

# The Effect of Intellectual Capital and Capital Structure on Firm Value with Profitability as an Intervening Variable in SOE Companies Listed on the IDX

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## ABSTRACT

This study aims to determine the effect of intellectual capital and capital structure on firm value and profitability as intervening variables. This research was conducted on publicly listed state-owned companies that have been and are still listed on the Indonesia Stock Exchange (IDX) for the 2015 -2019 period, namely 22 companies. Samples were taken using purposive sampling, so 17 companies were selected with 85 observations. Research data analysis techniques using path analysis techniques. The method used in this study is the random effect model panel data regression method. The study results show that Intellectual Capital, Capital Structure, and Profitability simultaneously affect Firm Value. Partially the Intellectual Capital and Capital Structure variables do not affect firm value, while Profitability has a positive and significant effect on firm value. Testing the second hypothesis shows that the variable Profitability cannot mediate the relationship between Intellectual Capital and Capital Structure on Firm Value.

**Keywords:** *intellectual capital, capital structure, profitability, firm value*

## INTRODUCTION

A company aims to increase the prosperity of company owners or shareholders by increasing the value of the company. Firm value is a condition a company achieves after going through a series of activities

within a certain period, illustrating public trust in the company (Muhammad & Tieka, 2021). The company's long-term goal is to optimize the value of the company. The firm value will be reflected in the market price of its shares. Suppose the firm value is assessed from the physical alone. In that case, the results will not match the market value because values other than physical or intangible affect it. High corporate value is the desire of company owners because high corporate value will be followed by high shareholder prosperity (Brigham & Houston, 2011). The stock market price represents Shareholder and company wealth, which reflects investment, financing, and asset management decisions. An increase in stock prices will be followed by an increase in the company's value, which cannot be separated from the influence of the company's performance. Financial performance is one of the fundamental aspects of assessing the conditions owned by companies, the public, or potential investors before considering several matters relating to information that they can use as a basis for investment decisions. The result of the policy taken by management is an advantage in taking profit ratios which are useful for determining how much profit the company gets. The higher the profit level, the better the management manages the company (Sutrisno, 2012). A

company is responsible for maintaining and improving financial performance so that these shares remain in demand by investors. Research conducted by Wahyudi (2019) shows that financial performance positively affects firm value. The higher the financial performance of financial ratios, the higher the firm value. The level of success of company management in managing assets and capital owned to maximize firm value is through financial ratios.

The Indonesia Stock Exchange is currently the only capital market in Indonesia. There are many companies listed on the Indonesia Stock Exchange, one of which is a company under the auspices of the Ministry of SOEs, in which BUMN companies are in almost all business sectors, including the mining sector, the service industry sector, banking, the property, and real estate sectors. As one of the economic actors, BUMN companies also face global competition, so they are asked to manage their resources efficiently and effectively (Karsam, 2017). In its strategic role, SOEs need innovation in policy instruments to encourage company development in a better direction.

State-owned companies have not fully optimized the use of intellectual capital before 2019. This can be caused by various factors, such as a lack of awareness of the importance of managing and utilizing intellectual capital, a lack of a clear strategy for managing and developing intellectual assets, and a lack of investment in developing and improving employee capabilities. However, with the launch of the AKHLAK Innovation in state-owned companies in 2019, it can be expected that there will be an increase in the utilization of intellectual capital. AKHLAK's innovation attempts to integrate high moral and ethical values into the corporate culture to form a more innovative, collaborative, and competitive work environment. Utilization of intellectual capital in State-Owned Enterprises (BUMN) companies has significant potential to improve the company's performance and competitive advantage. Intellectual capital refers to the

value embodied in an organization's knowledge, expertise, information, brand equity, and relationships. Good companies generally have a firm value (PBV ratio) greater than 1 (Elia, 2016). The higher the PBV value will reflect the higher share price compared to the book value per share. The higher the stock price, the more successful the company is in creating value for its shareholders.

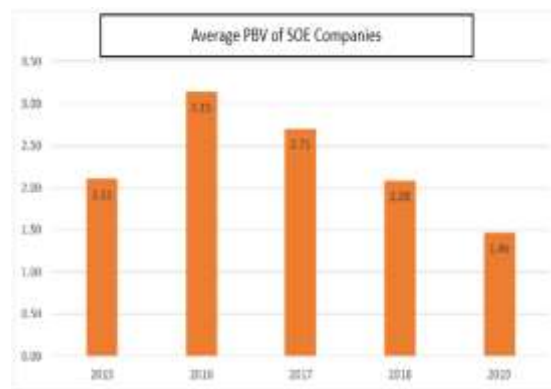


Figure 1. Average PBV of SOE Companies

Figure 1 above shows the increase and decrease in the average firm value, proxied by price to book value (PBV) for state-owned companies listed on the IDX for the 2015-2019 period. In 2015 the average firm value was 2.11, and the firm value increased in 2016 to 3.15, or an increase of 49%. It happened due to an increase in share prices in state-owned companies. However, in 2017 there was a decrease in the firm value to 2.71 or a decrease of 14%, and the decline in the average value of the company continued until 2019, namely to 1.46. The cause of problems related to the low value of BUMN companies is that the performance of BUMN companies has not been optimal. Budiando et al. (2018) argue, "BUMN companies pay less attention to the intellectual capital component, so they are less able to create added value for the company." BUMN, as a company, is expected to be able to build identity, create excellence, and corporate competitiveness. For this reason, a conducive work environment and BUMN Human Resources (HR) with positive behavior are needed so that the productivity and performance of

BUMN can be increased sustainably. This can be seen from market capitalization fluctuations, which reflect firm value fluctuations. Fluctuations in firm value can be interpreted as inconsistent company performance, and each company must take this seriously if investors want to invest in their company.

A company can have a competitive advantage if it can create higher economic value than other companies in its industry. The business world's focus is no longer based on tangible assets but has shifted to intangible ones. Intellectual capital is one of the capital in the scientific literature that can be used as a resource for the company's progress in the future. Soetedjo & Mursida (2014) suggest that employee competence, customer relations, innovation creation, computer systems, and administration, and the ability to master technology are part of intellectual capital.

Capital structure is also a variable that needs attention. Capital structure is needed to improve company performance because determining capital structure in the company's funding policy determines profitability. The optimal capital structure must achieve a balance between ratios and returns.

Non-banking companies are more flexible in choosing a capital structure because they are not bound by special regulations related to minimum capital adequacy. A non-banking company may use more debt than equity if it is deemed profitable in terms of costs or tax benefits. However, although non-banking companies have greater flexibility, they also consider risk, financial stability, and sustainability factors in choosing a capital structure. Too much debt can increase a company's financial risk, especially if the company faces bad economic conditions or high-interest rates.

The reason for choosing profitability as an intervening variable is to determine whether there is a mediating effect between intellectual capital variables on firm value variables because profitability can be said to be a company's ability to generate net

income from activities carried out in the accounting period (Bringham & Houston, 2011). The importance of profitability can be seen by considering the impact of the company's inability to obtain maximum profits to support its operational activities. When the company gets the maximum profit, it will have an impact on increasing the value of the company. Investors will be more interested in investing in companies with high profits. Investors invest by looking at the profitability ratio (Prasinta, 2012).

If the profit is large, more investors will invest by buying the company's shares which will affect the stock price and firm value. Therefore, management requires this way to make a decision. The stakeholder theory supports this phenomenon according to Ghozali & Chariri (2007), which states that a company is not an entity that only operates for its own sake but must provide benefits to its stakeholders (shareholders, employees, creditors, consumers, suppliers, government, community, and other parties). Many studies are often conducted on companies in the manufacturing sector, the mining sector, the financial and banking sectors, and the consumer goods industry sector. At the same time, there is still not much research on the object of the BUMN company group. Research that discusses the firm value in state-owned companies is also very minimal. BUMN is one of the significant sources of public revenue in the form of various types of taxes, public and privatization proceeds. In this regard, the researcher feels quite interested in conducting this research.

Based on the background of the phenomenon and the many inconsistencies found in previous studies, the effect of intellectual capital and capital structure on firm value still needs further investigation. Besides that, the use of profitability as an intervening variable is also worth testing considering that there are still many gaps in previous research on profitability. The use of intervening variables in this study is because the firm value is not only the direct

result or result of intellectual capital but also other factors that contribute to firm value, namely profitability. This research aims to determine whether intellectual capital has a role in increasing firm value. Based on this background, the research entitled "The Influence of Intellectual Capital and Capital Structure on Firm Value with Profitability as an Intervening Variable in Soe-owned Companies Listed on the IDX."

## LITERATURE REVIEW

### Firm Value

Firm value is an important factor for investors because it relates to how the company is valued in the market. Increased firm value can attract investors to invest. Sadalia (2010) stated, "Firm value is the value or amount of money that will be received if the company is sold." Firm value is an investor's perception of the company, often associated with stock prices. High stock prices increase the company's value, thereby maximizing the wealth or value of the company. Andinata (2010) suggests that "price to book value (PBV) is a ratio that is often used to determine firm value and make investment decisions by comparing the market price per share with the company's book value."

In this study, firm value is calculated using the PBV ratio. With this ratio, investors can find several multiples of the market price to the book value per share they invest in. The greater the PBV, the higher the company is valued by investors compared to the funds that have been invested in the company.

$$PBV = \frac{\text{Market price per share}}{\text{Book value per share}}$$

### Intellectual Capital

Intellectual capital is intellectual capital owned by knowledge-based companies. Mohsen et al. (2014) stated that intellectual capital has become an important part of the company. Stakeholder theory is related to increasing

corporate value because, based on this theory, management will try to use all available resources to create added value for the company. Following the study of stakeholder theory, it can be concluded that there is an influence of intellectual capital on firm value. Randa & Solon (2012) stated that intellectual capital positively affects firm value in the context of manufacturing companies on the IDX. Previous research by Dyah et al. (2019), Nenden (2018), Budianto et al. (2018), and Mardhiana (2020) concluded that intellectual capital has a positive effect on firm value. In contrast to research conducted by Riski & Lidya (2019) which concluded that intellectual capital has a negative effect on firm value. The company has not optimally managed and developed intellectual property to compete.

This study measures intellectual capital based on value-added (VAICTM). Ningrum (2012) states that intellectual capital in the Pulic model is measured based on the value added created by capital employed (VACA), human capital (VAHU), and structural capital (STVA). The formula for calculating VAICTM is as follows:

$$VAICTM = VACA + VAHU + STVA$$

### Capital Structure

The company's funding decision is one of the influential aspects in creating value for the company. Therefore, companies need to make appropriate funding policies. The indicator used to determine the size of the capital structure used by the company uses the debt-to-equity ratio (Hermawan, 2017). The relationship between intellectual capital and capital structure will occur when management, as the company's human capital, can manage capital expenditures and decide whether to use its own or foreign capital (debt/loans). This capital structure policy greatly influences the company's operational activities in the future.

Brigham & Houston (2011) argues that companies with favorable prospects tend to avoid issuing new shares and seek their funding needs by utilizing loan reserve capacity, especially when there are good investment opportunities. The trade-off theory also explains that companies with debt will pay loan interest which can reduce taxable income to benefit shareholders. This tax deduction will increase the company's profits, and these funds can be used for future company investments or to distribute dividends to shareholders.

Kusumajaya (2011) states that capital structure positively and significantly influences firm value. This result is in line with Andi et al. (2018). However, studies by Nenden (2018) and Gabrielle (2015) show inconsistent results, namely that capital structure does not affect firm value. Likewise, the research conducted by Yohana et al. (2018) shows that capital structure negatively affects firm value.

$$DER = \frac{\text{Total Debt}}{\text{Total Equity}} \times 100 \%$$

### Profitability

Profitability is the ratio used to measure the overall effectiveness of management proposed by the size of the level of profit earned from sales and investment. Based on the Signaling Theory, an increase in ROE causes an increase in demand for shares by investors so that the company's value increases. Return on equity (ROE) is a ratio that shows a company's ability to generate net income to return on shareholder equity. ROE is a financial ratio used to measure the profitability of equity. The greater the ROE results, the better the company's performance. The results of this study are consistent with research by Dyah & Dudy (2019), Prianka (2018), Budianto et al. (2018), and Andi et al. (2018), who concluded that profitability has a positive effect on

firm value. Based on the theory and reinforced by the results of this study, this study adds profitability as an intervening variable to mediate intellectual capital and capital structure with firm value.

$$ROE = \frac{\text{Net Profit}}{\text{Total Equity}} \times 100 \%$$

### Framework

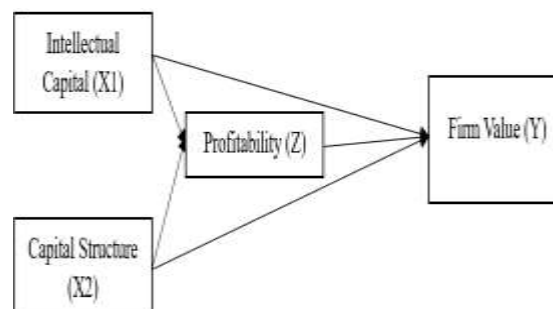


Figure 2. Framework

H1: Intellectual capital positively affects Profitability.

H2: Capital structure positively affects Profitability.

H3: Intellectual capital positively affects Firm Value.

H4: Capital Structure positively affects Firm Value.

H5: Profitability positively affects Firm Value.

H6: Profitability can mediate the influence between Intellectual Capital and Firm Value.

H7: Profitability can mediate the influence between Capital Structure and Firm Value.

### MATERIALS & METHODS

This type of associative research aims to determine the relationship between two or more variables (Sugiyono, 2015). The data in this study uses quantitative data types. This research was conducted to determine and analyze the effect of intellectual capital and capital structure on firm value, with profitability as the intervening variable.

The population in this study are all publicly listed state-owned companies that

have been and are still listed on the IDX for the 2015-2019 period. The total population in this study was 22 companies. The 20 companies are state-owned companies consisting of all sectors of companies listed on the IDX, and two public companies are also indirectly owned by the government where the company is a subsidiary of one of the public state-owned enterprises (public) and the rest are the result of acquisitions from private companies with public state-owned companies.

The sampling technique in this study was the purposive sampling technique. The purposive sampling method takes samples from the population based on certain criteria. The criteria used in selecting the sample are:

1. BUMN companies that have been and are still listed on the Indonesia Stock Exchange during the 2015-2019 research period.
2. The company published audited financial statements during the 2015-2019 research period.
3. Companies with positive net income during the 2015-2019 research period.
4. The company has complete data regarding the variables used in the research.

Based on these criteria, 17 companies were sampled in the study from 22 populations of state-owned companies listed on the IDX. The data in this study is sourced from the official IDX website via [www.idx.co.id](http://www.idx.co.id).

## RESULT

### A. Descriptive Statistical Analysis

Table 1 Descriptive Statistics

Ket.	VAIC	DER	ROE	PBV
Mean	4.150505	0.672706	0.588559	2.183765
Maximum	7.357377	1.940000	1.840000	6.840000
Minimum	1.277040	0.110000	0.012000	0.560000

Source: data processed with E-views 10

Based on the table above, it can be seen the description of the data from each variable

used in this study can be explained as follows:

1. The minimum value of intellectual capital is at PT. Kimia Farma (Persero) Tbk 2019 is 1.277, and the maximum value is at PT. Semen Baturaja (Persero) Tbk in 2015 amounted to 7,357. The average value of intellectual capital in the companies sampled in this study is 4.150.
2. The minimum value of the capital structure is at PT. Semen Baturaja (Persero) Tbk 2015 was 0.11%, and the maximum value was at PT. Wijaya Karya Beton Tbk in 2019 of 1.94%. The average value of the capital structure of the companies sampled in this study is 0.67%. Generally, a good company's debt ratio is one time, which indicates debt equals total equity. However, the acceptable debt-to-equity ratio is two times or more for companies that have gone public. This shows that the average state-owned company listed on the Indonesian Stock Exchange for the 2015-2019 period sampled in this study can pay all its debt obligations in full.
3. The minimum value of profitability is at PT. Housing Development (Persero) Tbk in 2018 amounted to 0.01%, and the maximum value is at PT. Waskita Karya (Persero) Tbk in 2017 by 1.84%. The average profitability value in the state-owned companies sampled in this study is 0.58%. This means that state-owned companies listed on the Indonesian Stock Exchange for the 2015-2019 period, which are the samples in this study, can generate profits using all their equity.
4. The minimum PBV value is at PT. Housing Development (Persero) Tbk in 2019 is 0.5, and the maximum PBV value is at PT. Kimia Farma (Persero) Tbk. in 2016 amounted to 6.84. The average PBV value for the BUMN companies sampled in this study was 2.18.

**B. Regression Model Consistency Test**

In panel data regression, there are three models tested, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Several tests can be carried out to choose the most appropriate model for this study: the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test.

**1) Chow Test**

**Table 2. Chow test**

Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.178586	(16,65)	0.0145
Cross-section Chi-square	36.495224	16	0.0025

Source: data processed with E-views 10

The Chow test is a test to determine which Common Effect Model (CEM) or Fixed Effect Model (FEM) is most appropriate for estimating panel data. If result:

- a) H0: Common Effect Model  
If the probability value of the chi-square cross-section  $\geq \alpha$  (0.05), then H0 is accepted, meaning that the Common Effect Model is accepted.
- b) H1: Fixed Effect Models  
If the probability value of the cross-section chi-square  $< \alpha$  (0.05), then H0 is rejected, meaning that the Fixed Effect Model is accepted.

The results of the Chow test in Table 2 show the probability value of the Chi-Square cross-section of 0.0025, which means that it shows the probability value of the Chi-Square cross-section  $< 0.05$ . So, if H0 is rejected and H1 is accepted, then the Fixed Effect Model is accepted, and continued to test the Random Effect Model with the Hausman Test.

**2) Hausman Test**

**Table 3. Hausman Test Result**

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.499964	3	0.3208

Source: data processed with E-views 10

The Hausman test was conducted to choose between the Fixed Effect Model (FEM) or Random Effect Model (REM), which is most appropriate for estimating panel data. If Result:

- a) H0: Random Effect Model (REM)  
If the cross-section probability value  $\geq \alpha$  (0.05), then H0 is accepted, meaning that the Random Effect Model is accepted.
- b) H1: Fixed Effect Model (FEM)  
If the cross-section probability value  $< \alpha$  (0.05), then H0 is rejected, meaning that the Fixed Effect Model is accepted.

In Table 3, the results of the Hausman Test analysis obtained a cross-section probability value of 0.3208, which means that it shows a Chi-Square cross-section probability value  $> 0.05$ , so H0 is accepted. The research model used is the Random Effect Model and continued to carry out the Lagrange Multiplier (LM) test.

**3) Lagrange Multiplier Test**

**Table 4. Lagrange Multiplier Test Result**

Lagrange Multiplier Tests for Random Effects			
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives			
	Cross-section	Test Hypothesis Time	Both
Breusch-Pagan	3.676066 (0.0052)	7.261826 (0.0070)	10.93789 (0.0009)

Source: data processed with E-views 10

The Lagrange Multiplier (LM) test is a test that aims to choose the most appropriate Random Effect Model or Common Effect Model (CEM). If Result:

- a) H0: Common Effect Model  
If the P-Value Cross Section Breusch Pagan  $\geq 0.05$ , H0 is accepted, meaning the Common Effect Model is accepted.
- b) H1: Random Effects Model  
If the P-Value Cross Section Breusch Pagan  $< 0.05$ , H0 is rejected, meaning the Random Effect Model is accepted.

Table 4 shows that the P-Value Cross Section Breusch Pagan is 0.0052, which means that the P-Value Cross Section Breusch Pagan shows  $< 0.05$ , so H0 is rejected, meaning the Random Effect Model is accepted.

After carrying out the Chow Test, Hausman Test, and Lagrange Multiplier Test, the Random Effect Model is the best panel data regression analysis method used in this study.

### C. Panel Data Regression Analysis

In selecting the estimation method in the previous section, this study's best method is the Random Effect Model (REM). So that the results of panel data regression analysis using the Random Effect Model method can be seen in the following table:

**Table 5. Results of Linear Regression Analysis Panel Data REM with Data Transformation**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_C	0.453116	0.223421	2.028061	0.0468
LOGVAIC	0.006373	0.153728	0.041457	0.9670
LOGDER	-0.008292	0.086354	-0.095867	0.9238
LOGROE	0.129455	0.045697	2.832678	0.0058

R-squared	0.080655	Mean dependent var	0.537956
Adjusted R-squared	0.048605	S.D. dependent var	0.561278
S.E. of regression	0.538279	Sum squared resid	23.46927
F-statistic	2.366740	Durbin-Watson stat	2.109915
Prob(F-statistic)	0.047672		

Source: data processed with E-views 10

Table 5 above shows the results of the analysis in this study. The regression model equation in this study is as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$$

$$PBV = 0.453116 + 0.006373 VAIC - 0.008292 DER + 0.129455 ROE + e$$

From the equation above, it can be concluded that:

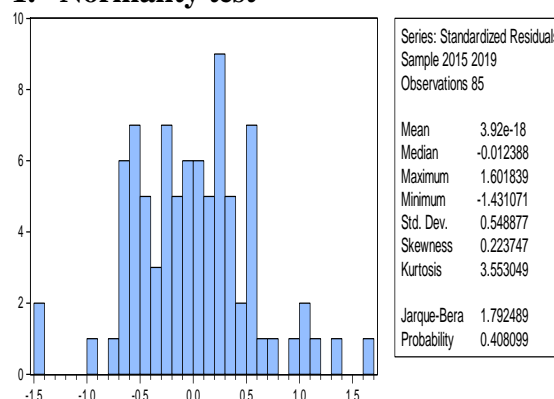
1. A constant value of 0.453116 means that the firm value will still be worth 0.453116 even though the VAIC, DER, and ROE variables are worth 0.
2. Intellectual Capital has a coefficient of 0.006373. This means that intellectual capital has a positive effect on firm value. If intellectual capital increases by 1%, the firm value will increase by 0.006373, assuming other variables are constant.
3. The capital structure has a coefficient of -0.008292. This means that the capital structure has a negative effect on firm value. If the capital structure increases

by 1%, the firm value will decrease by 0.008292, assuming other variables are constant.

4. Profitability has a coefficient of 0.129455. This means that profitability has a positive effect on firm value. If profitability increases by 1%, the firm value will increase by 0.129455, assuming other variables are constant.

### D. Classic assumption test

#### 1. Normality test



Source: data processed with E-views 10

**Figure 3. Normality Test Results with Data Transformation**

The picture above shows the data normality test, which is normally distributed because the Jarque-Bera Probability value is greater than 0.05, which is 0.408099.

#### 2. Heteroscedasticity Test

**Table 6. Heteroscedasticity Test Results**

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.500927	Prob. F(3,81)	0.2206
Obs*R-squared	4.476304	Prob. Chi-Square(3)	0.2144

Source: data processed with E-views 10

The table above shows the Prob. of 0.2144 > 0.05, so it can be concluded that there is no heteroscedasticity in the research data.

#### 3. Multicollinearity Test

**Table 7. Multicollinearity Test Result**

Variable	Variance Inflation Factor (VIF)
LOGVAIC	1.024841
LOGDER	1.031676
LOGROE	1.008371

Source: data processed with E-views 10



Ghozali (2016) states that if the VIF value is > 10, this is an indication of multicollinearity. The data from the multicollinearity test results in the table above show no symptoms of multicollinearity between the independent variables. This can be seen from the VIF value <10.

#### 4. Autocorrelation Test

Table 8. Autocorrelation Test Results

R-squared	0.080655	Mean dependent var	0.537956
Adjusted R-squared	0.046605	S.D. dependent var	0.551278
S.E. of regression	0.538279	Sum squared resid	23.46927
F-statistic	2.368740	Durbin-Watson stat	2.109915
Prob(F-statistic)	0.047672		

Source: data processed with E-views 10

Based on the table above, the DW statistical value is 2.1099. The Durbin Watson table obtained with  $\alpha = 5\%$ ,  $k = 3$  and  $n = 85$ ,  $dL = 1.57516$  and  $dU = 1.7210$ . With values of  $4-dU = 2.279$  and  $4-dL = 2.425$ , DW values are in the range  $dU < DW < 4-dU$ , which means  $1.7210 < 2.1099 < 2.279$ . So, it can be concluded that this study did not have autocorrelation problems.

#### E. Hypothesis testing

##### 1. Partial Test (T-test)

###### a) T-test Equation 1

Table 9. Results of the first Regression Equation

Dependent Variable: LOGROE				
Method: Panel EGLS (Cross-section random effects)				
Date: 05/23/23 Time: 10:18				
Sample: 2015 2019				
Periods included: 5				
Cross-sections included: 17				
Total panel (balanced) observations: 85				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.953863	0.438519	4.455600	0.0000
LOGVAIC	0.554612	0.250638	2.212806	0.0297
LOGDER	-0.143237	0.200691	-0.713721	0.4774
R-squared	0.081714	Mean dependent var	-0.210193	
Adjusted R-squared	0.059317	S.D. dependent var	0.533414	
S.E. of regression	0.517352	Sum squared resid	21.94751	
F-statistic	3.648396	Durbin-Watson stat	1.756541	
Prob(F-statistic)	0.030346			

Source: data processed with E-views 10

Based on Table 9. the following results can be obtained:

1. VAIC has a probability value of 0.0297 which is smaller than Sig t, which is 0.05. It indicates that intellectual capital

has a positive and significant effect on profitability.

2. DER has a probability value of 0.4774, greater than Sig t, which is 0.05. It indicates that capital structure has a negative and insignificant effect on profitability.

###### b) T-test Equation 2

Based on Table 5, the following results can be obtained:

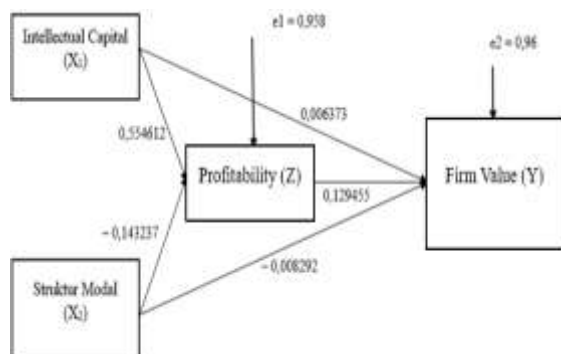
1. VAIC has a probability value of 0.9670, greater than Sig t, equal to 0.05. It indicates that intellectual capital has a positive and insignificant effect on firm value.
2. DER has a probability value of 0.9238, greater than Sig t, which is 0.05. It indicates that capital structure has a negative and insignificant effect on firm value.
3. ROE has a probability value of 0.0058, smaller than Sig t, which is 0.05. It indicates that profitability has a positive and significant effect on firm value.

#### 2. Simultaneous Significance Test (F Test)

Based on the results of the F test in Table 5 above, the Prob(F-statistic) value is 0.047672 < 0.05. It indicates that the independent variables in this study, namely intellectual capital, capital structure, and profitability, simultaneously (together) influence the dependent variable on firm value.

#### 3. Determination Coefficient Test (R2)

Table 5 shows the results of R2 are worth 8%, meaning that firm value is influenced by intellectual capital, capital structure, and profitability of 8% in state-owned companies listed on the Indonesia Stock Exchange for the 2015-2019 period, and other factors influence the remaining 92%. Based on Tables 5 and 9, the path analysis model is produced as follows:



Source: data processed with E-views 10  
Figure 4. Path Diagram (Path Analysis)

There are two structural forms in this study based on the picture above as follows:

**Equation 1:**  $Z = 0.554612 \text{ VAIC} - 0.143237 \text{ DER} + 0.958e1$

**Equation 2 :**  $Y = 0.006373 \text{ VAIC} - 0.008292 \text{ DER} + 0.129455 \text{ ROE} + 0.96e2$

### F. Sobel Test

After obtaining the value of direct and indirect effects through a path analysis test, the next test is carried out, namely the Sobel test, to determine the effect of the intervening variable, profitability, in mediating between intellectual capital and capital structure variables on firm value.

### The Effect of Intellectual Capital on Firm Value with Profitability as an Intervening Variable

Testing this hypothesis is to determine the influence of profitability in mediating intellectual capital on firm value. In Figure 4, we can see that the path value of the independent variable (X1) in the intervening variable path (Z) is 0.5546, and the value of the intervening variable path (Z) in the dependent variable path (Y) is 0.1294. Tables 5 and 9 show that the standard error coefficients a and b are respectively 0.2506 and 0.0456. So, we can calculate it using the Sobel test formula as follows:

$$\begin{aligned}
 sab &= \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2} \\
 &= \sqrt{0,1294^2 0,2506^2 + 0,5546^2 0,0456^2 + 0,2506^2 0,0456^2} \\
 &= \sqrt{0,0010 + 0,0140 + 0,0001} \\
 &= \sqrt{0,0151} \\
 &= 0,1228
 \end{aligned}$$

To test the significance of the indirect effect, it is necessary to calculate the t value of the ab coefficient with the following formula:

$$\begin{aligned}
 t &= \frac{ab}{sab} \\
 t &= \frac{0,5546 \times 0,1294}{0,1228} \\
 &= \frac{0,0717}{0,1228} \\
 &= 0,5844
 \end{aligned}$$

Based on the calculation results above, the t value is 0.5844 < t table 1.9893, so it can be concluded that intellectual capital does not affect firm value through profitability as an intervening variable.

### The Effect of Capital Structure on Firm Value with Profitability as an Intervening Variable

Testing this hypothesis is to determine the magnitude of the influence of profitability in mediating capital structure on firm value. In Figure 4, we can see that the path value of the independent variable (X2) in the intervening variable path (Z) is -0.143237, and the value of the intervening variable path (Z) in the dependent variable path (Y) is 0.1294. Tables 5 and 9 show that the standard error coefficients a and b are respectively 0.2006 and 0.0456. So, we can calculate it using the Sobel test formula as follows:

$$\begin{aligned}
 sab &= \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2} \\
 &= \sqrt{0,1294^2 0,2006^2 - 0,1432^2 0,0456^2 + 0,2006^2 0,0456^2} \\
 &= \sqrt{0,000676 - 0,000031 + 0,000064} \\
 &= \sqrt{0,000711} \\
 &= 0,0277
 \end{aligned}$$

To test the significance of the indirect effect, it is necessary to calculate the t value of the ab coefficient with the following formula:

$$\begin{aligned}t &= \frac{ab}{sab} \\t &= \frac{(-0,1432) \times 0,1294}{0,0277} \\&= \frac{-0,0185}{0,0277} \\&= -0,6678\end{aligned}$$

Based on the calculation results above, the t value is 0.6678 < t table 1.9893, so it can be concluded that capital structure does not affect firm value through profitability as an intervening variable.

## CONCLUSION

Based on data analysis, hypothesis testing, and research discussion, several conclusions can be drawn:

1. Intellectual Capital (VAIC) positively and significantly affects profitability in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.
2. Capital structure has no significant negative effect on profitability in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.
3. Intellectual Capital (VAIC) has no significant positive effect on Firm value in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.
4. Capital structure has no significant negative effect on firm value in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.
5. Profitability positively and significantly affects firm value in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.
6. Profitability cannot mediate the influence of Intellectual Capital (VAIC) on Firm value in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.

7. Profitability cannot mediate the influence of Capital Structure on Corporate Value in state-owned companies listed on the Indonesia Stock Exchange for 2015-2019.

## RESEARCH LIMITATIONS

The results of this study have several weaknesses, including:

1. This research is limited to state-owned companies listed on the Indonesia Stock Exchange, with a sample of only 17 companies out of 22 company populations.
2. The research period observed was only five years, from 2015 to 2019, so it is still insufficient to describe the real situation.
3. The results of this study have a low coefficient of determination of 8%, meaning that the effect of intellectual capital, capital structure, and profitability on firm value in state-owned companies listed on the Indonesia Stock Exchange for the 2015-2019 period is very weak. It is estimated that other variables have more influence on firm value.
4. This study uses a sample of state-owned companies from various industrial sectors, such as telecommunications, banking, pharmaceuticals, and other sectors. The diversity of industrial sectors results in differences in how companies manage and utilize intellectual capital and capital structure. This results in complexity in research.

## RESEARCH IMPLICATIONS

1. From the results of this study, it is hoped that investors will consider intellectual capital, capital structure, and company profitability in assessing companies so that investors can correctly choose investments that generate good returns.
2. For Company Management, from the results of this study, it is hoped that

management can make more appropriate policies by considering various factors, especially the value of intellectual capital and the company's capital adequacy. So, later the firm value created is expected to meet shareholders' expectations.

3. For future researchers who wish to conduct similar research, it is hoped that they will expand on other factors that can affect firm value to increase the value of the coefficient of determination from the research results.

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#### **REFERENCES**

1. Andinata, W. (2010). Analisis Pengaruh Profitabilitas dan Kebijakan Dividen Terhadap Nilai Perusahaan Manufaktur. *Jurnal Ekonomi* 7(1).
2. Arindha, Prianka T. (2018). Pengaruh Intellectual Capital terhadap Nilai Perusahaan dengan Profitabilitas sebagai Variabel Intervening: Studi Empiris pada Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia Periode 2014-2016. Tesis. Universitas Islam Negeri Maulana Malik Ibrahim.
3. Brigham, E.F., & Houston, J.F. (2011). *Dasar-dasar Manajemen Keuangan Terjemahan*. Edisi 10. Jakarta: Salemba Empat.
4. Budianto, B., Putra, Z., & Wahyuni, E.S. (2018). Pengaruh Modal Intelektual Dan Profitabilitas Terhadap Nilai Perusahaan Pada BUMN Di Indonesia. *Accounting Research Journal Of Sutaatmadja (Accruals) Volume 2 No.2*, September.
5. Febriana, Elia., Djumahir, & Djawahir A.H. (2016). Pengaruh Struktur Modal, Kebijakan Dividen, Ukuran Perusahaan, Kepemilikan Saham Manajerial dan Profitabilitas Terhadap Nilai Perusahaan (Studi pada Perusahaan Manufaktur yang Terdaftar di BEI Pada 2011-2013). *Jurnal Ekonomi Bisnis Tahun 21, Nomor 2*, Oktober 2016.
6. Ghozali, Imam. (2016). *Aplikasi Analisis Multivariete dengan Program SPSS*. Edisi 8. Semarang: Badan Penerbit Universitas Diponegoro.
7. Ghozali, I., & A, Chariri. (2007). *Teori Akuntansi*. Semarang : Badan Penerbit Universitas Diponegoro.
8. Hermawan, D. (2017). Pengaruh Modal Intelektual dan Struktur Modal Terhadap Nilai Perusahaan Pada Indeks LQ 45 Periode 2009-2016. Skripsi pada FEB Universitas Islam Negeri Syarif Hidayatullah. Jakarta.
9. Isfenti, Sadalia. (2010). *Akuntansi Manajemen*. USU Press. Medan
10. Karsam, K. (2017). Pengaruh Strategi Bisnis Terhadap Sistem Pengendalian Manajemen–Studi Pada BUMN Kategori Industri Strategis Di Indonesia. *Jurnal Dinamika Akuntansi Dan Bisnis. Jurnal Dinamika Akuntansi dan Bisnis Vol. 4(1)*, 2017, pp 113-124.
11. Kusumajaya, D. K. (2011). Pengaruh Struktur Modal Dan Pertumbuhan Perusahaan Terhadap Profitabilitas Dan Nilai Perusahaan Pada Perusahaan Manufaktur Di Bursa Efek Indonesia. Tesis. Denpasar: Program Pasca Sarjana Universitas Udayana.
12. Lestari, Dyah A.D., & Satyawan, M.D. (2019). Pengaruh Intellectual Capital Terhadap Nilai Perusahaan Dengan Profitabilitas Sebagai Variabel Moderasi. *Jurnal Akuntansi AKUNESA Vol 7 No 1* (2018).
13. Makkulau, Andi., Amin, F., & Hakim, A. (2018). Pengaruh Struktur Modal terhadap Nilai Perusahaan dengan Profitabilitas sebagai Variabel Intervening pada Perusahaan Properti dan Real Estate yang terdaftar di Bursa Efek Indonesia. *Sigma: Journal of Economics and Business*, 1(2), 67-74.
14. Mardhiana, Made D. (2020). The Effect of Intellectual Capital on Price to Book Value with Good Corporate Governance as a Moderating Variable. *Journal of Accounting, Finance and Auditing Studies* 6/4 (2020): 131-144.
15. Mohsen Allameh, S., Khazaei Pool, J., Jaber, A. & Mazloomi Soveini, F. (2014). Developing a model for examining the effect of tacit and explicit knowledge sharing on organizational performance based on the EFQM

- approach. *Journal of Science and Technology Policy Management*, Vol. 5 No. 3, pp. 265-280. <https://doi.org/10.1108/JSTPM-05-2014-0025>.
16. Muhammad, I. A., & Tieka, T. G. (2021). Pengaruh Profitabilitas, Kebijakan Dividen Dan Leverage Terhadap Nilai Perusahaan (Studi Kasus Pada Perusahaan Sub Sektor Pertambangan Logam Dan Mineral Yang Terdaftar Di Bursa Efek Indonesia Periode 2015 - 2019). *Jurnal e-Proceeding of Management: Vol.8, No.5 Oktober 2021*, 4694-4701.
  17. Ningrum, Nora R. R. (2012). Analisis Pengaruh Intellectual Capital dan Corporate Governance terhadap Financial Performance (Studi empiris pada perusahaan keuangan yang terdaftar di Bursa efek Indonesia tahun 2009-2011. Skripsi. Universitas Diponegoro, Semarang.
  18. Pardosi, Gabriella T. (2015). Pengaruh Struktur Modal Dan Profitabilitas Terhadap Nilai Perusahaan Dengan Pertumbuhan Perusahaan Sebagai Variabel Moderating Pada Perusahaan Manufaktur Sektor Industri Barang Konsumsi Di Bursa Efek Indonesia Periode 2010-2014. Skripsi. Medan: Universitas Sumatera Utara.
  19. Prasinta, Dian. (2012). Pengaruh Good Corporate Governance Terhadap Kinerja Keuangan. *Accounting Analysis Journal*, Vol. 1. No. 2. pp. 1-7.
  20. Randa, F., & Solon, S. A. (2012). Pengaruh Modal Intelektual Terhadap Nilai Perusahaan. *Jurnal Sistem Informasi Manajemen Dan Akuntansi*, 24-47.
  21. Santiani, Nenden P. (2018). Pengaruh Intellectual Capital Dan Struktur Modal Terhadap Nilai Perusahaan. *Jurnal Akuntansi Volume 13 Nomor 2 Juli-Desember 2018 Hal. 69-78*.
  22. Situmeang, Yohana M.L., & Wiagustini, Ni L.P. (2018). Pengaruh Struktur Modal Terhadap Nilai Perusahaan Dengan Kebijakan Hedging Sebagai Mediasi Pada Perusahaan BUMN go-public. *E-Jurnal Manajemen Universitas Udayana*, 7(3) 2018, doi:10.24843/EJMUNUD.2018.v7.i03.p09 1368-1396.
  23. Soetedjo, S., & Safrina, M. (2014). Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Pada Perusahaan Perbankan. *Simposium Nasional Akuntansi XVII. Mataram*.
  24. Sugiyono. (2015). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung:Alfabeta.
  25. Sutrisno. (2012). *Manajemen Keuangan Teori Konsep dan Aplikasi*. Yogyakarta: Ekonisia.
  26. Wahyudi, R., & Lidya, M. (2019). Analisis Modal Intelektual Dan Kinerja Keuangan Serta Pengaruhnya Terhadap Nilai Perusahaan. *INA-Rxiv*. doi:10.31227/osf.io/j5e9u.

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