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The effect of inflation and interest rate on profitability of PT Bank BNI period 2010-2020

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ABSTRACT

This research was conducted to examine macroeconomic factors as measured by inflation and interest rates on Return On Assets (ROA) of Bank Negara Indonesia (BNI) for the period 2010 to 2020. This type of research uses a quantitative approach which focuses on hypothesis testing, the data used must be measurable, and will produce generalizable conclusions. The sample in this research is PT Bank BNI in 2010-2020. The data analysis technique used in this study is multiple linear regression analysis, where the data has been tested by testing classical assumptions including data normality, multicollinearity, heteroscedasticity, and autocorrelation. During the observation period between 2010-2020, it shows that the research data is normally distributed. Based on data normality, multicollinearity, heteroscedasticity, and autocorrelation tests, no variables were found that deviated from the classical assumptions. This shows that the available data meets the requirements using multiple linear regression. The results of this study indicate that the inflation and interest rate variables have no significant effect on PT Bank BNI's ROA in 2010-2020.

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1. INTRODUCTION

Indonesia's economic crisis has created a complex inflation problem, weakened the banking system with a sharp decline in the rupiah exchange rate (Aprilia et al., 2024; Hossain, n.d.). As a result, the condition of banking institutions continued to suffer losses, their capital was dwindling, and eventually several banks were liquidated. Government policies to maintain financial sustainability and Bank Indonesia's commitment to maintaining rupiah stability and strengthening the banking system have had a positive impact on the direction of economic development (Harahap et al., 2022; Kalbuadi, 2021; Permana & Setiawan, 2022). Banks play the role of a payment system, inflation control and financial authority to stabilize the Indonesian economy. Banks play an important role in the country's economy. Until now, the life of the world economy cannot be separated from the world of banking. Almost every aspect of economic activity uses a bank as a financial institution that can carry out or guarantee its operations (Awasthi & Engelschalk, 2018; Fernández-Arias et al., 2020; Van Greuning & Bratanovic, 2020).

Broadbent, Ben (2020) argues, Inflation is an economic event that often occurs even though we never want it to. Broadbent, Ben said "inflation can happen anywhere and is always a monetary phenomenon". Facing these challenges and risks, Bank Indonesia (BI) and the government have increased synergy and variety while continuing to push for structural reforms to prioritize macroeconomic stability and strengthen economic fundamentals. The policy mix selected by BI aims to achieve the inflation target, reduce the current account deficit to a healthier level, and maintain financial system stability.

The results of Yuliana, Caecilia Widi Pratiwi research (n.d.) with the title Effects of Inflation, Interest Rates and Bopo on Banking ROA (Study of Persero Commercial Banks for the 2013-2015 Period), Muhammadiyah University of Surakarta shows that the inflation variable does not show a significant effect on ROA. The interest rate variable has no significant negative effect on ROA. The BOPO variable has a significant effect on ROA. The predictive ability of these three variables on ROA in this study was 74.8%

Given the important role of Islamic banks in Indonesia, the performance of Islamic banks needs to be improved so that banks remain healthy and efficient based on sharia principles. Profitability is the best indicator of bank performance. The profitability measure commonly used in the banking industry is the return on assets (ROA) (Sujud & Hashem, 2017). It is a measure used by bankers to measure their overall ability to receive funds. Profitability is the company's ability to earn profits in relation to sales, total assets and own capital (Ariyani et al., 2019). Kasmir (2011:196) The profitability ratio is the ratio to assess the company's ability to make a profit (Heikal et al., 2014; Satryo et al., 2016).

From the results of research conducted by Hulu, Merfiani (Hulu et al., 2023) with the title "The Influence of Inflation and Interest Rates on Return On Assets (ROA) of Banks Listed on the IDX" resulted in the conclusion that inflation and interest rates affect the profitability ratio, namely ROA.

Meanwhile, the results of Qolbi, Fikri Ainul, Dwi Pratika Karisma, and Imron Rosyadi (2020) research entitled "Analysis of the Effects of Inflation and the BI Rate on the Return On Assets (ROA) of Islamic Banks in Indonesia" concluded that the inflation and BI Rate variables did not significantly affect the Return On Assets of Islamic Banks in Indonesia. This is because the Islamic Bank Operational System does not use the interest system so that it is not directly affected by inflation and banking interest rates. Similar to the results of the research conducted by Havidz, Shinta Amalina Hazrati (2015), they concluded that inflation and interest rates had no effect

The provided data depicts the performance of PT Bank BNI over the period 2010 to 2020, focusing on Return on Assets (ROA), inflation rates, and the Bank Indonesia (BI) interest rate. ROA, a measure of profitability, remained relatively stable, fluctuating between 2.4% and 3.5% over the period, with a notable decrease to 0.5% in 2020. Inflation rates varied, with the highest recorded at 8.38% in 2013 and the lowest at 1.68% in 2020. Correspondingly, BI interest rates fluctuated, reaching a peak of 7.75% in 2014 and hitting a low of 3.75% in 2020. The data suggests a complex interplay between macroeconomic factors and the bank's performance, with fluctuations in inflation and interest rates potentially impacting ROA over the observed period.

Based on developments in inflation, interest rates and ROA data at PT Bank BNI for the 2016-2020 period as shown in the table above, it shows fluctuating fluctuations. It can be seen that the increase in inflation, interest rates and ROA is less stable.

From the background above, the authors raise research regarding the testing of two indicators. In this study, the authors raised the title "The Influence of Inflation and Interest Rates on PT Bank BNI's Profitability (ROA) for the 2010-2020 Period"

Inflation is a process of increasing prices in general and continuously related to market mechanisms which can be caused by various factors, among others, increased public consumption, excess liquidity in the market which triggers consumption or even speculation, including the result of uneven distribution goods (Anidiobu et al., 2018; Leijonhufvud, 2019). Inflation is a process of increasing the general prices of goods

continuously (Duesenberry, 2019). This does not mean that the prices of various goods increase by the same percentage. It may happen that the increase is not simultaneous. The important thing is that there is a continuous increase in the general price of goods during a certain period.

Return On Assets (ROA) is a ratio that shows the results (return) on the use of company assets in creating net income (Choiriyah et al., 2020; Saputra, 2022; Supriyadi & Terbuka, 2021). In other words, this ratio is used to measure how much net profit will be generated from every rupiah of funds embedded in total assets. The higher the return on assets means the higher the amount of net profit generated from each fund embedded in total assets. Conversely, the lower the return on assets means the lower the amount of net profit generated from each rupiah of funds embedded in total assets ROA, which is a company's financial ratio related to profitability measuring a company's ability to generate profits or profits at the level of income, assets and certain share capital.

2. METHODS

This type of research uses a quantitative approach. Research focuses on hypothesis testing, the data used must be measurable, and will produce conclusions that can be generalized. The quantitative approach is more because the quantitative approach directs the problem into a causal relationship, so that the relationship between variables can be explained (Scheel et al., 2021). This study analyzes the effect of inflation and interest rates on the profitability of the bank PT Bank BNI.

The data used is secondary data, namely power obtained from other parties, not directly obtained by researchers from their research subjects, this data is generally in the form of documentation data or report data that was previously available (Dirman, 2020). The data sources in this study are Return on Assets (ROA), inflation rates, and interest rates downloaded from the official website of Bank Indonesia, the Indonesian Statistics Agency, and reports from PT Bank BNI for the 2010-2020 period.

In this study trying to examine whether external banking factors have an influence or not on the profitability of PT Bank BNI. The period used is from 2010 to 2020. The independent variable in this study is Return on Assets (ROA), while the independent variables are the inflation rate and interest rates.

Technical analysis in this study using Multiple Linear Regression Analysis Techniques. The several steps that must be carried out in the form of multiple linear regression analysis before the regression model equation is formed are to carry out the Classical Assumption Test including the Data Normality Test, Autocorrelation Test, Multicollinearity Test, and Heteroscedasticity Test.

Research Model Specifications

The specification of the model used in this study is the following equation:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e} \quad (1)$$

Where: Y = Profitability Return on Assets (ROA) = Constant = Regression Coefficient, X1 = Inflation, X2 = Interest Rate, e = Nuisance Variable

Based on the theoretical basis and previous studies above regarding the various relationships between the independent variable and the dependent variable, the theoretical framework can be described as follows :

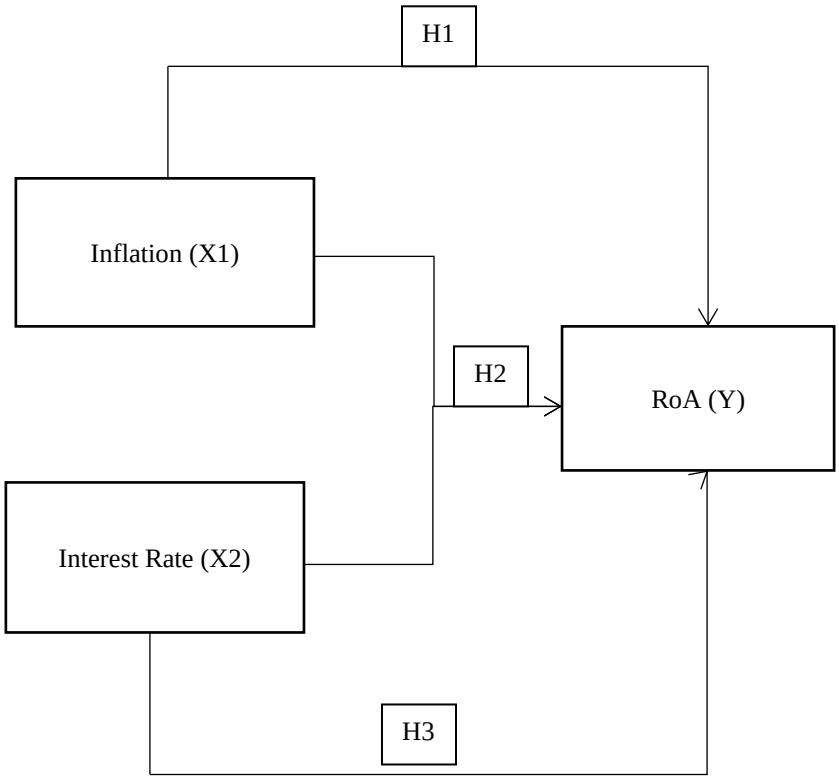

Figure 1. Framework

The conceptual framework for the research above is explained as follows: (a). Testing the independent variables, namely inflation (X1) and interest rates (X2) affect the dependent variable, namely Return On Assets (Y) partially (individually) using the T test. (b). Washing the independent variables, namely inflation (X1) and interest rates (X2) affect the dependent variable, namely Return On Assets (Y) simultaneously (together) using the F test.

3. RESULTS AND DISCUSSION

Multicollinearity Test

Table 1. Multicollinearity Test

Coefficients[a]

Model		Standardized Coefficients		Standardized coefficients	t	Sig.	Collinearity Statistic	
		B	Std.Error	Beta			Tolerance	VIF
1	(Constant)	.612	.950		.644	.538		
	Inflation	.099	.124	.297	.794	.450	.436	2.294
	Interest Rate	.268	.216	.464	1.239	.251	.436	2.294

a. Dependent Variable : RoA

This multicollinearity test is intended to test whether there is a high or perfect correlation between the independent variables or not in the regression model. To detect a high correlation between independent variables can be done in several ways, one of which is by using the Tolerance and

Variance Inflation Factor (VIF).

The assumptions of Tolerance and Variance Inflation Factor (VIF) can be stated as follows: 1). If VIF > 10 and the Tolerance value < 0.10 then multicollinearity occurs. 2)If VIF < 10 and Tolerance value > 0.10 then multicollinearity does not occur. It can be seen in the results above that the Centered VIF Inflation (X1) and Interest Rate (X2) values are 2.294 where the value is less than 10, it can be stated that there is no multicollinearity problem.

Normality Test

Table 2. Normality Test
One-SampleKolmogorov-SmirnovTest

		UnstandardizedResidual
N		11
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.54817854
Most Extreme Differences	Absolute	.204
	Positive	.140
	Negative	-.204
TestStatistic		.204
Asymp. Sig. (2-tailed)		.200[c,d]

a. Testdistributionis Normal.
b. Calculatedfrom data.
c. LillieforsSignificanceCorrection.
d. Thisis a lowerboundofthetruesignificance.

It can be seen in the results above that the Asymp. Sig. (2-tailed) value is at a number more than 0.05, so it is said that the data has a normal distribution.

Heteroscedasticity Test

According to (Ghozali&Latan, 2015) the heteroscedasticity test aims to test whether the regression model occurs inequality of variance from the residuals of one observation to another. If the variance from the residuals of one observation to another is constant, it is called homoscedasticity and if heteroscedasticity. A good regression model is homoscedasticity or no heteroscedasticity.

Table 3. Heteroscedasticity Test
Coefficients[a]

Model	Unstandardized Coefficients		StandardizedCoefficients	t	Sig.	CollinearityStatistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.502	.399	3.762	.006		
	Inflation	-.004	.052	-.029	-.081	.937	.436	2.294
	Interest Rate	-.183	.091	-.721	-2.013	.079	.436	2.294

a. Dependent Variable: ABS_RES

From the output above it can be seen that there is no heteroscedasticity problem. This is because the significance value of the 2 variables is more than 0.05 or greater than 5%. So it can be concluded that the data is free from heteroscedasticity problems or there is homoscedasticity.

Autocorrelation Test

The autocorrelation test aims to determine whether there is a correlation between confounding errors in period t and errors in the previous period. In this study, to determine

whether there is autocorrelation, the Durbin Watson test is used with the provisions that the Durbin Watson number is between -2 and +2.

Table 4. Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.715[a]	.511	.388	.61288	1.367

a. Predictors: (Constant), Interest Rate, Inflation
b. DependentVariable: ROA

From the results of the data using SPSS, the Durbin Watson number shows 1.367 so that it is between -2 to +2, meaning that the data does not have autocorrelation.

T test

The T test (Test T) is a statistical test that is used to test the truth or falsity of a hypothesis which states that between two mean samples taken randomly from the same population, there is no significant difference (Mishra et al., 2019).

1. Based on the results of the regression analysis, it was obtained that t count X1 was -0.081 < t table value 2.30600 and a significant value of 0.937 > 0.05. So it can be concluded that inflation has no significant negative effect on the profitability of PT Bank BNI in 2010-2020.
2. Based on the results of the regression analysis, the t count X2 is -2.013 < the t table value is 2.30600 and the significant value is 0.079 > 0.05. So it can be concluded that interest rates have no significant negative effect on the profitability of PT Bank BNI in 2010-2020.

F Test

Simultaneous test (F test) is a test conducted to see whether all independent variables jointly affect or not the dependent variable by comparing the value of Fcount with Ftable.

1. If the value of Fcount> Ftable then the hypothesis is rejected, meaning that together these independent variables affect the dependent variable.
2. If the value of Fcount <Ftable then the hypothesis is accepted, meaning that together these independent variables have no effect on the dependent variable.

Discussions

The analysis conducted on the dataset of PT Bank BNI from 2010-2020 indicates that the regression model is free from multicollinearity, heteroscedasticity, and autocorrelation issues. Specifically, the Variance Inflation Factor (VIF) values for both inflation and interest rate variables are below 10, indicating no multicollinearity. The normality test confirms that the residuals are normally distributed with a significance level greater than 0.05. The heteroscedasticity test shows that the significance values for both variables exceed 0.05, suggesting homoscedasticity. Additionally, the Durbin-Watson statistic falls within the range of -2 to +2, indicating no autocorrelation.

Regarding the impact of inflation and interest rates on profitability (RoA), the t-test results reveal that neither variable has a significant effect, as their respective p-values are greater than 0.05. The t-values for inflation and interest rates are -0.081 and -2.013, respectively, both of which fall short of the critical t-value of 2.306. Therefore, it can be concluded that neither inflation nor interest rates significantly influence PT Bank BNI's profitability during the examined period.

4. CONCLUSION

Based on the results of the data and discussion as well as the results of testing the hypotheses that have been described above, it can be concluded as follows: (a). Based on the partial t-test, it was found that inflation results did not have a significant negative effect on the profitability of PT Bank BNI in 2010-2020. (b). Based on the partial t test, it was found that the results of interest rates had a non-significant negative effect on the profitability of PT Bank BNI in 2010-2020. (c). Based on the simultaneous F test, it was found that the results of simultaneous inflation and interest rates did not affect the profitability of PT Bank BNI in 2010-2020. Despite the comprehensive analysis, this study has certain limitations. The sample size is relatively small, covering only 11 years, which may not capture the full range of economic fluctuations and their impacts on profitability. Additionally, the study focuses solely on PT Bank BNI, limiting the generalizability of the findings to other banks or regions. Future research should consider a larger sample size, including data from multiple banks and over a more extended period, to enhance the robustness and applicability of the results. Furthermore, incorporating other potential influencing factors such as macroeconomic variables or bank-specific characteristics could provide a more holistic understanding of profitability determinants.

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