

Effect of Interest Rates on Stock Returns in The Banking and Real Estate Industries

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Abstract: The study aims to explore the effect of interest rates on stock returns in the banking and real estate industries. Quantitative methods with an associative approach are used to explore relationships between certain variables. The data type used is secondary data, namely interest rate, stock return, type of industry, and market capitalization (size). The population in this study is banking companies listed on the Indonesia Stock Exchange and Bank Indonesia from January 1, 2016 to December 31, 2022. The sample selection method used is purposive sampling. The sample data amounted to 16,380 observations, which were monthly data (short-term). The results showed that interest rates significantly negatively influence stock returns, especially in the banking industry, compared to the real estate industry.

INTRODUCTION

Stock return is the amount of profit earned by an investor, which refers to the difference between the selling price and purchase price of a stock, and the difference is added to the dividends received during the period (Irawan, 2021; Pertiwi and Prihandini, 2021; Satwiko and Augusto, 2021; Utami and Sundara, 2023; Rimbano *et al.*, 2024). In making investment decisions, investors consider interest rate risk. Although interest rates are not the only factor that affects stock returns, they have a significant influence (Sausan, Korawijayanti and Ciptaningtias, 2020; Wei, 2020; Eko, Umaryadi and Saragih, 2021; Kpoti-mayor and Musimwa, 2022; Casta, 2023; Nilai, Dan and Saham, 2023) and complex, especially in the real estate industry;(Putra and Wasiaturrahma, 2021; Hesniati *et al.*, 2022) as well as the banking industry (Tejokusumo *et al.*, 2015; Isa, Ismail, N., Latif and Samsudin, 2021; Putra and Wasiaturrahma, 2021; Hesniati *et al.*, 2022; Järvinen, 2022). Exploring interest rates as a predictor for investors in stock return analysis is important (Aliyana, Salim and Priyono, 2021; Inggraini, 2021; Irawan and Fajri, 2021; Prayoga and Manda, 2021; Arianti and Handayani, 2022; Ramadhafani and Rivai, 2023) Because interest rates can have a significant impact on stock prices and general market performance. A more holistic exploration of the various factors that affect stock performance requires an accurate approach.

Each method has unique characteristics that need to be considered in research (Azhari *et al.*, 2023; Waruwu, 2023). In exploring interest rates on stock returns, researchers use quantitative methods with associative approaches as commonly adopted by previous researchers, including; Jaya and Kuswanto, (2021); Jie and Pradana (2021); Meilasari (2021); Mulyani, Jamaludin and Huda (2021); Palapa, Kumaat and Sumual (2021); and Marlina, Anggraini and

Rachman (2022); Suliyani and Benarda (2023). Quantitative methods provide objective results, allow generalization, and strengthen the validity and reliability of research instruments (Priadana and Sunarsi, 2021; Ali, 2022; Balaka, 2022; Marlina, Anggraini and Rachman, 2022; Syahrizal and Jailani, 2023). Although less in-depth, limited to the variables measured, and less flexible, quantitative data analysis is considered to be in accordance with the purpose of testing hypotheses that have been set.

The associative approach aims to explore the relationship between two or more variables (Afolabi *et al.*, 2021). In identifying and analyzing correlations or relationships between these variables, statistics are used in data processing. Associative approaches have been shown to be effective and have the highest level when compared to descriptive and comparative research (Seran, 2020; Ibrahim *et al.*, 2023). In identifying the relationship between variables, researchers use skunder data derived from publications of the Indonesia Stock Exchange, and Bank Indonesia. Although associative methods can identify relationships between variables, they cannot show definite cause-and-effect relationships. Therefore, interpretation of research results should be done carefully and consider other factors that might affect the results.

From the results of the literature review related to the effect of interest rates on stock returns, there is a research gap that deserves further discussion. There are two research results that conclude that the interest rate negatively affects stock returns (Muktadir, 2013; Assefa, Esqueda and Mollick, 2017, 2017; Demiralp, Eisenschmidt and Vlassopoulos, 2021; Kholifah and Retnani, 2021; Bats, Giuliadori and Houben, 2023; Eggertsson *et al.*, 2023) and the interest rate has a positive effect on stock returns (Maulani and Riani, 2021; Sukesti *et al.*, 2021; Saputra, 2022; Sulastris and Suselo, 2022; Hastuti, Irawan and Hukom, 2023; Mourine and Septina, 2023). These inconsistent results have led to the suspicion that there are other variables that may affect interest rates on stock returns. This motivates researchers to explore further by adding variables of industry type and market capitalization as moderation.

This type of banking company is often considered more sensitive to changes in interest rates (Du, 2020; Segev *et al.*, 2024) Because of their dependence on interest income, credit activities, asset risk, and monetary policy influence, compared to real estate companies that have different business characteristics and more diverse sources of income. Meanwhile, Kamila, Modal, and Suku (2022); Mahendra and Ainunnisa (2022) explained that real estate companies tend to be less sensitive because real estate companies usually have more stable business models and are less affected by fluctuations in macroeconomic conditions. Market capitalization has a significant role in the investment world (Niawaradila, Wiyono and Maulida, 2021; Tahmat, Lilyana and Mulyani, 2021; Handayani, Suhendro and Masitoh, 2022; Tahmat *et al.*, 2022). An investor should understand the concept of market capitalization so that it can help assess whether a company has potential or not. This motivates researchers to explore the effect of interest rates on stock returns in the banking and real estate industries.

LITERATURE REVIEW

Spillover volatility is often used as a short-term indicator where volatility in one market affects volatility in another. Spillover is an information relationship between markets, where new information that appears in one market can affect other markets. A good understanding of the origins and intensity of spillovers is essential for financial decision-making, such as optimal asset allocation, development of global hedging strategies for securities prices, and development of various regulatory requirements (Verma and Jackson, 2008). In this context, bank regulators need to understand the nature of spillovers to be able to properly assess capital adequacy and the

impact of proposed policy changes. Spillover in this paper refers to the transmission of the impact of interest rates on bank portfolios, systemic risk, and market stability. Previous studies have revealed different relationships in the effect of interest rates on bank stock returns.

Some studies state that changes in interest rates have a significant influence on stochastic changes and stock returns of financial institutions. However, other studies have found strong support for the negative influence of interest rates on stock returns. The difference in the results of this study can be caused by different treatments of changes in interest rates. Some studies also state that the effect of changes in interest rates on bank stock returns varies over time. Previous studies investigated the periodization of relatively stable and volatile interest rates, and found that interest rate sensitivity can vary over time. Market risk and credit risk models have also been used to analyze interest rate and exchange rate sensitivity, as well as the variability of risk coefficients to bank stock returns.

The research states that the effect of changes in interest rates on bank stock returns can vary over time and is influenced by other factors such as exchange rates and market risk. Furthermore, several studies distinguish between long-term interest rates and short-term interest rates and find that long-term interest rates have a greater impact on bank stock returns than short-term interest rates. Therefore, it is important to consider these factors in understanding the effect of interest rates on the performance of bank stocks.

Market Efficiency Theory

Market efficiency theory is a theory proposed by Fama (1965) in 1965. This theory divides the market into three forms, namely weak, half-strong, and strong. Each form of market has different characteristics in terms of information absorption. EMH theory relates the absorption of existing information to the price of a stock. In weak markets, information absorption is very low, and stock prices are said to reflect only past information. In semi-strong markets, stock prices reflect only all public information. The most efficient form is a powerful market, which quickly absorbs market information.

In strong markets, stock prices already reflect all available information, both public and private. In an efficient market, there is no abnormal return phenomenon. The study of speculation and irrational purchasing decisions is an old theory. The random walk theory discussed by Kolmogorov, Levy, and Samuelson is one of the earliest studies related to this theory. The random walk theory became the basis for studying anomalies and became the basis of the theory of the Efficient Market Hypothesis (Kiky, 2018).

Capital Structure Theory

Capital structure refers to the combination of types of securities and proportions that make up a company's capitalization. This includes a mix of various sources of long-term financing such as equity shares, preference shares, debentures, long-term loans, and retained earnings. Capital structure is long-term financing that is permanent for a company and involves mainly long-term debt and Capital structure refers to a combination of types of securities and proportions that make up a company's capitalization. This includes a mix of various sources of long-term financing such as equity shares, preference shares, debentures, long-term loans, and retained earnings. Capital structure is long-term financing that is permanent for the company and involves mainly long-term debt and equity (Sartono and Ratnawati, 2020).

Agency theory

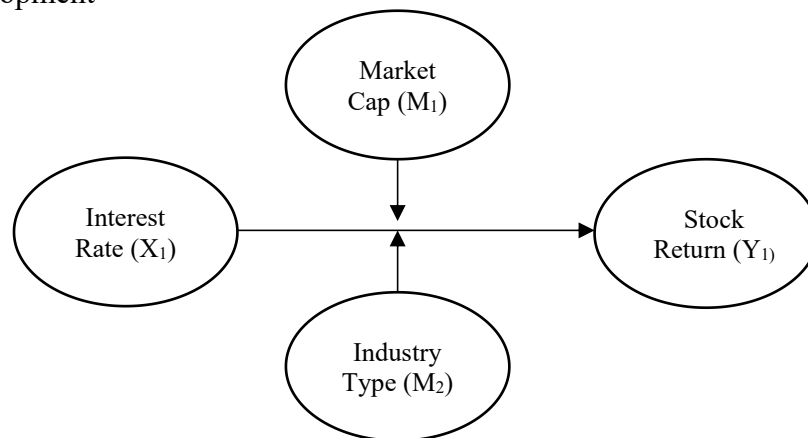
Agency theory refers to a concept that explains the relationship between two parties in a business context, namely the owner of capital (principal) and the manager (agent). This theory describes the separation of roles between capital owners and managers, as well as the impact they

cause. Here's the description:

1. Capital Owner (*principal*): Capital owner is an individual or group that owns shares or ownership in a company. They have the right and interest to ensure the company operates with efficiency and makes a profit.
2. Manager (agent): On the other hand, a manager is an individual or team that is responsible for the day-to-day management of the company. Their duties include making operational, financial, and strategic decisions to achieve company goals.

Agency theory explains the existence of separation and conflicts of interest between capital owners and managers. As an agent, managers must represent the interests of the owners of capital, but due to differences in interests and incentives between the two, conflicts often arise. Agency Theory helps us understand how incentives, oversight, and transparency affect the relationship between capital owners and managers. By understanding this concept, we can design systems that are more efficient and reduce agency conflicts in a business context.

Hypothesis Development



Gambar 1. Model Penelitian

The Effect of Interest Rate on Stock Return

Interest rates are an external factor that has a significant influence on stock prices. When interest rates rise, Investors tend to move their funds to banking institutions. Investors expect to benefit from higher interest as investors. As a result, the demand for stocks decreases, and the stock price falls. If many investors prefer to keep funds in banks rather than invest in stocks, then stock prices will decrease. The hypothesis of this study is as follows:

H1: *There is an effect of interest rates on stock returns*

The influence of industry type and market capitalization (size) on the relationship of interest rates to stock returns

The influence of industry type on the relationship between interest rates and stock returns is very important in investment analysis. Each industry has different characteristics that can affect how the companies within it react to changes in interest rates. For example, the banking industry may be more sensitive to interest rates, while the real estate and manufacturing industries may experience different impacts. In the banking industry, higher interest rates can increase interest margins which has the potential to increase stock returns. However, it can also reduce the amount

of loans provided, which could have a negative impact on long-term growth. Meanwhile, higher interest rates in the real estate industry due to more expensive financing, which can reduce demand for property and suppress real estate company stock returns.

On research conducted by (Verma and Jackson, 2008) indicates an asymmetry of response to large corporate portfolios and suggests that large companies are more sensitive to negative short- and long-term interest rate changes than positive ones. Where shares of large companies have crucial performance compared to small companies such as significant transaction value and large profit losses. This hypothesis was developed with the assumption that rising interest rates could have an effect on stock returns. Muktadir (2013); Assefa, Esqueda and Mollick (2017); Wei (2020); Demiralp, Eisenschmidt and Vlassopoulos (2021); Kholifah and Retnani (2021); Bats, Giuliadori and Houben (2023); Eggertsson *et al.* (2023) found a significant relationship between interest rate and stock return. However, the results of the study Maulani and Riani (2021); Sukesti *et al.*, (2021); Saputra (2022); Sulastris and Suselo (2022); Hastuti, Irawan and Hukom (2023); Mourine and Septina (2023) who deny the relationship.

This suggests a discrepancy in findings between the previous study and this study. Such differences can be caused by variations in the data used, different analysis methods, or other factors that affect the results of the study. Because the results of the study still have gaps, this study tries to observe based on the type of banking and real estate industry and based on large and small market capitalization. Thus, this study makes an important contribution in strengthening empirical evidence regarding the effect of interest rates on stock returns.

These findings can provide valuable insights for investors and stakeholders in understanding how interest rates can affect stock performance in financial markets. However, it should be noted that this study has certain limitations and further research is needed to deepen understanding of this relationship and overcome differences in the results of previous studies.

H2: *Banking industry reinforces negative influence of interest rates on stock returns*

H3: *Large company size reinforces the negative influence of interest rates on stock returns*

METHOD

This research uses quantitative methods that focus on collecting and analyzing data based on numbers and statistics. Its main purpose is to measure certain variables and identify relationships between them. The type of research used is an associative approach that focuses on analyzing cause-and-effect relationships and other variables that have the potential to affect these relationships. The associative approach aims to find out the relationship between two or more variables. In associative research, we can build theories that explain, predict, and control a symptom. In quantitative methods with an associative approach is used as a way to explore relationships between certain variables.

The type of data used is skunder data, namely interest rate, stock return, type of industry and market capitalization (size). The population in this study is banking companies listed on the Indonesia Stock Exchange and Bank Indonesia for the period January 1, 2016 to December 31, 2022. The sample selection method used is *purposive sampling*. The sample data amounted to 16,380 observations which were monthly data (*short term*). The sample of the banking industry consists of 100 types of banking companies, both small and large banking companies traded on the Stock Exchange companies. The real estate industry sample includes companies from small to large scale located in Indonesia sourced from the publication of the Indonesia Stock Exchange.

Rate of return

Stock return is one of the factors that can affect investor interest in investing. *Capital gain* or *Capital loss* is calculated using the following formula (Abdullah, Soedjatmiko and Sari, 2016):

$$Rit = [(Pit - Pt-1) / Pt-1]$$

Description:

Rit=Annual realized return for the period t

Pit = Annual share price of period t

Pt-1 = Stock price of period t-1

Interest Rate

The interest rate is one of the factors that can affect the return of a stock. There is an inverse relationship between interest rates and stock returns. When interest rates rise, usually stock returns will tend to be lower. This is because investors tend to prefer to invest their funds in securities in the money market rather than investing in stocks. As a result, the demand for stocks decreases and can lead to a decrease in stock prices. The interest rate that is generally used as a reference is the Bank Indonesia Certificate (Defawanti and Paramita, 2018). According to (Nasir and Mirza, 2015) SBI can be calculated with the following formula :

$$SBI = \frac{SBI_t - SBI_{t-1}}{SBI_{t-1}}$$

Information:

SBI_t : SBI interest rate year t

SBI_{t-1} : SBI Interest Rate before year t

RESULTS AND DISCUSSION**Descriptive Statistics****Table 1. Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Ri	15698	5593.793	2878.133	152	9363
BIRate	16464	.049	.004	.043	.055
Dummy	16464	.026	.025	0	.06

Source : Data Processed (2024)

The variable rate of return (Ri) had 15,698 observations with an average of 5593.793 and a standard deviation of 2878.133. The minimum value is 152, and the maximum value is 9363. From these statistics, we can conclude that "Ri" likely represents a continuous variable, perhaps representing some form of numerical measurement. The variable interest rate (BIRate) has 16,464 observations, this variable has a mean of 0.049 and a standard deviation of 0.004. The minimum and maximum values are 0.043 and 0.055, respectively. This low variable has 15,698 observations with a mean of 5593.793 and a standard deviation of 2878.133. The minimum value is 152, and the maximum value is 9363. From these statistics, we can conclude that the rate of return is likely to represent a continuous variable, perhaps representing some form of numerical measurement. Standard deviation showed relatively small variability in birth rates across observations.

The interaction of BIRate and industry type is a dummy variable. Symbol 1 for the banking industry and vice versa 0 for the real estate industry. The dummy variable also had

16,464 observations, with an average of 0.026 and a standard deviation of 0.025. It takes a binary value between 0 and 0.06.

Correlation analysis

Here is table 2 of the results of pearson correlation analysis

Table 2. Pairwise correlations

Variables	Ri	BIRate
Ri	1.000	
BIRate	-0.004	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source : Data Processed (2024)

The correlation between "Ri" and "BIRate" is -0.004, indicating a very weak negative correlation between the two variables. This correlation is statistically insignificant ($p > 0.1$), which means there is no evidence to suggest a meaningful linear relationship between these variables.

Regression Results

Here is table 3 of regression results. Model 1 tests hypotheses 1 and 2. Model 2 tests hypothesis 3

Table 3. Main Results of regression

	Model1	Model2
BIRate	14476.431** (2.63)	0.678 (0.74)
DInd	-34054.359*** (-38.30)	
Dsize		-0.254*** (-32.06)
Intercept	5731.837*** (21.11)	0.584*** (12.79)
N	15698	16380

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source : Data Processed (2024)

The value of N (16380) indicates a large dataset, which improves the reliability of the regression results. Regression analysis includes "BIRate" and "Dummy" as independent variables predicting "Ri" as the dependent variable. Both independent variables had a statistically significant effect on the "Ri". The interest rate has a coefficient of 14476.431 with a t-statistic of 2.63, indicating a significant positive relationship with the "Ri" at a significance level of 0.01. This suggests that a higher birth rate is associated with a higher rate of return value. Dummy" has a coefficient of -34054.359 with a very high t-statistic (-38.30), showing a very significant negative relationship with "Ri" at a significance level of 0.001. This suggests that the presence of a condition represented by the variable "Dummy" is associated with a much lower rate of return value. The term intercept is also statistically significant, indicating that even when both independent variables are zero, there is a significant expected value of "Ri."

According to model 2 the coefficient for BIRate is positive (0.678), indicating a direct relationship with the dependent variable. However, the associated t-statistic (0.74) is low, suggesting that this relationship is not statistically significant. This can mean that although

BIRate has a positive impact, it is not strong enough to be statistically reliable. The coefficient for Dsize is negative (-0.254), indicating an inverse relationship with the dependent variable. The high T-statistic (-32.06) and significance level (***, or $p < 0.001$) suggest that these are strong and statistically significant findings. This strong relationship may indicate that larger size is associated with lower performance in the context of the dependent variable. The intercept was 0.584 with a high t-statistic (12.79), indicating it was statistically significant at $p < 0.001$ level. This gives the base value for the regression equation when all other variables are zero.

A positive but insignificant coefficient for BIRate might indicate that while rate has a positive effect, it is not the primary determinant of outcome. This could imply that other factors are more influential, or that there is significant variability in how these levels affect outcomes. A negative and significant coefficient for Dsize may indicate that as the size increases, there is a corresponding decrease in the size of the yield. These findings may indicate problems such as scale diseconomy, inefficiencies, or management challenges as organizations grow larger.

DISCUSSION

The results showed that there is a significant negative influence of interest rates on stock returns, especially in the banking industry compared to the real estate industry. This evidence was obtained from the analysis of model 1 which resulted in a dind regression coefficient (*dummy industry*) of -34.054. This coefficient indicates that there is a tendency for lower returns on banking industry stocks compared to the real estate industry when interest rates are higher. These results show that the banking industry is more sensitive to changes in interest rates when compared to the real estate industry. This difference can be explained by the different business characteristics and financial structures between the two industries. The banking industry in general is more dependent on interest income and has a higher borrowing load, so changes in interest rates can have a significant impact on stock returns. Meanwhile, the real estate industry may have other factors that also affect its stock returns, such as property demand and real estate market cycles. Although interest rates can also affect the real estate industry, the impact may not be as great as it is on the banking industry.

Based on the results of model 2 in this study, it was found that in companies with large sizes, there is a greater negative influence of interest rates on stock returns when compared to companies with smaller market capitalizations. These findings indicate that companies with large market capitalizations are more vulnerable to changes in interest rates and can experience a more significant impact on their stock returns. These results support the study Muktadir (2013); Assefa, Esqueda and Mollick (2017); Wei (2020); Demiralp, Eisenschmidt and Vlassopoulos (2021); Kholifah and Retnani (2021); Bats, Giuliadori and Houben (2023) and reject the results of the study Maulani and Riani (2021); Sukesti *et al.*, (2021); Saputra (2022); Sulastri and Suselo (2022); Hastuti, Irawan and Hukom (2023); Mourine and Septina (2023). These differences can be due to variations in the data used, different analysis methods, or other factors that affect the results of the study.

CONCLUSION

This study succeeded in proving that an increase in interest rates resulted in an increase in stock returns on short-term observations. Conversely, in the banking industry, this influence does not apply because an increase in interest rates actually results in a decrease in stock returns. The same thing happens to companies with high asset capitalization, an increase in interest rates results in a decrease in stock returns. The results of this study have implications for investor decision making that if interest rates rise, then as soon as possible sell stocks, especially the

banking industry and companies with high capitalization. The limitation of this study is that this study did not conduct annual observations (*long term*) and there are limited costs in processing data. Advice for future researchers is to conduct a testing period by including monthly observations (*short term*) and annual observations (*long term*), and find sources of funding from sponsors.

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