INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 06 Issue 12 December 2023

DOI: 10.47191/ijmra/v6-i12-12, Impact Factor: 7.022

Page No. 5531-5538

Simultaneous Equation: The Case of Inflation & Rupiah Exchange Rate in Indonesia 2001-2022

Rheta Da Lhutfa Salam[1], Prayitno Basuki[2]

[1,2]Faculty of Economics and Business, University of Mataram & Lombok, Indonesia

ABSTRACT: This study aims to determine the relationship between inflation and the rupiah exchange rate in Indonesia in 2001-2022, using simultaneous equations through a two-stage least square (2SLS) approach. The method used in this study is simultaneous equation regression, in which the variables are interconnected. The data used in this study is Indonesian state data for 2001-2022, including inflation, exchange rates, interest rates, gross domestic product, and exports obtained from the Badan Pusat Statistik (BPS) Indonesia website. The results of the study based on the two-stage least square (2SLS), the simultaneous equation of inflation (INF), showed that the variable interest rate (R) and gross domestic product (GDP) had a significant effect on inflation (INF). In contrast, the exchange rate variable (ER) did not significantly affect inflation (INF). Simultaneously, the exchange rate (ER), interest rate (R), and gross domestic product (GDP) affected inflation (INF) because F (prob) was smaller from alpha = 5%. Then, in the exchange rate equation (ER), inflation variables (INF), money supply (M2) and exports (X) have a significant effect on the exchange rate. Simultaneously, Inflation (INF), money supply (M2), and exports (X) affect the exchange rate (ER) because F (prob) is smaller than alpha = 5%.

KEYWORDS: Simultaneous Equation, 2SLS, Inflation, Rupiah Exchange Rate, Interest Rate, Gross Domestic Product, Money Supply, Export

I. INTRODUCTION

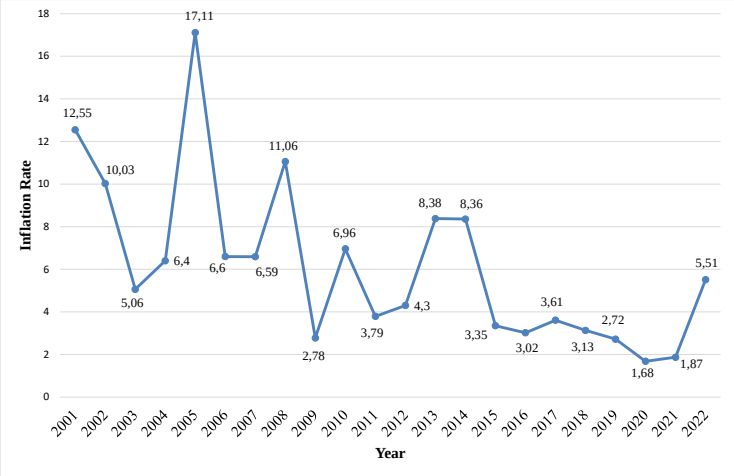
Issues that often concern economic thinkers and governments are exchange rates & inflation. Exchange rates & inflation should receive serious attention from relevant stakeholders, through maintenance of economic stability (Faizin, 2020). Inflation and exchange rates are important macroeconomic variables that influence each other. Inflation can affect a country's exchange rate; when it experiences economic changes, it usually affects large exchange rate movements (Khomariyah et al., 2022). According to (Fitilai et al., 2017), inflation has a strong relationship with the exchange rate. The rupiah exchange rate will decrease against foreign currencies (US dollars) when inflation increases. Likewise, it will appreciate the rupiah exchange rate against foreign currencies (US Dollars) when inflation decreases. As for the influence of exchange rates on inflation, foreign prices and nominal exchange rates directly affect inflation and aggregate demand indirectly (Rakhmat et al., 2022)

Exchange rates are used to compare currency values and prices between two countries to exchange between these currencies (Hidayat et al., 2018). According to (Arifin & Mayasya, 2018), the exchange rate of the State of Indonesia (Rupiah) against the United States (US Dollar) is influenced by the inflation rate, interest rate, and money supply. According to (Adhista, 2022), a high amount of exports can also affect the exchange rate because high exports will increase demand for domestic currency, which can cause the strengthening of the Indonesian exchange rate (Rupiah). Conversely, a decrease in a country's exports will increase its exchange rate (Sharma & Dahiya, 2023).

According to Bank Indonesia (2023), inflation is a condition in which a general increase in the price of goods and services occurs continuously within a certain period. If the increase only occurs in one or two goods, this condition cannot be considered inflation (Budhijana, 2023). High inflation will have an impact on reducing the level of public welfare (Ilmas et al., 2022). The declining level of public welfare will reduce people's purchasing power because the price of goods is higher than before inflation. Income distribution will worsen because many people cannot adapt to inflationary conditions (Susanto, 2018).

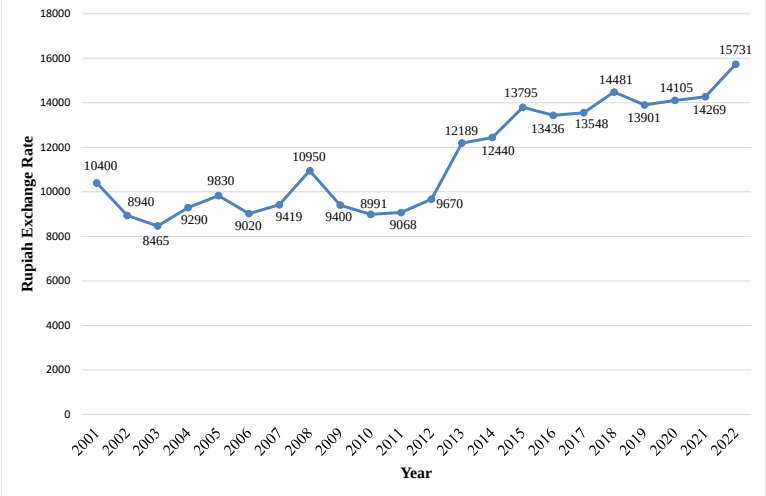
Inflation is a macroeconomic problem that often occurs in Indonesia. Therefore, Indonesia must avoid high inflation to create a healthy and stable state economy. Controlling inflation is an important thing to do because it harms the socioeconomic conditions of the community in addition to having an impact on interest rate and exchange rate instability (Harjunawati et al.,

2021). According to Bank Indonesia (Arjunita, 2016), there are three reasons for inflation to be stable. First, inflation is the cause of the decline in people's real income. If a country experiences inflation, prices will increase which has an impact on people's purchasing power will decrease. Second, inflation causes doubts in all economic actors, it will hamper economic growth. Third, the real domestic interest rate is less competitive due to high inflation and will likely pressure the rupiah exchange rate. As a result, exchange rate pressures will increase inflation to be greater, and if the exchange rate depreciates, then the price of imported goods, which are consumer goods and factors of production, will rise.



A. *Inflation Rate*

Based on the inflation rate graph for 2001-2022 above, it can be observed that inflation in Indonesia experienced significant fluctuations from 2001-2022. Inflation in Indonesia in the period 2001-2015 tended to experience instability until it reached peak inflation in Indonesia of 17.11% in 2005. According to (Harmono, 2022), inflation in Indonesia increased significantly during the implementation of the fuel subsidy transfer policy. Judging from the chart above, in 2015-2021, inflation in Indonesia was quite controlled and stable. However, in 2021, the inflation rate jumped to 5.5% from the previous period, which was only 1.68%.



B. *Rupiah Exchange Rate*

From the Rupiah exchange rate chart above, from 2001 to 2012, the Rupiah exchange rate tended to be stable. A significant increase in the Rupiah exchange rate reached Rp12,189 in 2013, while in the following year (2013-2022), the exchange rate tended to increase gradually to the highest point in 2022, namely the Rupiah exchange rate appreciated against the Dollar by Rp15,731.

There are previous studies that have examined the relationship between inflation and exchange rates using the simultaneous equation method; research previously conducted by Yusuf, Resmawan, & Payu (2021) showed test results that the rupiah exchange rate significantly influences the inflation equation, and the money supply, while interest rates do not have a significant effect on inflation. Then, the exchange rate is affected by inflation and the money supply, while the variable economic growth has no significant effect on the exchange rate. Rahmadeni & Veronika (2020) show that the interest rate significantly influences the results of inflation testing at 5%. In contrast, the exchange rate and money supply do not significantly affect inflation. Then

the exchange rate is influenced by GDP at 5%, while inflation significantly affects alpha 10%. GDP has no significant effect on the exchange rate.

Based on the explanation above, simultaneous equation analysis can be used in this case because related variables tend to have simultaneous relationships. There is a relationship between variables, so the modeling in this study will apply the simultaneous recession regression method of the 2SLS (Two Stage Least Square) equation to determine the corellation of inflation & exchange rate variables.

II. RESEARCH METHODS

There are six variables used, namely Inflation (INF), Rupiah Exchange Rate (ER), Interest Rate (R), Gross Domestic Product (GDP), Money Supply (M2), and export (X). The data type used is secondary data obtained through the Badan Pusat Statistik (BPS) Indonesia website. This research will use the simultaneous equation method using the 2SLS (Two Stage Least Square) Approach. Researchers use Eviews 12 as a tool to analyze data.

A. Simultan Equation Modeling

The simultaneous equation regression model is a model that has multiple equations and can be found feedback relationships in the variables (Gujarati & Porter, 2009) in their book. Here is a general model of simultaneous equations:

$$Y_{1t} = \beta_{12}Y_{2t} + \beta_{13}Y_{3t} + \dots + \beta_{1M}Y_{Mt} + Y_{11}X_{1t} + y_{12}X_{2t} + \dots + y_{1K}X_{Kt} + u_{1t}$$
$$Y_{2t} = \beta_{21}Y_{1t} + \beta_{23}Y_{3t} + \dots + \beta_{2M}Y_{Mt} + Y_{21}X_{1t} + y_{22}X_{2t} + \dots + y_{2K}X_{Kt} + u_{2t}$$
$$\vdots$$
$$Y_{Mt} = \beta_{M1}Y_{1t} + \beta_{M2}Y_{2t} + \dots + \beta_{M,m-1}Y_{M-1,t} + Y_{M1}X_{1t} + \dots + Y_{M3}X_{3t} + u_{Mt}$$

B. Identify Orders and Ranks

Before estimating the parameter equation, you must identify the equation to determine whether the equation model used can use the Two Stage Least Square approach. Therefore, we identify it by order and rank identification tests.

C. Estimation Using the 2SLS (Two Stage Least Square)Approach

Estimation using the 2SLS approach can be applied to simultaneous equation models identified over identified and used in equation models identified exactly identified.

Suppose 3 simultaneous equations, as follows:

$$Y_1 = \beta_{10} + \beta_{12}Y_2 + \beta_{13}Y_3 + y_{11}X_1 + y_{12}X_2 + \dots + y_{1K}X_K + \varepsilon_1$$
$$Y_2 = \beta_{20} + \beta_{11}Y_1 + \beta_{23}Y_3 + y_{21}X_1 + y_{22}X_2 + \dots + y_{2K}X_K + \varepsilon_1$$
$$Y_3 = \beta_{30} + \beta_{31}Y_1 + \beta_{32}Y_2 + y_{31}X_1 + y_{32}X_2 + \dots + y_{3K}X_K + \varepsilon_1$$

Langkah pertama: Bentuk *reduced form*

$$Y_1 = \pi_{10} + \pi_{11}X_1 + \pi_{12}X_2 + \dots + \pi_{1K}X_K + v_1$$
$$Y_2 = \pi_{20} + \pi_{21}X_1 + \pi_{22}X_2 + \dots + \pi_{2K}X_K + v_2$$
$$Y_3 = \pi_{30} + \pi_{31}X_1 + \pi_{32}X_2 + \dots + \pi_{2K}X_K + v_3$$

Step two: Estimation of equations y1, y2, and y3 in reduced *form model* step 1

$$\hat{Y}_1 = \hat{\pi}_{10} + \hat{\pi}_{11}X_1 + \hat{\pi}_{12}X_2 + \dots + \hat{\pi}_{1K}X_K$$
$$\hat{Y}_2 = \hat{\pi}_{20} + \hat{\pi}_{21}X_1 + \hat{\pi}_{22}X_2 + \dots + \hat{\pi}_{2K}$$
$$\hat{Y}_3 = \hat{\pi}_{30} + \hat{\pi}_{31}X_1 + \hat{\pi}_{32}X_2 + \dots + \hat{\pi}_{2K}X_K$$

Third step:

Substitute the equations $\hat{Y}2$ *and* $\hat{Y}3$ *in the equation* Y1

$$Y_1 = \beta_{10} + \beta_{12}\hat{Y}_2 + \beta_{13}\hat{Y}_3 + y_{11}X_1 + y_{12}X_2 + \dots + y_{1K}X_K$$

This model will produce an estimate of the parameters of the equation *Y1*

Substitution of values $\hat{Y}_1$ and $\hat{Y}_3$ on equation *Y2*

$$Y_2 = \beta_{20} + \beta_{21}\hat{Y}_2 + \beta_{23}\hat{Y}_3 + y_{21}X_1 + y_{22}X_2 + \dots + y_{2K}X_K$$

This model will produce an estimate of the parameters of the equation *Y2*

Substitution of values $\hat{Y}_1$ and $\hat{Y}_2$ on the equation *Y3*

$$Y_3 = \beta_{30} + \beta_{31}\hat{Y}_2 + \beta_{32}\hat{Y}_3 + y_{31}X_1 + y_{32}X_2 + \dots + y_{3K}X_K$$

This model will produce an estimate of the parameters of the equation *Y3*

III. RESULTS AND DISCUSSION

A. Simultaneous Equation Model

The model of the equation is formed, as follows:

$Y1 = \alpha_{10} + \alpha_{11}Y_2 + \beta_{11}X_1 + \beta_{12}X_2 + \varepsilon 1$ (1)

$Y2 = \alpha_{20} + \alpha_{21}Y_1 + \beta_{23}X_3 + \beta_{24}X_4 + \varepsilon 2$ (2)

Information:

Y1 : Inflation (INF)
Y2 : Indonesian rupiah exchange rate (ER)
X1 : Interest Rate (R)
X2 : Gross Domestic Product (GDP)
X3 : Money Supply (M2)
X4 : Export (X)
α, β : Parameter coefficients
ε : Error

B. Test Order and Rank conditions

The order must meet the identification conditions to identify the equation model using the test condition. If the model equation proves K-k < m-1, the equation is under-identified. Then, if the equation model proves K-k = m-1, the equation is exactly identified, and if the equation model proves K-k > m-1, the equation is over-identified. The following table is the result of the order condition test:

Model	K	k	K-k	M	1	m-1	Result
Y1	6	4	2	2	1	1	Over Identified
Y2	6	4	2	2	1	1	Over Identified

Information:

K : The sum of all variables in the model, including intercepts.
k : Number of variables in the equation model.
M : Number of equations in the model or number of endogenous variables in the equation.

Based on the results of the order testing show, the equation model in this study is over identified so that the estimation will use 2SLS. Next, a rank condition test will be carried out; in this test, if it has one determinant that is not equal to 0, the model is identified. The following are the results of the rank condition test:

Model	Constanta	Y1	Y2	X1	X2	X3	X4
Y1	α_{10}	1	α_{11}	β_{11}	β_{12}	0	0
Y2	α_{20}	α_{21}	1	0	0	β_{23}	β_{24}

Based on the results of testing rank conditions, it is known that the value of the inflation equation coefficient in the variables X3 = 0 and X4 = 0 then it is formulated as follows:

A = [β23] dan B = [β24]

Based on the above formula, it means Det|A| ≠ 0 and Det|B| ≠ 0. Then, the inflation equation can be identified. Then, it is known that the value of the coefficient of the rupiah exchange rate equation in the variables X1 = 0 and X2 = 0, then it is formulated as follows:

C = [β11] dan D = [β12]

Based on the above formula, it means Det|C| ≠ 0 and Det|D| ≠ 0. Then, the rupiah exchange rate equation can be identified, and this shows that both equations can use 2SLS.

C. Reduce Form

The following is a model equation in this study:

$Y1 = \alpha_{10} + \alpha_{11}Y_2 + \beta_{11}X_1 + \beta_{12}X_2 + \varepsilon 1$ (1)

$Y2 = \alpha_{20} + \alpha_{21}Y_1 + \beta_{23}X_3 + \beta_{24}X_4 + \varepsilon 2$ (2)

Then the reduction result of equations 1 and 2 is:

$Y_1 = \pi_{10} + \pi_{11}X_1 + \pi_{12}X_2 + \pi_{13}X_3 + \pi_{14}X_4 + v_1$ (3)

$Y_2 = \pi_{20} + \pi_{21}X_1 + \pi_{22}X_2 + \pi_{23}X_3 + \pi_{24}X_4 + v_2$ (4)

D. 2SLS Equation Model Estimation

After testing order and rank conditions, the next stage will be estimated using the 2SLS approach.

1. Estimation of the Inflation Equation (INF)

The 2SLS test on the inflation equation (INF) obtained a result of R^2 = 73.10%, meaning that predictor variables of 73.10% influenced inflation, then the remaining 26.90% was influenced by other variables outside the model. The following is a presentation of the estimated results of the 2SLS inflation equation:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.226765	4.449876	-0.949861	0.3548
ER	7.52E-05	0.000261	0.288310	0.7764
R	0.973502	0.167386	5.815923	0.0000
GDP	0.447751	0.284478	1.573938	0.1329

Based on the table above, inflation (INF) is not significantly affected by the exchange rate (ER) and gross domestic product (GDP). The interest rate (R) significantly affects inflation (INF). Simultaneously, all predictor variables affect inflation (INF) because F(prob) is smaller than alpha = 5%. Here is a model of the inflation equation:

$$\hat{Y}1 = -4.22676 + 7.522364Y_2 + 0.973501X_1 + 0.447751X_2 \quad (5)$$

Based on the model above, a constant value of -4.22676 is obtained, which means that if all predictor variables have a fixed value, the inflation rate in Indonesia will decrease by 4.22676. If the rupiah exchange rate increases by 1%, it increases inflation by 7.522364. Furthermore, if the interest rate increases by 1%, it will increase inflation by 0.973501. As for if GDP increases by 1%, it will increase inflation by 0.447751.

2. Exchange Rate Model Estimation (ER)

The 2SLS test on the exchange rate equation (ER) obtained a value of R^2 = 90.71%, meaning that predictor variables of 90.71% influenced inflation, then the remaining 9.29% was influenced by other variables outside the model. The following table is a presentation of the estimated results of the 2SLS exchange rate equation:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7369.794	809.5609	9.103446	0.0000
INF	192.3883	71.33766	2.696868	0.0147
M2	0.001397	0.000153	9.125381	0.0000
X	-0.014552	0.005279	-2.756773	0.0130

Based on the table above, all predictor variables significantly influence the exchange rate (ER). Simultaneously, all predictor variables affect the exchange rate (ER) because F(prob) is smaller than alpha = 5%. Here is a model of the exchange rate equation:

$$\hat{Y}2 = 7369.793924 + 192.3882701Y_1 + 0.001396X_3 - 0.014551X_3 \quad (6)$$

Based on the model above, a constant value of 7369.793924 is obtained, which means that if all predictor variables have a fixed value, then the exchange rate in Indonesia will increase by 7369.793924. If the inflation rate rises by 1%, the exchange rate will increase by 192.3882701. Furthermore, if the money supply increases by 1%, the exchange rate will increase by 0.001396. As for if exports increase by 1%, it will reduce the exchange rate by 0.014551; this is in line with research conducted by (Wulandari, 2014) and (Silitonga & Ishak, 2017).

E. Test Classical Assumptions

A model of the equation will be said to be good if it meets the conditions of classical assumptions. Classical assumptions consist of tests of normality, autocorrelation, heteroscedasticity and multicollinearity. Here are the results of testing classic assumptions:

1. Normality Test

The normality test is needed to determine whether the data used in the study is normally distributed or not, and testing can be done using the Jarque-Bera test. Here are the hypotheses before testing:

H0: Normal distributed data

H1: Data is not normally distributed

The following is a table presentation of normality test results:

Model	P-Value	Result
INF	0,116966	Accept H_0
ER	0,895758	Accept H_0

Based on the results of the Jarque-Bera normality test, the p-value in the inflation equation (INF) is 0.116966, and the rupiah exchange rate (ER) is 0.895758, the value is > 0.05. It can be concluded that with this value, H0 is accepted, meaning that the inflation & exchange rate equation model meets the requirements of normally distributed data.

2. Autocorrelation Test

Autocorrelation tests are needed to measure whether the equation model has a relationship between disturbance variables. The Breusch-Godfrey Serial Correlation LM Test can be used in autocorrelation testing. Here are the hypotheses before testing:

H0: No autocorrelation occurs

H1: Autocorrelation occurs

The results of testing the autocorrelation assumption are presented in the following Table:

Model	Prob. Chi-Square(2)	Result
INF	0,2460	Accept H_0
ER	0,3278	Accept H_0

A prob value is obtained based on the autocorrelation test results. Chi-Square(2) uses the Lagrange Breusch-Godfrey Serial Correlation LM Test on the inflation equation (INF) of 0.2460 and the rupiah exchange rate (ER) of 0.3278, the value is > 0.05. It can be concluded that with this value, H0 is accepted, and there is no autocorrelation problem.

3. Heteroscedasticity Test

The hetoroskedasticity test is needed to measure whether the equation model has the same variance from the residual of one observation to another. The Glejser test can be used in heteroscedasticity testing. Here are the hypotheses before testing:

H0: $\beta k = 0$ (No heteroscedasticity occurs)

H1 : $\beta k = 0$; $k=1,2,...,K$ (Heteroscedasticity occurs)

The results of the heteroscedasticity assumption test are presented in the following table:

Model	Prob. Chi-Square(3)	Result
INF	0,1012	Accept H_0
ER	0,2512	Accept H_0

Based on the results of the heteroscedasticity test with the Glejser test, the p-value in the inflation equation (INF) was 0.1012 & the rupiah exchange rate (ER) was 0.2512, the value was > 0.05. It can be concluded that with this value, H0 is accepted, and there is no heteroscedasticity problem.

4. Multicollinearity Test

Multicollinearity tests are needed to find out whether in the equation model, there is a correlation between predictor variables; the identification of multicollinearity can use a high-value matrix analysis method (>0.90), this can identify the problem of multicollinearity in the equation model. The following is a presentation of the results of the multicollinearity test:

Multicollinearity assumptions for inflation			
	ER	R	GDP
ER	1.00000	-0.503250	-0.311323
R	-0.503250	1.000000	0.060958
GDP	-0.311323	0.060958	1.000000

Multicollinearitas assumptions for exchange rate			
	INF	M2	GDP
INF	1.000000	-0.601673	-0.477371
M2	-0.601673	1.000000	0.842315
X	-0.477371	0.842315	1.000000

Based on the results of the multicollinearity test, there is no matrix value >0.9, meaning there is no multicollinearity problem. Based on the results of the classical assumption test, it can be concluded that the equation model of the inflation equation (INF) and exchange rate (ER) has met the requirements, meaning that testing using 2SLS can obtain good test results.

IV. CONCLUTION

Based on the two-stage least square (2SLS) test, the simultaneous inflation equation (INF) shows that the variable interest rate (R) has a significant effect on inflation (INF) while the variable exchange rate (ER) and gross domestic product (GDP) do not have a significant effect on inflation (INF), while simultaneously the exchange rate (ER), interest rate (R), and gross domestic product (GDP) affect inflation (INF) simultaneously because F (prob) is smaller than alpa = 5%. Then in the exchange rate equation (ER) inflation variables (INF), money supply (M2) and exports (X) have a significant effect on the exchange rate, while simultaneously Inflation (INF), money supply (M2), exports (X) affect the exchange rate (ER) simultaneously because F (prob) is smaller than alpa = 5%.

REFERENCES

1) Adhista, M. (2022). Analisis Ekspor, Impor, dan Jumlah Uang Beredar (M2) TerhadapNilai Tukar Rupiah. Jurnal Ilmiah Ekonomi Pembangunan, 1(2), 73–92.
2) Arifin, S., & Mayasya, S. (2018). Faktor - Faktor Yang Mempengaruhi Nilai Tukar Rupiah Terhadap Dolar Amerika Serikat. Jurnal Ekonomi-Qu, 8(1), 82–96. https://doi.org/10.35448/jequ.v8i1.4965
3) Arjunita, C. (2016). Faktor-Faktor Yang Mempengaruhi Inflasi Di Indonesia. Ecosains: Jurnal Ilmiah Ekonomi Dan Pembangunan, 5(2), 137. https://doi.org/10.24036/ecosains.11065357.00
4) BPS. (2023). BI Rate 2005-2022. Badan Pusat Statistik.
5) BPS. (2023). Ekonomi Indonesia Tahun 2001-2022. Badan Pusat Statistik.
6) BPS. (2023). Inflasi (Umum) 2001-2022. Badan Pusat Statistik.
7) BPS. (2023). Kurs Tengah Beberapa Mata Uang Asing Terhadap Rupiah di Bank Indonesia dan Harga Emas di Jakarta (Rupiah), 2001-2022. Badan Pusat Statistik.
8) BPS. (2023). Nilai Ekspor Menurut Negara Tujuan Utama (Nilai FOB: juta US$), 2001-2022. Badan Pusat Statistik.
9) BPS. (2023). Uang Beredar (Milyar Rupiah), 2001-2022. Badan Pusat Statistik.
10) Budhijana, B. (2023). Analysis of The Effect of Inflation, Rupiah Exchange Rate, and BI Rate on The Net Asset Value of Sharia Mutual Funds In Indonesia (2015-2019 Period). Jurnal Ekonomi, Manajemen Dan Perbankan (Journal of Economics, Management and Banking), 9(2), 213–224. https://doi.org/10.35384/jemp.v9i2.401
11) Faizin, M. (2020). Analisis hubungan kurs terhadap inflasi. Akuntabel, 17(2), 314–319.
12) Fitilai, E., Program, Z., Stie, S. M., & Selatan, N. (2017). Analisis Inflasi Terhadap Nilai Tukar Rupiah Di Indonesia. Jurnal Ekonomi Dan Bisnis Nias Selatan, 1(1), 22–35.
13) Gujarati, D. N., & Porter, D. C. (2009). BASIC ECONOMETRICS (Fiffth Edi). McGraw-Hill Irwin.
14) Harjunawati, S., Hendarsih, I., Addin, S., & Marthanti, A. S. (2021). Effect of Inflation, BI Rate And Net Export To USD Central Exchange Rate to Rupiahs In Bank Indonesia For 2005-2019. Moneter - Jurnal Akuntansi Dan Keuangan, 8(1), 85–89. https://doi.org/10.31294/moneter.v8i1.10338
15) Hidayat, L. R., Setyadi, D., & Azis, M. (2018). Pengaruh Inflasi dan Suku Bunga dan Nilai Tukar Rupiah serta Jumlah Uang Beredar terhadap Return Saham. Forum Ekonomi, 19(2), 148. https://doi.org/10.29264/jfor.v19i2.2121

16) Ilmas, N., Amelia, M., & Risandi, R. (2022). Analysis of the Effect of Inflation and Exchange Rate on Exports in 5-Year Asean Countries (Years 2010–2020). Jurnal Ekonomi Trisakti, 2(1), 121–132. https://doi.org/10.25105/jet.v2i1.13561
17) Indonesia, B. (2023). Inflasi. BANK INDONESIA. https://www.bi.go.id/id/fungsi-utama/moneter/inflasi/default.aspx
18) Khomariyah, R. N., Setyowati, E., & Utomo, Y. P. (2022). Analysis of the Effect of Inflation, Interest Rate, Exchange Rate, and National Income on Financial Deepening in Indonesia From 2000 to 2020. Proceedings of the International Conference on Economics and Business Studies (ICOEBS 2022), 655(Icoebs), 154–161. https://doi.org/10.2991/aebmr.k.220602.020
19) Rakhmat, Warjiyo, P., & Sadli, A. M. (2022). The Influence of Exchange Rate and Foreign Capital on the Performance of Inflation Targeting Framework in Indonesia. International Journal of Sustainable Development and Planning, 17(5), 1585–1592. https://doi.org/10.18280/ijsdp.170523
20) Sharma, S., & Dahiya, M. (2023). Analysis of the Effect of Currency Exchange Rate, Broad Money (M3) and Oil Prices on Inflation in India. International Journal of Economics and Financial Issues, 13(3), 158–168. https://doi.org/10.32479/ijefi.14304
21) Silitonga, R. B. R., & Ishak, Z. (2017). Pengaruh Ekspor, Impor dan Inflasi Terhadap Nilai Tukar Rupiah di Indonesia. Ekonomi Pembangunan, 15(1), 53–59.
22) Susanto, S. (2018). Pengaruh Inflasi, Tingkat Suku Bunga, Dan Nilai Tukar Terhadap Pertumbuhan Ekonomi Indonesia. JEBI | Jurnal Ekonomi Bisnis Indonesia, 12(01), 52–68. https://doi.org/10.36310/jebi.v12i01.27
23) Wulandari, E. (2014). Analisis Makro Ekonomi Indonesia Periode 1980-2012. Jurnal Ilmiah Mahasiswa, 2(1).
24) Yusuf, R., Resmawan, R., & Payu, B. R. (2021). Pernerapan Model Persamaan Simultan Dengan Pendekatan Two Stage Least Square Pada Kasus Inflasi Dan Nilai Tukar Rupiah Di Indonesia. Euler : Jurnal Ilmiah Matematika, Sains Dan Teknologi, 9(2), 71–84. https://doi.org/10.34312/euler.v9i2.11173