INFLATION AND INTEREST RATE WITH EXCHANGE AS INTERVENING VARIABLES : ON STOCK RETURN

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ABSTRACT

This research aims to find out Interest Rates and Inflation With Exchange Rates As Intervening Variables: Stock Returns. This type of research uses secondary data. The population of manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2014-2020. Sampling techniques used purposive sampling. The research population is a company registered with PT. IDX and sample of 8 companies. The data analysis method used is Path Analysis with SPSS. The results explained that inflation has a positive and insignificant effect on stock returns. Interest rates have a positive and insignificant effect on stock returns. Inflation has a positive and significant effect on the exchange rate. Interest rates have a positive and significant effect on the exchange rate. Inflation and return of stocks through exchange rates have a positive and significant effect on the exchange rate. Interest rates and stock returns through exchange rates have a negative and significant effect on the exchange rate. exchange rates have a positive and significant effect on stock returns.

Keywords : Inflation, Interest Rate, Stock Return and Exchange Rate

PRELIMINARY

The increase in a country's economy can be reflected in an increase in trading volume activity in the capital market. So that the ups and downs of a country's economy can be reflected in the condition of the capital market in that country. The current capital market has experienced rapid development and plays an important role in mobilizing funds from people who want to invest in the capital market.

According to Brigham (2013: 410), stock return is the difference between the amount received and the amount invested, divided by the amount invested. Shares are one of the securities traded on the Indonesia Stock Exchange in addition to bonds and certificates. The Composite Stock Price Index (JCI) is one of the stock market indexes used by the Indonesia Stock Exchange (IDX). From the picture below, it can be seen that the Jakarta Composite Index (JCI) has fluctuated for the last three years starting from 2014 to 2020.

Figure 1
The movement of the Composite Stock Price Index (JCI) for the last 7 (seven) years for the 2014-2020 period
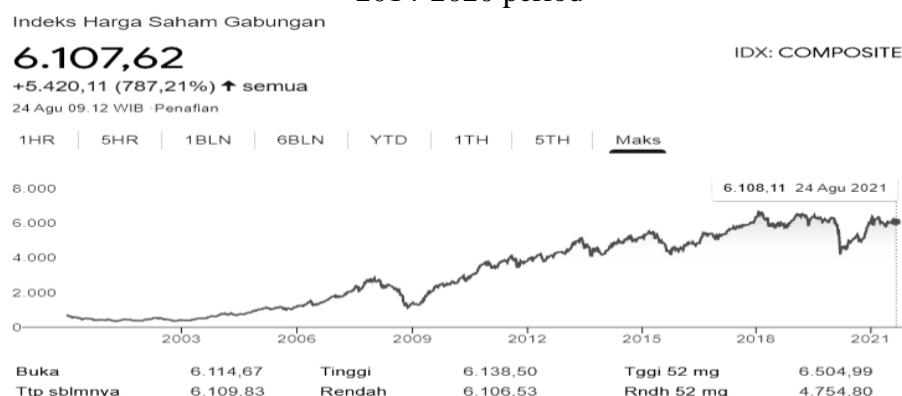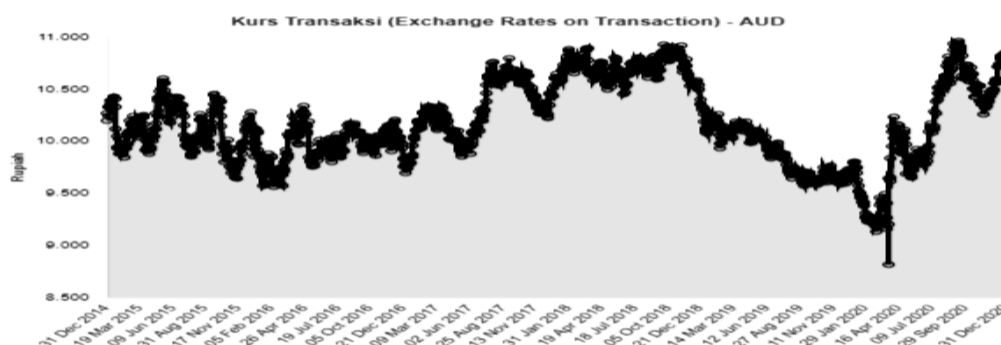

Source: www.idx.co.id

Based on the graph above, it is known that the movement rate of the Jakarta Composite Index (JCI) from 2014 to 2020 has fluctuated. In the 2014 period, the movement of the Composite Stock Price Index (JCI) was around 5,166.98, while in the 2015 period the movement of the Composite Stock Price Index (JCI) decreased, which was around 4,522.65. In the 2016 period, the movement of the Composite Stock Price Index (JCI) experienced an increase of around 5,296.71, while in the 2017 period the movement of the Composite Stock Price Index (JCI) experienced an increase of around 6,355.65. In the 2018 period, the movement of the Composite Stock Price Index (JCI) also decreased, which was around 6,194.50. Furthermore, in the 2019 period the movement of the Composite Stock Price Index (JCI) has increased, which is around 6,329.31 and in the 2020 period, the movement of the Composite Stock Price Index (JCI) has decreased, which is around 5,979.07.

According to Kewal (2012:54), changes in the inflation rate will have an impact on the decline in people's purchasing power for goods and services. If the inflation rate is high, then public demand for goods and services will decrease because the prices of production factor goods increase.

Economic fluctuations that can lead to fluctuations in the price of a stock or the return obtained by investors are influenced by several macroeconomic factors such as interest rates, inflation and exchange rates. According to Kasmir (2014:114) interest rates can be interpreted as remuneration provided by banks based on conventional principles to customers who buy or sell their products. According to Purnomo, et al (2013), the currency exchange rate is the value of a certain country's currency which is measured, compared, or expressed in currency. This can occur if the fundamentals of the Indonesian economy are not strong, so the US dollar strengthens and will lower stock prices.

Figure 2
Movement of AUD Transaction Rates for the last 7 (seven) years
2014-2020 period

Source: www.id/statistik/information-kurs/transaksi-bi

Based on the graph above, it is known that the movement of the AUD (Australian Dollar) transaction exchange rate from 2014 to 2020 has fluctuated.

There is a research gap in the research of Wahyuningsih, Elvina (2018). The results show that partially the interest rate variable has a positive and significant effect on the rupiah exchange rate of PT Astra International Tbk. However, in another study conducted by Erni Indah Sari, Ervita Safitri and Ratna Juwita (2013) which showed that interest rates had no effect on stock returns. by Ujawat, et al (2015), states that the rupiah exchange rate has a negative effect on stock returns.

LITERATURE REVIEW
Stock returns

According to Brigham (2013: 410), stock return is the difference between the amount received and the amount invested, divided by the amount invested. And means that the higher the change in stock prices, the higher the stock returns generated. So that the total return can be formulated as follows (Hartono, 2013: 236):

Return total = $\dfrac{Pt - Pt + 1 + Dt}{Pt - 1}$

Inflation

According to Fahmi and Hadi (2012: 67), inflation is an event that describes situations and conditions in which goods experience an increase and the value of the currency experiences weakness. If this happens continuously, it will result in poor economic conditions as a whole and be able to shake the political stability of a country.

The percentage change in the index in a certain period of time is seen as a measure of inflation that occurs at the beginning of the period to the end of the period. The indicator that is often used to measure inflation is the Consumer Price Index (CPI). Inflation in this study can be expressed in the following formula:

$$inf(t) = \frac{[IHK(t) - IHK(t-1) \times 100}{IHK(t-1)}$$

Interest rate

According to Kasmir (2014:114) interest rates can be interpreted as remuneration provided by banks based on conventional principles to customers who buy or sell their products. Interest rates can be calculated using the following formula (Fahmi, 2012):

Average interest rate = $\dfrac{\text{Total daily interest rate for 1 month}}{\text{Number of time periods for 1 month}}$

Exchange rate

According to Asnawi and Wijaya (2015: 201), the exchange rate is an important part of the current economy. The existence of transactions between countries, where there are differences in currency is what produces the exchange rate.

According to Enggal Kristanto, Muhamad (2016), to measure the exchange rate the following formula is used:

Middle rate = selling rate + buying rate / 2

According to Hardiansyah, Tegar (2018), with the research title The Effect of Exchange Rate and Interest Rate Variables on Stock Returns with Profitability as an Intervening Variable. Interest rates have a negative and significant effect on stock returns, but partially the exchange rate has a significant effect on stock returns. In addition, exchange rates and interest rates are negative and significant on stock returns with profitability as an intervening variable.

Research framework

Figure 3.
Research framework
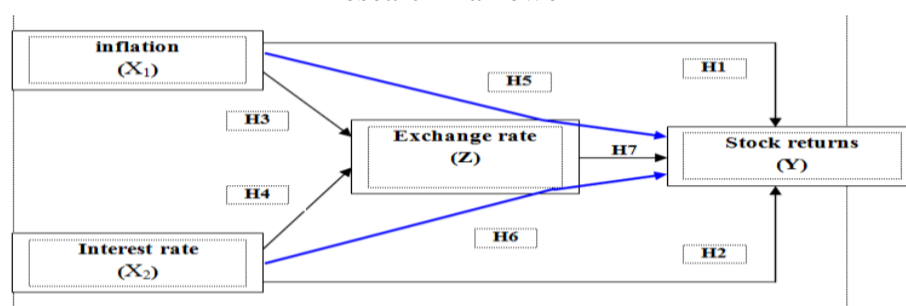
Source: Data processed in 2021

RESEARCH METHODOLOGY

This research was conducted by the Indonesia Stock Exchange covering data on stock returns obtained from IDX *Statistics* or the *Indonesian Capital Market Dictionary (ICMD)* . The data used in this study concerns quantitative data. The population is a collection of all measurements, objects, or individuals being studied. The population used in this study is a manufacturing company registered at PT. Indonesia Stock Exchange (IDX) 2014-2020. The samples used in this study were 8 manufacturing companies registered with PT. Indonesia Stock Exchange (IDX) during 2014-2020 which has certain criteria.

The sampling technique was carried out by *purposive sampling* with the aim of obtaining a representative sample in accordance with the specified criteria. The *purposive sampling method* is sampling based on the subjective considerations of the researcher where the conditions must be met by the sample. In this study, the authors use secondary data obtained from the financial statements of manufacturing companies in 2014-2020 which are published to the public.

Data analysis used classical assumption test, normality test, multicollinearity test, heteroscedasticity test, autocorrelation test.

Multiple linear regression analysis using two models

Regression Model I

Y= + b1x1 + b2x2 + e

Regression Model II

Z = + b1x1 + b2x2 + b3Y + e

Hypothesis testing and path analysis (*Path Analysis*)

Path model I

Y = yx1 + yx2 +ρzy + 1

Path model II

Z = zx1 + zx2 + 2

RESULTS AND DISCUSSION

Normality test results

Table 1.

Kolgomorov-Smirnov . normality test results

	Unstandardized residual Model 1	*Unstandardized residual* Model 2
asymp. Sig. (2-tailed)	0.249	0.015

Source: SPSS 21, Data processed

Based on the table above, it can be observed that the *Kolgomorov-Smirnov test* shows that the data is normally distributed, namely in the *Asymp* I model . *Sig* > 0.05. Thus it can be concluded that the residual data are normally distributed and the regression model has met the assumption of normality.

Multicollinearity test results

Table 2

Multicollinearity tolerance test results and VIF (model one)

	Coefficients [a]		
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Inflation	0.269	3,724
	Interest rate	0.269	3,724

a. Dependent Variable: Stock Return

Source: SPSS 21, Data processed

Table 3

Multicollinearity test results for tolerance and VIF (model two)

	Coefficients [a]		
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Inflation	0.269	3,724
	Interest rate	0.269	3,724

a. Dependent Variable: Stock Return

Source: SPSS 21, Data processed

Based on the table above, it is known that the *tolerance* value of all *independent* variables is > 0.10. The value of *Variance Inflation Factor (VIF) of the* three variables <10. Based on the criteria in decision making, it can be concluded that there is no multicollinearity.

Autocorrelation test results

Table 4

Autocorrelation test results

Model	Std. Error of the Estimate	Durbin-Watson
1	1.56983	0.406
2	0.02704	3.108

Source: SPSS 21, Data processed

From the table above, it can be seen that the DW number obtained is 0.406 for the one-number model, which lies between -2 to +2. This means that in this regression model there is no autocorrelation. Meanwhile, 3.108 for the two-dimensional model. DW numbers above +2 mean that there is a correlation. The Durbin Watson value indicates that there is no autocorrelation that occurs.

Multiple Linear Regression analysis results
Regression Model I

Table 5
Multiple Linear Regression test results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.347	1.160		11.505	0.000
	Inflation	-0.006	0.257	-0.007	-0.025	0.980
	Interest rate	0.012	0.321	0.010	0.037	0.971

Coefficients ᵃ

 a. Dependent Variable: Stock Return
Source: SPSS 21, Data processed

Based on the table above, the regression equation can be seen as follows:

$Y = 13{,}347 - 0.006 X1 + 0.012 X2$

From the results of calculations and statistical analysis equations of multiple linear regression coefficients above, it can be interpreted:

a. The constant value of (a = 13,347) is a constant if all the values of the independent variables = 0, then the stock return value (Y) is 13,347

b. The value of the inflation coefficient (X1 = -0.006), meaning that if the other independent variables are fixed and inflation has increased by 1 unit, then inflation will increase by 0.006. The coefficient is negative, meaning that there is a negative relationship between inflation and stock returns

c. The value of the inflation coefficient (X2 = 0.012), meaning that if the other independent variables remain constant and the interest rate increases by 1 unit, the interest rate will increase by -0.012. The positive coefficient means that there is a positive relationship between interest rates and stock returns.

Regression Model II

Table 6
Multiple Linear Regression test results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9,272	0.037		248,100	0.000
	Inflation	0.023	0.004	1.123	5,165	0.000
	Interest rate	-0.024	0.006	-0.929	-4,271	0.000
	Stock returns	0.000	0.002	0.019	0.165	0.870

Coefficients ᵃ

 a. Dependent Variable: Exchange Rate
Source: SPSS 21, Data processed

Based on the table above, the regression equation can be seen as follows:

$Z = 9.272 + 0.023 X1 - 0.024 X2 + 0.000Y$

From the results of calculations and statistical analysis equations of multiple linear regression coefficients above, it can be interpreted:

a. The constant value of (a = 9.272), is a constant if all the values of the independent variables = 0, then the value of the exchange rate (Z) is 9.271

b. The value of the inflation coefficient (X1 = 0.023), meaning that if the other independent variables are fixed and inflation has increased by 1 unit, then inflation will increase by 0.023. The coefficient is positive, meaning that there is a positive relationship between inflation and the exchange rate

c. The interest rate coefficient value (X2 = -0.024), meaning that if the other independent variables remain constant and the interest rate increases by 1 unit, the interest rate will increase by -0.024. The coefficient is negative, meaning that there is a negative relationship between interest rates and the exchange rate

d. The value of the stock return coefficient (Y = 0.000), meaning that if the other independent variables are fixed and the stock return has increased by 1 unit, then the stock return will increase by 0.000. The coefficient is positive, meaning that there is a positive relationship between stock returns and the exchange rate

Hypothesis test

t test results

From the results of data processing can be presented in the following table:

Regression Model I

Table 7
Partial over all independent variables

Independent Factor	t-count	Significant
Inflation (X1)	-0.025	0.980
Interest Rate (X2)	0.037	0.971

Source: SPSS 21, Data processed

Based on the table above, it can be seen that

a. the effect of interest inflation on stock returns
   The test results with SPSS obtained t-count for the inflation variable -0.025. By using a significant limit of 0.05 with an inflation significance value of 0.980, Ho is accepted and H1 is rejected. Thus, the first hypothesis that the inflation variable has a partially negative and insignificant effect on stock returns is rejected

b. the effect of interest rates on stock returns
   The test results with SPSS obtained t-count for the variable interest rate 0.037. By using a significant limit of 0.05 with an interest rate significance value of 0.971, Ho is accepted and H2 is rejected. Thus, the second hypothesis that the interest rate variable partially has a positive and insignificant effect on stock returns is rejected

Regression Model II

Table 8
Partial over all independent variables

Independent Factor	t-count	Significant
Inflation (X1)	5,165	0.000
Interest Rate (X2)	-4,271	0.000
Stock Return (Y)	0.165	0.870

Source: SPSS 21, Data processed

Based on the table above, it can be seen that

c. the effect of inflation on the exchange rate
   The test results with SPSS obtained t-count for the inflation variable 5.165. By using a significant limit of 0.05 with a significance value of 0.000 inflation, Ho is rejected and H3

is accepted. Thus, the third hypothesis that the inflation variable partially has a positive and significant effect on the accepted exchange rate

d. the effect of interest rates on exchange rates

The test results with SPSS obtained t-count for the interest rate variable -4.271. By using a significant limit of 0.05 with a significance value of 0.000 interest rates, Ho is rejected and H4 is accepted. Thus, the fourth hypothesis is that the interest rate variable partially has a negative and significant effect on the accepted exchange rate

e. the effect of stock returns on the exchange rate

The test results with SPSS obtained t-count for the stock return variable 0.165. By using a significant limit of 0.05 with a significance value of 0.870 stock returns, Ho is accepted and H5 is rejected. Thus, the fifth hypothesis that the stock return variable partially has a positive and insignificant effect on the exchange rate is rejected

f . test results

Regression Model I

Table 9
Hypothesis testing of all variables simultaneously

ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.004	2	0.002	0.001	0.999 [b]
	Residual	130,611	53	2,464		
	Total	130.615	55			

a. Dependent Variable: Stock Return

b. Predictors: (Constant), Inflation, interest rates

Source: SPSS 21, Data processed

The table above shows that the calculated F value is 0.001 with a significance level of 0.999 > 0.05. These results show that simultaneously inflation and interest rates have no significant effect on stock returns

Regression Model II

Table 10
Hypothesis testing of all variables simultaneously

ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.020	3	0.007	8.926	0.000 [b]
	Residual	0.038	52	0.001		
	Total	0.058	55			

a. Dependent Variable: Exchange Rate

b. Predictors: (Constant), Stock Return, Inflation, Interest Rate

Source: SPSS 21, Data processed

The table above shows that the calculated F value is 8.926 with a significance level of 0.000 <0.05. These results indicate that simultaneously inflation, interest rates and stock returns have a significant effect on the exchange rate.

Coefficient of Determination (R ^{2})
Regression Model I

Table 11
Coefficient of determination test results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.005 ^{a}	0.000	-0.038	1.56983

a. Predictors: (Constant), Inflation, interest rates

Source: SPSS 21, Data processed

Based on the table above, the Adjusted R ^{2} (R square) number is 0.000 or 0%, this shows that the percentage of the contribution of the independent variable Inflation, interest rates on the dependent variable of stock returns is 0.000 or 0%. While the remaining 100% is influenced by other variables outside this study.

Regression Model II

Table 12
Coefficient of determination test results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.583 ^{a}	0.340	0.302	0.02704

a. Predictors: (Constant), Stock Return, Inflation, Interest Rate

Source: SPSS 21, Data processed

Based on the table above, the Adjusted R ^{2} (R square) number is 0.340 or 34%, this shows that the percentage of the contribution of the independent variable Inflation, interest rates on the dependent variable of stock returns with the intervening variable exchange rate is 0.340 or 34%. While the remaining 66% is influenced by other variables outside this study.
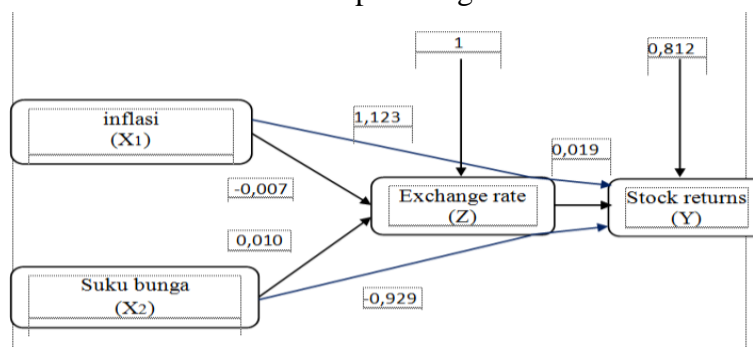
Path analysis test results
Path model coefficient I

Figure 4.
I . model path diagram
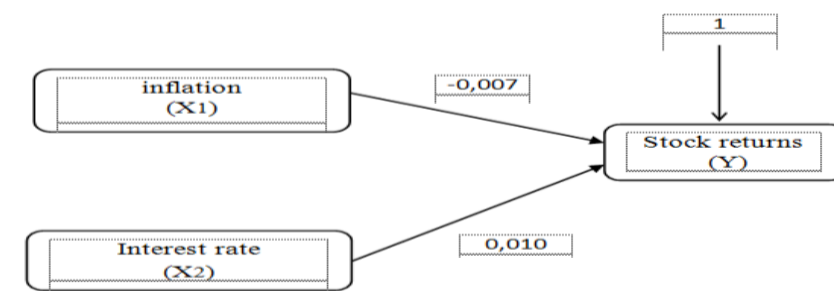
Source: SPSS 21, Data processed

Path model coefficient II

Figure 5.
Model II path diagram

DISCUSSION OF RESEARCH RESULTS

The effect of inflation on stock returns

The results of the study found that inflation had a positive and insignificant effect on stock returns. Evidenced by the value of *sig* (0.980) > (0.05). Based on the results obtained, Ho is accepted and H1 is rejected. Thus, the first hypothesis that the inflation variable partially has a positive and insignificant effect on stock returns is rejected.

The effect of interest rates on stock returns

The results of the study found that interest rates have a positive and insignificant effect on stock returns. Evidenced by the value of *sig* (0.971) > (0.05). Based on the results obtained, Ho is accepted and H2 is rejected. Thus, the second hypothesis that the interest rate variable partially has a positive and insignificant effect on stock returns is rejected.

The effect of inflation on the exchange rate

The results of the study found that inflation had a positive and significant effect on the exchange rate. Evidenced by the value of *sig* (0.000) < (0.05). Based on the results obtained, Ho is rejected and H3 is accepted. Thus, the third hypothesis of the inflation variable partially has a positive and significant effect on the accepted exchange rate.

The effect of interest rates on exchange rates

The results of the study found that interest rates have a positive and significant effect on the exchange rate. Evidenced by the value of *sig* (0.000) < (0.05). Based on the results obtained, Ho is rejected and H4 is accepted. Thus, the fourth hypothesis is that the interest rate variable partially has a positive and significant effect on the accepted exchange rate.

The effect of inflation on stock returns through the exchange rate as an intervening variable

The results of the study found that inflation and stock returns through the exchange rate had a positive and significant effect on the exchange rate. It is proven by the value of *sig* (1.123) > (0.05). Based on the results obtained, Ho is rejected and Ha is accepted. So it can be concluded that together the variables of inflation and stock returns have a significant effect on the exchange rate.

The effect of interest rates on stock returns through the exchange rate as an intervening variable

The results of the study found that interest rates and stock returns through the exchange rate had a negative and significant effect on the exchange rate. Evidenced by the value of *sig* (-0.929) > (0.05). Based on the results obtained, Ho is rejected and Ha is accepted. So it can be concluded that together the interest rate and stock return variables have a significant effect on the exchange rate.

Effect of exchange rate on stock returns

The results of the study found that the exchange rate had a positive and significant effect on stock returns. It was proven by the value of *sig* (0.870) > (0.05). Based on the results obtained, Ho is accepted and H7 is rejected. Thus, the fifth hypothesis that the exchange rate variable partially has a positive and insignificant effect on stock returns is rejected.

CONCLUSION

The conclusion from the research that has been carried out is that inflation has a positive and insignificant effect on stock returns. Interest rates have a positive and not significant effect on stock returns. Inflation has a positive and significant effect on the exchange rate. Interest rates have a positive and significant effect on the exchange rate. Inflation and stock returns through the exchange rate have a positive and significant effect on the exchange rate. Interest rates and stock returns through the exchange rate have a negative and significant effect on the exchange rate. Exchange rate has a positive and significant effect on stock returns

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