only human capital has a positive effect, while structural and relational capital does not affect profitability. Another study by

Surjandari & Minanari (2019) finds only structural capital has a beneficial effect on profitability. Human and relational capital show contradicting results and do not affect a firm's profitability.

This study differs from the existing researches by examining the variables in the general insurance sector. Falikhatun & Mudrikah (2022) examine the relationships in the sharia banking sector, Tangngisalu (2022) studies the property and real estate sectors, while Febrianty & Febriantoko (2018) focus on the food and beverage industries. General insurance, both conventional and sharia, is selected as the object of this study because it is considered vital in improving financial service integration in a country. The observation period in this study is the last six years, from 2017 to 2022. Control variables in the form of the firm's age and interest rate are included as novelties of the current study from the existing ones.

1.2 Literature Reviews and Hypothesis Development

1.2.1 Resource-Based Theory

Resource Based Theory explains that firms are focused on utilizing their strategic resources to achieve long-term competitive advantages. Besides physical assets, strategic resources include intangible assets, such as intellectual capital. Every business has unique and diverse resources that firms utilize to support their performance and differentiate them from other businesses (Kabuye et al., 2021). Business capability to manage their internal resources enables them to create new products, open new markets, and increase customer value chain. As a result, a firm's internal resources or intellectual capitals are vital in supporting its operational activities and creating competitive advantages (Madhani, 2010). Thus, intellectual capital provides added values that boost a company's sales and income, improving the business's performance because of the profit growth (Andriani & Herlina, 2015).

1.2.2 Profitability

Profitability is a metric used to assess a firm's financial success because a manager's effectiveness in generating profit will be observable from the firm's profitability (Astoety et al., 2019). Profitability describes a company's capacity to manage its resources and decide on the best approach for increasing earnings (Musdholifah & Triambodo, 2018). Therefore, the profitability ratio is a sure measurement of a firm's financial performance. Return on equity (ROE) is a profitability ratio that assesses a company's capacity to create a return for its stockholders (Ichsani & Suhardi, 2015).

1.2.3 Intellectual Capital

Intellectual capital is an intangible asset comprised of knowledge, personnel competencies, organizational technological usage, and customer loyalty (Salvi et al., 2020). In accordance with Pew Tan et al. (2007), the independent variable intellectual capital can be assessed using the Value Added Intellectual Capital Coefficient (VAICTM) model developed in 1998 by Pulic. To employ VAICTM, the first step is to determine the value added or the differences between income (out) and input (in). The value-added score is vital as it represents all wealth generated in a specific period. Input is all costs incurred by firms except for labor costs, as labor plays an active role in the value-creation process. In this approach, human capital is represented by Value

Added Human Capital (VAHU), structural capital by Structural Capital Value Added (STVA), and relational capital by Value Added Capital Employed (VACA).

1.2.4 Hypothesis Development

Firms could achieve optimum financial performance when capable human resources manage their business. Therefore, human capital is crucial in measuring intellectual capital because it explains every point of the cost incurred to support the human capital in generating a firm's value (Nizar & Anwar, 2015). Olarewaju & Msomi (2021) study finds that human capital affects profitability, supporting Asyik (2021), Costa et al. (2020), Simarmata & Subowo (2016), and Arifa & Ahmar (2016). Thus, the proposed hypothesis, according to the findings from the previous studies, is as follows:

H1: Human capital positively affects profitability.

Structural capital determines how much structural capital is needed to required to produce one point of value added. Structural capital consists of non-human capital, such as the organization's strategy, business process, and organization chart. Therefore, structural capital can be used as a parameter for the success of structural capital in creating values (Septiani et al., 2021). This value-creation process will affect the firm's activities in improving its performance. The research of Falikhatun & Mudrikah (2022) and Ur Rehman et al. (2022) investigate the influence of value added provided by structural capital on a firm's profitability. Additionally, Olarewaju & Msomi (2021), Surjandari & Minanari (2019), and Febrianty & Febriantoko (2018) also explain that structural capital increases a firm's profitability. Following is the hypothesis proposed based on the existing studies:

H2: Structural capital positively affects profitability.

Relational capital or capital employed (CE), or physical capital, is something a firm needs to manage to generate the maximum return. Relational capital is a parameter to measure every point of capital employed used to generate value added. Therefore, relational capital can be used as a benchmark for a firm's intellectual capital used in managing the physical capital to generate profits (Febrianty & Febriantoko, 2018). Tangngisalu (2022) finds that relationship capital increases a firm's profitability. This conclusion is confirmed by Rajindra (2021), Septiani et al. (2021), Solechan (2017), Simarmata & Subowo (2016), and Arifa & Ahmar (2016), who find that relational capital affects profitability. The consistent finding in studies prompted the researchers to develop the following hypothesis:

H3: Relational capital positively affects profitability.

2. Method

In this study, the population is the general insurance firms registered in OJK's directory, and the selected samples are conventional and sharia general insurance firms listed in OJK and Indonesia Sharia Insurance Association in 2017-2022. Each firm's financial report is downloaded to collect the needed research data, and samples are selected according to the predetermined criteria or the purposive sampling method. Profitability is the present study's major topic as its dependent variable. The independent variables proposed to affect the dependent variables is the intellectual

capital, with the firm’s size and interest rate added as the control variables. Table 1 illustrates how each variable is measured.

Table 1. Operational Definition of Variables

Variables	Abbreviation	Measurement	References
Profitability	ROE	ROE is measured by dividing income after tax by total equity.	Ur Rehman et al, (2022); Hermawan, (2013); Ulum, (2013)
Human Capital	VAHU	This variable is measured by computing the Value Added Human Capital that describes the level of VA generated from a firm’s human capital expenditure. VAHU = VA/HC VA= Out – In HC= Labor Costs	Falikhatun and Mudrikah (2022); Tangngisalu (2022); Ulum (2013)
Structural Capital	STVA	Structural capital is determined using the Structural Capital Value Added, which measures the entire structural capital needed to create one point of VA. STVA= SC/VA SC= VA-HC VA= Out – In	Ur Rehman et al, (2022); Tangngisalu (2022); Ulum (2013)
Relational Capital	VACA	Relational capital is measured using Value Added Capital Employed, which explains the level of VA generated using one unit of physical capital. VACA= VA/CA VA= Out-In CA= Total Equity	Tangngisalu (2022); Surjandari and Minanari (2019); Ulum (2013)
Interest Rate	INTEREST RATE	The interest rate reflects Bank Indonesia’s monetary policy.	Hidayat et al. (2020)
Firm’s Age	AGE	A firm’s age shows how long a firm has operated, measured by deducting the research year by the year a firm was established.	Mahardika et al. (2014)

The collected data are analyzed through a series of statistical analyses starting from model selection tests, descriptive statistics, classical assumption tests, and hypothesis testing. Model selection tests are conducted to select the most appropriate method among the Fixed Effect

Model (FEM), Common Effect Model (CEM), and Random Effect Model (REM). The analysis shows that FEM is the appropriate model using the following regression formula:

$$ROE = \alpha + \beta_1VAHU + \beta_2STVA + \beta_3VACA + \beta_4AGE + \beta_5RATE + e$$

3. Results

The summary presented in Table 2 illustrates the result of the purposive sample method, which consisted of 36 general insurance firms and 216 observations.

Table 2. Research Samples and Observations

Sample Criteria	Total
Conventional general insurance firms listed in OJK (71 firms x 6 years)	425
Sharia general insurance firms listed in OJK and Indonesia Sharia Insurance Association (AASI) (25 firms x 6 years)	150
General insurance firms with acquisition or merger (9 firms x 6 years)	(54)
Incomplete financial reports (51 firms x 6 years)	(306)
Total panel data observations (36 firms x 6 years)	216

Source: Processed Data (2023)

3.1 Descriptive Statistic

According to the descriptive statistics analysis, profitability as the dependent variable measured using ROE shows a mean value of 0.0907, suggesting that the samples have an ROE of 0.0907 or 9.07%. This value is relatively low because it is below 0.1. The human capital measured sing VAHU has the highest mean value of 2.8369 than STVA and VACA measurements for intellectual capital. The oldest firm selected as a sample is PT Asuransi Bintang TBK, with 67 years of operation, and the youngest is PT Sampo Insurance Indonesia Unit Syariah, with one year of operation. The highest interest rate was 6% in 2018, and the lowest was 3.5% in 2021.

Table 3. Descriptive Statistics

	ROE	VAHU	STVA	VACA	AGE	RATE
Mean	0.0907	2.8369	0.5972	0.2617	34.9722	4.6666
Median	0.0776	1.8706	0.5030	0.2669	35.0000	4.6250
Max	0.6784	42.977	8.2753	1.1399	67.0000	6.0000
Min	-0.7752	-2.3733	-5.5139	-0.5209	1.0000	3.5000
Std. Dev.	0.1581	4.4368	1.0364	0.1863	16.4206	0.9111

Source: Processed Data (2023), Eviews 12

3.2 Classic Assumption

The normality test is conducted using the long-run test by assessing the kurtosis and skewness of data. The results show a probability score of 0.0617 > p-value 0.05. Therefore, the data have a normal distribution.

Table 4. Multicollinearity Test Results

	VAHU	STVA	VACA	AGE	RATE
VAHU	1.000000	0.031935	0.482529	-0.328249	0.046661
STVA	0.031935	1.000000	-0.170281	-0.076498	-0.083418
VACA	0.482529	-0.170281	1.000000	0.087056	-0.073769
AGE	-0.328249	-0.076498	0.087056	1.000000	-0.013989
RATE	0.046661	-0.083418	-0.073769	-0.013989	1.000000

Source: Processed Data (2023), Eviews 12

Table 4 shows the outcomes of the multicollinearity test that all independent variables scored below 0.80. These findings imply that there is no high correlation among the independent variables. As a consequence, it is possible to conclude that the acquired data has no multicollinearity issues (Ghozali & Ratmono, 2017).

Table 5. Heteroskedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016423	0.008765	1.873561	0.0627
VAHU	-0.000240	0.000156	-1.543923	0.1244
STVA	0.000194	0.000411	0.473509	0.6364
VACA	0.001069	0.003731	0.286553	0.7748
AGE	-0.000256	0.000231	-1.108642	0.2691
	-0.056492	0.043333	-1.303672	0.1941

Source: Processed Data (2023), Eviews 12

Glejser Test is a tool used to assess the presence of heteroskedasticity problems in the data by regressing the absolute residual score with the independent variables. The findings summarized in Table 5 demonstrate that each independent variables generate a probability score is greater than 0.05, suggesting that the data is devoid from the heteroskedasticity problem.

The result of the Durbin-Watson analysis is 1.65628 with a DI of 1.718. The Durbin-Watson score is > 0 and $< DI$ ($0 < 1.656285 < 1.718$), or detecting a symptom of autocorrelation in the data. However, despite the positive autocorrelation result, the OLS estimator is still considered unbiased, consistent, and asymptotically normally distributed. Therefore, the hypotheses testing using regression remains appropriate for the current study (Jaggia & Kelly-Hawke, 2005).

3.3 Hypotheses Testing

The results of hypotheses testing show an F-statistic of $0.000000 < p\text{-value} < 0.05$, indicating that the three independent variables (human capital, structural capital and relational capital), firm's age, and interest rate simultaneously and positively affect the firm's profitability. Table 6 additionally presents the Adjusted R-squared score of 0.599604, meaning that the independent variables in the model account for 59.96% of variations in the firm's profitability. In comparison, 40.04% is affected by variables other than the proposed model

Table 6. Hypotheses Testing Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.343363	0.156385	2.195622	0.0294
VAHU	0.006692	0.002776	2.410822	0.0170
STVA	-0.002706	0.007327	-0.369386	0.7123
VACA	0.394327	0.066566	5.923865	0.0000
AGE	-0.010267	0.004116	-2.494482	0.0135
RATE	-0.003026	0.007731	0.391379	0.6960
F- statistic	9.049206			
Prob(F-statistic)	0.000000			
R-squared	0.674096			
Adjusted R-squared	0.599604			

Source: Processed Data (2023), Eviews 12

The t-test analysis outcomes reveal that partially, the independent variable of human capital measured using VAHU and relational capital measured using VACA positively affect the firm's profitability. Contradicting result is observed on structural capital (STVA) that does not affect a firm's profitability. Lastly, the control variable firm's age (AGE) negatively affects profitability, while interest rate (RATE) does not.

4. Discussion

4.1 Human Capital and Profitability

The t-statistics analysis shows a $0.0170 < 0.05$ significance score for human capital on profitability. This finding supports the first hypothesis that human capital positively affects profitability and aligns with previous research by Falikhatun and Mudrikah (2022), Asyik (2021), and Rajindra (2021) that found similar results.

The finding of this study aligns with the previous studies in Resource Based Theory that an organization with strong resources can generate optimum long-term performance. The increasing effectiveness in a firm's resource management, in this case, intellectual capital, including human capital, will generate better results that improve their financial performance (Nizar & Anwar, 2015). Human capital's positive effect on profitability also provides information that a firm's products and processes can be improved through their human capital as an intangible resource. Investing in human resource competence will increase financial performance (Tran & Vo, 2020).

4.2 Structural Capital and Profitability

Structural capital has a significance level of $0.7123 > \rho$ -value 0.05, indicating that the result of the statistical analysis does not support the second hypothesis on the positive effect of structural capital on a firm's profitability. This conclusion aligns with those of Rajindra, (2021), Ozkan et al. (2017), and Simarmata and Subowo (2016). Structural capital consists of non-human knowledge, which includes a company's strategy, organizational structure, and firm routines (Arifa & Ahmar, 2016), referring to the concept of a "knowledge-based economy" that knowledge supports economic growth. According to this notion, a firm's success is ensured by

physical resources like as buildings and plants, as well as humans resources' mastery of science and technology. Thus, non-human capital, such as technology, will not significantly influence a firm's profitability if not supported by adequate human knowledge (Asyik, 2021).

4.3 Relational Capital and Profitability

The t-statistic test results demonstrate that a positive effect of relational capital on a firm's profitability with a significance level of $0.0000 < 0.05$, supporting the third hypothesis. This finding also aligns with those of Tangngisalu (2022), Septiani et al. (2021), and Febrianty & Febriantoko (2018), that relational capital can increase a firm's profitability. Furthermore, positive relationships between companies and external parties, such as client satisfaction, can strengthen the firm's relations and image, hence enhancing profitability. (Falikhatusun & Mudrikah, 2022).

The research also supports the theory utilized, Resource Based Theory. Company's resources must be prioritized because each firm has distinct and diversified resources. The theory also emphasizes that both tangible and intangible resources need to be considered by firms in running their business (Kabuye et al., 2021). Human capital, as a part of a firm's resources, can generate desired outcomes when managed professionally. This activity will then affect the relational capital that covers all organization's relationships with its stakeholders: customers, suppliers, government, and other external parties. Without adequate relational capital, firms cannot manifest satisfying market value and financial performance (Chizari et al., 2016).

4.4 Control Variables and Profitability

The statistical analysis on the control variable, the firm's age, shows a significance level of $0.0135 < 0.05$ with a negative coefficient, indicating that the firm's age negatively affects the firm's profitability. Older firms often face difficulties adapting to new technologies, thus facing difficulties competing with competitors. Older firms might have a more extended operational history, but their productivity might be decreasing because of this (Rahman & Yilun, 2021).

Another t-statistic test using the control variable generates a level of significance of $0.696 > 0.05$ on the interest rate effect on profitability. This conclusion demonstrates that the control variable shows no effect on profitability. According to Ehiogu & Nnamocha (2018), general insurance firms tend to invest their funds into financial instruments such as short-term deposits. A general insurance policy is valid annually, matching the maturity period of short-term deposits, which is less than a year. Thus, interest rate does not affect a general insurance firm's profitability.

4.5 Robustness Test

A robustness test examines the changes in the primary regression model when the specifics are modified. In most cases, the adjustment is made by adding or removing a regressor. The robustness test assists researchers in determining the weaknesses of a regression coefficient. Insignificant changes in the regression coefficient indicate the regression coefficient's robustness (Lu & White, 2014). The robustness test is conducted in this study by changing the measurement for the dependent variable from ROE to Return on Assets (ROA) and Net Profit Margin (NPM), adding the firm's size as the control variable, and conducting separate analyses for conventional and sharia general insurance company.

Table 7. Robustness Test

	Model 1 (ROA)		Model 2 (NPM)		Model 3 (SIZE)		Model 4 (Conventional)		Model 5 (Sharia)	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
C	-0.0005	0.9628	0.1022	0.1330	-0.3844	0.0000	-0.0625	0.0075	0.0094	0.8460
VAHU	0.0028	0.0000	0.0114	0.0001	0.0146	0.0000	0.0190	0.0000	0.0053	0.0082
STVA	-0.0062	0.0007	0.0396	0.0003	-0.0122	0.0010	-0.0111	0.0011	-0.0632	0.0052
VACA	0.0075	0.0000	0.0623	0.3702	0.3941	0.0000	0.4132	0.0000	0.1198	0.0001
AGE	0.0001	0.3806	0.0009	0.1866	-0.0001	0.6310	0.0001	0.5401	0.0004	0.6217
RATE	0.0011	0.5795	-0.0025	0.8353	0.0005	0.8907	0.0022	0.5703	0.0052	0.6269
SIZE					0.0127	0.0000				
Adjusted R²-Squared	0.4508		0.1637		0.7872		0.8174		0.5876	
Rⁿ-Squared Stat.	166.4463		38.0241		1075.524		1458.564		34.3456	
Prob.	0.0000		0.0000		0.0000		0.0000		0.0000	

Source: Processed Data (2023), Eviews 12

Model 1 shows that replacing ROE with ROA as a measure of a firm’s profit brings different results from the primary regression model. Human capital, relational capital, and interest rate are robust, while structural capital is not robust because it negatively affects profitability. The firm’s age also shows not robust results because it does not affect profitability. Replacing ROE with NPM generates the result summarized in Model 2. The result of this analysis also differs from the primary model in which structural capital, relational capital, and firm age are not robust.

Model 3 shows the robustness test result by adding firm size as a control variable. The regression findings show that human and relational capital remain robust and have similar results to the primary model. Interest rate as a control variable is also robust because it does not affect profitability. A different result is generated in structural capital, which negatively affects the firm’s profitability, while the primary model shows no significant effect of interest rate. Thus, the result is not robust, similar to the firm’s age, which generates non-robust results.

Separate analysis for conventional (Model 4) and sharia segments (Model 5) generate similar results: human capital, relational capital, and interest rate remain robust. Structural capital and firm age are not robust because the result differs from the primary model.

5. Conclusions and Suggestions

According to the statistical analysis results, human capital, structural capital, relational capital, firm age, and interest rate simultaneously have an influence on a company’s profitability. Therefore, intellectual capital simultaneously and positively affects a firm’s profitability. This outcome compatible with the implementation of Resource Based Theory, which assumes that a

corporation owns unique intangible resources, such as intellectual capital, that can achieve competitive advantage and create values. This finding shows that an efficient value creation process in a firm is an effort to increase profits that affect a firm's profitability.

Partially, human capital positively affects profitability, meaning that the increase in human capital will improve the firm's profitability. Structural capital does not affect profitability; consequently, structural capital changes have no effect on profitability changes. Relational capital positively affects profitability, meaning that increasing relational capital can increase firm performance. A firm's age as a control variable negatively affects profitability, while interest rate does not. Thus, the changes in interest rates do not affect the firm's profitability.

ROE as the measure of profitability in the primary model and ROA and NPM in the robustness check show the weaknesses in the model. ROE is commonly used to calculate the level of return from a stockholder's investment by dividing the total net income by the total equities. In this matter, ROE does not explain the risks taken by the firm in generating ROE. Thus, ROE only focuses on return while disregarding the component of risks. Since income is impacted by fixed asset depreciation and value distortion during inflation, ROA as a measure of profitability has a limitation. Therefore, the relationship between the market and the firm's financial performance is poorly described. NPM also has a limitation because net income does not always reflect the firm's operational activities because it may come from asset sale activities. Thus, future studies are expected to adopt alternative measurements besides ROE, ROA, and NPM to measure profitability and represent profitability scores accurately.

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