

# Relative Strength Index, Moving Average Convergence- Divergence on Stock Performance and Fundamental Analysis as Moderating

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## **Relative Strength Index, Moving Average Convergence-Divergence on Stock Performance and Fundamental Analysis as Moderating**

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### **Abstract**

This study aims to determine the effect of Relative Strength Index (RSI) and Moving Average Convergence-divergence (MACD) on stock performers with Debt to Equity Ratio (DER) as a Moderation variable in Financing companies listed on the Indonesian Stock Exchange (IDX). Sampling in the study using purpose sampling method obtained 14 companies with time series data. The analysis method used in this study is multiple linear regression analysis using eview. The results show that Relative Strength Index (RSI) partially has a positive and significant effect on stock performance, Moving Average Convergence-divergence (MACD) partially has a positive and significant effect on stock performance, Relative Strength Index (RSI) has a positive and significant effect on stock performance, which is moderated by Debt to Equity Ratio (DER), Moving Average Convergence-divergence (MACD) has a positive and significant effect on the Performance of Shares moderated by Debt to Equity Ratio (DER).

**Keywords:** Relative Strength Index, Moving Average Convergence-Divergence, Stock Performance, Debt to Equity Ratio

### **1. Introduction**

World stock exchanges are still hit by the covid-19 pandemic. Although some countries that were earlier affected by the covid-19 virus have begun to improve, some other countries are still at the height of the pandemic, including Indonesia. Various public sectors and the business world have also received significant impact from these global events, not least the world stock market. As in the release submitted by the Indonesian Stock Exchange (IDX) mentioned, if all stock exchanges in the world experience a decline in stock prices. This is marked by the combined stock price indices of global exchanges that simultaneously declined during the pandemic.

The IDX composite Index since January 2020 declined to its lowest point in early April, but began to show a slow upward trend entering May 2020. This means that if investors currently invest in stocks, they can buy stocks at relatively low prices. The price comparison of stock prices today is the same as when buying stocks seven years ago. This is an opportunity for investors in the Indonesian capital market to start investing and realize profits when the world economy improves or has grown rapidly again.

The reason investors prefer stocks as a means of investment lies in the freedom of investing time and

liquidity. Investing in stocks has a high potential return. However, investing in stocks is never free from risk. The higher the return of an investment, the greater the risk faced by investors. The risk is unavoidable but can be minimized by conducting analysis (Lumban Tobing et al., 2019).

According to Hanafi (2016) capital market is a market that conducts transactions of buying and selling financial instruments over a long period of time. The capital market operates in an organized manner in which there is securities trading activity. According to Pardiansyah (2017) investors who buy shares will get a profit according to the number of shares they own. Investors can trade stocks every trading day in accordance with price changes in the capital market. Stocks have the nature of high risk high return which means that investors can get high profits but with high risk as well (Monika & Yusniar, 2020). Leverage or Debt to Equity Ratio (DER) is a ratio that compares the amount of debt to equity (Nuraini et al., 2017). This ratio is often used by investors to see how much a company's debt is compared to the equity owned by the company or its shareholders. The higher the DER number, it is assumed that the company has a higher risk to the company's liquidity. The smaller DER better for the company and will increase the stock price.

Relative Strength Index (RSI) was developed by J. Welles Wilder. State that the RSI is a momentum oscillator that measures the speed and change in price movement. This indicator is used to calculate the comparison between the strength of rising and falling prices, with a value of 0-100 (Bhargavi., 2017). Moving Average Convergence-Divergence (MACD) is one of the technical indicators that help traders identify changes in direction. In addition, MACD can provide information on whether an ongoing trend is strong enough or not.

## 2. Method

The research method used is quantitative with causal approach and Time Series data. Sampling in this study uses purposive sampling, which is a technique to determine the sample with certain criteria. So that we get 14 samples of companies from 19 companies in the service industry financing sector. Data analysis consisting of hypothesis test T Test before moderation and after moderation and Coefficient of Determination ( $R^2$ ). The method in this study uses by using EVIEWS.

## 3. Result and Analysis

### Result

The result partial hypothesis testing (t-Test) without moderation variables are shown in table 1.

**Table 1.**  
**t-Test Result without Moderating Variables**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1_RSI	0.343272	0.031649	-20.32531	0.0000
X2_MACD	0.040012	0.009311	-4.297397	0.0220
C	1.205605	0.256735	6.591744	0.0000

Data processed by authors

The results of partial hypothesis testing (t-Test) with moderating variables are shown in table 2.

**Table 2.**  
**t-Test Result with Moderating Variable**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1_RSI	1.093550	0.334251	12.24694	0.0000
X2_MACD	0.340859	0.072276	-4.716072	0.0000
Z_SIZE	0.218095	0.068465	-3.185478	0.0018
X1_Z	0.204833	0.017952	-11.41004	0.0000
X2_Z	0.011105	0.002414	4.599574	0.0000
C	4.427289	2.037502	4.136089	0.0001

Data processed by authors

Based on tables 1 and 2 above which examine the effect of the Relative Strength Index (RSI) and Moving Average Convergence-Divergence (MACD) on Stock Performance with Debt To Equity Ratio (DER) as moderation, it can be tested as follows:

For hypotheses 1, from table 1 it can be seen that the Relative Strength Index (RSI) has a t-statistic value of -20.325 with a probability of  $0.0000 < 0.05$ . Because the probability value is small from the 5% significance level, it shows that the Relative Strength Index (RSI) variable partially has a positive and significant effect on Stock Performance in the Financing Sector listed on the Indonesia Stock Exchange in 2015-2019. Thus  $H_a$  is accepted.  $H_0$  is rejected.

For hypotheses 2, from table 1 it can be seen that the Moving Average Convergence-Divergence (MACD) has a t-statistic value of -4.297 with a probability of  $0.0220 < 0.05$ . Because the probability value is large from the 5% significance level, it shows that the Moving Average Convergence-Divergence (MACD) variable partially affects the Stock Performance in the Financing Sector listed on the Indonesia Stock Exchange in 2015-2019. Thus  $H_a$  is accepted.  $H_0$  is rejected.

For hypotheses 3, from table 2 it can be seen that the multiplication variable between the Relative Strength Index (RSI) and the Debt To Equity Ratio (DER) [ $X1*Z$ ] has a t-statistic value of -11.410 with a probability of  $0.0000 < 0.05$ . Because the probability value is less than 5% significance level, it shows that the multiplication variable between the Relative Strength Index (RSI) and the Debt To Equity Ratio (DER) [ $X1*Z$ ] has a positive and significant effect on Stock Performance in the Financing Sector listed on the Indonesia Stock Exchange in 2015-2019. So it can be concluded that the third hypothesis is accepted, namely the Relative Strength Index (RSI) which is moderated by the Debt To Equity Ratio (DER) has a significant effect on Stock Performance.

The interaction of the moderating variable can strengthen or weaken the influence of the independent variable on the dependent variable. The multiplication between the Relative Strength Index (RSI) and the Debt To Equity Ratio (DER) strengthens the effect of the Relative Strength Index (RSI) on Stock Performance. It can be known by the coefficient value is positive. So it can be concluded that the use of the Debt To Equity Ratio (DER) strengthens the influence of the Relative Strength Index (RSI) on Stock Performance. Therefore the third hypothesis is accepted. Thus  $H_a$  is accepted,  $H_0$  is rejected.

For hypothesis 4, from table 2 it can be seen that the multiplication variable between Moving Average Convergence-Divergence (MACD) and Debt To Equity Ratio (DER) [ $X2*Z$ ] has a t-statistic value of 4.599 with a probability of  $0.0000 < 0.05$ . Because the probability value is small from the 5% significance level, it shows that the multiplication variable between the Moving Average Convergence-Divergence (MACD) and the Debt To Equity Ratio (DER) [ $X2*Z$ ] has a positive and significant effect on Stock



Performance in the Financing Sector listed in Indonesia Stock Exchange in 2015-2019.

The coefficient determination test results without moderating variable are presented in table 3 below:

**Table 3.**  
**Coefficient Determination Test Result without Moderating Variable**

R-squared	0.473706
Adjusted R-squared	0.632981

*Data processed by authors*

The coefficient of determination generated in the R-squared test is 0.4737. The results obtained indicate that the Relative Strength Index (RSI) and Moving Average Convergence-divergence (MACD) variables contribute to influencing stock performance by 47.37% while the remaining 52.63% is influenced by other variables.

The coefficient determination test results with moderating variable are presented in table 3 below:

**Table 4.**  
**Coefficient Determination Test Result with Moderating Variable**

R-squared	0.560631
Adjusted R-squared	0.548741

*Data processed by authors*

The coefficient of determination generated in the R-squared test is 0.5606. The results obtained indicate that the variables that the Relative Strength Index (RSI) and Moving Average Convergence-divergence (MACD) contribute to influencing Stock Performance with Debt To Equity (DER) as the moderating variable of 56.06% while the remaining 43.94% influenced by other variables.

#### Analysis

From the research results that have been described previously that the Relative Strength Index (RSI) has an effect and is significant on stock performance. This shows that the Relative Strength Index (RSI) is a momentum oscillator that measures the speed and changes in stock price movements.

Moving Average Convergence-Divergence (MACD) partially has no effect on Stock Performance. In the study (Patel et al., 2019) revealed that MACD is an easy indicator to predict the trend because it is the only problem to know the difference between two moving averages plotted against the middle line in the histogram. The use of the MACD indicator in making decisions to buy or sell is accurate because there is a middle line in the histogram so that shareholders are not worried about seeing the stock's up and down trend using this indicator is proven to be good

The Relative Strength Index (RSI) has a positive effect on Stock Performance which is moderated by the Debt To Equity Ratio (DER). Research (Monika et al., 2017) says that the MACD and RSI indicators produce the same investment decisions (buy and sell signals) statistically. Both MACD and RSI indicators can provide the best time to buy or sell a stock. Both indicators have similarities in predicting the movement of up and down trends. Both are needed in choosing when to sell and when to buy. If each indicator says the selling trend is above 70 and the buying trend is below 30.

Moving Average Convergence Divergence (MACD) has a positive effect on stocks which are moderated by the Debt To Equity Ratio (DER). In the study (Patel et al., 2019) revealed that MACD is an easy indicator to predict the trend because it is the only problem to know the difference between two moving averages plotted against the middle line in the histogram.

#### 4. Conclusions

After conducting a simple study of 19 financing companies listed on the Indonesia Stock Exchange on the Indonesia Stock Exchange, the results of the description of the implications of investment advisory companies (RSI and MACD) on the performance of the financing sector stocks with fundamental analysis (DER) as a moderating variable, can be concluded as follows:

The Relative Strength Index (RSI) variable has a positive and significant effect on Stock Performance in the Financing Sector listed on the Indonesia Stock Exchange in 2015-2019. The Moving Average Convergence-divergence (MACD) variable partially affects the performance of stocks in the financing sector listed on the Indonesia Stock Exchange in 2015-2019.

The Relative Strength Index (RSI) moderated by the Debt To Equity Ratio (DER) has a significant effect on Stock Performance. The multiplication between the Relative Strength Index (RSI) and the Debt To Equity Ratio (DER) strengthens the effect of the Relative Strength Index (RSI) on Stock Performance. It can be known by the coefficient value is positive. So it can be concluded that the use of the Debt To Equity Ratio (DER) strengthens the influence of the Relative Strength Index (RSI) on Stock Performance.

Moving Average Convergence-divergence (MACD) moderated by Debt To Equity Ratio (DER) has a significant effect on Stock Performance. The multiplication between Moving Average Convergence-divergence (MACD) and Debt To Equity Ratio (DER) strengthens the effect of Moving Average Convergence-divergence (MACD) on Stock Performance. It can be known by the coefficient value is positive. So it can be concluded that the use of Debt

To Equity Ratio (DER) strengthens the effect of Moving Average Convergence-divergence (MACD) on Stock Performance.

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