

Influence of Market Rate of Return (R_m) and Systematic Risk (β) on Stock Decision Making in Non-State-Owned Banks (2019–2023)

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Abstract

This study investigates the influence of the Market Rate of Return (R_m) and Systematic Risk (β) on stock investment decision-making in non-state-owned banking companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period. Employing a quantitative approach with a causal-associative research design, the study uses secondary data and applies multiple linear regression analysis. The empirical findings reveal that both the Market Rate of Return (R_m) and Systematic Risk (β) have no significant partial effect on stock investment decisions. Moreover, the two variables jointly also do not demonstrate a significant influence. These results indicate that investors may rely on other determinants beyond CAPM variables when making investment decisions in the non-state-owned banking sector. The study suggests that companies enhance performance stability through risk diversification and improved transparency to strengthen investor confidence. Furthermore, managers are encouraged to emphasize non-financial value drivers, such as innovation capability, digital transformation, and financial literacy enhancement, to support more informed investment decision-making.

1. Introduction

The capital market plays a strategic role in supporting national economic growth by channeling funds from investors to productive sectors. In Indonesia, non-state-owned banking companies have shown dynamic development, with total assets growing from IDR 3,756 trillion in 2019 to IDR 4,892 trillion in 2023, reflecting a compound annual growth rate (CAGR) of 6.8%. Despite this growth, investment decision-making in the banking sector remains challenged by market volatility. The average beta value of non-state-owned bank stocks (1.32) is notably higher than that of state-owned banks (0.94), indicating greater exposure to systematic risk.

Digital transformation further intensifies the complexity of investment analysis. Digital banking transaction volume increased by 32.4% in 2023, reaching IDR 4,827 trillion, while non-state-owned banks consistently allocate 15–20% of their capital expenditure to technology investment. These developments highlight the need for a more rigorous assessment of how market dynamics, particularly the Market Rate of Return (R_m) and systematic risk (β), shape investment decisions.

In investment theory, risk and return expectations are central to investor behavior. The Capital Asset Pricing Model (CAPM) is commonly used to estimate expected returns by incorporating systematic risk, measured through the beta coefficient. Market Rate of Return (R_m) represents overall market performance, while beta reflects the sensitivity of a stock's return to market movements. Prior studies have shown mixed results. Some

report a positive relationship between beta and stock returns (Putri & Syaichu, 2023; Apriani et al., 2023), whereas others highlight the influence of external factors such as sustainability performance, monetary policy, and digital innovation on beta variations (Melina et al., 2023; Mandala et al., 2023; Venturini, 2022).

However, the existing literature reveals three critical gaps. First, many studies focus on state-owned banks or aggregated banking sectors, leaving limited empirical evidence concerning non-state-owned banks, which exhibit distinct ownership structures and risk profiles. Second, prior research has not sufficiently examined how fluctuations in R_m and β jointly influence investment decisions, particularly in emerging markets where CAPM assumptions may not fully hold. Third, although recent studies highlight digitalization, sustainability, and machine-learning-based risk modeling, few have analyzed whether traditional CAPM variables still significantly drive investment decisions in technologically adaptive banking institutions.

Addressing these gaps is essential, as non-state-owned banks contribute substantially to Indonesia's financial system and attract investors seeking higher returns despite elevated risk. Therefore, this study aims to analyze the influence of the Market Rate of Return (R_m) and Systematic Risk (β) on stock investment decision-making in non-state-owned banking companies listed on the Indonesia Stock Exchange during the 2019–2023 period. The core problem investigated is whether CAPM-based indicators remain reliable decision-making variables for investors in the increasingly digital and competitive banking environment.

2. Literature Review

2.1 Theoretical Basis

2.1.1 Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model is a theoretical model that links systematic risk to expected return. This model has been the foundation of modern portfolio theory for six decades, providing a systematic framework for calculating an asset's required return based on its systematic risk (Kumar et al., 2023). In developing markets like Indonesia, this model requires adjustments to accommodate local characteristics (Madani et al., 2024).

2.1.2 Market Rate of Return (R_m)

Market Rate of Return (R_m) is the expected rate of return from a perfectly diversified market portfolio. This rate of return is a key indicator of overall stock market performance (Kumar et al., 2023). In general, R_m consists of capital gain/loss (changes in stock prices) and dividend yield (the distribution of company profits). R_m can be calculated using changes in the Jakarta Composite Index (JCI) using the formula (Putri & Syaichu, 2023). In the calculation, R_m can be calculated using changes in the Composite Stock Price Index (IHSG) with the formula:

$$R_m = \frac{IHSG_t - 1IHSG_{t-1}}{IHSG_{t-1}}$$

2.1.3 Systematic Risk (β)

Systematic Risk, or market risk, is the risk that cannot be eliminated through portfolio diversification (Apriani et al., 2023). Beta (β) is a quantitative measure of systematic risk that reflects the sensitivity of a stock's returns to overall market movements. Stocks with a beta greater than 1 are more sensitive to market movements, while stocks with a beta less than 1 are less sensitive. A beta of 1 indicates that the stock moves in line with the market (Putri & Syaichu, 2023).

2.1.4 Investment Decision Making

Investment decision-making is a systematic process of allocating financial resources by considering risk and return (Almansour et al., 2023). This process involves comprehensive evaluation, including fundamental and technical analysis, as well as multidimensional analysis from the macroeconomic, industry, and company levels. Behavioral factors such as risk appetite and market sentiment also influence this process (García & Vidal, 2024).

2.1.5 Non-State-Owned Banking

Non-state-owned banks have unique characteristics, such as dispersed ownership structures and greater operational flexibility (Le et al., 2023). However, these characteristics also pose challenges in terms of coordination and strategic decision-making (Skorupski, 2023).

2.1.6 Banking Sector Investment Analysis

Investment analysis in the banking sector requires a comprehensive evaluation of asset quality, profitability, operational efficiency, and macroeconomic and regulatory conditions (Kolari et al., 2022). With technological advancements and changing consumer preferences, investment risk analysis has become increasingly complex, making the use of advanced analytics and machine learning essential (Rawson & Brito, 2023).

2.2 Research Hypothesis

2.2.1 The Influence of Market Rate of Return on Stock Decision Making

Market Rate of Return Market Rate of Return (MRR) is a key indicator in investment analysis that reflects overall market return expectations. Research by Kumar et al. (2023) found a significant positive relationship between Market Rate of Return (MRR) and stock investment decisions, with a correlation coefficient of 0.68 ($p < 0.05$). This finding is supported by Madani et al. (2024), who reported an R^2 value of 0.72, indicating that this variable has a strong ability to explain variations in investment decisions.

García and Vidal's (2024) research in the context of emerging markets shows that a 1% increase in the Market Rate of Return correlates with a 1.24% increase in the probability of an investment decision. Meanwhile, Melina et al. (2023) confirmed this positive effect specifically in the banking sector, with a significance level of $p < 0.01$.

H1: Market Rate of Return (R_m) significantly affects stock decisions.

2.2.2 The Influence of Systematic Risk on Stock Decision Making

Systematic Risk (β) describes the sensitivity of stock returns to market fluctuations. A study by Skorupski (2023) showed that a one-unit increase in beta can reduce the probability of making an investment decision by 0.84 ($p < 0.01$). This finding is supported by Ganguly and Bhunia (2022), who showed a negative correlation ($r = -0.72$, $p < 0.05$) between beta and investment decisions.

Kolari et al. (2022) also found that investors tend to avoid stocks with high beta values, with a 0.1 unit increase in beta decreasing the probability of investment by 0.92%. Meanwhile, Le et al. (2023) confirmed this negative effect with a significance level of $p < 0.01$.

H2: Systematic Risk (β) has a significant negative effect on stock decision making in non-state-owned banking companies.

2.2.3 The Effect of Simultaneous Market Rate of Return and Systematic Risk on Stock Decision Making

The simultaneous influence of Market Rate of Return and Systematic Risk on investment decisions has been demonstrated by various studies. Mandala et al. (2023) demonstrated a significant simultaneous influence with an F-statistic of 24.68 ($p < 0.01$). Kaur and Dharni (2022) also found that the combination of these two variables had an R^2 of 0.78.

Almansour et al. (2023) reported that the combination of Market Rate of Return and Systematic Risk explained up to 82% of the variation in investment decisions (adjusted $R^2 = 0.82$, $p < 0.01$). Venturini (2022) found similar results with an F-statistic of 31.42 ($p < 0.01$).

H3: Market Rate of Return (R_m) and Systematic Risk (β) simultaneously have a significant influence on stock decision making in non-state-owned banking companies.

3. Research Methods

3.1 Research Object

This study focuses on stocks in banking companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. This selection was based on several important considerations. The non-state-owned banking sector has unique characteristics in investment decision-making due to its relatively high market influence and systematic risk. Therefore, this sector is a relevant subject for measuring the influence of market rate of return and systematic risk on stock decision-making.

3.2 Types of Research

The type of research used in this study is quantitative research with an associative approach. Quantitative research aims to test hypotheses using numerical data and statistical analysis. The associative approach is used to determine the relationship or influence between two or more variables, namely the market rate of return and systematic risk, on stock decision-making.

3.3 Operational Definition of Variables

The operational definitions of the variables used in this study are presented in the following table to provide clarity regarding the indicators and measurement scales applied in the research.

Table 1 Presents the operational definitions, indicators, and measurement scales for each research variable

Variables	Indicator	Measurement Scale
<i>Market Rate of Return</i> (X_1)	1. Changes in the Composite Stock Price Index (Composite Stock Price Index _t - Composite Stock Price Index _{t-1}) 2. Dividend yield of the JCI 3. Market trading volume	Ratio
<i>Systematic Risk</i> (X_2)	1. Covariance of stock returns with market returns 2. Market return variance 3. Stock price volatility relative to the market	Ratio
Stock Decision Making (Y)	1. Expected Return (30%): a. Required rate of return b. Risk premium c. Historical return 2. Risk Assessment (30%): a. Price volatility b. Value at Risk (VaR) c. Stock beta 3. Fundamental Valuation (25%): a. Price to Earnings Ratio (P/E) b. Price to Book Value (P/B) c. Return on Equity (ROE) 4. Technical Aspects (15%): a. Moving averages b. Trading volume c. Momentum indicator	Interval

3.4 Population and Sample

The population in this study is all non-state-owned banking companies listed on the Indonesia Stock Exchange during the period 2019 to 2023. The sampling technique was carried out using the purposive sampling method, namely, a sampling determination technique based on certain criteria relevant to the research objectives.

The criteria used as the basis for selecting samples are:

- Shares of Banking Companies listed on the Indonesia Stock Exchange during the 2019-2023 sampling period.
- Companies that did not issue financial reports during the 2019 - 2023 period.
- State-owned banking companies 2019 – 2023

3.5 Data Collection Technique

The data collection technique used is a documentation study, namely by collecting secondary data obtained from the official website of the Indonesian Stock Exchange (www.idx.co.id), *Yahoo Finance*, and other relevant sources. The data collected includes monthly stock prices, market returns, and betas for each company's stock.

3.6 Data Analysis Techniques

This study analyzed data by calculating the Market Rate of Return (RRR) by dividing the Jakarta Composite Index (JCI) by the previous period's JCI, and Systematic Risk using a regression of individual stock returns against market returns to obtain beta (β) values. Furthermore, multiple linear regression was used to test the influence of both independent variables on stock decision-making.

Before the regression analysis was conducted, a series of classical assumption tests were applied, including: normality test (Kolmogorov-Smirnov), multicollinearity test (VIF and Tolerance), heteroscedasticity test (Glejser method), and autocorrelation test (Durbin-Watson statistic). Hypothesis testing was conducted through partial test (t-test), simultaneous test (F-test), and coefficient of determination (R^2) analysis to assess the model's ability to explain the dependent variable. Testing variables and hypotheses, the data analysis process in this study used a computer application, namely International Business Machines Statistical Product and Service Solution (IBM SPSS).

4. Results and Discussion

4.1 Results and Analysis

4.1.1 Normality Test

To ensure that the regression model meets the required classical assumption, a normality test was conducted using the One-Sample Kolmogorov-Smirnov method. The results are presented in Table 2.

Table 2 Normality test results

One-Sample Kolmogorov-Smirnov Test			Unstandardized Residual
N			185
Normal Parameters ^{a,b}	Mean		,0000000
	Standard Deviation		,00075622
Most Extreme Differences	Absolute		,126
	Positive		,077
	Negative		-,126
Test Statistics			,126
Asymp. Sig. (2-tailed) ^c			,142
Monte Carlo Sig. (2-tailed) ^d	Sig.		,132
	99% Confidence Interval	Lower Bound	,123
		Upper Bound	,141

The results of the normality test using the One-Sample Kolmogorov-Smirnov method showed an Asymp. Sig. value of 0.142 ($p > 0.05$), so the residual data were normally distributed and met the regression assumptions.

4.1.2 Multicollinearity Test

A multicollinearity test was conducted, and the results (shown in Table 3) indicate no multicollinearity issues among the independent variables.

Table 3 Multicollinearity test results

Model	Unstandardized Coefficients		Coefficients Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
1 (Constant)	,006	,000		25,843	,000		
Market Rate of Return	-,002	,003	-,134	-,802	,428	,986	1,015
Systematic Risk	,000	,000	-,197	-1,179	,247	,986	1,015

a. Dependent Variable: Stock Decision Making

The results of the multicollinearity test show a tolerance value of 0.986 (> 0.10) and a VIF of 1.015 (< 10), so there are no symptoms of multicollinearity and the regression model is suitable for use.

4.1.3 Heteroscedasticity Test

The heteroscedasticity test results (see Table 4) indicate that the model is free from heteroscedasticity, fulfilling the homoscedasticity assumption.

Table 4 Heteroscedasticity test results

Model	Coefficients			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients Beta		
	B	Std. Error			
1 (Constant)	,001	,000		4,581	,000
Market Rate of Return	,000	,001	,039	,232	,818
Systematic Risk	8,535	,000	,231	1,377	,178

a. Dependent Variable: ABS_RES

The Glejser test shows a significance value > 0.05, so there are no symptoms of heteroscedasticity and the model meets the assumption of homoscedasticity.

4.1.4 Autocorrelation Test

The results of the autocorrelation test using the Durbin-Watson statistic are presented in Table 5.

Table 5 Autocorrelation test results

Model	R	R Square	Model Summary		
			Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
1	,251a	,063	,008	,001	2,031

a. Predictors: (Constant), Systematic Risk, Market Rate of Return
 b. Dependent Variable: Stock Decision Making

The Durbin-Watson value of 2.031 indicates the absence of autocorrelation, so the residual independence assumption is met, and the regression model is suitable for use.

4.1.5 Multiple Linear Regression

The results of the multiple linear regression analysis are presented in Table 6.

Table 6 Multiple linear regression test results

Model		Coefficients			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients Beta		
		B	Std. Error			
1	(Constant)	,006	,000		25,843	,000
	Market Rate of Return	-,002	,003	-,134	-,802	,428
	Systematic Risk	,000	,000	-,197	-1,179	,247

a. Dependent Variable: Stock Decision Making

Based on the regression results, the following equation is obtained:

$$Y = 0.006 - 0.002X_1 + 0.000X_2$$

From the equation above, the analysis is taken:

- a. Constant (0.006): The value of a stock decision when the Market Rate of Return and Systematic Risk are zero.
- b. Market Rate of Return (- 0.002): Negative influence, but not significant (sig. 0.428 > 0.05).
- c. Systematic Risk (0.000): Does not have a significant impact (not significant, sig. 0.247 > 0.05).

4.2 Hypothesis Testing

4.2.1 Partial Test (t-test)

The results of the partial hypothesis testing (t-test) are presented in Table 7.

Table 7 Partial test results (t-test)

Model	Coefficients ^a			t	Sig.
	Unstandardized	Standardized			
	Coefficients	Coefficients			
	B	Std. Error	Beta		
1 (Constant)	,006	,000		25,843	,000
Market Rate of Return	-,002	,003	-,134	-,802	,428
Systematic Risk	,000	,000	-,197	-1,179	,247

a. Dependent Variable: Stock Decision Making

The Market Rate of Return variable has a significance value of 0.428 (>0.05), indicating that it has no partial significant effect on stock decision-making. This indicates that changes in the market rate of return have not yet been able to influence investor decisions.

Meanwhile, Systematic Risk also had no partial significant effect (significance 0.247 > 0.05). Although the regression coefficient was negative (0.000), its effect was not statistically strong. This means that increasing systematic risk has not been proven to decrease stock-making decisions, holding other variables constant.

4.2.2 Simultaneous Test (F-Test)

Table 8 displays the results of the F-test, which was conducted to examine the simultaneous effect of the independent variables.

Table 8 Simultaneous test results (F-Test)

Model		ANOVA			F	Sig.
		Sum of Squares	df	Mean Square		
1	Regression	,000	2	,000	1,146	,330b
	Residual	,000	34	,000		
	Total	,000	36			

a. Dependent Variable: Stock Decision Making
b. Predictors: (Constant), Systematic Risk, Market Rate of Return

The F-test results show a significance value of 0.330 (>0.05) and a calculated F of 1.146, indicating that Systematic Risk and Market Rate of Return do not have a significant simultaneous effect on Stock Decision Making. Thus, the regression model is not yet adequate to explain the relationship between the two independent variables and the dependent variables.

4.2.3 Determination Coefficient Test

The results of the coefficient of determination test (R^2) are presented in Table 9.

Table 9 Coefficient of determination test

Model	Model Summary			
	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	,251a	,063	,008	,001

a. Predictors: (Constant), Systematic Risk, Market Rate of Return
b. Dependent Variable: Stock Decision Making

The R-square value of 0.063 indicates that only 6.3% of the variation in stock decision-making is explained by systematic risk and market rate of return. The adjusted R-squared value of 0.008 indicates the model's very low predictive ability. This means the model is ineffective in explaining investor decisions based on these two variables.

4.3 Discussion of Research Results

4.3.1 The Influence of Market Rate of Return on Stock Decision Making

Based on the partial t-test results for the first hypothesis (H1), the Market Rate of Return variable yields a significance value of 0.428, which is greater than (> 0.05), thus H1 is rejected. This means that the Market Rate of Return does not significantly influence stock decision-making, although in theory, this variable is an important indicator in assessing potential market profits. These results indicate that changes in market returns are not yet strong enough to influence investors' decisions to buy or sell shares in the non-state-owned banking sector.

These findings contradict the Capital Asset Pricing Model (CAPM) theory and several previous studies, such as those by Kumar et al. (2023), Madani et al. (2024), and García & Vidal (2024), which state that market returns are an important indicator in investment decision-making. However, these results reinforce the view that in the context of emerging markets like Indonesia, other factors influence investment decisions, such as market sentiment, risk perception, and investor psychology.

Practically, this insignificance suggests that investors in the non-state-owned banking sector may rely less heavily on market return indicators when making investment decisions. In volatile market conditions, investors focus more on fundamental aspects or the sustainability of a company's performance than solely on market returns. This also indicates that the effectiveness of the market rate of return as an investment benchmark is still limited in this sector.

4.3.2 The Influence of Systematic Risk on Stock Decision Making

Based on the partial test results (t-test) on the second hypothesis (H2), it shows that the Systematic Risk (β) variable produces a significance value of 0.247 which is greater than (> 0.05), so H2 is rejected. This means that Systematic Risk does not have a significant effect on stock decision making, although the negative regression coefficient may indicate investor uncertainty regarding undiversified market fluctuations. Thus, although the regression coefficient β is negative, its influence on investment decisions cannot be proven empirically.

Theoretically, these results contradict the findings of Skorupski (2023), Ganguly & Bhunia (2022), and Kolari et al. (2022), which show that systematic risk influences investor preferences. However, in the context of the non-state-owned banking sector in Indonesia, this insignificance could be due to risk mitigation factors implemented by companies or investor diversification strategies that reduce sensitivity to market fluctuations.

Implicitly, these findings suggest that investors may perceive systematic risk as less significant as long as a company's fundamentals remain strong. For example, investors may remain invested in a digital bank with a high beta because they believe in its long-term growth and technological innovation. Thus, investment decisions are not solely based on market volatility but are also influenced by long-term perceptions of the company.

4.3.3 The Effect of Simultaneous Market Rate of Return and Systematic Risk on Stock Decision Making

Based on the results of the simultaneous test (F-test) on the third hypothesis (H3), it shows that the two independent variables, namely Market Rate of Return and Systematic Risk, produce a significance value of 0.330 which is greater than (> 0.05), so H3 is rejected. This means that the two variables simultaneously do not have a significant effect on stock decision making, even though theoretically both are the main components in the Capital Asset Pricing Model (CAPM). This is also supported by the R Square value of 0.063 which indicates that only 6.3% of the variation in investment decisions can be explained by Market Rate of Return and Systematic Risk.

These results indicate that investors in the non-state-owned banking sector likely use considerations beyond these two variables, such as fundamental analysis, macroeconomics, market sentiment, or even technological and sustainability factors. Mandala et al. (2023) and Almansour et al. (2023) also note the importance of a multidimensional approach in investment decision-making.

In practice, investors assess not only potential returns and market risk but also technology integration, operational efficiency, and business sustainability. Banks with aggressive digital transformation may remain attractive to investors despite their high systematic risk. Therefore, investment decisions cannot be explained solely by the CAPM.

4.4 Managerial or Decision-Making Aspects

4.4.1 Diversification of Risk Strategy

Systematic Risk is not significant, companies need to implement risk diversification strategies, such as selective portfolio management, use of derivatives, and operational efficiency to remain stable amid market fluctuations.

4.4.2 Repositioning of Market Indicators

Market Rate of Return does not influence investment decisions, companies should emphasize other indicators such as asset growth, profitability, digitalization, and credit quality in communications to investors.

4.4.3 Investor Education and Information

The CAPM's inconsistency with investor behavior indicates the need for more comprehensive education and information, encompassing fundamental, technical, and environmental and social aspects.

4.4.4 Improving Performance Transparency

Even if the CAPM is insignificant, transparency remains crucial. Companies need to publicly present financial and sustainability reports to build trust and attract long-term investors.

5. Conclusion

Based on the results of the data analysis and discussion that has been carried out, the following conclusions can be drawn:

- *Market Rate of Return* has no significant impact on stock decision-making. This means that investors do not rely entirely on market return indicators when making investment decisions in the non-state-owned banking sector.
- *Systematic Risk* also has no significant effect on stock decision-making. This indicates that stock volatility, as reflected in beta, is not yet a dominant factor in investor considerations.
- Simultaneously, Market Rate of Return and Systematic Risk do not significantly influence investment decisions. This indicates that investors tend to consider other variables in their investment analysis. The CAPM model used in this study is not yet able to explain stock decision-making.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

*The authors confirm contribution to the paper as follows: **Study conception and design:** Hayyu Fadli Firmadhani, Wiwiek Kusumaning Asmoro; **data collection:** Wiwiek Kusumaning Asmoro; **analysis and interpretation of results:** Hayyu Fadli Firmadhani, Wiwiek Kusumaning Asmoro, Atik Tri Andari, Ahmad Saifi Athoillah; **draft manuscript preparation:** Wiwiek Kusumaning Asmoro, Atik Tri Andari, Ahmad Saifi Athoillah. All authors reviewed the results and approved the final version of the manuscript.*

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