



MACROECONOMIC FACTORS & ASSET PORTFOLIO THEORY IN IDX30: STOCK RETURNS 2013-2020

Andreas Billyarta Harsanico*, Fx. Sugiyanto

Faculty of Economics and Business, Universitas Diponegoro, Semarang, Indonesia

*Corresponding author: andreasbillyartaharsanico@gmail.com

ARTICLE INFO

ABSTRACT

Article history

Received : 24 December 2021

Revised : 1 March 2023

Accepted : 7 March 2023

Keywords

IDX30;

Macroeconomics;

OLS;

VECM;

Stock Returns

JEL classification

G12; E44; C32

This study examines the influence of macroeconomic factors on stock returns within Indonesia's IDX30 index, the nation's leading stock index. The primary aim is to evaluate both short-term and long-term impacts of these macroeconomic variables on stock market returns, guided by Milton Friedman's theoretical framework. The research utilizes Ordinary Least Squares (OLS) to assess immediate relationships and Vector Error Correction Model (VECM) to capture long-term dynamics. The study analyzes historical data from the IDX30, focusing on variables such as inflation rates, interest rates, and GDP growth as key indicators. Results indicate that specific macroeconomic factors, particularly interest rates and inflation, have significant effects on IDX30 stock returns. In the short term, interest rates exhibit a strong inverse relationship with stock returns, while in the long term, GDP growth positively correlates with stock market performance.

This is an open-access article under the [CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



1. INTRODUCTION

In economic theory, individuals play a crucial role in driving a country's economic activities through their consumption and investment decisions. Keynes' macroeconomic theory highlights that individuals have the ability to save a portion of their income rather than spending it all on consumption (Keynes, 1936). The aggregate savings of individual consumers and the collective investment behavior of individual entrepreneurs together determine the overall level of economic activity.

Individuals' savings decisions are influenced by their ability to meet their living expenses from their disposable income. As societies modernize, the savings behavior evolves, with individuals channeling their savings towards investment activities that can generate additional (passive) income. Investment activities can be categorized into two broad types: real asset investments and financial asset investments. Financial markets play a crucial role in facilitating the flow of funds from those with surplus capital to those with productive investment opportunities, as described by Mishkin (2017).

Financial market products can be broadly classified into equity and debt instruments. Among these, shares or equities are the primary focus, as they represent a claim on a company's revenues and assets. Shares are also traded as long-term securities due to their lack of a maturity date (Mishkin, 2019). Stock investment involves participating in the capital of a company, and the stock market is the platform where these shares are traded (Sunariyah, 2000). The trading activities in the stock market determine the share prices, and the difference in share prices represents the investment return or rate of return.

The capital market serves as an alternative investment instrument for the public (Adisetiawan, 2009). The stock market, as a part of the capital market, offers returns that incentivize individuals to invest (Khan et al., 2021). An investor is someone who has purchased shares in a well-performing company, thereby channeling their funds into that company. Investors, as partial owners of the company, expect to receive substantial returns from their investments. This investment behavior in the stock market can be seen as an indication of a country's overall economic health and activity.

When investing in the stock market, particularly in shares that are part of a stock index, investors need to consider the analytical approach. This study emphasizes that the most important factor in stock investment analysis is the macroeconomic fundamentals. Investors view the stock market's efficiency as a barometer of a country's economic health, prospects, and an indication of domestic and global investor confidence (Uddin, 2009).

Mishkin (2017) argues that the future movement of a variable is unpredictable, as its current value can either increase or decrease. Consequently, future changes in share prices should, for all practical purposes, be unpredictable. Moreover, the capital market situation has a strong relationship with the overall state of the country's economy. Widodoatmodjo (2009) asserts that the condition of the capital market is greatly influenced by the aggregate economic performance, and the relationship between the capital market and macroeconomic factors exhibits a positive correlation, indicating that the financial situation has a significant impact on the capital market.

The stock exchange serves as a crucial indicator of a nation's economic health, playing a pivotal role in fostering economic stability, investment, and domestic savings. By organizing stocks into indices, the stock exchange aids investors in mitigating asymmetric information, thus facilitating informed investment decisions (Shelly Singhal & Biswal, 2019). Among these indices, blue-chip companies, recognized for their robust financial health and sound fundamentals, are prominently featured. The IDX30 index, comprising the top thirty companies in Indonesia with substantial market capitalization and strong fundamentals, epitomizes such an index (Fauzia, 2019).

This research examines the impact of macroeconomic factors on the IDX30 index, categorizing these influences into internal factors, external macroeconomic factors, and asset substitutes. The study acknowledges that the capital market's return is shaped not only by domestic sentiments but also by foreign economic dynamics and alternative asset classes. Key domestic macroeconomic factors analyzed include JUB (term savings), which influences the flow of public money into deposit investments as an alternative to stocks, inflation, which drives investment behavior through price increase patterns, and interest rates (BI Rate), which affect banking interest rates and consequently investment decisions (Nugroho, 2008; Rudiger Dornbusch & Starts, 2017).

Moreover, the research explores external macroeconomic variables such as the price of gold, which serves as an investment alternative; Foreign Direct Investment (FDI), representing foreign capital influx boosting domestic investment; and exchange rates, which offer speculative opportunities and reflect domestic financial conditions. By integrating Milton Friedman's theoretical framework, this study aims to elucidate the relationship between these macroeconomic factors and stock market performance, providing a comprehensive understanding of their interconnectedness.

2. RESEARCH METHODS

This study explores the impact of macroeconomic factors and asset substitution on stock returns in the IDX30 index. Key variables such as inflation, the BI Rate, exchange rates, world gold prices, deposits, and Foreign Direct Investment (FDI) are analyzed to understand their influence on stock returns. Stock returns represent the profit from the difference between buying and selling shares, calculated as the percentage change in the IDX30 index's price from one quarter to the next, measuring the performance of the top 30 Indonesian companies from 2013Q1 to 2020Q4.

The study's population includes quarterly stock return data from the IDX30 index for 2013Q1 to 2020Q4. The sample consists of secondary data from the World Gold Price website and Bank Indonesia, including economic indicators such as inflation, exchange rates, deposits/savings, and FDI on a quarterly basis.

Several analytical methods are employed to understand the relationships between these variables. The Vector Auto Regression (VAR) model analyzes non-structural data to capture the dynamic relationship between stock returns and independent variables over time. The Vector Error Correction Model (VECM) addresses uncertainties in the VAR model, providing insights into both short-term adjustments and long-term equilibrium relationships among variables while incorporating past data for time series forecasting (Sulistiana et al., 2017).

An Ordinary Least Squares (OLS) Time Series Test examines Milton Friedman's portfolio theory by testing the specified model:

$$Y_t = \alpha_1 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \varepsilon_t \dots \dots \dots (1)$$

Where as:

- Y = Stock Rate of Return Ratio (CIND)
- X₁ = Money Supply Ratio on term deposits (CMS)
- X₂ = Inflation Ratio (CINF)
- X₃ = BI Rate Ratio (CBIR)
- X₄ = Exchange Rate Ratio (CEXR)
- X₅ = World Gold Price Ratio (CGLD)
- X₆ = FDI Ratio (CFDI)
- α = constant

The study also uses a Stationarity Test with a unit root approach to ensure the time series data's mean and variance remain constant. The Lag Length Test determines the appropriate lag in the VAR model, eliminating autocorrelation using criteria like AIC, SC, and HQ (Shrestha & Bhatta, 2018). The Cointegration Test, based on Johansen Trace Statistics, identifies long-term equilibrium relationships (Talwar & Srivastava, 2018). The Granger Causality Test assesses causal relationships between variables, and the Impulse Response Test evaluates the effect of shocks in one variable on others over time (Lee et al., 2013). Finally, the Variance Decomposition Test explores the forecast error variance, offering insights into the future influence of these variables on stock returns. These methods together provide a detailed understanding of factors affecting stock returns in the IDX30 index.

3. RESULTS AND DISCUSSION

This research aims to explore and provide empirical evidence for Milton Friedman's portfolio theory through structural testing using the Ordinary Least Squares (OLS) method. Additionally, it examines the influence of macroeconomic factors and asset substitutions on IDX30 index returns over both long-term and short-term periods using the Vector Error Correction Model (VECM), along with impulse response and variance decomposition analyses.

Structural Testing with OLS Test

To verify Milton Friedman's theory on the impact of macroeconomic factors and asset substitutions on IDX30 index returns, OLS testing was conducted. The findings are summarized in Table 1 below.

Table1. Structural Test Results of Portfolio Theory, Using OLS on Research Variables on the IDX30 Index

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006533	0.025996	0.251297	0.8036
BIR	0.106547	0.073588	1.447884	0.1601
INF	4.66E-05	0.002632	0.017722	0.9860
EXC	-1.511518	0.401228	-3.767224	0.0009
GLD	-0.142934	0.196655	-0.726823	0.4741
FDI	0.003448	0.017018	0.202607	0.8411
MS	1.086003	1.076164	1.009142	0.3226

Source: Processed data (2021)

The Ordinary Least Squares (OLS) results indicate that the exchange rate (EXC) has a significant negative impact on stock returns, with a p-value of 0.0009. This finding aligns with the theory that an appreciating domestic currency can reduce export competitiveness, thereby negatively affecting stock performance. On the other hand, the price of gold (GLD) shows an insignificant negative effect on IDX30 returns, with a p-value of 0.4741, suggesting that gold may not act as a significant substitute asset in this context. Additionally, deposits (MS) exhibit an insignificant positive effect on stock returns, with a p-value of 0.3226, which contradicts Friedman's theory as the expected substitution effect is not observed. Furthermore, other variables such as the BI Rate (BIR), inflation (INF), and Foreign Direct Investment (FDI) also show insignificant effects on IDX30 returns, with p-values exceeding 0.05.

Stationary Test

In stationary testing, we use the Unit Root Test, which is useful for testing the stationarity of time series data. In Unit Root Test testing, it is produced at the level where the data is stationary. This is obtained by using the ADF (Augmented Dickey-Fuller) indicator where the probability value is <0.05, and then this test data is stationary at level. Stationarity test obtained in the table 2 below.

Table 2. Stationarity Test on the IDX30 Index

Method	Statistic	Prob.**
ADF - Fisher Chi-square	114.744	0.0000
ADF - Choi Z-stat	-8.960	0.0000

Source: Processed data (2021)

The test results show that the lowest error rate occurs at the level. Testing the Unit Root Test in this research has the benefit of testing stationary so that spurious regression does not occur.

Lag Length Test

Conclusions about the lag in the research can be seen from the AIC indicator on the table 3 below, where the first lag has a star so that the length of the lag in this study is one, which means that the influence of the current variable is influenced by one period of the previous variable.

Table 3. Results of the VAR Long Lag Test to Determine the Influence of Past Variables in Testing the IDX30 Index Return

Lag	LogL	LR	FPE	AIC	SC	HQ
0	145.3462	NA*	3.14e-13*	-8.925561*	-8.601758*	-8.820010*
1	178.1751	48.71383	9.68e-13	-7.882264	-5.291835	-7.037849

Source: Processed data (2021)

Cointegration Test

The following are the results of the cointegration test which can be seen in table 4 below.

Table 4. Cointegration Test Results to Determine Long-Term Relationships

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.777542	149.5682	111.7805	0.0000
At most 1 *	0.677457	104.4777	83.93712	0.0008
At most 2 *	0.596836	70.53211	60.06141	0.0051
At most 3 *	0.533456	43.27975	40.17493	0.0236
At most 4	0.355824	20.40768	24.27596	0.1425
At most 5	0.195795	7.214197	12.32090	0.3043
At most 6	0.022319	0.677154	4.129906	0.4702

Source: Processed data (2021)

Based on the results of the cointegration test, it was found that on the BI rate, inflation and exchange rate variables, there was a long-term influence (At most 1, at most 2 and at most 3) with the Trace statistic value being greater than the critical value of 0.05. Interest rates generally control the monetary sector, and there is a long-term relationship with stock returns. The influence of inflation causes enthusiasm to invest in decreasing and substituting assets in which the rupiah exchange rate against the dollar has the effect of diverting investment in a securities asset into the difference between currencies.

Granger Causality Test

Table 5. Granger Causality Test Results Between Research Variables

Null Hypothesis:	Obs	F-Statistic	Prob.
BIR does not Granger Cause IND	31	0.06256	0.8043
IND does not Granger Cause BIR		0.07888	0.7809
INF does not Granger Cause IND	31	0.62995	0.4340
IND does not Granger Cause INF		0.03321	0.8567
EXC does not Granger Cause IND	31	0.19949	0.6586
IND does not Granger Cause EXC		0.17394	0.6798
GLD does not Granger Cause IND	31	0.06862	0.7953
IND does not Granger Cause GLD		4.17003	0.0507
FDI does not Granger Cause IND	31	0.52964	0.4728
IND does not Granger Cause FDI		0.00882	0.9258
MS does not Granger Cause IND	31	1.39844	0.2469
IND does not Granger Cause MS		0.00304	0.9564
INF does not Granger Cause BIR	31	0.47254	0.4975
BIR does not Granger Cause INF		1.72191	0.2001
EXC does not Granger Cause BIR	31	0.68593	0.4146
BIR does not Granger Cause EXC		0.13156	0.7195
GLD does not Granger Cause BIR	31	1.01214	0.3230
BIR does not Granger Cause GLD		0.03297	0.8572
FDI does not Granger Cause BIR	31	0.05309	0.8195
BIR does not Granger Cause FDI		1.82821	0.1872

The table above continued on the next page

The table below is a continuation of the image from the previous page.....

Null Hypothesis:	Obs	F-Statistic	Prob.
MS does not Granger Cause BIR	31	0.58148	0.4521
BIR does not Granger Cause MS		0.00011	0.9915
EXC does not Granger Cause INF	31	0.01235	0.9123
INF does not Granger Cause EXC		1.63595	0.2114
GLD does not Granger Cause INF	31	1.21061	0.2806
INF does not Granger Cause GLD		0.00616	0.9380
FDI does not Granger Cause INF	31	0.28702	0.5964
INF does not Granger Cause FDI		1.29779	0.2643
MS does not Granger Cause INF	31	1.57860	0.2193
INF does not Granger Cause MS		4.16151	0.0509
GLD does not Granger Cause EXC	31	3.38663	0.0763
EXC does not Granger Cause GLD		0.02845	0.8673
FDI does not Granger Cause EXC	31	1.07460	0.3088
EXC does not Granger Cause FDI		0.00218	0.9631
MS does not Granger Cause EXC	31	0.09045	0.7658
EXC does not Granger Cause MS		0.52030	0.4767
FDI does not Granger Cause GLD	31	0.11252	0.7398
GLD does not Granger Cause FDI		0.00347	0.9534
MS does not Granger Cause GLD	31	0.00273	0.9587
GLD does not Granger Cause MS		0.21466	0.6467
MS does not Granger Cause FDI	31	0.15476	0.6970
FDI does not Granger Cause MS		0.51180	0.4803

Source: Processed data (2021)

The results of the Granger Causality test in table 5 above showed that causality testing between research variables resulted in causality occurring in the research variables, based on probability values $\alpha > 0.5$, and there is no reciprocal relationship between research variables indicated by probability values $\alpha > 0.05$.

VECM

VECM results consist of standard error along with t-statistics to determine the long-term and short-term significance levels of variables. Therefore, in interpreting VECM, we can see the t-statistic results in table 6 and table 7 below.

Table 6. VECM Long-Term Test Results on the IDX30 Index

Cointegrating Eq:	Cointegrating Eq1
IND(-1)	1.000000
BIR(-1)	-0.625737 (0.07972) [-7.84943]
INF(-1)	0.010244 (0.00266) [3.84947]

The table above continued on the next page

The table below is a continuation of the image from the previous page.....

Cointegrating Eq:	Cointegrating Eq1
EXC(-1)	1.482879 (0.33509) [4.42531]
GLD(-1)	0.592288 (0.18451) [3.21005]
FDI(-1)	0.058853 (0.01427) [4.12306]
MS(-1)	-1.670131 (0.43625) [-3.82841]

Source: Processed data (2021)

The long-term test on table 6 above shows that all variables have a long-term influence on stock returns on the IDX30 index seen from the t-statistic value in square brackets, which is greater than the absolute value of 2, so it is significant $\alpha=5\%$.

Table 7. VECM Short Term Test Results on the IDX30 Index

Error Correction:	D(IND)	D(BIR)	D(INF)	D(EXC)	D(GLD)	D(FDI)	D(MS)
CointEq1	-0.593741 (0.23893) [-2.48501]	1.410686 (0.65151) [2.16527]	-49.29389 (14.5321) [-3.39206]	0.161892 (0.11388) [1.42161]	0.235566 (0.22596) [1.04252]	-4.199400 (2.61591) [-1.60533]	-0.011057 (0.03932) [-0.28123]
D(IND(-1))	-0.052501 (0.25742) [-0.20395]	-1.255622 (0.70193) [-1.78882]	44.93280 (15.6568) [2.86985]	-0.192829 (0.12269) [-1.57163]	-0.628523 (0.24345) [-2.58177]	-0.352256 (2.81836) [-0.12499]	-0.084570 (0.04236) [-1.99643]
D(BIR(-1))	-0.253455 (0.10240) [-2.47524]	-0.091336 (0.27921) [-0.32712]	-16.67289 (6.22794) [-2.67711]	0.053317 (0.04880) [1.09246]	0.141444 (0.09684) [1.46063]	-0.630450 (1.12108) [-0.56236]	0.000801 (0.01685) [0.04752]
D(INF(-1))	0.003257 (0.00269) [1.21150]	-0.003025 (0.00733) [-0.41270]	-0.472868 (0.16350) [-2.89213]	-0.002122 (0.00128) [-1.65631]	0.000215 (0.00254) [0.08473]	0.050130 (0.02943) [1.70327]	-0.000382 (0.00044) [-0.86336]
D(EXC(-1))	-0.881494 (0.73878) [-1.19318]	-3.039155 (2.01448) [-1.50866]	106.1910 (44.9339) [2.36327]	-0.397076 (0.35212) [-1.12767]	-0.955559 (0.69867) [-1.36768]	-6.307246 (8.08848) [-0.77978]	-0.257267 (0.12157) [-2.11617]
D(GLD(-1))	0.681360 (0.25096) [2.71497]	0.144558 (0.68432) [0.21124]	-9.298745 (15.2641) [-0.60919]	-0.144229 (0.11962) [-1.20577]	-0.514868 (0.23734) [-2.16932]	3.851262 (2.74767) [1.40165]	0.081499 (0.04130) [1.97343]
D(FDI(-1))	-0.013510 (0.01848) [-0.73120]	-0.046418 (0.05038) [-0.92133]	0.769501 (1.12377) [0.68475]	0.006597 (0.00881) [0.74908]	0.003661 (0.01747) [0.20950]	-0.072564 (0.20229) [-0.35871]	0.002517 (0.00304) [0.82787]
D(MS(-1))	1.836735 (1.31070) [1.40134]	1.800501 (3.57398) [0.50378]	-107.3276 (79.7194) [-1.34632]	0.287881 (0.62471) [0.46082]	0.579924 (1.23955) [0.46785]	-4.125042 (14.3501) [-0.28746]	-0.299143 (0.21569) [-1.38694]

Source: Processed data (2021)

The short-term test in table 7 on previous page shows that the t-statistic value in the square brackets is greater than the absolute value of 2, so it is significant $\alpha=5\%$. The test results show that short-term substitute assets on the exchange rate, gold price and deposit variables do not have a significant short-term influence. The results of testing macroeconomic variables show that the monetary policy variable has a significant short-term influence, while the FDI variable does not have a significant short-term influence.

Impulse Response

Simple impulse response testing means that the response to the influence of a variable is due to a shock or shock that occurs due to another variable. The shock test is the error component of each of these variables. The shock results for macroeconomic variables on the IDX30 index with impulse response can be seen in the appendix. With each change in the standard deviation of the BIR, INF, GLD and MS variables, the IND response will grow positively, while the shock given by EXC and FDI will have a negative influence on the IND variable.

Variance Decomposition

Testing produces meaning that VECM testing can be used to test the role of variables in the future. The result of variance decomposition in this paper is on the figure 1 below.

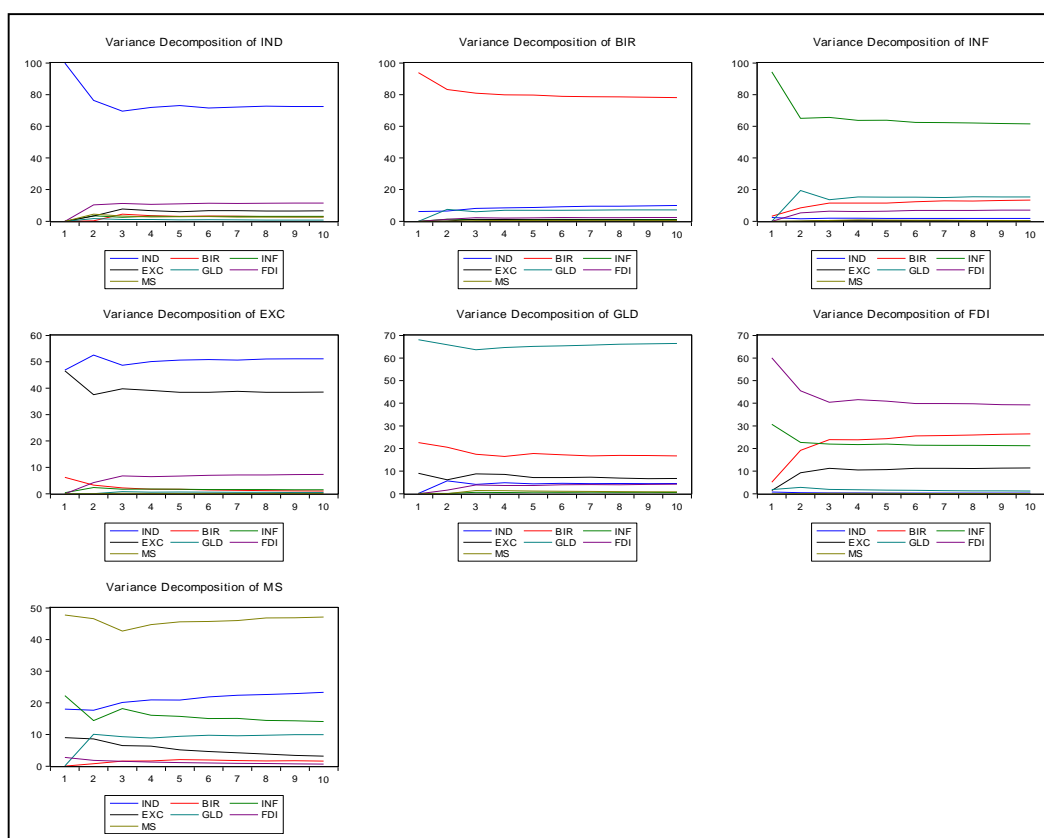


Figure 1. Results of Variance Decomposition of Macroeconomic Variables on the IDX30 Index
Source: Processed data (2021)

These results show that in IND output, the contribution to the independent variable shows that a decrease in the rate of return on IND will increase FDI BIR, INF, EXC, GLD, and MS slowly over the next ten quarter periods.

4. CONCLUSION

This study confirms Milton Friedman's portfolio theory by analyzing the effects of macroeconomic variables and asset substitution on the IDX30 index. The research reveals that: 1) While inflation positively influences stock returns, its impact is not significant, suggesting that investors are motivated by rising price levels to seek investment opportunities; 2) The BI Rate shows a minor positive influence on stock returns, indicating that low-interest rates encourage holding cash rather than investing in stocks; 3) Investors expect returns from the IDX30 to surpass inflation and interest rates, demonstrating strong confidence in the Indonesian stock market; 4) Deposits remain attractive for their stability and low risk, though higher stock returns diminish interest in currency exchange and gold investments; 5) Over time, BI rates and deposits have a negative impact, while inflation, gold prices, exchange rates, and foreign direct investment contribute positively; 6) Short-term Effects: In the short term, the BI Rate boosts stock returns, whereas inflation negatively affects them, and substitute assets show no substantial impact.

5. REFERENCES

- Adisetiawan. (2009). Hubungan Tingkat Suku Bunga Sertifikat Bank Indonesia (SBI), Inflasi, dan Indeks Harga Saham Gabungan (IHSG). *BENEFIT: Jurnal Manajemen Dan Bisnis*, 13(1), 23–33. <https://journals.ums.ac.id/index.php/benefit/article/view/1301/0>
- Fauzia, S. (2019). *Pengaruh Faktor Fundamental dan Teknikal terhadap Harga Saham (Studi Empiris pada Saham Syariah Jakarta Islamic Index Tahun 2015-2017)* [Universitas Islam Negeri Raden Intan Lampung]. [http://repository.radenintan.ac.id/8691/1/SILVIA FAUZIA SKRIPSI FULL AFTER MUNAQASYAH CETAAAK%21%21%21.pdf](http://repository.radenintan.ac.id/8691/1/SILVIA%20FAUZIA%20SKRIPSI%20FULL%20AFTER%20MUNAQASYAH%20CETAAAK%20%20%20%20.pdf)
- Keynes, J. M. (1936). *The General Theory of Employment, Interest, and Money*. London: Palgrave Macmillan.
- Khan, M. I., Teng, J.-Z., Khan, M. K., Jadoon, A. U., & Khan, M. F. (2021). The impact of oil prices on stock market development in Pakistan: Evidence with a novel dynamic simulated ARDL approach. *Resources Policy*, 70(101899). <https://doi.org/10.1016/j.resourpol.2020.101899>
- Lee, C.-C., Chen, M.-P., & Chang, C.-H. (2013). Dynamic relationships between industry returns and stock market returns. *The North American Journal of Economics and Finance*, 26, 119–144. <https://doi.org/10.1016/j.najef.2013.08.002>
- Mishkin, F. S. (2019). *The Economics of Money, Banking, and Financial Market* (Twelfth ed). Boston: Pearson Education.
- Nugroho, H. (2008). *Analisis Pengaruh Inflasi, Suku Bunga, Kurs dan Jumlah Uang Beredar terhadap Indeks LQ45 (Studi Kasus Pada BEI Periode 2002-2007)*. Universitas Diponegoro.
- Rudiger Dornbusch, S. F., & Starts, R. (2017). *Macroeconomics*. McGraw-Hill.
- Shelly Singhal, S. C., & Biswal, P. C. (2019). Return and volatility linkages among International crude oil price, gold price, exchange rate and stock markets: Evidence from Mexico. *Resources Policy*, 60, 255–261.
- Shrestha, M. B., & Bhatta, G. R. (2018). Selecting appropriate methodological framework for time series data analysis. *The Journal of Finance and Data Science*, 4(2), 71–89. <https://doi.org/10.1016/j.jfds.2017.11.001>
- Sulistiana, I., Hidayati, H., & Sumar, S. (2017). Model Vector Auto Regression (VAR) and Vector Error Correction Model (VECM) Approach for Inflation Relations Analysis, Gross Regional Domestic Product (GDP), World Tin Price, Bi Rate and Rupiah Exchange Rate. *IJBE: Integrated Journal of Business and Economics*, 1(2), 17–32.

-
- Sunariyah. (2000). *Pengantar Pengetahuan Pasar Modal*. Yogyakarta: UPP Akademi Manajemen Perusahaan YKPN.
- Talwar, S., & Srivastava, S. (2018). Integration of GDP and FDI in Economies at Different Stages of Growth. *Theoretical Economics Letters*, 2011(8), 2199–2219. <https://doi.org/10.4236/tel.2018.811144>
- Uddin, M. G. S. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management*, 4. <https://doi.org/10.5539/ijbm.v4n3p43>
- Widoatmodjo, S. (2009). *Pasar Modal Indonesia: Pengantar & Studi Kasus*. Bogor: Ghalia Indonesia.

APPENDIX 1: Impulse Response Figure

