Analysis Of The Influence Of Interest Rate Savings And Other Factors On Term Saving Of Commercial Banks (Empirical Data 1990-2019)

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Abstract: This study aims to examine and analyze the effect of interest rate, inflation, exchange rate, and GDP per capita to time deposits at commercial banks in Indonesia using time series research data from 1990 to 2019, both short-term equilibrium relationship and long-term equilibrium relationship. The analytical method used in this research is to use the multiple linear regression method is the ordinary least squares (OLS). The results of this study indicate that there is a significant long-term equilibrium relationship between inflation and GDP on time-saving. However, in the interest rate and exchange rate variables, there is no long-term equilibrium relationship or no significant effect on time-saving. Meanwhile, the simultaneous (simultaneous) relationship or model test between the four independent variables (interest rate, exchange rate, inflation, and GDP) and the dependent variable (time-saving) in the research model is very influential (significant). The results of the error correction model (ECM) test, which is to test the short-term equilibrium relationship, show that all independent variables (interest rate, exchange rate, inflation, and GDP) do not have a short term equilibrium relationship to the dependent variable (time deposit), but simultaneously all of these independent variables affect short-term term savings.

Keywords: Exchange Rate, GDP per Capita, Inflation, Interest rate, Time Deposit.

1.   Introduction

One of the sources of funds collected in banking is a source of funds that come from raising public funds (product funding), one of which is public term savings. The collected community savings are used for sustainable development and are needed by the business community (companies) to invest (venture capital).

Several factors influence people's savings, including the interest rate. There is a positive relationship between the interest rate and savings. The higher the savings interest rate, the more funds that can be collected from the public. So that the interest rate is a reflection of the power of demand and supply of sources of funds. The higher the interest rate for term savings set by the Indonesian bank, the will encourage fund owners to save or invest their funds in the form of time deposits. According to Keynes's theory, the interest rate is a monetary phenomenon. This means that the interest rate is determined by the supply and demand for money on the money market.

On the other hand, from the business world, the higher the interest rate, the smaller the desire to invest, the reason is that an entrepreneur will increase his investment expenditure if the expected profit from the investment is greater than the interest rate that must be paid for the investment fund as a cost. for the use of funds (cost of capital) (Nopirin, 71) The

determined interest rate can also be used to reduce the amount of money circulating in the community, thereby reducing the rate of inflation.

The savings interest rate that applies in commercial banks is determined and controlled by the central bank, namely Bank Indonesia through the BI Rate. The BI rate is a reference set by Bank Indonesia that will affect the interest rates for commercial banks or leasing companies to conduct credit transactions. Thus a bank is a financial institution that is a place for companies, government agencies, the private sector, and individuals to store their funds. According to the State Law of the Republic of Indonesia Number 10 of 1998 concerning banking, what is meant by a bank is a business entity that collects funds in the form of deposits and distributes them to the public in the form of credit and/or other forms to improve the standard of living of the people at large. The function of the Bank itself is as a collector and channel of public funds to support national development to improve equality in the standard of living of the community.
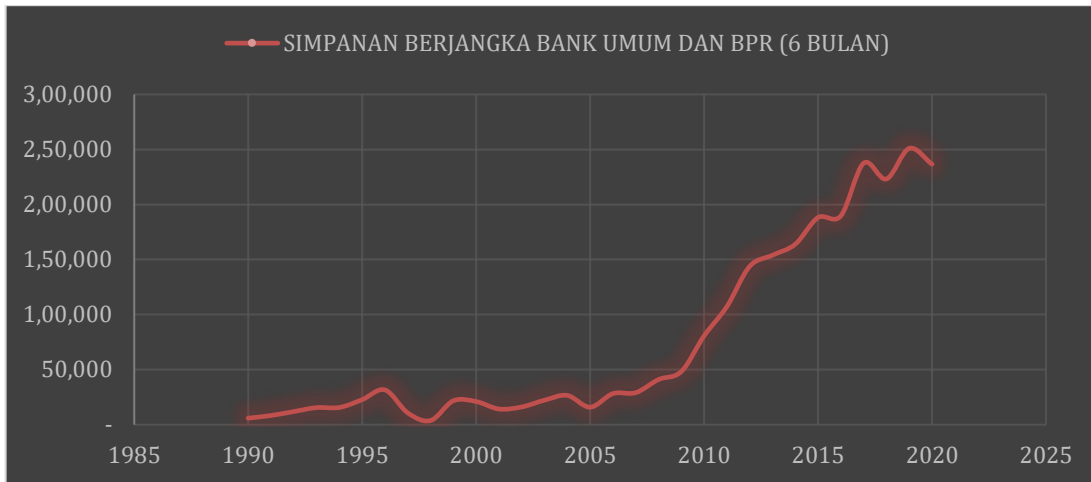
Picture 1.1: Graph of Long-Term Savings from 1990 to 2020

In Figure 1.1 above, it can be seen that the trend of public interest in saving has continued to increase over 30 years, even though the interest rates of commercial banks have fluctuated.

Apart from interest rates, other factors that affect public saving are inflation, GDP per capita, and the exchange rate. The inflation rate also has a role in the number of funds deposited by the public in the Bank. inflation is negatively related to time savings (deposits) collected by banks. This is because when inflation increases, customers will disburse their funds to maintain their level of consumption.

The relationship between inflation and public saving can be seen in the table below:

Table 1.1: Development of Inflation and Commercial Bank Savings for the Period 2010-2019

YEAR	SAVINGS (DEPOSITS) INRUPIAH TRILLIONS	INFLATION (%)
2010	80,693	5.134204008
2011	107,352	5.35604779
2012	143,789	4.279499996
2013	153,969	6.412513302
2014	163,938	6.394925408
2015	188,177	6.363121131
2016	189,658	3.525805157
2017	237,548	3.80879807
2018	223,184	3.198346416
2019	251,002	3.03058665

can be seen in Table 1 which shows that inflation in 2012-2016 fluctuates (increases and decreases). Inflation tends to increase from 4.3% in 2012 to 6.41% in 2013, and in 2016 it fell to 3.52%, and from 2016 to 2019 inflation has remained relatively unchanged, on average, around 3%. In terms of time savings during the period 2010-2019, it tends to increase or increase.

Gross Domestic Product (GDP per capita) also affects people's savings, namely where the development of savings is influenced by an increase in people's per capita income. This is in Keynes's opinion which states that the consumption function is based on behavior, namely if there is an increase in income, the increase is not used entirely to increase consumption but from the remaining income is also used for saving. This means that the relationship between income per capita of the savings is linear (positive), meaning that if the per capita income has

increased it will also increase people's desire to save money, but on the contrary, if the per capita income has decreased then be correspondingly reduced people's desire to save

Then research The objective of this research is to analyze how much influence the interest rate, GDP per capita, inflation, and exchange rate ((Rupiah against US Dollar) on people's time savings. So it is hoped that the results of this study will serve as information for commercial banks in Indonesia to increase fundraising. especially in the form of time savings (deposits).

2.   Literature review

Term Savings

Definition of savings according to Law No. 10 of 1998: "Savings are deposits whose withdrawals can only be made according to certain agreed conditions, but cannot be withdrawn. by check, billet giro, and or other instruments equivalent ".

According to Bank Indonesia sources, public savings are defined as deposits in rupiah and foreign currency belonging to non-bank third parties (excluding government and non-residents) which can only be withdrawn according to certain agreed conditions, but cannot be withdrawn with check or equivalent (www.bi.go.id).

Community Savings, namely deposits belonging to third parties, not commercial banks and Rural Banks (including fundraising under sharia principles) both in rupiah and foreign currency in the form of demand deposits, savings, and time deposits, excluding deposits belonging to the central government and non-residents.
The public savings referred to in this study are time deposits, namely a type of savings product where customers deposit a certain amount of funds within a predetermined period starting with a fixed amount of money. The money collected by new customers can be withdrawn at the end of the period the deposit is due.

Banks as financial institutions, which act as intermediaries between parties that have excess funds and those who need or lack funds.

Funds sourced from the wider community are funds that must be processed or managed by the bank itself as well as possible or funds that have been successfully collected from the public in the form of deposits which are manifested in various forms such as demand deposits, deposits, and savings.

Interest rate

Bank interest is a remuneration provided by the bank based on conventional principles to customers who buy or sell their products or usually interpreted as the price that must be paid to customers (who have deposits) and the price that must be paid by customers to the bank (customers who have deposits). loan) (Kasmir, 2003: 121 in Ritayani Iyan et al).

Several definitions of interest rates are based on Bank Indonesia sources, namely:
BI Rate is a policy interest rate that reflects the monetary policy stance or stance set by Bank Indonesia and announced to the public. The BI Rate is announced by the Board of Governors of Bank Indonesia at every monthly Board of Governors Meeting.
•   Bank Indonesia Certificates (SBI) are securities in the rupiah currency issued by Bank Indonesia in recognition of short-term debt.
•   Bank Indonesia Certificates of Deposit (SDBI) are securities in rupiah currency issued by BI as recognition of short-term debt traded only between banks.

According to classical theory, a high-interest rate will lead to a high volume of public savings. Besides, a high-interest rate will also increase the company's capital costs, so that it will experience competition in investment, meaning that investors tend to choose to invest in the money market or savings compared to the capital market. On the other hand, a low-interest rate, either the loan interest rate or the deposit interest rate, will cause a decrease in people's desire to save, while companies can take credit to increase capital or invest with low interest (Nopirin, 2007: 70; Kim et al., 2019).

Keynes's theory argues that the interest rate is determined by the demand and supply of money. According to this theory, there are three motives why people hold cash, namely transaction motives, watchfulness, and speculation. These three motives are the source of the demand for money which is named Liquidity preference. This preference or desire to remain liquid is what makes people willing to pay a certain price for the use of money. Keynes's theory, in particular, emphasizes the direct relationship between people's willingness to pay the price of money (the interest rate) and

elements of demand for money for speculation purposes (Yuliadi, 2008: 51 in Ritayani Iyan, Rosyetti, and Susie Lenggogeni)

Gross Domestic Product (GDP)

Gross Domestic Product is the value of all products (goods and services) produced by a country within one year and is a product (output) produced not only by domestic citizens but also products produced by foreign nationals or foreign companies operating or having businesses in that country.

So that GDP is one of the important indicators to determine the condition of the economy in a country in a certain period, both at current prices and constant prices. GDP is the amount of added value generated by all business units by a particular country, or is the total value of the final goods and services produced by all economic units ((www.bi.go.id). The GDP referred to in this research is GDP per capita.

To be able to produce products, especially goods, companies need capital, the required capital can come from banks while borrowing money from banks to make these investments is subject to loan interest as a form of compensation for rent money to borrowers. Banks collect funds from the public through savings The relationship between GDP and interest rates is that if interest rates rise, the investment will fall and this will result in a decrease in the product (output) nationally and this has an impact on economic growth which can be affected by an increase in bank loan interest rates. saving interest increases, so people's interest in saving becomes m increase.

Inflation

Inflation has a negative relationship with the saving term because when there is inflation, the price of the commodity will increase. The increase in commodity prices is caused by the production used to produce a commodity that costs a lot of money. Thus, when inflation increases, customers will disburse their funds to maintain the level of consumption, so that people's interest in saving will decrease. The definition of inflation itself (Dornbusch, 2004; 32) is the rate of change in prices and the price level is the accumulation of previous inflation, so the measurement of inflation itself can be used from the Consumer Price Index (CPI), which can be written in the following equation:

$$\pi = \frac{P_t - P_{t-1}}{P_{t-1}}$$ …………..………………… 2.1

Where P_ (t-1) is the last year's price level and P_t is the current year's price level. So that from the above equation we can determine the current price is:

$$P_t = P_{t-1} + \pi P_{t-1}$$ ………...…………… 2.2

The effect of inflation on the domestic situation will affect the stability of prices which in turn creates instability in the economy itself, which will lead to a sluggish domestic economy.

Exchange Rate Exchange

the rate itself can be interpreted as the price of a country's currency (domestic currency) which is converted into another country's currency (foreign currency). The exchange rate referred to in this study is the rupiah exchange rate against the USD.

The exchange rate is an indicator used to explain the value of a country's currency relative to the currencies of other countries and shows how much value consumers have to pay in buying imported goods. Thus, this indicator can also be used to measure the level of competitiveness of a country in terms of prices. An increasing index indicates that the level of competitiveness is decreasing (www.bi.go.id).

The exchange rate used in this study is the nominal exchange rate, which is the value a person uses when exchanging a country's currency with another country's currency.

Apart from that, if the value of the domestic currency depreciates against the foreign currency, it will indicate the low price of Indonesian products (domestic) relative to foreign products, because with the same dollar it gives a larger amount of rupiah. (Zuhroh, Idah, 2007)

The exchange rate can also be used as a tool to measure the economic condition of a country. The stable growth in the value of the currency indicates that the country has a relatively good or stable economic condition (Salvator, 1997: 10 in Santoso, Eko Budi). Also, the difference in a country's currency exchange rate (exchange rate) is in principle determined by the amount of demand and supply of the currency (Levi, 1996: 129).

The relationship between real and nominal exchange rates can be stated by the following formula:

$$\varepsilon = e \times (P^f/P) \qquad \ldots\ldots\ldots\ldots\ldots \quad 2.3$$

Where Pf / P is the comparison of price levels between the two countries; Pf (other country prices) and P (domestic prices).

3. Hypothesis

Based on the literature description above, the research hypothesis to be carried out in this study is as follows:

Equilibrium Relationship Test:
H1.1: There is a long-term Equilibrium Relationship.
H1.2: There is a Short-term Equilibrium Relationship.

Simultaneous Test (Model Test):
H0: No There is a significant influence between the level of interest rate, exchange rate, inflation, and GDP on long-term savings simultaneously
H1: There is a significant influence between the interest rate, exchange rate, inflation, and GDP on the savings Simultaneously

Partial Test:
H2.1: There is a significant influence between the interest rate on time savings partially.
H 2.2: There is a significant influence between the exchange rate on time savings partially
H 2.3: There is a significant effect between inflation on time savings partially
H 2.4: There is a significant effect between GDP on time savings partially

4. Research method

The scope of research done is macroeconomics. This study analyzes the factors that affect time deposits at commercial banks in Indonesia using annual data taken from several sources (Bank Indonesia, World Bank, and the Central Bureau of Statistics).

This research is quantitative. The analytical method used in this study is multiple linear regression with the OLS (ordinary least square) method using secondary data (time series) from 1990 to 2019 (for 29 years).

In this study, we will analyze how much influence the interest rate, inflation, exchange rate, and gross domestic product (GDP) on people's interest in saving in the form of time savings and how the relationship between the independent variable and the dependent variable either simultaneously or partially. To analyze this, a research model was created. The research model that will be used to analyze is multiple regression as follows:

$$ln(Saving_t) = \beta_0 + \beta_1 ln(interest_t) + \beta_2 ln(exch_{Rate_t}) + \beta_3 ln(GDP_t) + \beta_4 ln(inflation_t) + u_t$$
...... (1)

Information:
Saving   : Time Savings (Time Deposit)
Interest   : Interest Rate
GDP   : Gross Domestic Product
Exch_Rate   : Exchange Rate (IDR / USD)
Inflation   : Inflation
β1 -3:Regression coefficient (slope parameters), this coefficient also determines the direction as a the determinant of the forecast/contribution which shows the value of increase (+) or decrease (-)

β0   : Constant (intercept).
Ut   : White-noise process (disturbances or error term)
Ln   : Natural logarithmic

Multiple regression models mentioned above will be used to analyze and be used to see the effect of independent variables (predictors), namely interest rate, exchange rate, inflation, and GDP on the dependent variable, namely community term savings.

Besides, this study also to determine whether there is a long-term equilibrium relationship between the independent variable and the dependent variable and to determine whether there has been a short-term equilibrium relationship between the two variables.

The analysis method used in this research is to use several statistical tools and statistical tests that are relevant to the research carried out so that the research results obtained can be Best, Linear, Unbias, and Estimator (BLUE). The following are the stages in the analytical method used. are as follows:
First Stage   : Hypothesis Testing
Second Stage : Classical Assumptions
Third Stage   : Stationarity Testing
Stage Four   : Co-integration Testing
Stage Five: Error Correction Model (ECM)

5.   Findings and argument

Data processing carried out in this study is by using the help of application software E -View 8.0 so that the expected results (output) can be accurate and by what is expected.

4.1 Normalization Test.
The first test performed before estimating the research model used is the normalization test for all operational variables used in this research model. Several operational variables are not normal, so the variable data is transformed first before being used in the estimation of the model.
This normality test can be done using several ways, one of which is the Jarque-Bera (JB) test. With the following hypothesis:
H0: Data is normally distributed.
H1: The data are not normally distributed.

The results of the normalization test performed using the Jarque-Bera method are as follows:

Table 4.1: Normalization of the Output

No.	Variable	Results	Jarque-Berra Test	Prob.	Information
			Test Normality Test of Model Variables		
1	Term Savings	Normal	4.863975	0.087862	Less then α = 0.05
2	Interest Rate	Normal	2,998498	0.223298	Less then α= 0.05
3	Inflation	Normal	1,399857	0.496621	Less then α= 0.05
	Exchange Rate		4,196930	0,084388	
4	GDP	Normal	3,878449	0.143815	Less then α= 0.05

Source: Output Eviews 6.0 (processed) It

Can be seen from the output using E-Views above where the Jarque-Berra result is greater than Prob. And Prob. Greater than alpha. These shows accept Ho, which means that the data is the normal distribution.

4.2 Research Model Estimation.

After conducting a normalization test on all data used in the study, the next step is to estimate the research model that will be used. Estimates are performed to analyze the long-term equilibrium relationship between the independent variables (exchange rate, inflation, interest rate, and GDP) on the dependent variable (time savings). The results of the estimation of this research model are as follows:

Table 4.2: Estimation Results of the Research Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
log(interest_rate)	0.300218	0.363516	0.825872	0.4174
log(Exchange Rate)	0.060824	0.141919	0.428580	0.6722
log(Inflation)	-0.431377	0.201813	-2.137504	0.0434
log(GDP)	1.592964	0.190642	8.355800	0.0000
C	-1.590936	2.507823	-0.634389	0.5321
R-squared	0.934829			
Adjusted R-squared	0.923495			
F-statistic	82.47917			
Prob(F-statistic)	0.000000			
Akaike info criterion	0.731373			
Schwarz criterion	0.969267			
Hannan-Quinn criter.	0.804099			
Durbin-Watson stat	1.211926			

The estimation results (output) above can the research model as follows:
*LOG (SAVING) = -1.59093624 + 0.300217677 * LOG (INTEREST_RATE) + 0.06082387 * LOG (EXCHANGE_RATE) + 1.5929638 * LOG (GDP) - 0.43137698 * LOG (INFLATION)*

From the results of the research model in equation 4.1 above, it can be explained that the interest rate factor has a positive relationship (directly proportional) to long-term savings with a coefficient of 0.300217677, meaning that if the interest rate is increased by 1%, this will also increase. time savings of 0.300217677. The factor exchange rate has a positive relationship (directly proportional) to term savings with a coefficient of 0.06082387, meaning that if the exchange rate increases by 1 IDR / USD this will also increase the time savings by 0.06082387. The inflation factor has a negative (inversely proportional) relationship to time savings with a coefficient of 0.43137698, meaning that if inflation occurs an increase of 1% will result in a decrease in time savings by 0.43137698.

Below is shown the results of the normalization test output for the above research model as follows:
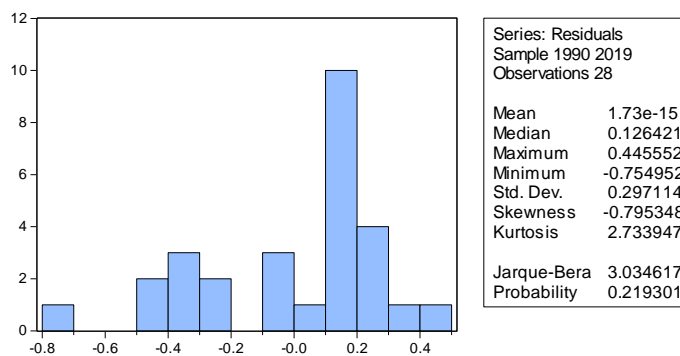

Figure 4.1: Results of the Research Model Normalization Test The

Results where the probability of 0.219301 is greater than $\alpha = 5\%$. This shows that the research model used is normal.

4.3 Hypothesis Testing

From the estimation results on the output results above, it can be seen that the partial relationship between the independent variable, namely inflation, and GDP, on the dependent variable term savings shows a significant relationship, meaning that there is an influence between these variables. This can be seen from the value of each Prob. (probability) variable inflation and GDP is smaller than the alpha of 0.05. This means that H0 is accepted for the free variable partially against the dependent variable. While the inflation and GDP variables do not have a relationship or there is no significant effect on time savings, this can be proven from the results of Prob. (probability) variable inflation and GDP is greater than $\alpha = 0.05$. This means that partially reject H0 for the free variable (inflation and GDP) against the dependent variable (time-saving).

While the relationship together (simultaneously) or model testing between the four independent variables (interest rate, exchange rate, inflation, and GDP) and the dependent variable (time-saving) in the research model can be seen from the estimation results above is very influential (significant) This can be seen with the F test, where the probability of F is 0 which is smaller than $\alpha = 0.05$. This means that H0 is accepted or affected for all independent variables together (simulates) on the dependent variable.

Also, seen from the feasibility of the model (goodness of fit) used in this study is very good, this can be seen from the determinant coefficient of the Adjusted R-squared value is 0.923495, meaning the contribution between the independent variables, namely GDP, inflation, exchange rate and interest rate with the dependent variable, namely time savings amounted to 92.35%. The feasibility of the model can also be seen from the Akaike info criterion (AIC) value of 0.731373. The smaller the AIC value, the better the research model used.

Although the explanation of the results of the estimation of the research model output, as shown above, is quite good, in this study it is necessary to be careful about the existence of spurious or false regressions ((Spurious Regression). This false regression is characterized by almost all the data used in this study. the research is not stationary but from the estimation of the research model the goodness of fit is quite good which is indicated by the coefficient of reflection (R ^ 2) greater than Durbin-Watson (D / W), each data has a high significance value (t). but it has a low Durbin-Watson (D / W) value. So to prove whether there has been a spurious or false regression (Spurious) Regression, it is necessary to have a further process by performing a stationary test for all research data used in research and co-integration tests.

4.4 Classical Assumption Test of Research Model
For the analysis carried out on the research model used to be BLUE (Best, Linear, Unbias, and Estimator), before the stationary test is carried out, the classical assumption test will first be carried out, namely to find out whether there are problems in the research model. classic assumption problem. With the following results:

4.4.1 Autocorrelation Testing The autocorrelation
the test was carried out on the research model using the Breusch-Godfrey Serial Correlation LM Test with the following results:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.707016	Prob. F(2,21)	0.0900
Obs*R-squared	5.739106	Prob. Chi-Square(2)	0.0567

From the output results above where the Obs * R-squared value is 0.0567 and the Prob value. F (2.12) is 0.0900, this value is greater than $\alpha = 0.05$, thus indicating that H0 is accepted, meaning that the research model used does not occur autocorrelation.

4.4.2 Heteroscedastic Testing
The heteroscedastic test was carried out on the research model using the Test: Breusch-Pagan-God with the following results:

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.198353	Prob. F(4,23)	0.9367
Obs*R-squared	0.933685	Prob. Chi-Square(4)	0.9197
Scaled explained SS	0.546193	Prob. Chi-Square(4)	0.9689

From the results of the WhiteTest output above where the Prob. Obs * R-squared is 0.5806 and the Prob value. F (9.8) is 0.7394, this value is greater than $\alpha = 0.05$, so that shows that H0 is accepted means that the research model used does not occur heteroscedastically (homoscedastic).

4.4.3 Multicollinear Test Multicollinear

the test is used to determine whether or not there is a high correlation between independent variables (predictors) in a multiple linear regression model. If there is a high correlation between the independent variables, then the relationship between the independent variable and the dependent variable (prediction) is disturbed. The condition of multicollinearity is indicated by where the coefficient of determination (R2) is high but many of the independent variables are not significant

. The multicollinear test can be expressed by the following hypothesis:
H0: There is no multicollinearity in the model.
H1: Multicollinearity occurs in the model.

The statistical tool used to test multicollinearity in this study is to use variance inflation factor (VIF).

4.5 Stationary Test

After estimating the research model above, the next step is to carry out a stationary test of all research variable data before conducting the cointegration test and the error correction method (ECM) test. This is to identify long and short-term relationships between the variables used in the model. The results of the stationary test all variables used are as follows:

Table 4.3: Unit Root Test Results With Augmented Dickey Fuller - ADF

Description	Diferensiasion	Order Integrasion		
	Level	1st difference	2nd difference	
	p-value	p-value	p-value	
Saving	0.9995	0.0007	---	I(1)
Exchange Rate	0.7932	0.0002	---	I(1)
GDP	0.9815	0.0085	----	I(1)
Interest Rate	0.0336	----	---	I(0)
Inflation	0.1333	0.2163	0.0235	I(2)
Prob. Pada ADF - Fisher Chi-square	0.9071	0.0000	0.000	

The results of the stationary test above show that almost all the variables used in the research model are not stationary except for the interest rate variable data. Where the p-value of all variables is greater than alpha, which is 0.05. So we need to change the data to be stationary, namely through differentiation to the first level (1st difference), the second level (2nd difference), and so on. which is done through the unit root test using the Augmented Dickey Fuller (ADF) test.

4.6 Cointegration Testing

The purpose of this cointegration test is to determine whether there is a long-term *equilibrium* relationship between the independent variable (GDP, inflation, exchange rate, and interest rate) on the dependent variable (time-saving) with the cointegration test. The results obtained are as follows:

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.845601	89.21972	69.81889	0.0007
At most 1	0.640610	44.38250	47.85613	0.1022
At most 2	0.475093	19.82217	29.79707	0.4350
At most 3	0.139365	4.353350	15.49471	0.8731
At most 4	0.030820	0.751326	3.841466	0.3861

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.845601	44.83722	33.87687	0.0017
At most 1	0.640610	24.56033	27.58434	0.1163
At most 2	0.475093	15.46882	21.13162	0.2574
At most 3	0.139365	3.602024	14.26460	0.8988
At most 4	0.030820	0.751326	3.841466	0.3861

The results of the co-integration test output above show that the value is *trace statistic* 89.21972, much greater than the critical value (5%), which is 69.81889. Besides, to strengthen the results of this co-integration test, you can also see the results of the Maximum Eigenvalue Statistic, namely the results of 44.83722 which are greater than the critical value of 5%. A total of 33.87687. From these results, we can conclude that there has been a co-integration between the five variables, namely interest rate, GDP, inflation, exchange rate, and saving. This shows that there has been a long-term relationship *equilibrium* between the economic variables in this study. Thus the multiple regression equation of this research model no longer contains the problem of spurious *regression*.

4.7 Estimation of Error Correction Model (ECM)
Even though in the long term relationship there has been an equilibrium relationship as described above, in the short term it does not necessarily mean that there is a balance (disequilibrium) so this research will be continued by using an error correction model (*Error Correction Model*- ECM) using the Engle-Granger test to analyze the movement of the interest rate, exchange rate, inflation and GDP against time-saving in short-term so that there is a balance (equilibrium). In ECM we have to enter error correction variables to eliminate imbalance problems in the short-term. This error correction variable is the residual for the previous period obtained from the residual estimate from lang-term. So that the estimation for the model (ECM) is obtained as follows:

Table 4.4: Estimated Error Correction Method-ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024767	0.549561	0.045068	0.9646
LOG(INTEREST_RATE)	-0.019162	0.252872	-0.075778	0.9405
D(D(LOG(EXCHANGE_RATE)))	-1.725620	1.479748	-1.166158	0.2606
D(D(LOG(GDP)))	1.329435	1.333395	0.997030	0.3336
D(D(D(LOG(INFLATION))))	-0.023387	0.084362	-0.277226	0.7852
RESIDUAL_1(-1)	-0.579217	0.319707	-1.811713	0.0888
R-squared	0.520408			
Adjusted R-squared	0.370536			
F-statistic	3.472343			
Prob(F-statistic)	0.025780			
Akaike info criterion	1.101138			
Schwarz criterion	1.398695			
Hannan-Quinn criter.	1.171233			
Durbin-Watson stat	2.328147			

The results from the error correction model (ECM) test above where the *lag of residual value* is negative, which is -0.579217 and the result must be negative. This shows that the error *correction terms* 57.92% and the result is not significant (prob. Greater than 0.05). Besides, the results of each independent variable (partially), namely interest rate, GDP, exchange rate, and inflation show that all independent variables are not significant to the dependent variable, namely time savings. This shows or it can be concluded that the independent variables do not have a short-term equilibrium relationship to the dependent variable, this is evidenced by the value of Probability (Prob.) For each variable is greater than $\alpha = 0.05$, but simultaneously all The independent variables, namely the

interest rate, exchange rate, GDP, and inflation influence term savings in short terms, this is evidenced by the value of Prob. (F-statistic) is 0.025780, this value is smaller than $\alpha = 0.05$, which means reject H0.

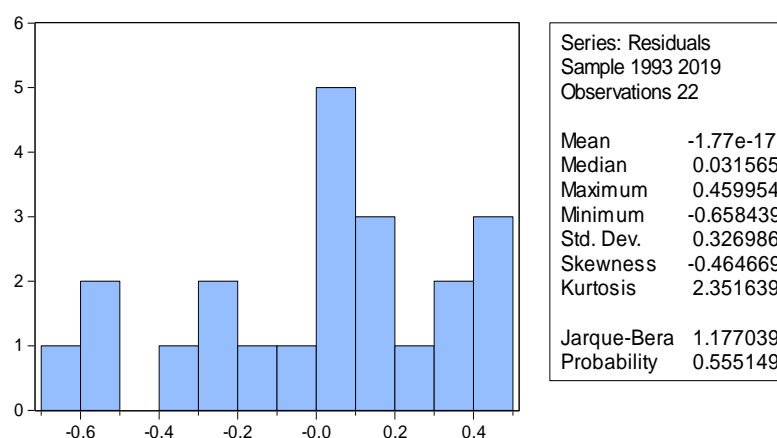Next, we look at the normality test on the model from the ECM with the following results:

Figure 4.2: Normalization Test Results on the ECM Model

Figure 4.2 is the result of the normality test using the Jarque-Bera. We see that the Jarque-Bera value is 1.177039 under 2 and the probability value of JB is 0.555149 which is greater than $\alpha = 0.05$, this shows that the residuals of the ECM model are normal.

6.   Conclusions.

From the results of research that has been conducted on the effect of the BI interest rate, interest rate, Rupiah exchange rate against the US dollar, GDP, and inflation on term deposits, using data *time series* from 1990-2019, the results show that there is a significant long-term equilibrium relationship between inflation. and GDP against time-saving. However, in the interest rate and exchange rate variables, there is no long-term equilibrium relationship or no significant effect on time-saving. While the relationship together (simultaneously) or model testing between the four independent variables (interest rate, exchange rate, inflation, and GDP) with the dependent variable (time savings) in the research model can be seen from the results of the estimations that have been carried out are very influential (significant). The results of the error correction model (ECM) test, namely to test whether there is a short-term equilibrium relationship, show that the independent variable (interest rate, exchange rate, inflation, and GDP) does not have a short term equilibrium relationship with the dependent variable (term deposit). however, simultaneously all of these independent variables affect short-term term savings.

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