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The Effect of Intellectual Capital and Profitability on Firm Value: Evidence from Banking Industry Listed in Indonesia Stock Exchange

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ABSTRACT

This research aims to analyze the effect of Intellectual Capital (Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), Structural Capital Value Added (STVA) and Profitability on Firm Value Evidenve from Banking Industry Listed in Indonesia Stock Exchange. The object of research from banking on the IDX in the period 2013-2023. The research method used is quantitative, secondary data type with multiple linear regression models. The sampling technique used purposive sampling method. The number of samples used in this research amounted to 5 banking industry. The results of the research state that Value Added Capital Employed (VACA), Value Added Human Capital (VAHU) Structural Capital Value Added (STVA) simultaneously affects the firm value, then the effect of Value Added Capital Employed (VACA), has a positive effect on firm value, Value Added Human Capital (VAHU) has a positive effect on firm value while Structural Capital Value Added (STVA) has no significant effect on Firm Value and Profitability affects Firm Value.

Keywords: *Intellectual Capital*, *Value Added Capital Employed* (VACA), *Value Added Human Capital* (VAHU), *Structural Capital Value Added* (STVA), *Profitability, Firm Value*.

1. Introduction

Firm value is important, because with high firm value, the welfare or prosperity of shareholders will increase. Good firm value provides an overview for potential investors to make investment decisions (Palupi & Hendiarto, 2018). The high firm value will be followed by an increase in stock prices which illustrates increased prosperity for investors. Investor confidence in a firm is not only in the firm's current performance but in its future prospects. The value presented in the financial statements is considered insufficient to describe the firm value. This statement is evidenced by the gap between the market value and book value of shares which is considered as a benchmark for the firm value, the difference between the two values is widening every year in most countries (Lev and Zarowin, 1999). This gap has attracted the attention of researchers to explore the value that is not visible in the financial statements.

One of the internal factors that affect firm value is Intellectual Capital (Amirullah et al, 2021). Intellectual Capital is an intangible asset, which is a non-monetary asset that can be identified and has no physical form and is owned for use in producing or delivering goods and services, leased to other parties, or for administrative purposes (IAI, 2009). The concept of intellectual capital according to Madani et al., (2015) states that the intellectual capital of a firm consists of 2 important components, namely; tangible assets in Pulic termed capital employed which includes physical assets and financial assets, the last component is; intangible assets which includes human capital and structural capital.

The concept of tangible assets reflected in capital employed which includes physical and financial assets, for example how a firm manages physical assets so that these assets can work efficiently, then for financial assets namely how firm manage finances by increasing sales, budgeting appropriately, efficient use of firm capital and analyzing financial ratios in predicting future financial challenges and needs. As for the concept of intangible assets reflected in human capital, for example, in the form of expertise and innovation generated from employees who are inseparable from training. From structural capital, an example can be given of how firm manage knowledge such as corporate culture, firm operational systems and production processes to support employee performance along with other firm infrastructure Singh and Rao (2016). Based on this concept, Pulic (2000) suggested an indirect measurement of Intellectual Capital, namely by measuring the efficiency of the added value generated by the firm intellectual capabilities called Value Added Intellectual Coefficient (VAIC), namely physical capital (VACA) value added capital employed, human capital (VAHU) value added human capital, and structural capital (STVA) structural capital value added.

In this research, researchers position Intellectual capital (VACA, VAHU and STVA) as an independent variable and Profitability (ROA) as the dependent variable. This research is a replication of Anggraini et al., (2020) in which there is only one independent variable, namely intellectual capital, while this research adds one independent variable, namely the profitability variable. Previous research chose the population and sample of firm in the real estate and construction industry which are listed on the IDX, while this research population is banking industry on the Indonesia Stock Exchange (IDX). Furthermore, previous research used the years 2014-2018, while this research was conducted in the 2013-2023 period.

2. Literature Review

2.1 Resources Based Theory

Resources based theory reviews the firm's strategy in processing and utilizing all of its resources. Firms achieve competitive advantage when they have the ability to manage and utilize their resources. Thus, resources based theory in this research explains about the firm's competitive advantage obtained by utilizing all of its resources, including intellectual resources, both employees (human capital), physical assets (physical capital) and structural capital.

2.2 Signaling Theory

Signaling theory is a signal that discusses how management views the firm's prospects in order to provide signals to investors (Brigham and Hauston, 2011). Signal theory has relevance to the availability of firm information. Information commonly used by external parties is financial statements.

2.3 Firm Value

Firm value is a value that can be used to measure the importance of a firm from the point of view of many parties, such as investors who associate the value of a firm with its share price (Gultom et al., 2013). This study chose Tobin's Q because the measurement has the advantage that it tends to compare the market value of the firm with the replacement value of assets so that intangible assets also affect it.

$$Q_{it} = \frac{(EMV_{it} + D_{it})}{(EBV_{it} + D_{it})}$$

Description:

Q : Firm Value

EMV : Market Value of Equity = closing price x number of shares outstanding

D : Book Value of Total Debt

EBV : Book Value of Total Assets

2.4 Intellectual Capital

Intellectual capital is the firm's intangible assets which include: knowledge, information, experience, resources and organization. VAIC™ is contained in the firm's financial statement accounts (balance sheet, profit and loss). There are three component elements in VAIC™, namely VACA (physical capital), VAHU (human capital), and STVA (structure capital). According to Pulic (1999), in summary, the formulation and calculation stages of VAIC™ are as follows:

2.4.1 Calculating Value Added (VA)

The formula for calculating VA is as follows: VA = OUTPUT – INPUT

Description:

VA : Value Added

Output : total sales and other income

Input : expenses / operating expenses and other expenses (other than employee expenses)

2.4.2 Calculating Value Added Capital Employed (VACA)

VACA shows how much VA can be created by one unit of capital employed (CE).

The formula to calculate VACA is as follows: VACA = VA / CE

Description:

VACA : Value Added Capital: Ratio of VA to CE

VA : Value Added

CE : Capital Emlpoyed: Physical assets (equity, net income)

2.4.3 Calculating Value Added Human Capital (VAHU)

VAHU shows how much value added (VA) is obtained from spending money on human capital.

The formula for calculating VAHU is as follows:VAHU = VA / HC

Description:
VAHU : Value Added Human Capital: the ratio of VA to HC
VA : Human Capital: Employee expenses or staffing

2.4.4 Calculating Structure Capital Value Added (STVA)

This ratio measures the amount of structure capital (SC) needed to generate value added (VA) and is an indication of how successful SC is in carrying out the value creation process in the Company.
The formula for calculating STVA is as follows: STVA = SC / VA
Description:
STVA : Structural Capital Value Added: ratio of SC to VA
VA : Value Added
SC : Structural Capital (VA -HC)

2.4.5 Calculating Value Added Intellectual Coefficient (VAICTM)

The ratios above are calculations of the intellectual capabilities of a firm. The result is a new and unique indicator contained in the value added intellectual coefficient (VAIC), which is as follows:
VAIC = VACA + VAHU + STVA

2.5 Profitability

Profitability shows the end result of a number of firm management policies and decisions. Profitability describes and measures the firm's ability to generate profits from the operational processes that have been carried out to ensure the continuity of the firm in the future (Manoppo and Arie, 2016).

$$ROA_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Assets_{i,t}}$$

Net Income: Earning After Tax

3. Research Methodology

3.1 Research Design

This research is quantitative research. The population in this research is banking industry which listed on the Indonesia Stock Exchange for the period 2019 - 2023. This study uses purposive sampling technique in data collection so that it determines 5 banking industry listed on the Indonesia Stock Exchange for the 2019-2023 period which publish annual reports with complete data according to the research variables.

The research data collection technique is to use data sources in the form of secondary data, because the data source uses secondary data, the data collection technique used is documentation. The secondary data used in this study comes from the Indonesia Stock Exchange (IDX) website, in the form of annual financial reports.

3.2 Analysis Thnique

3.2.1 Descriptive Analysis

According to Ghazali (2014: 19) descriptive statistics provide an overview or explanation of data seen from the average value (mean), standard deviation, variance, maximum and minimum.

3.2.2 Classical Assumption Test

3.2.2.1 Normality Test

This research tests the normality of the data using the one sample Kolmogorov-Smirnov test, with a significance level of 5%.

3.2.2.2 Multicollinearity Test

Multicollinearity testing aims to test whether there is a relationship between several or all independent variables in the regression model. A good regression model should not have a correlation between the independent variables (Ghozali, 2014: 92).

3.2.2.3 Autocorrelation Test

Autocorrelation testing aims to test whether in a linear regression model there is a correlation between confounding errors (residuals) in period t and confounding errors in period t-1 (previous period). To detect the presence of autocorrelation, it can be done with the Durbin Watson test (DW test).

3.2.2.4 Heteroscedasticity Test

A good regression model is one with homoscedasticity or no heteroscedasticity (Ghozali, 2018). The Park test is one of the statistical techniques used to test for heteroscedasticity in regression models.

3.2.3 Regression Analysis

The analysis model used in this research is

$Y = \alpha + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4$

Description:

Y is Firm Value, α is Constant, β is Regression Coefficient, X_1 is Value added capital employed (VACA), X_2 is Value added human capital (VAHU), X_3 is Structural capital value added (STVA) and X_4 is Profitability.

3.2.4 Coefficient of Determination

This test is intended to determine the best level of certainty in regression analysis, which is expressed by the coefficient of determination. The coefficient of determination, namely ��2 = 1, means that the independent variable has a perfect effect on the dependent variable, and if on the contrary ��2 = 0, it means that the independent variable has no effect on the dependent variable.

3.2.5 Hypothesis Test

The dependent variable in this study is firm value (Y), while the independent variable consists of Value added capital employed (VACA) (X_1), Value added human capital (VAHU) (X_2),Structural capital value added (STVA) (X_3) while Profitability (X_4).

Hypothesis Statement:

H1 : Value added capital employed (VACA) has a positive effect on firm value.

H2 : Value added human capital (VAHU) has a positive effect on firm value.

H3 : Structural capital value added (STVA) has a positive effect on on firm value.

H4 : Profitability has a positive effect on on firm value.

H5 : Value added capital employed (VACA), Value added human capital (VAHU), Structural capital value added (STVA) and Profitability have a positive effect on on firm value

4. Results

4.1 Classical Assumption Result

4.1.1 Normality Test

Table 1. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		50
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.03993877
Most Extreme Differences	Absolute	.125
	Positive	.125
	Negative	-.083
Test Statistic		.125
Asymp. Sig. (2-tailed)		.048[c]
Exact Sig. (2-tailed)		.380
Point Probability		.000

Source: SPSS output, 2024 (processed).

According to Table 1 the exact value of sig. (2-tailed) is 0.380. The exact value has a significance ≥ 0.05 which indicates that the data is normally distributed.

4.1.2 Autocorrelation Test

Table 2. Model summary durbin watson value

R	*R-Square*	*Adj. R-Square*	*Std. Error*	*Durbin-Watson*
0.979[a]	0.959	0.956	0.041	1.296

Source: SPSS output, 2024 (processed).

Detecting the presence or absence of autocorrelation can be done by doing the durbin-watson test (Ghozali, 2018). There is no autocorrelation, positive or negative if du ≤ d ≤ 4 - du. The analysis uses 5 variables and 50 data, so it has a du table value of 1.770. Because the value of 1.296 ≤ 1.770 ≤ (4 - 1.296) or 1.296 ≤ 1.770 ≤ 2.704, the data can be interpreted that the data has passed the autocorrelation test.

4.1.3 Multicolonieality Test

Table 3. Tolerance and VIF values

Variable	*Tolerance*	VIF
X1	0.612	1.635
X2	0.758	1.32
X3	0.672	1.488
X4	0.937	1.068

Source: SPSS output, 2024 (processed).

It is known that the tolerance value is ≤ 0.10 or equal to the VIF value ≥ 10. There is no significant evidence that there is a perfect or strong linear relationship between pairs of independent variables in the multiple linear regression model.

4.1.4 Heteroscedasticity Test

Table 4. Park Test significance value

Variable	B	*Std. Error*	*Beta*	t	*Sig.*
(Constant)	33.086	15.511		2.133	0.438
X1	0.646	0.414	0.260	1.560	0.126
X2	3.643	3.660	0.149	0.995	0.325
X3	1.039	0.355	0.466	2.925	0.055
X4	2.810	1.297	0.292	2.166	0.136

Source: SPSS output, 2024 (processed).

Based on the table, it is known that the data has a significance value ≥ 0.05 when using LN_RES as the dependent variable. There is no strong indication that the residual variance has a special pattern and remains stable throughout the range of predictor values or observation groups.

4.2 Regression Analysis Result

4.2.1 F-test (simultaneous)

Table 4. Durbin Watson model summary value

R	*R-Square*	*Adj. R-Square*	*Std. Error*	*F Change*
0.979[a]	0.959	0.956	0.041	264.538

Source: SPSS output, 2024 (processed).

It is known that the significance value in this study is 0.000 which is less than alpha 0.050. The independent variable simultaneously affects the dependent variable. The amount of data tested is 50 and the number of variables is 5, so to determine the F table, the df for the denominator N2 is n - k = 50 - 5 = 45 and N1 is k - 1 = 5 - 1 = 4. Then the F table value is 2.40. Because F count 264.538 is greater than F table 2.40, Ho is rejected, which means that the independent variables together have a real effect on the dependent variable. VACA (X_1), VAHU (X_2), STVA (X_3), and ROA (X_4) have an impact on company value (Y).

4.2.2 Coefficient of determination (R^2)

This coefficient of determination lies between 0 and 1 (0 ≤ R-Square ≤ 1). The coefficient of determination is getting better the closer it is to 1. According to Ghozali and Latan (2015), an R-Square value of 0.75 is categorized as strong, 0.5 is categorized as moderate, and 0.25 is categorized as weak. It is known that the R-Square value in the summary model output is 0.956, which is 95.6 percent of the influence of the independent variable on the dependent can be explained by the model. The remaining 4.4 percent is another variable outside the tested model. The R-Square value of 0.956 is included in the strong category, in which the regression model as a whole is able to explain most of the variation in the dependent variable.

4.2.3 t test (partial)

Table 5. Regression Analysis Result

Model	*Unstandarized C.*		*Stand. C.*	t	*Sig.*
	B	*Std. Error*	*Beta*		
(Constant)	1.681	0.393		4.279	0.000
X1	0.263***	0.010	0.966	25.087	0.000
X2	0.197**	0.093	0.074	2.128	0.039
X3	0.006ns	0.009	0.024	0.665	0.509
X4	0.072**	0.033	0.068	2.178	0.035

Source: SPSS output, 2024 (processed).

*** : Significance value alpha 1%, t table 2.414
** : Significance value of alpha 5%, t table 1.679
* : Significance value of alpha 10%, t table 1.300
ns : Not significant

The amount of data tested is 50 and has 5 variables. Then the value of df = n - k = 50 - 5 = 45. The t value at level 0.01 (α = 1 percent) is 2.412, level 0.05 (α = 5 percent) is 1.679, and level 0.10 (α = 10 percent) is 1.300. The variable that has no effect individually is STVA (X_3) because it has a t value ≤ t table and has a significance of more than the alpha value. Variables that have an individual effect are VACA (X_1), VAHU (X_2), and ROA (X_4) because they have a t value > t table and have a significance less than the alpha value.

The results of multiple linear regression analysis are as follows
$Y = 1{,}681 + 0{,}263X_1 + 0{,}197X_2 + 0{,}006X_3 + 0{,}072X_4 + e.$
Firm Value = 1,681 + 0,263 VACA + 0,197 VAHU + 0,006 STVA + 0,072 Profitability + error.

5. Discussion

5.1 The Effect of Intellectual Capital Value Added Capital Employed (VACA) on Firm Value

VACA (X_1) has an individual effect on firm value (Y). It is evident from the value of t> t table (25.087 > 2.414) and has a significance value of less than alpha level 0.01 (α = 1 percent) which is 0.000. VACA that increases by 1 unit will increase firm value by 0.263 units with the assumption that other variables are considered constant. The positive relationship results are in line with the theoretical basis. Firm that are able to manage assets well and can reduce operating costs so as to increase the added value of the results of the Firm's intellectual abilities.

There is a significant positive correlation between Value Added Capital Employed (VACA) and firm value and VACA is the most dominant indicator compared to other indicators in forming Intellectual Capital (Utami, 2018; Nugrahanto, 2018).

5.2 The Effect of Intellectual Capital Value Added Human Capital (VAHU) on Firm Value

VAHU (X_2) has an individual effect on firm value (Y). Evidenced by the value of t count> t table (2.128 > 1.679) and has a significance value smaller than the alpha level of 0.05 (α = 5 percent), which is 0.039. VAHU which increases by 1 unit will increase the firm value by 0.197 units with the assumption that other variables are considered constant. The positive relationship results are in line with the theoretical basis. Based on the resource-based theory, intellectual capital owned by the firm can create added value that provides a competitive advantage over its competitors, so it is expected to increase sales. According to Tseng et al., (2015), an increase in therevenue per employee means that the employees make more contribution to the corporationand enhance the corporate value, which might be the reason for human capital being soimportant to the firm.

5.3 The Effect of Intellectual Capital Structural Capital Value Added (STVA) on Firm Value

STVA (X_3) has no effect individually on firm value (Y). Evident from the value of t count ≤ t table (0.665 < 1.679) and has a significance value of more than the alpha level of 0.05 (α = 5 percent), which is 0.039. STVA which increases by 1 unit does not increase the company value by 0.006 units with the assumption that other variables are considered constant. This is supported by the results of research (Utami, 2018) that there is no significant relationship between STVA and firm value. So that it rejects research (Nugrahanto, 2018) which says STVA has a significant effect on firm value. Structural Capital is a means of supporting employee performance infrastructure in issuers. Based on the results of the hypothesis, it can be observed that the issuer's infrastructure services have not been able to mobilize employees in increasing the added value of the issuer. Databases, software, company operational systems, production processes, organizational structures, good work culture, and others owned by issuers are not economical and efficient in creating firm value.

5.4 The Effect of Profitability on Firm Value

Profitability (X4) has an individual effect on firm value (Y). Evidenced by the value of t count > t table (2.178 > 1.679) and has a significance value smaller than the alpha level of 0.05 (α = 5 percent) which is 0.035. Profitability that increases by 1 unit will increase the firm value by 0.072 units with the assumption that other variables are considered constant. The results of this positive relationship are in line with the theoretical basis. Based on the results of hypothesis testing, it shows that profitability has a positive effect on firm value. With high profitability, the firm will be considered very good in its performance because it has a lot of profit and the potential to attract investors will be more, therefore if the firm's profit is high, the firm's value will also increase. Investors consider that the firm earns net income from managing its equity efficiently so that it will have an impact on the market of firm value (Amro and Asyik, 2021).

5.5 The Effect of Intellectual Capital Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), Structural Capital Value Added (STVA) and Profitablitas on Firm Value

The results of the F-test test explain if the X variables such as VACA, VAHU and STVA together have a significant effect on variable Y, namely firm value through Tobin's Q measurement. It can prove the calculated F value of 0.596 and a significance of 0.000, which is smaller than the research significance level of 0.05. And hypothesis 5 (five), namely Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), Structural Capital Value Added (STVA) and Profitability simultaneously have a significant effect on Company Value. The results of this hypothesis are supported by the hypotheses (Tangngisalu, 2021) VACA, VAHU and STVA simultaneously have a positive and significant effect on firm value.

6. Conclusion

This research reveals that average net income per employee has a positive impact on firm value, which suggests that firm should make more efforts to improve their human resources. With the different skills and abundant knowledge of employees, knowledge, technology diffusion, and R&D performance can be improved, which is favorable for innovation and competition. Therefore, firms with qualified employees can generate firm value constantly and survive in a highly competitive business world even though, goodwill and intangible assets, do not have a positive impact on firm value, this means that low structural capital can inhibit employee productivity in creating firm value added, where the inhibition of value added will have an impact on the firm's less than optimal performance. Meanwhile, Profitability affects Firm Value, if the firm's profitability is good, investors will see the extent to which the company is able to create profits on sales and investment. Firm with increasing profitability, the greater the net profit of the firm.

7. References

Amro, P. Z. N., & Asyik, N. F. (2021). The Effect of Profitability, Firm Size, and Capital Structure on Firm Value. *Journal of Accounting Science and Research*, 10(7), 1-20.

Anh Huu Nguyen & Duong Thuy Doan, 2020. "The Impact of Intellectual Capital on Firm Value: Empirical Evidence from Vietnam," *International Journal of Financial Research, Sciedu Press*, vol. 11(4), pages 74-85, July.

Anisyah and Purwohandoko. 2017. The Effect of Profitability, Leverage, firm Size and Capital Structure on Firm Value in the Mining Sector Listed on the Indonesia Stock Exchange for the 2010-2015 Period. *Journal of Business Managerial* - Volume 1, Number 1, August - November 2017: 34 - 46

Bontis, N. (2001), "Assessing knowledge assets: a review of the models used to measure intellectual capital", *International Journal of Management Reviews*, Vol. 3 No. 1, pp. 41-60.

Brigham, Eugene F. and Houston, Joel F. 2011. *Fundamentals of Financial Management Translation*. 10th Edition. Jakarta: Salemba Empat.

Gultom et al. (2013). Analysis of Factors Affecting Firm Value in Pharmaceutical Firms on the Indonesia Stock Exchange. *Journal of Wira Ekonomi Mikrosil*, 3 (1), 51-60.

Heven Manoppo, Fitty Valdi Arie. 2016. The Effect of Capital Structure, Firm Size and Profitability on the Value of Automotive Firms Listed on the Indonesia Stock Exchange for the Period 2011-2014. *Journal of Economics, Management, Business and Accounting 485* Vol.4 No.2 June 2016 (Santoso, 2002: 212).

Indriyani, Eka. 2017. The Effect of Firm Size and Profitability on Firm Value. Accountability: *Journal of Accounting Science* Volume 10 (2), October 2017 P-ISSN: 1979-858X; E-ISSN: 2461-1190 Page 333 - 348

Lev Baruch and Paul Zarowin. 1999. The Boundaries of Financial Reporting and How to Extend Them. *Journal of Accounting Research*, Vol, 37, No. 2 pg 353-385. The Institute of Professional Accounting, Graduate School of Business, University of Chicago.

Palupi, R. S., & Hendiarto, S. (2018). Debt Policy, Profitability and Dividend Policy on Property & Real Estate Firm Value. *Journal of Ecodemica*, 2(2), 177-185.

Pulic, A. 2000. "VAICTM - an Accounting Tool for IC Management". *International Journal Technology Management*, Vol. 20 No. 5/6/7/8. Pp 702-714.

Singh, B. and Rao, M.K. (2016), "Effect of intellectual capital on dynamic capabilities", *Journal of Organizational Change Management*, Vol. 29 No. 2, pp. 129-149

Tangngisalu, J. (2021). The Impact of Intellectual Capital on firm Value. *Journal of Business Management*, 8(1), 182-190. https://doi.org/10.33096/jmb.v8i1.690

Tseng, K.A., Lin, C.I. and Yen, S.W. (2015), "Contingencies of intellectual capitals and financial capital on value creation: moderation of business cycles", *Journal of Intellectual Capital*, Vol. 16 No. 1, pp. 156-173

V. Wiratna Sujarweni, 2007, "*Easy Guide to Using SPSS & Examples of Research in Economics*", Publisher Ardana Media, First Print February 2007.