DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3
P-ISSN : 2654-4946
E-ISSN : 2654-7538

Interest Rates as an Intervening Variable Mediating the Effect of Banking Liquidity and Inflation on Economic Growth

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Abstract: The objective of this study is to explain how independent variables such as bank liquidity and inflation as measured by, affect economic growth with interest rates as an intervening variable. Bank liquidity is projected using the cash ratio, inflation is determined based on information from Statistics Indonesia (BPS), interest rates are projected using the BI rate, and economic growth is projected using gross domestic product (GDP). The regression technique that used in this study is panel data regression, which is a combination of cross-sectional data and time series data. To test the hypothesis in this study, panel data regression was used with the selected regression model, namely the Random Effect Model (REM). Data processing and hypothesis testing were performed using Eviews13 software. The sample involved 12 companies with the largest assets in the banking sector. This study concluded that liquidity doesn't affect interest rates, while inflation affects interest rates. Liquidity doesn't affect economic growth, while inflation and interest rates affect economic growth. Liquidity and inflation simultaneously affect interest rates and can explain 27% of interest rates. Then, liquidity, inflation, and interest rates simultaneously affect economic growth and can explain 99% of economic growth. Then, liquidity and inflation affect economic growth through interest rates.

Keywords*: Inflation, Liquidity, Interest Rates, Economic Growth*

1. Introduction

Indonesia is a country with a very large population and ranked 4th largest in the world. Based on information from the Central Bureau of Statistics (BPS) as of June 30, 2025, the population of Indonesia reached 284,438,800. It is certainly not an easy task for the government to carry out its responsibility to improve the welfare of Indonesia's large population. The welfare of the people is closely related to the country's economic growth. According to (Sukirno & Sadono, 2011), "Economic growth is defined as the development of economic activities that lead to an increase in the production of goods and services in society and an improvement in the prosperity of the people". Economic growth is an indicator of how an economy develops from one period to another. This increased ability is caused by an increase in production factors, both in terms of quantity and quality. Investment will increase capital goods and the technology used will also develop. This increase in ability can occur due to an increase in production factors, both in terms of quantity and quality. In addition, investment will also increase and technology will continue to develop, thereby ensuring the prosperity of the people.

The government strives to implement the best policies to increase Indonesia's economic growth. In handling this matter, the Minister of Finance has also made policies that are considered to support the government's efforts to increase economic growth. September 2025, Minister of Finance Purbaya Yudhi Sadewa issued Minister of Finance Decree No. 276 of 2025 concerning the placement of state funds in the context of managing cash surpluses and deficits to support the implementation of government programs in promoting economic growth. Based on this decree, Finance Minister Purbaya transferred half of the government funds held at Bank Indonesia to the accounts of members of the Association of State-Owned Banks (Himbara) amounting to IDR 200 trillion, with different portions allocated according to the size of the banks, namely BRI, BNI, and Bank Mandiri, each bank receiving IDR 55 trillion, followed by BTN with IDR 25 trillion and BSI with IDR 10 trillion. This policy was implemented to support the deepening of the financial market and encourage real sector credit so that economic

P-ISSN : 2654-4946
E-ISSN : 2654-7538 DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3

growth would increase. The injection of funds was expected to boost liquidity in these banks. With the placement of these funds, the interest rate expected by the government was only 80.476% of the BI reference rate.

The impact of the policy implemented by the Minister of Finance is believed to have begun to show. The effectiveness of this policy is reflected in the response given by the well-known lawyer Hotman Paris regarding the decline in deposit interest rates. Minister Purbaya reiterated that the placement of funds in these banks is targeted to increase liquidity and reduce the cost of funds, which will ultimately boost credit growth, consumption and investment, as well as the multiplier effect on economic growth. This strategy is believed to be relevant in boosting liquidity and lowering interest rates, which will ultimately have a positive impact on customers. People who previously chose to save their money in banks will begin to shift to spending their money rather than saving it with minimal interest rates. With lower interest rates, business actors will also be more willing to take out loans, resulting in simultaneous growth in demand and supply. In addition, with increased business credit, this will have an impact on increased investment and employment, which will ultimately further boost the country's economic growth.

In addition to contributing to a country's economic growth, banking companies also play an important role in maintaining the stability of the financial system. Liquidity is an important component of the banking function as an intermediary, which means that banks are able to meet their short-term obligations with their liquid assets. With adequate liquidity, banks are able to channel credit optimally, maintain customer confidence, and keep the payment system running smoothly. Conversely, liquidity problems can disrupt the financial system and hamper economic growth. In terms of liquidity, banks become a relevant variable in determining interbank interest rates for national private foreign exchange banks, national private non-foreign exchange banks, and regional development banks. Loan interest rates are determined by deposit interest rates, borrower risk, and SBI interest rates. Banks respond significantly to changes in benchmark interest rates. When the SBI interest rate falls, banks will reduce deposit interest rates and SBI ownership portfolios, then increase loan portfolios, especially for working capital loans. In addition, banks tend to raise lending rates and reduce loan portfolios when liquidity is tight or there is a significant increase in the SBI interest rate. Abundant liquidity, market segmentation, and higher risk factors in the financial market require higher policy interest rate changes to influence market interest rates. However, once market interest rates move, the impact on the real economy becomes more apparent. Bank liquidity conditions significantly affect lending rates. In determining lending rates, banks will use deposit rates as the base rate, where increases in time deposit rates will directly affect lending rates, and also review the latest lending rates as a benchmark for new lending rates, (Warjiyo Perry and Juda Agung, 2002). Previous research on liquidity and economic growth was conducted by (Putri Yuli Novita Sari, 2016) with estimation results showing that the effect of banking liquidity creation on Indonesia's economic growth is positive and significant, where the greater the liquidity creation created by banks, the greater the increase in Indonesia's economic growth.

Deposit interest rates are one of the most important instruments in banking activities and monetary policy transmission. Deposit interest rates are the cost of funds that banks must pay to attract funds from the public. The deposit interest rate offered can be influenced by changes in banking liquidity. Banks tend to lower deposit interest rates when the public's funding needs decrease. Conversely, when liquidity levels are low, banks tend to raise deposit interest rates in an effort to collect more funds from the public.

Ultimately, economic growth is closely related to this phenomenon. Banking costs become cheaper when deposit interest rates are low, which allows for the distribution of credit with lower interest rates. Higher investment and consumption will drive economic growth because lower interest rates will increase consumption and economic growth. Conversely, high deposit interest rates can hamper credit distribution, suppress consumption, and slow economic growth. In a study conducted by (Pangaribuan et al., 2024), it was concluded that by raising interest rates, Bank Indonesia can reduce the amount of money in circulation, curb

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P-ISSN : 2654-4946
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consumption and investment, and suppress inflation. Conversely, in situations where the economy needs stimulus, Bank Indonesia can lower interest rates. This stimulates consumer spending and investment, thereby driving economic growth. By using interest rates as an instrument, Bank Indonesia strives to achieve a balance between stable economic growth and inflation control, which are key elements in achieving overall economic stability. However, there are concerns that Himbara's fund placement policy could lead to an increase in inflation if carried out in the long term and the funds injected flood the banking system with liquidity. In a study conducted by (Mahardika, 2019), it is explained that inflation has a positive and significant effect on interest rates in Indonesia. Fluctuations in interest rates are caused by other factors, so the government and Bank Indonesia set interest rates to keep inflation stable or balanced.

Based on this explanation of the phenomenon, the author became interested in further examining the effect of liquidity and inflation on economic growth through interest rates. Thus, the title of this article is "***Interest Rates as an Intervening Variable that Mediates the Effect of Banking Liquidity and Inflation on Economic Growth***".

Framework and Hypothesis Development

In general, Bank Indonesia will raise the BI Rate if inflation is expected to exceed the target set, and conversely, Bank Indonesia will lower the BI Rate if future inflation is expected to be below the target set. The BI Rate is set by the Board of Governors every month through the Board of Governors' Meeting (RDG). The BI Rate monetary policy is effective from the date of its enactment until the next Board of Governors' Meeting. The BI Rate response is determined by taking into account the lag effect of monetary policy on inflation. If developments occur that is beyond initial expectations, monetary policy responses may be determined prior to the monthly RDG through weekly RDGs. The monetary policy response is expressed in changes to the BI Rate. Fluctuations in interest rates are caused by other factors, so the government and BI set interest rates to keep inflation stable or balanced.

Economic growth drives the development of banking intermediation and increases purchasing power and third-party funds, thereby lowering deposit interest rates but keeping the credit market, economic liquidity, and output market growing positively. (Matari, 2022) The more effectively the intermediation function is carried out, the more significant the contribution of the banking sector to the economy becomes. This is the basic formulation of the idea. Therefore, financial inclusion in the financial world has become a focus of attention because it is the key to accelerating economic system development. A mutually beneficial relationship between economic growth and the banking sector must be created. Such a relationship will enable all elements in the economic system to grow and develop synergistically, so that the credit cycle from the financial sector to the real sector can run more smoothly. This positive correlation will strengthen the stability of the economic and financial system (Matari, 2022) .

The inflation rate affects the economic growth rate because high inflation increases the risk of economic growth projects and, in the long term, high inflation can reduce the average loan period and cause distortion of information about relative prices. Keynes stated that high inflation is often considered a measure of macroeconomic instability and the government's inability to control macroeconomic policy. Thus, the domestic inflation rate also indirectly affects economic growth through its influence on domestic interest rates. The inflation rate is very important in forecasting and analyzing interest rates.

The difference between the nominal interest rate and inflation is a very important measure of the actual burden of interest costs faced by individuals and companies. In addition, real interest rates are also a very important measure for monetary authorities. In a study conducted by (Hakim, 2023), it was concluded that inflation has a significant effect on economic growth in Indonesia, with $t_{calculated} = 0.895 < t_{table} = 1.734$. In a study conducted by (Rosmawati Agustini and Yulia, 2024), it was shown that the effect of inflation on economic growth is statistically significant. This means that there is a clear and measurable relationship between inflation and economic growth during the period studied.

P-ISSN : 2654-4946
E-ISSN : 2654-7538 DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3

Inflation, in the context of this study, has a positive effect on economic growth. This positive effect may be due to price increases that drive economic activity, such as investment and consumption, which ultimately support economic growth.

Interest rates are one factor that has a significant impact on a country's economy, especially on the welfare of the general public. Low interest rates can stimulate economic growth. This is because low interest rates mean lower borrowing costs, which are more affordable for the public. This condition will stimulate consumption, inflation, and investment, as both the public and companies are more likely to borrow funds when interest rates are low. Meanwhile, high interest rates will increase borrowing costs, which will reduce consumption and investment, thereby slowing down economic activity across the board. Interest rates also play a very important role in Bank Indonesia's monetary policy.

Bank Indonesia uses interest rates as a tool to achieve price stability by controlling inflation to support economic growth. According to (Yodiatmaja, 2012), when the monetary authority raises the benchmark interest rate (BI Rate), banking interest rates, namely savings, deposit, and credit interest rates, will also increase. An increase in credit interest rates will cause a decline in credit demand from the public or companies, resulting in no increase in production capacity and ultimately affecting the inflation rate. The following table illustrates the framework for explaining the relationship between liquidity and inflation on economic growth with interest rates as an intervening variable, along with a description of the hypothesis.

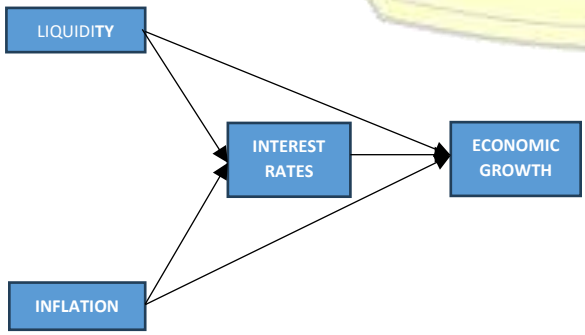

Figure 1. Conceptual Framework

Source: Data Processing, 2025

Table 1. Hypothesis Table

No	Hypothesis	Description
1.	H1	Liquidity affects interest rates
2.	H2	Inflation affects interest rates.
3.	H3	Liquidity and inflation simultaneously affect interest rates.
4.	H4	Liquidity affects economic growth.
5.	H5	Inflation affects economic growth.
6.	H6	Interest rates affect economic growth.
7.	H7	Liquidity, inflation, and interest rates simultaneously affect economic growth.
8.	H8	Liquidity affects economic growth through interest rates.
9.	H9	Inflation affects economic growth through interest rates.

Source: Data Processing, 2025

2. Research Method

Research Location and Object

This type of research is quantitative research. Quantitative research is research based on the philosophy of positivism (Sugiyono, 2017). Quantitative data analysis aims to test predetermined hypotheses. The research strategy used in this study is causal associative. Causal associative is a research problem formulation that asks about the relationship between two or more variables (Sugiyono, 2017). Causal associative in this study is used to determine the extent of the causal relationship between liquidity and inflation as independent variables, economic growth as a dependent variable, and interest rates as an intervening variable.

Data Collection Method

This study uses secondary data in the form of annual financial reports of companies in the banking sector listed on the Indonesia Stock Exchange. Other secondary data were obtained from literature, articles, journals, and previous studies relevant to this research. The observational data were obtained from the 2021-2024 annual financial reports published on the Indonesia Stock Exchange, through the website www.idx.co.id.

Population and Sample

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P-ISSN : 2654-4946
E-ISSN : 2654-7538

The population in this study consisted of 48 banking sector companies listed on the Indonesia Stock Exchange in 2021-2024 with samples selected based on purposive sampling techniques focusing on the following criteria: Twelve banking sector companies listed consecutively on the Indonesia Stock Exchange in 2021-2024, and these banking sector companies must have published complete financial reports for 2021-2024. The banking companies are BMRI, BBRI, BBCA, BBNI, BBTN, BRIS, BNGA, NISP, BNLI, BDMN, PNBN, and MEGA.

Data Analysis Technique

The software used in statistical data analysis is eviews13. The data in this study is in the form of panel data. According to (Gujarati, Damodar N, 2010), panel data also known as longitudinal data, is a combination of cross-sectional data and time series data. Cross-sectional data is data collected at one point in time from many individuals. Meanwhile, time series data is data collected over time from individuals.

Estimation Model Approaches

According to (Basuki, 2016) , there are three types of Panel Data Regression Estimation Models. First, Common Effect Model (CEM) or Pooled Least Square (PLS) This is the simplest panel data model approach because in the Common Effect Model, all data are combined, both cross-sectional and time series data, ignoring the time and place of the study, so it is assumed that the behavior of company data is the same over various time periods. The second, Fixed Effect Model is a regression method that estimates panel data by adding dummy variables to capture differences in intercepts between companies. Differences in intercept can occur due to differences in work culture, management, and incentives. In the Fixed Effect Model, each individual is an unknown parameter and will be estimated use dummy variable techniques, so this method is often referred to as Least Square Dummy Variable (LSDV). Third, Random Effect Model (REM) estimates panel data where disturbance variables may be correlated over time or between individuals. In the Random Effect model, differences in intercepts are accommodated by the error terms of each company. The advantage of using the Random Effect model is that it eliminates heteroscedasticity. This model is also known as Generalized Least Square (GLS) technique.

Selection of Panel Data Regression Model

Explanations for conducting tests include models with OLS (common), fixed effect models, and random effect models. To determine the best method for panel data regression in this study, several tests are required, including Chow Test. According to (Basuki, 2016), the Chow test is used to determine the best method between Common Effect and Fixed Effect. The hypothesis of the Chow test is H_0: The regression model is common effect and H_1: The regression model is fixed effect. In making decisions from this Chow test, researchers use a significance level of 5% (α = 0.05). The decision from the Chow test is that if the p-value is < 0.05, then H_0 is rejected, which means that the appropriate model for panel data regression is fixed effect, whereas if the p-value is > 0.05, then H_0 is accepted, and the appropriate model for panel data regression is common effect.

Then Hausman Test. According to (Basuki, 2016), the Hausman test is a statistical test to determine whether a fixed effect or random effect model is the appropriate model for data regression. The Hausman test hypothesis is H_0: The regression model is a fixed effect model and H_1: The regression model is a random effect model. If the probability value (P-value) for cross section random $\leq$ 0.05 (significant value), then H_0 is accepted and H_1 is rejected, so that the Fixed Effect Model (FEM) is the most appropriate model to use. If the probability value (P-value) for cross-section random $\geq$ 0.05 (significant value), then H_0 is rejected and H_1 is accepted, so that the Random Effect Model (REM) is the most appropriate model.

The last, Lagrange Multiplier Test. This test is the selection of the best approach for estimating panel data used in this test. There are two approach models, namely the Common Effect Model (CEM) and the Random Effect Model (REM). The underlying criteria include H_0: The regression model is the Common Effect Model (CEM) and H_1: The regression model is the Random Effect Model (REM). If the cross-section Breusch-Pangan value is $\geq$ 0.05 (significant value), then H_0 is accepted, and the Common Effect Model

P-ISSN : 2654-4946
E-ISSN : 2654-7538 DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3

(CEM) is the most appropriate model. However, if the cross-section Breusch-Pangan value is < 0.05 (significant value), then H_0 is rejected, and the Random Effect Model (REM) is the most appropriate model.

Classical Assumption Tests

Classical assumption tests are conducted to ensure that the data used in the study is valid, unbiased, consistent, efficient, and meets the basic assumptions for panel data regression. Some literature states that classical assumption tests are more relevant to apply if the panel regression model used is estimated with OLS, such as the Common Effect Model (CEM) or Fixed Effect Model (FEM), because OLS estimation relies on the fulfillment of classical assumptions. Meanwhile, the Random Effect Model (REM) uses Generalized Least Squares (GLS), which has different characteristics regarding residual assumptions (Gujarati, Damodar N, 2010).

Hypothesis Test

The formulated hypothesis needs to be tested accordingly. To determine the use of testing in this study, the researcher used individual parameter significance testing (t-test) and the coefficient of determination R^2. The t-test was used to determine the effect of independent variables on dependent variables individually (partially). The test criteria were conducted at a significance level of 5%, namely: If $t\text{-}_{calculated} < t\text{-}_{table}$ and p-value > 0.05, then H_0 is accepted and H_1 is rejected, which means that one of the independent variables does not significantly affect the dependent variable and If $t\text{-}_{calculated} > t\text{-}_{table}$ and p-value < 0.05, then H_1 is accepted and H_0 is rejected, which means that one of the independent variables significantly affects the dependent variable. The coefficient of determination is used to explain the extent to which the model is able to describe the variation in the dependent variable (Ghozali, 2018). The value of the coefficient of determination is between zero and one, or $0 < R^2$. If the coefficient of determination is equal to one or close to one, then the value of R^2 is considered good.

Sobel Test

The Sobel Test is used to determine the effect of the intervening variable, following the procedure developed by Sobel (1982). This test is conducted by examining the strength of the indirect effect of the independent variable (X) on the dependent variable (Y) through the intervening variable (Z). The test can be directly calculated using:

$$t = \frac{ab}{\sqrt{(b^2\text{SE}a^2) + (a^2\text{SE}b^2)}}$$

a = Path of the independent variable to the intervening variable
b = Path of the intervening variable to the dependent variable
SE = Standard Error
Sea = Standard error of estimation of the effect of the independent variable on the intervening variable
Seb = Standard error of estimation of the effect of the intervening variable on the dependent variable

If the $\text{t-value-}_{calculated} > \text{t-value-}_{table}$ then it can be concluded that there is an intervening effect.

3. Results and Discussions

Selection of Panel Data Regression Model, below are the results of the Chow test using the Eviews13 application:

Table 2. Chow Test

Redundant Fixed Effects Tests			
Equation: Untitled			
Cross-section fixed effects test			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.004861	(11.34)	1.000
Cross-section Chi-square	0.075434	11	1.000

Source: Results of Eviews13 Data Processing, 2025

The data processing results table above shows that the prob value in the cross-section Chi-square is 1.0000, which means that the value is greater than 0.05 (1.0000 > 0.05), so the appropriate model is the Common Effect Model. Because the Common Effect Model is selected, the Hausman test is not necessary, and we proceed to the Lagrange Multiplier Test.

Table 3. Lagrange Multiplier Test

	Cross-section	Time	Both
Breusch-Pagan	7.982338	263.8071	271.7
	(0.0047)	(0.0000)	(0.0)

DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3
P-ISSN : 2654-4946
E-ISSN : 2654-7538

Source: Results of Eviews13 Data Processing, 2025

The data processing results table above shows that the cross-section Breusch-Pagan probability value is 0.0047, which is less than 0.05 (0.0047 < 0.05), so the selected model is the Random Effect Model (REM). In determining the panel data regression model for sub-structure 2, which represents the variables of liquidity, inflation, and interest rates on economic growth, the same results were obtained for the Chow test and Lagrange Multiplier Test. Thus, it can be concluded that the regression model selected for both sub-structures is the Random Effect Model (REM). In this study, classical assumption tests will be conducted through multicollinearity. Multicollinearity will be detected using a correlation matrix, with the following results:

Table 4. Multicollinearity Test

Correlation			
	X1_LIKUIDITAS	X2_INFLASI	Z_BIRATE
X1_LIKUIDITAS	1.000000	-0.047900	0.040652
X2_INFLASI	-0.047900	1.000000	-0.523528
Z_BIRATE	0.040652	-0.523528	1.000000

Source: Results of Eviews13 Data Processing, 2025

Where the coefficient value is below 0.9, there is no multicollinearity, but if the value is above 0.9, multicollinearity occurs. Based on the results of the data processing above, it can be explained that all coefficient values are below 0.9, so the conclusion is that there is no multicollinearity.

t-test of Sub-structural 1

t-test for sub-structure 1 was conducted to determine the extent to which the liquidity variable and the inflation variable can explain the interest rate variable. The following table shows the results of the t-test for sub-structure 1.

Table 5. Sub-Structural 1 t-Test

Variable	Coefficient	Std. Error	Prob.
C	0.054475	0.003653	0.0000
X1_LIQUIDITY	4.32E-05	0.000405	0.9154
X2_INFLATION	-0.393786	0.110086	0.0008

Source: Results of Eviews13 Data Processing, 2025

Based on the t-test in the table above, variable X_1_Liquidity has a p-value of 0.9154 > significance level (α=0.05). This means that variable X_1_Liquidity does not affect variable Z_BI-$_{rate}$ or H_1: Liquidity affects interest rates is rejected. Variable X_2 _Inflation has a p-value of 0.0008 < the significance level (α=0.05). This means that variable X_2_Inflation variable Z_BI-$_{rate}$ or H_2: Inflation significantly affects interest rates is accepted.

F-Test of Sub-structural 1

Table 6. Substructural F Test 1

R-squared	0.274	Mean dependent var	
Adjusted R-squared	0.242	S.D. dependent variable	
S.E. of regression	0.006	Sum of squared residuals	
F-statistic	8.505	Durbin-Watson statistic	
Probability of F-statistic	0.000 736		

Source: Results of Eviews13 Data Processing, 2025

Based on the f-test in the table above, it is explained that the Prob (F-statistic) value of 0.000736 < 0.05, then H_3 is accepted and H_0 is rejected, which means that X_1_Liquidity and X_2_Inflation simultaneously affect the variable Z_BI-$_{rate}$ or interest rate.

Determination Coefficient Test of Sub-structural 1

Table 7. Determination Coefficient Test of Sub-structural 1

R-squared	0.274324	Mean dependent variable	0.043500
Adjusted R-squared	0.242072	S.D. dependent variable	0.007844
S.E. of regression	0.006829	Sum of squared residuals	0.002099
F-statistic	8.505585	Durbin-Watson statistic	0.838109
Probability of F-statistic	0.000736		

Source: Results of Eviews13 Data Processing, 2025

Based on the Coefficient of Determination Test in the table above, the R-squared value in the panel data regression model using the random

P-ISSN : 2654-4946
E-ISSN : 2654-7538 DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3

effect model with individual effects (cross section) is 0.27. This means that the liquidity and inflation variables can explain 27% of the interest rate. The remaining 73% is influenced by other factors.

T-test of Sub-structural 2

T-test Substructural 2 was conducted to determine the extent to which the liquidity variable, inflation variable, and interest rate variable explain the economic growth variable. The following are the t-test results for substructural 2:

Table 8. Substructural t-test 2

Variable	Coefficient	t-Statistic	Prob.
C	222.0537	2.325609	0.0247
X1_LIQUIDITY	0.198222	0.051398	0.9592
X2_INFLATION	70807.40	57.57143	0.0000
Z_BIRATE	58,608.04	35.90601	0.0000

Source: Results of Eviews13 Data Processing, 2025

Based on the table above, variable X_1_Liquidity has a p-value of 0.959 > significance level (α=0.05). This means that variable X_1_Liquidity does not affect variable Y_EconomicGrowth or H_4: Liquidity has a significant effect on economic growth is rejected. Variable X_2 _Inflation has a p-value of 0.0000 < the significance level (α=0.05). This means that variable X_2 _Inflation affects variable Y_EconomicGrowth. In this case, H_5: Inflation has a significant effect on economic growth is accepted. The variable Z_BI-$_{rate}$ has a p-value of 0.0000 < the significance level (α=0.05). This means that the variable Z_BI-$_{rate}$ (interest rate) affects the variable Y_EconomicGrowth. In this case, H_6: Interest rate has a significant effect on economic growth is accepted.

F-Test of Sub-structural 2

Table 9. Substructural F Test 2

R-squared	0.990280	Mean dependent var	4772.50
Adjusted R-squared	0.989617	S.D. dependent variable	635.638
S.E. of regression	64.76984	Sum of squared residuals	184,585.
F-statistic	1494.201	Durbin-Watson statistic	4.16876
Prob of F-statistic	0.0000		

Based on the table above, it is explained that the Prob (F-statistic) value of 0.00000 < 0.05, then H_7 is accepted and H_0 is rejected, which means that X_1_Liquidity and X_2_Inflation and Z_BI-$_{rate}$ together or simultaneously affect the variable Y_EconomicGrowth.

Determination Coefficient Test of Sub-structural 2

Table 10. Determination Coefficient Test of Sub-structural 2

R-squared	0.99028	Mean dependent var	4772.50
Adjusted R-squared	0.98961	S.D. dependent variable	635.63
S.E. of regression	64.7698	Sum of squared residuals	184,585.8
F-statistic	1494.20	Durbin-Watson statistic	4.16
Prob (F-statistic)	0.00000		

Source: Results of Eviews13 Data Processing, 2025

According to the table above, the R-squared value in the panel data regression model using the random effect model with individual effects (cross section) is 0.99. This means that the variables of liquidity, inflation, and interest rates can explain 99% of economic growth. The remaining 1% is influenced by other factors.

Sobel Test

The Sobel Test will be performed using the following calculation:

$$t = \frac{ab}{\sqrt{(b^2\mathrm{SE}a^2) + (a^2\mathrm{SE}b^2)}}$$

Based on the t-test results in sub-structural 1 and sub-structural 2, a Sobel test will be conducted with the following calculations:

1. **X_1_Liquidity on Y_Economic Growth through Z_BI-$_{rate}$**

DOI : https://doi.org/10.37817/ikraith-ekonomika.v8i3
P-ISSN : 2654-4946
E-ISSN : 2654-7538

$$t = \frac{(4{,}32)(58.608{,}04)}{\sqrt{(58.608{,}04)^2(0{,}0004)^2) + ((4{,}32)^2(1.632)^2)}}$$

$$t = \frac{(253.186{,}73)}{\sqrt{(3.434.902.352{,}64)(0{,}00000016) + (18{,}66)(2.664.282{,}50)}}$$

$$t = \frac{(253.186{,}73)}{\sqrt{(549{,}548) + (49.721.905{,}74)}}$$

$$t = \frac{(253.186{,}73)}{\sqrt{(49.722.455{,}33)}}$$

$$t = \frac{(253.186{,}73)}{(7.051{,}41)}$$

$$\boldsymbol{t = 35{,}905}$$

From the calculation results, t-$_{calculated}$ (35.905) > t-$_{table}$ (2.014). These results mean that X_1_ Liquidity affects Y_Economic Growth through Z_BI-$_{rate}$.

2. X_2_Inflation on Y_Economic Growth through Z_BI-$_{rate}$

$$t = \frac{(-0{,}393)(58.608{,}04)}{\sqrt{(58.608{,}04)^2(0{,}11)^2) + ((-0{,}393)^2(1.632)^2)}}$$

$$t = \frac{(-23.032{,}95)}{\sqrt{(3.434.902.352{,}64)(0{,}0121) + (0{,}1544)(2.664.282{,}50)}}$$

$$t = \frac{(23.032{,}95)}{\sqrt{(41.562.318{,}46) + (411.495{,}76)}}$$

$$t = \frac{(23.032{,}95)}{\sqrt{(41.973.814{,}23)}}$$

$$t = \frac{(23.032{,}95)}{(6.478{,}72)}$$

$$\boldsymbol{t = -3{,}5551}$$

From the results of the Sobel test calculation above, t-$_{calculated}$ (-3.5551) > t-$_{table}$ (2.015) is obtained. Thus, it can be concluded that X_2_Inflation has a negative effect on Y_Economic Growth through Z_BI-$_{rate}$ as an intervening variable.

4. Conclusions

Based on the results of the data analysis that has been carried out, it can be concluded that liquidity does not affect interest rates, while inflation has a significant effect on interest rates. Then, based on the F test, it can be concluded that liquidity and inflation together affect interest rates. Inflation has a significant positive effect on economic growth. According to research conducted by (Simanungkalit, 2020) , it is explained that basically not all inflation has a negative impact on the economy. This is especially true in the case of mild inflation, which is inflation below ten percent. Mild inflation can encourage economic growth. This is because inflation can encourage entrepreneurs to further increase their production. Entrepreneurs are eager to expand their production because the increase in prices means they will earn more profits. In addition, increased production has another positive impact, namely the availability of new jobs. Inflation will have a negative impact if it exceeds ten percent. Liquidity does not affect economic growth. Interest rates also affect economic growth. Simultaneously, liquidity, inflation, and interest rates affect economic growth. Liquidity affects economic growth through interest rates, and inflation also affects economic growth through interest rates.

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