

The Effect of Interest Rates, Inflation, Money Supply on Indonesian Economic Growth in The Digitalization Era

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Abstract

This study aims to determine the influence of interest rates, inflation, money supply on the growth of the Indonesian economy in the digital era. The variables in this study are interest rates, money supply, inflation and GDP. The analysis method used is Vector Auto Regression with the Impulse Response Function (IRF) test, Forecast Error Variance Decomposition (FEVD), stationarity test, cointegration test, lag structure stability test, and optimal lag length test. The results of the Vector Autoregression study using the lag 2 basis show that there is a contribution from each variable to the variable itself and other variables. The results of the Vector Autoregression analysis also show that past variables (t-1) contribute to the current variable both to the variable itself and other variables. From the results of the analysis, there is a reciprocal relationship between one variable and another. Response Function analysis shows the response of other variables to changes in one variable in the short, medium and long term, and it is known that the stability of the response of all variables is formed in the short, medium and long term. Variance Analysis Decomposition shows the existence of variables that have the largest contribution to the variable itself in the short, medium and long term such as JUB and GDP. While other variables that have the greatest influence on the variable itself and are supported by other variables in the short, medium and long term are Interest Rates and Inflation which are most influenced by GDP.

Keywords: Interest Rate, Inflation, Money Supply, GDP and Vector Auto Regression Method

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Introduction

Economic growth is the main goal that every country, including Indonesia, wants to achieve. In achieving this goal, monetary policy plays a very important role. Effective monetary policy can encourage economic growth by regulating interest rates, inflation, and the money supply. These three variables are interrelated and have a significant impact on the economy as a whole. The benchmark interest rate set by Bank Indonesia serves as the main instrument in controlling liquidity and economic activity. Interest rate adjustments can affect people's investment and consumption decisions. When interest rates are low, borrowing costs become cheaper, encouraging growth in consumption and investment. Conversely, high interest rates can control inflation, but risk slowing economic growth.

Inflation, as measured by the Consumer Price Index (CPI), is also a major concern in monetary policy. A stable and controlled inflation rate is essential to maintain people's purchasing power and create a conducive investment climate. Inflation that is too high can erode consumer and investor confidence, thus negatively impacting economic growth. The money supply, which includes M1, M2, and M3, reflects the liquidity available in the market. Policies that regulate the money supply aim to ensure that liquidity is not excessive, which can cause inflation, but is also sufficient to support economic growth. Proper management of the money supply helps maintain price stability and support economic activity.

Economic growth is a tool to explain or measure the achievements of the development of an economy. In actual economic activities, economic growth means the physical development of production of goods and services that apply in a country, such as the increase in production of the service sector and the increase in production of capital goods. However, using various types of production data will not clearly provide a picture of the economic growth achieved. The economic problem that is of concern to economists is inflation. Inflation is a macroeconomic index, used to measure the economic stability of a country. Changes in this macroeconomic index have an impact on economic growth. Inflation is caused by the increase in money in circulation, put forward by the classics who stated that there is a relationship between the amount of money in circulation and prices. If the amount of goods remains the same but the amount of money in circulation is twice as large, then the price of goods will be twice as expensive. When the inflation rate is high, to control it, the central bank raises interest rates so that the inflation rate decreases. When interest rates rise, loans become expensive because the costs also increase. This condition will suppress public demand for loans, so that the amount of loans decreases. This is one of several factors that influence inflation (Dewi, 2021).

The government also uses monetary policy to maintain economic stability. To reduce instability in the economy, the government through the central bank will implement monetary policy. According to (Nanga, 2005), the monetary policy implemented by the government is by controlling interest rates and the amount of money in circulation (money supply). This policy is to influence the development of money in circulation, interest rates, credit interest rates, and exchange rates which are monetary variables in achieving the desired targets, namely economic growth, employment, price stability, and balance of payments balance. (Sitompul, 2022).

Bank Indonesia plays a role as a monetary authority in Indonesia. In monetary policy, the effectiveness of monetary policy depends on the relationship between the amount of money in circulation and key economic variables such as output (economic growth), interest rates, and inflation. From a number of literatures, various interesting empirical findings can be seen regarding the relationship between money in circulation, inflation, interest rates, and output. These empirical findings generally conclude that in the long run, the relationship between circulating growth and inflation is perfect, while the relationship between money growth or inflation and real output growth may approach zero. While the interest rate is a monetary authority policy by looking at global economic conditions (Utami, 2019).

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One of the main factors causing inflation is the difference between the increase in aggregate demand in the economy that cannot keep up with aggregate supply. To maintain positive growth momentum and business spirit in Indonesia, high inflation must be avoided. Overcoming inflation in Indonesia requires improvements in the real sector. Money supply is the cause of inflation from the demand side. The supply of money to the public must be in accordance with the needs or demands of the public. If the supply of money is excessive from the needs or demands of the public, inflation will occur. Interest rates serve as a measure of a country's economic activity, which can affect the country's financial money flow, banking, investment, and inflation. Both raising and lowering interest rates must prioritize the welfare of the people in the country. (Kristiyanti, 2018).

Interest rates in Indonesia are interest rates that reflect the attitude of monetary policy set by Bank Indonesia. Bank interest rates are used to control a country's economy, regulated and set by the government with the aim of maintaining the sustainability of a country's economy. Bank Indonesia is strengthening the monetary operations framework by implementing a new reference interest rate or policy interest rate, namely the BI 7-Day (Reverse) Repo Rate, which has been in effect since August 19, 2016, replacing the BI Rate. Strengthening this monetary operations framework is common practice in various central banks and is an international best practice in implementing monetary operations. The monetary operations framework is constantly being refined to strengthen the effectiveness of policies in achieving the set inflation target. The BI 7-day (Reverse) Repo Rate instrument is used as a new policy interest rate because it can quickly affect the money market, banking and real sectors. The BI 7-Day Repo Rate instrument as a new reference has a stronger relationship to money market interest rates, is transactional or traded in the market, and encourages financial market deepening, especially the use of repo instruments (Utami, 2019).

The basic principles underlying the framework *Inflation Targeting* is that the ultimate goal of monetary policy is prioritized to achieve and maintain a low and stable inflation rate. This is based on two main considerations, namely:

1. High inflation rates create social costs that must be borne by society due to decreased purchasing power from the income they earn and increased uncertainty which can complicate business planning and worsen economic activities.
2. The development of economic theory in the literature and empirical findings in various countries show that monetary policy in the medium to long term only has an effect on inflation and not on economic growth in the short term. (Utami, 2019).

Money is also called an important indicator in an economy. This condition is because money is related to all economic activities including production, distribution, and consumption. If the payment system fails, it will have an impact on the economic instability of a country. The payment system must be regulated and its security and smoothness must be maintained by an institution, which is generally carried out by the central bank or also called Bank Indonesia. Controlling money in circulation is very necessary to create a good climate for price stability, economic growth and credit control. If the money circulating in the community exceeds that requested by the community, either in terms of interest rates, prices or income, it will cause an increase in money in the community. This will greatly affect price stability in a country. Therefore, the government or monetary authority is very necessary to make efforts to control the amount of money in circulation in terms of monetary policy (Bahr, 2023).

The money supply in Indonesia is defined as the public's bill to the banking sector and is limited to the amount between quarterly money and demand deposits. The money supply in monetary theory is equal to the money supply. On the gold standard, the money supply can only be increased by increasing gold production. The money supply cannot be increased according to the government's wishes but is limited by the cost of increasing the money. There are several definitions of money, each of which differs according to its level of liquidity. Usually money is defined as:

1. M1 is paper money and coins + savings in the form of current accounts (demand deposits). M1 is the most liquid, because the process of making it cash is very fast and without any loss of value (meaning one rupiah becomes one rupiah).
2. M2 is M1 + savings + time deposits in commercial banks. M2 includes time deposits so its liquidity is lower.
3. M3 is M2 + savings + time deposits at non-bank savings institutions (Anjalina, 2017).

The digital era has brought significant changes to Indonesia's economic landscape. With the advancement of information and communication technology, the way transactions, consumption, and investment are transformed profoundly. In this context, interest rates, inflation, and money supply are three very important economic variables in driving economic growth. Interest rates, as the cost of borrowing, have a direct impact on people's investment and consumption decisions. Low interest rates can stimulate economic growth by facilitating access to credit. On the other hand, stable inflation plays an important role in maintaining people's purchasing power. Controlled inflation creates a conducive environment for economic growth, while high inflation can create uncertainty and hinder investment. The money supply also plays a key role in driving economic activity. In the digital era, easy access to financial services through digital platforms accelerates transactions and increases liquidity. However, it should be remembered that the growth of the money supply must be balanced with prudent monetary management to avoid the risk of excessive inflation.

METHOD

The approach taken by quantitative researchers is based on secondary data from the period 2005-2022 through the Worldbank. The conceptual framework of the research is as follows:

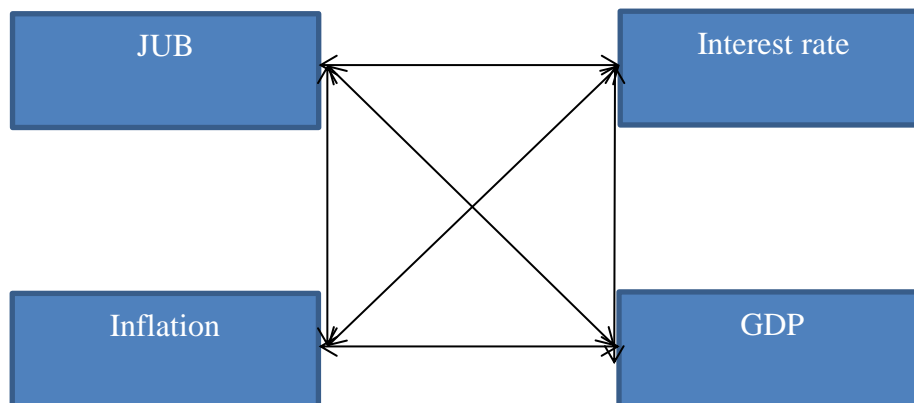


Figure 1. Conceptual Framework of VAR

The conceptual framework image explains the model used is the Vector Autoregression (VAR) test to analyze monetary policy in strengthening economic fundamentals in Indonesia by looking at the formation of vectors that influence each other between variables. According to Manurung (2009) it is impossible to distinguish between endogenous and exogenous variables if simultaneity between several variables is true. Testing simultaneous relationships and degrees of integration between variables in the long term using the VAR method is used because it is easier to use and to empirically prove the complex long-term reciprocal relationship of endogenous variables. The VAR analysis model consists of the following formula:

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$$JUB_t = 10 JUB_{t-p} + 12 SKB_t + p + 13 INF_t + p + 14 PDB_t + p + e_{t1}$$

$$SKB_t = 10 JUB_{t-p} + 12 SKB_t + p + 13 INF_t + p + 14 PDB_t + p + e_{t1}$$

$$INF_t = 10 JUB_{t-p} + 12 SKB_t + p + 13 INF_t + p + 14 PDB_t + p + e_{t1}$$

$$PDB_t = 10 JUB_{t-p} + 12 SKB_t + p + 13 INF_t + p + 14 PDB_t + p + e_{t1}$$

Where :

JUB = Amount of Money in Circulation

GDP = Economic Growth

SKB = Interest Rate

INF = Inflation

p = length lag

Next is the analysis of the Impulse Response Function (IRF) model, conducted to understand how each variable affects the standard deviation of innovation. Ariefianto (2012) explains that IRF conducts a search related to the impact of shocks or shocks on a variable in the system within a certain period of time. The purpose of the IRF analysis is to determine whether each transmission variable is cointegrated in both the short and long term. Manurung (2005) states that IRF is an indicator of changes in the direction of movement of transmission variables as a result of changes in other transmission variables. To find out how important various shocks are to the variable itself and other variables, the Forecast Error Variance Decomposition (FEVD) is used. Manurung (2005) states that the purpose of the FEVD analysis is to determine the contribution or influence between transmission variables.

Further analysis is carried out with the Assumption test consisting of the Data Stationarity Test (Unit Roots Test) and the Johansen Cointegration Test. Data stationarity can be obtained from data that is initially non-stationary through testing the degree of integration or stationarity at the level of data differentiation. This process involves testing the availability of data stationarity at one level and then repeating the test at the differentiation level until it reaches a stationary condition. Dickey-Fuller recommends applying certain regression models to determine the presence of unit roots in the data, as follows:

$$\Delta Y_t = \theta Y_{t-1} + e_t \quad (1)$$

$$\Delta Y_t = \beta_1 + \theta Y_{t-1} + e_t \quad (2)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \theta Y_{t-1} + e_t \quad (3)$$

In equation (1), the variable that shows the difference in time trend is denoted as t, and there are two additional regressors that include constant and time trend variables. Each model has two hypotheses considered: the null hypothesis $\Theta = 0$, which indicates the non-stationarity of the data, and the alternative hypothesis $\Theta < 0$, which indicates that the data is stationary. The DF statistic, represented by the t value of the coefficient ΘY_{t-1} , is compared with its critical value; the rejection of the null hypothesis occurs if the absolute value of the DF statistic exceeds the critical value, indicating that the observed data is stationary. Conversely, if the value of the DF statistic is smaller than the critical value of the t distribution, then the data is considered non-stationary. The residuals e_t and the autocorrelation elements are often related and interrelated according to the assumptions in equations (1) and (2). Dickey Fuller then included the autocorrelation elements into his model, known as the Augmented Dickey-Fuller (ADF) to

develop the unit root test. This ADF test is commonly used to assess the stationarity of data. The formulation of the ADF test can be explained as follows:

$$\Delta Y_t = \gamma Y_{t-1} + \sum \beta \Delta Y_{t-1} + \alpha_0 + \alpha_1 T + \epsilon_t \quad (4)$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \sum \beta \Delta Y_{t-1} + \epsilon_t \quad (5)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + \sum \beta \Delta Y_{t-1} + \epsilon_t \quad (6)$$

Where: Y = Research variable $Y_t = Y_t - Y_{t-1}$ T = Time trend N = lag value The process of assessing whether the data is stationary or not involves comparing the ADF statistic value with the Mackinnon critical distribution value. The t statistic value of the coefficient γY_{t-1} is given in equations (4 to 6). If the absolute value of the ADF statistic exceeds its critical value, then the observed data shows a stationary nature. Conversely, if the absolute value of the ADF statistic is smaller than its critical value, then the data is considered non-stationary. It is also important to determine the length of the lag in the ADF test, and the Aikake Information Criterion (AIC) or Schwarz Information Criterion (SIC) can be used for this purpose. The model with the lowest AIC and SIC values is considered the most appropriate model. After knowing that the Export and Import data are stationary, the next step will determine whether there is a long-run equilibrium relationship between the two. There is one direction of Granger causality that is most uncertain if the two variables are integrated at degree one, I (1) and cointegrated. Based on the representation theorem, It is said that if a vector $n/ (1)$ of time series data X_t is cointegrated with the cointegration vector, then there is an error correction representation, which can be mathematically represented by: $A(L).X_t = -\alpha X_{t-1} + \beta(L) \epsilon_t$ (7) Where: $A(L)$ is a polynomial matrix in the lag operator with $A(0) = I$; $\beta(L)$ is a polynomial scalar in L; and ϵ_t is a vector of error variables that are white noise. In the short term, any deviation from long-term equilibrium ($\alpha X=0$) will affect the change in X_t and will adjust back towards equilibrium. The cointegration test that will be used here uses a test procedure.

Results and Discussion

The results of Vector Autoregression (VAR) show that with a lag of 1, the vector autoregression analysis shows the contribution of each variable to the variable itself and other variables, which is more clearly described in the following table:

Table 1. VAR Results

Lag 1	Lag 2
Vector Autoregression Estimates Date: 09/21/24 Time: 10:48 Sample (adjusted): 2 18 Included observations: 17 after adjustments Standard errors in()&t-statistics in[] Determinant resident covatiance (dofadj.) 681.5992 Determinant of residual covariance 169.2226 Log likelihood -140.1031 Akaike informationcriterion 18.83566 Black criterion 19.81592 Number of coefficients 20	Vector Autoregression Estimates Date: 09/21/24 Time: 10:48 Sample (adjusted): 3 18 Included observations: 16 after adjustments Standard errors in()&t-statistics in[] Determinant resident covatiance (dofadj.) 62.02511 Determinant residual covariance 2.272374 Log likelihood -97.67233 Akaike informationcriterion 16.67233 Black criterion 18.41066 Number of coefficients 36

Source: Author's processed data, 2024

In Table 1. above, the VAR results show the Lag value.1 AIC 18.83566 < Lag value 2 AIC 16.67233 also shows that the past variable (t-1) contributes to the current variable, both to the variable itself and to other variables. The analysis results show that there is a reciprocal

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relationship between the variables. Next is the Impulse Response Function (IRF) analysis with the results described as follows:

Table 2. Summary of Impulse Response Function (IRF) results

Response of INF:				
Period	INF	JUB	GDP	SKB
1	0.988370	0.000000	0.000000	0.000000
5	0.031735	0.190395	0.528471	-0.026321
10	0.059839	0.024146	-0.163101	-0.067193
Response from JUB:				
Period	INF	JUB	GDP	SKB
1	0.184096	2.422649	0.000000	0.000000
5	0.321525	0.441952	-1.883284	-0.444239
10	0.039760	0.096369	0.141878	0.201446
Response of PDB:				
Period	INF	JUB	GDP	SKB
1	0.032155	-0.736840	2.042484	0.000000
5	0.114746	0.031594	0.308957	-0.209045
10	0.009493	-0.114194	0.098446	0.001465
Response of SKB:				
Period	INF	JUB	GDP	SKB
1	-0.660111	-0.621902	-0.239431	1.610331
5	-0.133081	0.560100	0.763615	0.036917
10	0.041482	0.032012	-0.255557	-0.069445

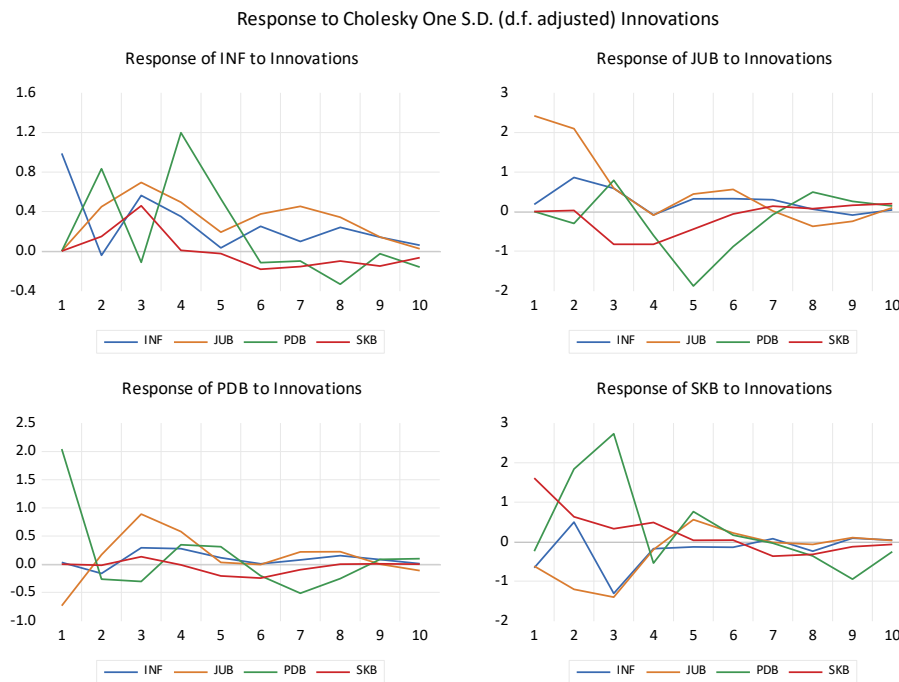
Cholesky Ordering: INF JUB GDP SKB

Source: Author's processed data, 2024

Based on Table 2. Above, the results obtained state that the inflation variable received a positive response if both in the short term, medium term and long term. Then for the JUB variable it is responded positively in the short term, medium term and long term. After that for

the economic growth variable it is responded positively in the short, medium and long term and for the interest rate variable it is responded positively in the short, medium term but responded negatively in the long term.

Figure 2. Impulse Response Function (IRF) graph



Source: Author's processed data, 2024

Based on Figure 2 above, it is known that changes to one standard division between variables can be responded to by other variables, both variables. INF, JUB, PDB, and SKB. The analysis in the image above shows that the stability of the response of all variables is formed in the short term or period 1 (one) and the medium term or period 5 (five) and the long term or period 10 (ten). Stable response stability is caused by the movement behavior between variables that are responded to by all variables almost the same as the movement in the short term, medium term and long term that have been analyzed. Next are recommendations for the influence of interest rates, inflation, and money supply on economic growth in the digital era.

Table 3. Recommendations for Interest Rates, Inflation, Money Supply for Economic Growth in the Digitalization Era

Period	JUB	Biggest 1	Biggest 2
Short-term	99.42%	JUB 99.42%	GDP 88.46%
Medium term	59.29%	JUB 59.29%	GDP 69.88%
Long-term	56.17%	JUB 56.17%	GDP 69.39%

Source: Author's processed data, 2024

Table 3 shows that the JUB variable itself is responsible as interest rates, inflation, money supply on economic growth in the digitalization era in the short, medium, and long term.

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Furthermore, JUB control is responsible for other variables that can be used to control short, medium and long term GDP.

According to the analysis results *Forecast Error Variance Decomposition* (FEVD), there are many relationships between variables as interest rates, inflation, money supply on economic growth in the digital era. The most effective variables are determined by this Forecast Error Variance Decomposition. Here is an example of a relationship as a variable interest rates, inflation, money supply on economic growth in the digital era:

Table 4. Interaction of Interest Rates, Inflation, Money Supply on Economic Growth in the Digitalization Era

Variables	Interest Rates, Inflation, Money Supply on Economic Growth in the Digitalization Era				Period
	INF	JUB	GDP	SKB	
Interest rate	12.54%	11.13%	1.65%	74.66%	Short-term
	11.24%	19.20%	54.21%	15.34%	Medium term
	10.89%	18.20%	55.44%	15.44%	Long-term
Inflation	100.0%	0.00%	0.00%	0.00%	Short-term
	28.16%	19.14%	48.09%	4.59%	Medium term
	26.29%	24.39%	43.59%	5.51%	Long-term
Money Supply	0.57%	99.42%	0.00%	0.00%	Short-term
	6.76%	59.29%	25.32%	8.62%	Medium term
	7.14%	56.17%	28.43%	8.25%	Long-term
Economic growth	0.21%	11.51%	88.46%	0.00	Short-term
	3.12%	26.04%	69.88%	0.95%	Medium term
	3.37%	25.38%	69.39%	1.85%	Long-term

Source: Author's processed data, 2024

 : Largest 1

 : Largest 2

Based on table 4 above, In the short term, interest rates reached (12.54%) with inflation at (11.13%) and unemployment at only (1.65%). GDP was at (74.66%), reflecting strong growth and stability in the labor market. However, in the medium term, the situation changed. Interest rates fell slightly to (11.24%), while inflation jumped to (19.20%) and unemployment rose sharply to (54.21%). GDP also declined to (15.34%), indicating challenges to economic growth. In the long term, interest rates fell further to (10.89%), but inflation remained high at (18.20%) and unemployment reached (55.44%). GDP was at (15.44%), indicating the need for a more effective strategy to address these challenges. In the short term, inflation reached (100.0%), indicating an extreme situation, while the proportion of unemployment and other economic growth showed (0.00%). This reflects significant instability in the economy. In the medium term, inflation declined to (28.16%). Here, the inflation figure is accompanied by the proportion of unemployment and other growth, indicating that inflation is starting to impact the economic dynamics with a more measurable influence. In the long term, inflation has decreased slightly to (26.29%), with a more balanced proportion in other variables such as unemployment and GDP. This shows that inflation, although still significant, is starting to stabilize and can be managed, providing an opportunity for more sustainable economic growth. In the short term, the money supply is very high at (99.42%), but economic growth only reaches (0.21%),

indicating that although there is a lot of money in the market, it is not enough to drive significant growth. This reflects the economic instability that may be caused by extreme inflation. In the medium term, the money supply becomes more balanced, with (59.29%) and economic growth increases to (3.12%). This shows that the increase in the money supply is starting to contribute to growth, although the growth is still moderate. In the long term, the money supply stabilizes at (56.17%), and economic growth increases slightly to 3.37%. This proportion reflects a better relationship between money supply and economic growth, indicating that effective monetary policy can drive sustainable growth. Overall, these data suggest that managing interest rates, inflation, and money supply is critical in supporting economic growth, especially in the context of digitalization. A balance between these variables is needed to achieve sustainable and inclusive growth.

Conclusion

Based on the analysis conducted in Indonesia with the main focus on the influence of interest rates, inflation, money supply, on Indonesia's growth. Economy in the Digitalization Era with Vector Autoregression (VAR) analysis obtained the results of the VAR analysis using the lag 2 basis. Where according to the lag 2 basis, the contribution of each variable to itself and other variables can be seen clearly. Vector autoregression analysis also reveals that there is not only the influence of past variables (t-1) on the current variables, but the influence can also be felt both on the variables themselves and on other variables. Therefore, the results of the analysis confirm the existence of a significant reciprocal relationship between the various variables, illustrating the complexity and interconnectedness in the system. The results of the Impulse Response Function (IRF) test show that increasing inflation provides a positive response in the short, medium and long term. Then for the amount of money in circulation and GDP provide a positive positive response in the short, medium and long term. But for interest rates provide a positive response in the short and medium term but give a negative response in the long term. Changes in one standard deviation variable between variables can be responded by other variables. Response stability is formed in the short term (period 1), medium term (period 5) and long term (period 10). Forecast Error Variance Decomposition (FEVD) analysis shows the relationship between variables and determines the most effective, namely the variables Interest rate, Inflation, GDP and Money supply contribute significantly to temporary changes for the short, medium and long term, namely the GDP and JUB variables are more effective as recommendations for developing economic growth in the digital era. Then for other variables become variables as supporting variables. The overall results of FEVD provide in-depth insight into which variables have the most influence on economic growth in this digital era.

Bibliography

- Anjalia, T. d. (2017). Analisis Pertumbuhan Ekonomi, Suku Bunga, Jumlah Uang Beredar, Harga Minyak Dunia dan Inflasi di Indonesia. *Jurnal Ilmiah Mahasiswa*, 554-565.
- Bahr, E. S. (2023). Pengaruh e-money, tingkat suku bunga dan inflasi terhadap jumlah uang beredar di Indonesia. *Journal Perdagangan Industri dan Moneter*, 10-15.
- Dewi, I. M. (2021). Pengaruh Jumlah Uang Beredar (JUB), BI Rate dan Inflasi Terhadap Pertumbuhan Ekonomi di Indonesia Periode 2009-2018. *Warmadewa Economic Development Journal*, 21-27.

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Kristiyanti, S. N. (2018). Analisis Pengaruh Jumlah Uang Beredar, Suku Bunga, dan Nilai Tukar Terhadap Inflasi di Indonesia Periode 2014-2016. *Jurnal Ekonomi Manajemen Sumber Day*, 96-103.

Sitompul, P. N. (2022). Analisis Pengaruh E-Money Terhadap Pertumbuhan Ekonomi Indonesia. *Jurnal Manajemen dan Akuntansi Medan*, 1-15.

Utami, A. (2019). Determinan Jumlah Uang Beredar, Tingkat Bunga, dan Inflasi terhadap Pertumbuhan Ekonomi Indonesia. *Jurnal Al-Buhuts*, 45-64.