STOCK RETURN MODEL IN THE BANKING SECTOR

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Abstract

The purpose of this research is to analyze the impact of the Interest Rates (I.R) and Loan to Deposit Ratio (LDR) variables on Return On Assets (ROA) which has implications for Stock Return (SR). This is based on the occurrence of phenomena and inconsistencies in various previous studies, thus encouraging researchers to conduct research again. The type of research is quantitative with multiple regression analysis methods for panel data using 7 cross section samples and 10 years as a time series. The research uses a formula to maximize the Stock Return value through Return On Assets as an intervening variable using the research object of banking sector companies on the Indonesia Stock Exchange. This research uses two models that are integrated into one research model, each of which goes through the model selection test stages, Chow Test, Hausman Test, and Lagrange Multiplier Test. The result is that explaining I.R can only explain its influence on SR indirectly, namely through ROA which functions as a mediator. Another result is that LDR cannot explain its influence on SR directly or indirectly. It is hoped that the results of this research can provide guidance for banking practitioners in Indonesia and market players so they can maximize Stock Returns.

Keywords: Interest Rate, Loan to Deposit Ratio, Return on Assets, Stock Return.

INTRODUCTION

The occurrence of changes in the price of an asset or investment, over time, can be represented in the form of changes in the price or value of an asset. The result of a positive change in the price or value of an asset can be said to be a positive return which indicates a profit, but on the contrary it will be said to be a negative return or indicates a loss. There are two criteria for investment returns, namely first, the real rate of return taking into account the impact of inflation which is closely related to interest rates and second, the nominal rate of return which is only influenced by price changes.

Profitability is a ratio as a measuring tool for corporate efforts to gain profits in a certain period Suwandani & Suhendro (2017). There are several studies conducted by researchers Mariani et al., (2016), Octaviani & Komalasari (2017), Almira & Wiagustini (2020), that profitability has a positive impact on stock returns. However, Pandaya et al., (2020), Yudistira & Adiputra, (2020) provide different results that profitability has a negative influence on stock returns.

Related to ROA, it can also be said to be a tool for measuring the level of management effectiveness in terms of generating profits with available assets. The resulting level of profitability is determined more by factors that can be controlled by management and factors outside management's control. Various factors that can be controlled by management are factors that describe the policies and decisions of corporate management itself, such as fund source management, working capital management, liquidity management, and cost management.

Meanwhile, factors beyond management's control include environmental factors and characteristics of the corporate sector, environmental factors include market structure, regulations, inflation, interest rates and market growth.

In Dendawijaya (2006), the interest rate is one of the conventional instruments for controlling the rate of inflation, a high increase in inflation will have an impact on decreasing the profitability of a corporation. In interest rates there are two meanings, first, nominal interest rates which can be observed under market mechanism conditions and second, real interest rates are the concept of nominal interest rates minus the inflation rate. The factors that influence the determination of interest rates are the need for funds, time period, expected profits, quality of collateral or assets pledged, government policy, company reputation, good relationships and competitive products.

To find out the factors that influence ROA, research has been carried out, including by Pardede and Pangestuti (2016), where the results of their research found that there are several factors that influence profitability, including inflation, interest rates, financing risk. These results are different from those produced by Agung Gumelar (2016), namely that inflation, interest rates, exchange rates, NPF, BOPO, have an insignificant effect on ROA. Credit interest rates have the potential to influence credit distribution from a bank. People will avoid borrowing from banking institutions if credit interest rates increase. This will have an impact on banking profitability because interest income will decrease. A high increase in credit interest rates will have the potential for bad credit to occur, which makes it possible for debtors to have difficulty paying their debts. Research conducted by Saputra (2012) resulted that credit interest rates had no significant effect on profitability and supported the results of previous research by Agung Gumelar (2016) with the research object of Islamic banks.

Variable Return on Assets (ROA) as an intervening variable used by researchers is that they want to see any problems in stock returns. There are not a few determinants that can explain its influence on ROA, but in several studies, including by Avrita and Pangestuti (2016), the Loan To Deposit Ratio (LDR) has an insignificant effect on profitability, while the different results produced by Yogianta (2013) are that the variable Loan To Deposit Ratio (LDR) has a significant effect on ROA with a positive correlation.

Different results as empirical evidence have also been carried out by other researchers, such as in Quadir (2012), regarding the influence of interest rates on stock returns, namely that interest rates have a significant effect with a negative correlation on stock returns. Meanwhile, the results are different and show inconsistent results, as in Karim (2015), that interest rates have a significant effect with a positive correlation to stock returns. A very different result was produced in Kristanto (2016), namely that interest rates had an insignificant effect on stock returns.

Among several researchers, Sambul S.H., et., al., (2016) conducted research on stock returns using LDR as an exogenous variable, with the result that LDR had a significant effect on stock returns. Among researchers, there are inconsistent results carried out by Suardana (2009), which shows that LDR has an insignificant effect on stock returns.

Another word for profitability, often also called profitability, is the ability of a company to create profits during a certain period. The ratio in relation to a company's profitability shows the comparison between profits and assets or capital used to generate profits. Profitability is one way to see the level of success of a corporation in carrying out its business ventures. The higher a corporation creates profitability, the higher the market appreciation of that corporation will be. Profitability or profitability is also an indicator of management performance in managing company assets. Several researchers have conducted research studies on the impact of profitability on market appreciation or stock returns. This research was conducted by Lia Rosalina, J. Kuleh, and Maryam Nadir (2013), Haryetti (2012), Sambul S.H., et., al., (2016), Alfianti D. and Andarini S., (2018), Watung and Ilat (2016) with the result that profitability has a significant effect on share prices. However, inconsistent results were carried out by Nadeak (2011), namely that profitability did not have a significant impact on Stock Return.

After the researcher observed the various research results mentioned above, which showed inconsistent results among previous researchers, this prompted the researcher to conduct another research study.

LITERATURE REVIEW AND HYPOTHESIS

Research conducted by Pardede and Pangestuti (2016), Wulandari (2011), Hendrayati (2013), Almanaseer & Alsehat (2016), Hidayati (2014), Wibowo and Syaichu (2013), Ali et al. (2012), Durraj & Moci (2015), Malik et al. (2015), Sahara (2013), Suarmi et., al. (2014), Widiantari et.,al., (2014), Pranata et.,al., (2016), Novitasari (2018), Sumawati N. K. A., (2019) where the results of their research found that there are several factors that influence profitability, including interest rate. These results are different from those carried out by Agung Gumelar (2016), Khotijah et.al., (2020), Kalengkongan G. (2013), namely that interest rates have an insignificant effect on ROA.

H_1: There is an influence of interest rates on Return on Assets (ROA).

Penelitian di dalam Avrita dan Pangestuti (2016), Sari et.al., (2016), Sarifudin (2005), adalah menjelaskan bahwa Loan To Deposit Ratio (LDR) berpengaruh secara tidak signifikan terhadap profitabilitas. Hasil yang tidak konsisten atau berbeda adalah di dalam hasil penelitian yang dilakukan oleh Budi Ponco (2008), Almilia dan Hedyningtyas (2005), Yogianta (2013), Kuncoro (2002), bahwa Loan To Deposit Ratio (LDR) berpengaruh secara signifikan dengan korelasi positif terhadap ROA.

H_2: There is an influence of the Loan to Deposit Ratio (LDR) on Return on Assets (ROA).

The results of research conducted by researchers include Quadir (2012), Olweny & Omondi (2011), Oshaibat (2016), Latha et al. (2016), Butt et al.. (2010), Bilal et al.. (2012), Kandir (2008), Sadikin (2010), Setyaningrum (2016), Oktiar (2014), Saputra & Dharmadiaksa (2016), Faoriko (2013), Nidianti (2013) and Adeputra & Wijaya (2016), that interest rates significantly influence and have a negative correlation with stock returns. Other different research results are in Karim (2015), Buana (2014), Sudarsono & Sudiyanto (2016), that interest rates have a significant effect on stock returns and are positively correlated. Very different results from

research by Kristanto (2016), Dwita & Rahmidani (2012), Suriyani and Sudiartha (2018), that interest rates have an insignificant effect on stock returns.

H$_3$: There is an influence of interest rates on stock returns.

Several researchers conducted research studies on stock returns such as those carried out by Asna (2006), Sambul S.H., et.,al., (2016), Rahmi (2004) with the results that the Loan To Deposit Ratio (LDR) had a significant effect on stock returns. . However, there are different research results conducted by Risky (2009), Suardana (2009), with research results that LDR has an insignificant effect on stock returns.

H$_4$: There is an influence of Loan to Deposit Ratio (LDR) on Stock Return.

Other research on Stock Returns using Profitability as exogenous has been conducted by Haryetti (2012), Sambul S.H., et.,al., (2016), Alfianti D. and Andarini S., (2018), Lia Rosalina, J. Kuleh, and Maryam Nadir (2013), Watung and Ilat (2016), the results of their research are that profitability has a significant effect on stock prices. Meanwhile, inconsistent or different results were carried out by Nadeak (2011), with the result that profitability had an insignificant effect on Stock Return.

H$_5$: There is an influence of Profitability (ROA) on Stock Return.
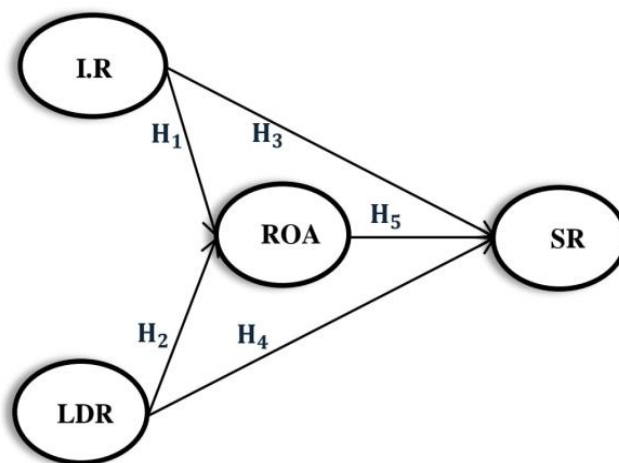
Figure 1: Research Framework Model

RESEARCH METHODS

The approach used in this research is quantitative using a panel data multiple regression analysis method which is a combination of 10 year time series data or the 2014 or 2023 year period and cross section. The objects used in this research are banking companies listed on the Indonesia Stock Exchange.

The research sampling technique uses purposive sampling with the criteria for banking companies that are included in the 50 companies with large market capitalization. By using these criteria, a total research sample of 7 companies was obtained.

Operational Variables:

<p style="text-align:center">**Table 1: Operational Variables**</p>

No	Variables	Notation	Formulas
1	Interest Rate	$I.R_{it}$	BI Rate
2	Loan to Deposit Ratio	LDR it	$\dfrac{\text{Amount of credit disbursed}}{\text{Total Capital+Third party funds}}$
3	Return On Assets	ROA it	$\dfrac{\text{Earnings After Tax}}{\text{Total Assets}}$
4	Stock Return	SR it	$\dfrac{\text{Market Price}_{it} - \text{Market Price}_{i(t-1)}}{\text{Market Price}_{i(t-1)}}$

Panel Data Multiple Regression Estimation

To estimate multiple regression on panel data, it must first be ensured that there is a combination of time series data and cross section data. The approach that can be taken in carrying out the analysis between time series data and cross section data can be using analysis:

1) Common Effect Model (CEM)

2) Fixed Effect Model (FEM)

3) Random Effect Model (REM)

Model Selection Test

The three basic analyzes mentioned above as a basic reference for carrying out three model suitability testing procedures in selecting the best panel data multiple regression model are as follows:

Chow Test

F-statistic is the standard used to determine the choice between the Common Effect model or the Fixed Effect model. Acceptance or rejection of the hypothesis is based on the level $\alpha = 5\%$ in the null hypothesis (H_0) and alternative hypothesis (H_a). Each of the two models above will technically compare the F-statistics calculation with the F-table. The result of F count < from F table will reject the null hypothesis (H_0) and instead accept the alternative hypothesis (H_a). Thus, the appropriate model to use is the Fixed Effect Model, the decision will be taken otherwise if the results are different.

Hausman Test

Hausman testing will determine the choice of Fixed Effect Model or Random Effect Model. The use of the Chi-Square statistical distribution with k degrees of freedom as the number of exogenous variables as the basis for the test.

The results will accept the null hypothesis (H_0) and reject the alternative hypothesis (H_a) then the model will be said to be fit and use the Random Effect Model, but on the contrary it will use the Fixed Effect Model if the statistical hypothesis rejects the null hypothesis (H_0) and accepts the alternative hypothesis (H_a).

Uji Lagrange Multiplier **(LM)**

Determining the fit model in the Lagrange Multiplier (LM) through a selection process between the Common Effect Model or Random Effect Model. The basis for the test uses the Chi-Squares distribution with a degree of freedom equal to the number of exogenous variables.

If the result is that the LM statistical value is greater than the critical value of the Chi-Squares statistic, it will reject the null hypothesis (H_0) and accept the alternative hypothesis (H_a), so that it means that the estimate that is suitable for use is the Random Effect Model. On the other hand, if the LM statistical value is smaller than the critical value of the Chi-Squares statistic, it will accept the null hypothesis (H_0) and reject the alternative hypothesis (H_a), this means that the use of the Common Effect Model is more appropriate.

Panel Data Regression Model

Structural Equation Research Model 1,

$$ROA\ it = \alpha + \beta_1\ I.R\ it + \beta_2\ LDR\ it + \varepsilon_{it}; \ldots\ldots\ldots\ldots (1)$$

$$i = 1,2,.,.,., N ; \quad t = 1,2,.,.,.,T$$

Structural Equation Research Model 2,

$$SR_{it} = \alpha + \beta_1\ I.R\ it + \beta_2\ LDR\ it + \beta_3\ ROA\ it + \varepsilon_{it}; \ldots (2)$$

$$i = 1,2,.,.,., N ; \quad t = 1,2,.,.,.,T$$

Where:

I.R	=	Interest Rate	β	=	Slope
LDR	=	Loan to Deposit Ratio	α	=	Intercept
ROA	=	Return on Assets	N	=	Number of Observations
SR	=	Stock Return	T	=	Lots of time
ε	=	Error component	NxT	=	Number of Panel Data

RESEARCH RESULTS

A. Descriptive Statistics

Table 2: Statistics Descriptive

	I.R	LDR	ROA	SR
Mean	0.031500	6.185529	0.805429	0.387600
Median	0.028000	6.355500	0.865000	0.440500
Maximum	0.064000	9.744000	1.135000	0.597000
Minimum	0.011000	2.476000	0.016000	-0.385000
Std. Dev.	0.015761	1.842533	0.190975	0.232963
Observations	70	70	70	70

Source: Data processed

B. Return on Assets and Stock Return as Endogenous Variables in Testing the Suitability of Research Models

Table 3: Research Model 1
Chow Test & Hausman Test

Research Model 1: Chow Test Common Effect Vs Fixed Effect *Endogenous Variable: ROA*				Research Model 1: Hausman Test Fixed Effect Vs Random Effect *Endogenous Variable: ROA*			
Effects Test	**Statistic**	**d.f.**	**Prob.**	**Effects Test**	**Statistic**	**d.f.**	**Prob.**
Cross-section F	5.191416	(6,61)	0.0002	Cross-section Random	1.806413	2	0.4053

Source: Data processed

The results of testing the Chow-Test and Hausman Test in Research Model-1 produce different statistical hypotheses:

- The test results in the Chow Test will reject the null hypothesis (H_0) and accept the alternative hypothesis (Ha) at the level of $\alpha = 5\%$ so that it can be interpreted that the Fixed Effect Model (FEM) is better to use than the Common Effect Model (CEM). (Table-3)

- The test results in the Hausman Test will accept the null hypothesis (H_0) and reject the alternative hypothesis (Ha) at the level of $\alpha = 5\%$ so it can be interpreted that the Random Effect Model (REM) is better to use than the Fixed Effect Model (FEM). (Table-3)

- Based on the test results between the two which are different, namely the Fixed Effect Model (FEM) and Random Effect Model (FEM), then a determining test will be carried out to be used as an analytical tool using the Lagrange Multiplier Test (LM Test).

Table 4: Research Model 1
Lagrange Multiplier Test (LM-Test)

Research Model 1: LM Test Common Effect Vs Random Effect *Endogenous Variable: ROA*			
Test Hypothesis			
	Cross-section	**Time**	**Both**
Breusch-Pagan	16.95425 (0.0000)	1.970720 (0.1604)	18.92497 (0.0000)

Source: Data processed

The results of testing the Lagrange Multiplier Test (LM-Test) in Research Model 1 produced a statistical hypothesis that rejected the null hypothesis (H_0) and accepted the alternative hypothesis (H_a) at the level of $\alpha = 5\%$. These results can be interpreted that the Random Effect Model (REM) will be better used than the Common Effect Model (CEM). (Table-4)

Table 5: Research Model 2
Chow Test & Hausman Test

Research Model 2: Chow Test Common Effect Vs Fixed Effect *Endogenous Variable: SR*				Research Model 2: Hausman Test Fixed Effect Vs Random Effect *Endogenous Variable: SR*			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section F	3.219329	(6,60)	0.0083	Cross-section random	9.304970	3	0.0255

Source: Data processed

The test results of the Chow-Test and Hausman Test in Research Model-2 produce the same statistical hypothesis:

- The test results in the Chow Test will reject the null hypothesis (H_0) and accept the alternative hypothesis (H_a) at the level of $\alpha = 5\%$ so that it can be interpreted that the Fixed Effect Model (FEM) is better to use than the Common Effect Model (CEM). (Table-5)

- The test results in the Hausman Test will reject the null hypothesis (H_0) and accept the alternative hypothesis (H_a) at the level of $\alpha = 5\%$ so that it can be interpreted that the Fixed Effect Model (FEM) is better to use than the Random Effect Model (REM). (Table-5)

Table 6: Endogenous Variable: ROA
Total pool (balanced) observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.312113	0.082642	3.776686	0.0004
I.R	**1.480430**	**0.618779**	**2.392502**	**0.0198**
LDR	0.013325	0.012446	1.070680	0.2885
Adjusted R-squared	0.303702			
F-statistic	4.761943			
Prob(F-statistic)	0.000142			

Source: Data processed

Table 7: Endogenous Variable: SR
Total pool (balanced) observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.624009	0.068825	9.066656	0.0000
I.R	1.125079	0.671678	1.675028	0.0987
LDR	-0.010483	0.005807	-1.805131	0.0756
ROA	**-0.190501**	**0.056105**	**-3.395444**	**0.0012**
Adjusted R-squared	0.172403			
F-statistic	5.791308			
Prob(F-statistic)	0.001411			

Source: Data processed

C. Explanation of Research Results

1) Interest Rate (IR) has a significant effect and is positively correlated with Return On Assets (table-6).

2) Loan to Deposit Raio (LDR) has an insignificant effect on Return On Assets (ROA). (table-6)

3) Interest Rate (IR) has an insignificant effect on Stock Return (SR). (table-7).

4) Loan to Deposit Raio (LDR) has an insignificant effect on Stock Return (SR). (table-7)

5) Return on Assets (ROA) has a significant and negative correlation with Stock Return (SR). (table-7)

6) Return On Assets (ROA) as an intervening variable only functions to mediate the indirect influence between I.R on SR (table-7), but not LDR on SR (table-7).

DISCUSSION

The results of this research can explain the relationship between interest rates and the profitability of Return on Assets (ROA) and the implications for stock returns, that interest rates will have an impact indirectly or through ROA on market reactions or stock returns. High interest rates will have an increasing reaction to ROA profitability and conversely a decrease in interest rates will have the impact of decreasing ROA profitability levels.

The use of the intervening variable ROA has a significant negative impact on stock returns. These results still require a comprehensive answer to the negative impact of ROA on stock returns, where theoretically an increase in profitability should provide a positive market reaction which is represented in stock returns.

A comprehensive explanation of the research results is still possible that the distribution of earnings or business profitability is not to retained earnings for business expansion but to dividend payments or predominantly to payment of obligations so it is feared that future business performance will experience disruption. Refining the results of this research is needed in the future by adding exogenous variables dividend and capital structure.

The size of the distribution of credit distribution by the banking sector should be able to explain the level of profitability, but in reality the results of this research cannot explain the level of profitability and stock returns. It is very possible that there will be a relatively high level of Non-Performing Loans (NPL), so to improve future research it is also necessary to use exogenous NPL variables.

CONCLUSION

Findings: The conclusion of this research is that Interest Rate (I.R) can only explain its influence on Stock Return (SR) indirectly or through Profitability (ROA) which functions as an intervening variable, whereas it cannot explain it directly. The other variable LDR cannot explain directly or indirectly the Stock Return (SR).

Acknowledgments

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