Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

Relationship of Inflation, BI Rate and Deposit Interest Rate

Danang Indrajaya

Sekolah Tinggi Ilmu Manajemen dan Ilmu Komputer ESQ, Jakarta Selatan, Indonesia
Email: [1]danang.indrajaya@esqbs.ac.id
Email Penulis Korespondensi: danang.indrajaya@esqbs.ac.id
Submitted: **99/01/2022**; Accepted: **99/02/2022**; Published: **25/02/2022**

Abstract−This study aims to model the relationship between the inflation rate, BI rate, and deposit interest rates, then analyze the model, and provide forecasting and structural analysis of the model. Therefore, the method used in this study is Vector Error Correction Model analysis which is applied to time series data of the inflation rate (CPI), BI rate, and deposit interest rates. The results of the model analysis show that the policy of changing the BI rate has an effect on the rise and fall of the inflation rate (CPI) and fluctuations in the deposit rate (deprate). The BI rate is also influenced by two other variables (CPI and Deprate), but the biggest influence is from the variable BI Rate itself, and CPI and Deprate are mutually influencing (causality effect), but like the BI rate, the most influential variable is the lag variable of each of these variables.

Keywords: Monetary Policy; BI Rate; Inflation; Deposit Interest Rate

1. INTRODUCTION

The Bank Indonesia Rate (BI rate) is an interest rate control instrument used by Bank Indonesia to achieve monetary policy targets, both initial targets, as well as intermediate and final targets. The initial target of monetary policy was to achieve the Bank Indonesia Certificate (SBI) interest rate and the Interbank Call Money Market interest rate. The intermediate target is the formation of interest rates on deposits (deposits) and interest rates on loans (credit) that affect the money supply. The final targets are the desired price level (ie the inflation rate) and economic growth (Mubin, M. Khoirul, 2009).

The transmission of BI rate determination by Bank Indonesia at the macro level and deposit and loan interest rates at the micro level as well as the ultimate goal in the form of achieving the desired inflation rate, are interesting themes for the author to determine the success of these monetary instruments in achieving the targets set by the Bank Indonesia as the monetary authority.

RI Law No. 3 of 2004 concerning Bank Indonesia explains that Bank Indonesia (BI) is given the authority to take policy in the monetary sector in such a way as to achieve stability in the value of the rupiah, controlled inflation, and adequate economic and real sector growth. In 2005, Bank Indonesia applied the Inflation Targeting Framework (ITF) to achieve the target of monetary stability. The implementation of the ITF is carried out in a forward looking manner, in which Bank Indonesia announces its inflation target to the public. The operational instrument used is the BI Rate. The BI Rate is expected to have an influence on money market interest rates, bank deposit rates, and lending rates through the monetary policy transmission mechanism. Many people doubted the effectiveness of the BI Rate as a monetary instrument, so BI issued a new monetary instrument, namely the BI 7-day repo rate to influence banking interest rates quickly and effectively in 2016.

Bank Indonesia made an expansionary monetary policy by reducing interest rates to encourage vibrant economic activity and higher economic growth. A decrease in the BI Rate will lead to a reduction in bank lending rates, thereby boosting demand for credit from companies and households. The decline in loan interest rates causes the cost of capital to be lower and encourages companies to increase their investment. Expansive monetary policy will increase consumption and investment activities so that economic activity becomes more vibrant. On the other hand, if inflationary pressure arises due to an overheating economy, Bank Indonesia responds by launching a contractionary monetary policy by raising the BI Rate with the aim of reducing excessively high economic activity so that inflationary pressure can be controlled.

2. METHODOLOGY

2.1 Monetary Policy

Monetary policy is the policy of the Central Bank in influencing the development of monetary variables, namely money supply, credit interest rates and exchange rates, to achieve certain economic goals (Mishkin, 2009). Monetary policy as part of macroeconomic policy aims to achieve macroeconomic policy objectives, namely economic growth, job creation, price stability and balance of payments. These four targets are the ultimate goal of monetary policy.

In theory, the four targets are often contradictory, for example high growth can raise inflation and conversely low inflation can reduce economic growth (Keynesian Theories and Neo Classical Theories). Several research results confirm this theory. Fischer and Modigliani (1978) showed a negative relationship between the inflation rate and economic growth through the new mechanism of growth theory. Research conducted by Lubis (2014) shows that there is a correlation between inflation and economic growth in Indonesia in 1968-2012, both of which have a negative correlation of 4.3%. Therefore, the Indonesian government should avoid too high an inflation rate, so that goods and

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

services or controlled inflation can have a positive effect on economic growth. Starting from this fact, central banks in many countries tend to set a single ultimate goal of a monetary policy, namely "managing the inflation rate" within a reasonable and stable level at a certain level.

Several monetary control instruments commonly used by the central bank to achieve the ultimate goal of monetary policy are Open Market Operations (OMO), Discounted Interest Rate, Statutory Reserves (reserve requirement), Moral Appeal (Solikin and Suseno, 2002; Ascarya, 2002). There are three important targets to be achieved by the Central Bank in conducting monetary operations. The first target is the operational target, which is the target to be achieved immediately reflected in the interbank call money market interest rate. The second target is the intermediate target, namely monetary aggregates (M1 and M2), bank credit, and the exchange rate. While the third target is the final target, namely growth, employment opportunities, price stability (inflation rate), and balance of payments balance.

Operational targets are short-term goals to be achieved by the Central Bank in its monetary operations, used to achieve intermediate goals. The operational target criteria are monetary variables that have a stable relationship with intermediate targets, it can be controlled by the Central Bank, and it accurates and not frequently revised (Mishkin, 2004:347).

The transmission mechanisms of monetary policy is the process through which monetary policy decisions are transmitted into changes in real GDP and inflation (Taylor, 1995). The transmission mechanisms of monetary policy is the paths that must be passed by monetary policy in order to achieve the final target of monetary policy, namely national income and inflation.

The transmission mechanisms of monetary policy begins when the central bank changes its instruments to influence its goals, namely operational goals, intermediate goals and final goals. Changes in the SBI instrument (SBI interest rate) will affect the Interbank Call Money Market interest rate, deposit interest rates, loan interest rates, asset prices, exchange rates, and inflation expectations in the community. The changes that occur are a sign that monetary transmission has worked and will have an impact on consumption, investment, and exports and imports as components of aggregate demand. In practice, aggregate demand is not always the same as aggregate supply, this creates an output gap that can affect changes in the inflation rate.

The transmission process from the operational target to the final target takes a long time (time lag). To that end, monetary experts set another target, namely the intermediate target. The intermediate target is needed to assess whether the operational policy has been successful and is expected to achieve the final target, namely inflation. In addition, the intermediate targets are selected from variables that have a strong relationship with the final target, have a broad scope and can be controlled by the central bank, are available relatively quickly, accurately and are not frequently revised. Intermediate targets include monetary aggregates (M1 and M2), bank credit and exchange rates. Meanwhile, the final target of Bank Indonesia's monetary policy is as mandated by Law number 3 of 2004 concerning Amendments to Law number 23 of 1999 concerning Bank Indonesia (article 7 paraFigure 1) which clearly states that the ultimate goal of monetary policy is to achieve and maintain stability in the value of the rupiah.

2.2 BI Rate

Bank Indonesia defines the BI Rate as the policy rate reflecting the monetary the policy stance adomoed by Bank Indonesia and announced to the public (www.bi.go.id). The BI Rate functions to manage market liquidity in order to achieve the operational targets of monetary policy. The purpose of the BI Rate is also to keep the economy stable and control inflation. Usually BI will raise the BI Rate if inflation is expected to be above the target, and vice versa BI will lower the BI Rate if inflation is expected to be below the target.

The central bank's benchmark interest rate in the US is known as the Federal Funds Rate, which is one of the most influential interest rates in the US economy, especially on employment, economic growth and inflation. Mishkin (2007) defines the federal funds rate as the interest rate on overnight loans of reserves from the bank to another. The Fed has further strengthened the role of the federal funds rate as the main indicator of monetary policy. Since 1994, the Fed has announced the target for the federal funds rate at every meeting of the Federal Open Market Committee (FOMC). These meetings are usually held about eight times a year. In practice, the BI Rate is announced by the Board of Governors of Bank Indonesia at every monthly Board of Governors' Meeting and implemented in monetary operations, carried out by Bank Indonesia through liquidity management in the money market to achieve the operational targets of monetary policy. The operational targets of monetary policy are reflected in the development of the Overnight Interbank Call Money Market interest rate. The movement in interbank rates is expected to be followed by developments in deposit rates and, in turn, bank lending rates. Taking into account other factors in the economy, Bank Indonesia will generally increase the BI Rate if future inflation is estimated to exceed the set target. On the other hand, Bank Indonesia will lower the BI Rate if future inflation is estimated to be below the anchoring inflation expectations.

In order to strengthen the monetary operating framework, Bank Indonesia introduced a new benchmark interest rate or policy rate, namely the BI 7-Day Repo Rate, which came into effect on 19 August 2016. This new policy does not annul the current BI Rate, and does not change the current BI Rate. Current monetary policy stance. The purpose of the new BI benchmark interest rate is that policy interest rates can quickly affect the money market, banking and real sector. The BI 7-Day Repo Rate instrument as a new reference has a stronger relationship to money market interest

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

rates, is transactional or traded in the market, and encourages financial market deepening. During the transition period, the BI Rate will continue to be used as a reference along with the 7-Day (Bank Indonesia) BI Repo Rate.

2.3 Inflation

Inflation is a condition where prices increase but on the other hand the value of money decreases (Irham, 2015). If the increase is only temporary, the increase in one type of commodity cannot be called inflation unless the increase can have a broad impact on the increase in other goods and services. (Hamzah et al., 2019) mentions that inflation is a condition when the demand for commodities exceeds supply. CPI is an indicator used to measure the inflation rate. CPI is an index that calculates the average price change of a package of goods and services consumed by households within a certain period of time.

2.4 Deposit Rate

Deposit rate or deposit interest rate is the interest paid by financial institutions to customers holding deposit accounts. Most investors are interested in having a time deposit account because deposits are a safe means to earn fixed interest, and get insurance. Interest rates on deposits tend to be lower than the returns from other financial vehicles, such as investments in real estate, mutual funds, stocks, and bonds. Financial institutions encourage customers to have long-term deposits (12 months) because the interest rates are higher and also because long-term deposits offer more liquidity to these financial institutions.

2.5 Method

This paper uses a descriptive quantitative approach with a statistical approach. The data used is secondary data, obtained from various books, journals and articles in various media. Descriptive qualitative analysis was carried out using pictures, tables and Figures. While quantitative analysis is done by using views.

The deposit rate, CPI and BI rate data used in this study are monthly data obtained from BPS for the period January 2020 to July 2021. The deposit rate data selected is deposit rate data for a period of 12 months.

Quantitative analysis is used to obtain quantitative evidence regarding the feasibility of the BI rate being used as a monetary instrument. This is obtained by looking at the response of the dependent variable to changes that occur in the independent variable. Also seen the contribution of each independent variable on changes that occur in the dependent variable. The general model in this study is as follows.

$$\Delta DepRate_t = a_1 + \sum_{i=1}^{k} \alpha_i \Delta DepRate_{t-i} + \sum_{i=1}^{k} \beta_i \Delta BI\ Rate_{t-i} + \sum_{i=1}^{k} \gamma_i \Delta CPI_{t-i} + \varepsilon_t \quad (1)$$

$$\Delta CPI_t = a_1 + \sum_{i=1}^{k} \alpha_i \Delta CPI_{t-i} + \sum_{i=1}^{k} \beta_i \Delta BIRate_{t-i} + \sum_{i=1}^{k} \gamma_i \Delta DepRate_{t-i} + \varepsilon_t \quad (2)$$

$$\Delta BIRate_t = a_1 + \sum_{i=1}^{k} \alpha_i \Delta BIRate_{t-i} + \sum_{i=1}^{k} \beta_i \Delta DepRate_{t-i} + \sum_{i=1}^{k} \gamma_i \Delta CPI_{t-i} + \varepsilon_t \quad (3)$$

Notes:

a_1 = Konstanta
$\alpha, \beta, \gamma, \theta$ = Parameter
ε = Error
$BIRate$ = Bank Indonesia rate
CPI = *Consumer Price Index*
$DepRate$ = Deposit Rate 12 months

3. RESULT AND DISCUSSION

The results of the model analysis The development of the BI rate from January 2020 to July 2021 can be seen in Figure 1. The highest in January 2020 was 6.77%. While the lowest occurred in July 2021, namely 4.59%. This means that there is a downward trend in the BI rate.

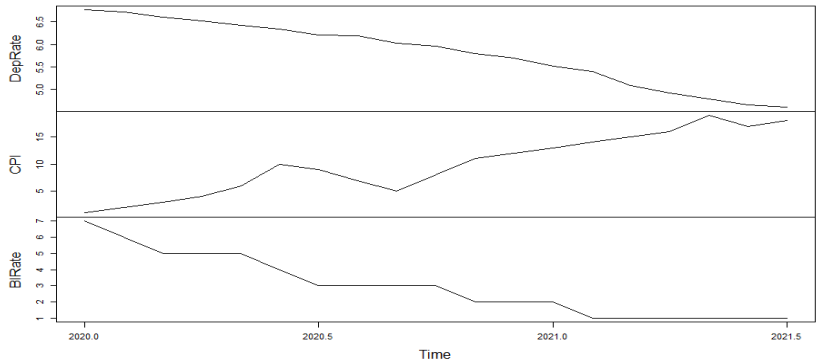

Figure 1. BI Rate, CPI and Deposit Rate Developments

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

Indonesia's inflation rate (CPI) is quite under control. January 2020 was the lowest record inflation rate for Indonesia, while the highest occurred in May 2021. Meanwhile, there was a downward trend in deposit rates compared to the highest peak on deposits that occurred in January 2020.

3.1 Model Analysis

3.1.1 Model Test

The author uses the VAR/ VECM model developed by Johansen and Juselius in 1990 as a further development of the VAR (Vector Autoregressive) model developed by Christopher A. Sims in 1980. The difference between VECM and VAR is VECM can model cointegrated and non-stationary time series data. VECM is also known as the restricted VAR model. VECM is a method derived from VAR. The assumptions that need to be met are the same as for VAR, except for the stationarity problem. In contrast to VAR, VECM must be stationary in the first differentiation and all variables must have the same stationary, i.e. differentiated in the first derivative (Gujarati, 2004).

3.1.2 Unit Root Test

The first step is to test the stationarity of the data using the Unit Root Test, using the Augmented Dickey-Fuller (ADF) statistical test. The first step in this procedure is to perform a unit root test on the three data. Based on data processing, the results are obtained as shown in Table 2.

Table 2. Unit Root Test

Data	Nilai Kritis	Level		1st Difference	
(*a*)		Stat ADF	P value	Stat ADF	P value
Bi rate		-4.38	0.01	-3.14	0.01
	5%	-2.94		-3.14	
CPI		1.442	0.9	-3.0	0.01
	5%	0.937		-2.5	
Dep rate		-7.05	0.0389	-4.16	0.01
	5%	-3.22		-4.57	

In table-2 it can be seen the results of the unit root test or root test where at the level, there are non-stationary data. Meanwhile, in the first difference, the three data are stationary, as reflected in the p value which is below the critical value of 5% (0.05).

3.2 Johansen Cointegration

For cointegration test, Johansen cointegration test is used as follows:

Table 3. Cointegration Test

	test	10percent	5percent	1percent
r <= 2	7,05	7,52	9,24	12,97
r <= 1	12,13	13,75	15,67	20,20
r = 0	17,82	19,77	22,00	26,81

From the cointegration test results with the two methods above, it can be concluded that there is no cointegration, because test value less than level of confidence, so we use the VAR estimation model.

3.3 Impulse Response Function (IRF)

IRF analysis shows the response of a variable in the system to shocks from other variables. To see the response of one variable due to a shock to other variables, it is as shown in figures below.

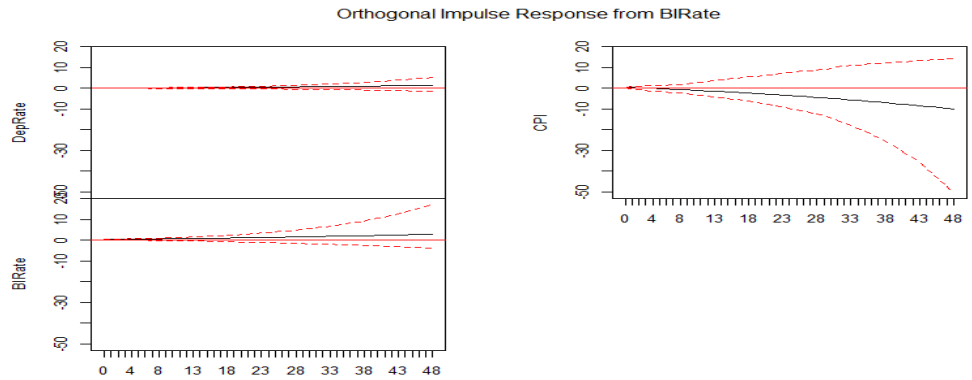

Figure 2. Impulse response from BIRate

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

Based on figure 2, if a shock or random shock/ impulse occurs in the BI Rate, then the BI Rate itself will respond positively from the first period to the 48th period. Although initially the BI Rate response was small (0.11%), but in the next period until the 48th period, the BI Rate response itself increased. Based on the picture above, the BI Rate response due to the BI Rate shock in the 48th period was 1.28%. In the first period, DepRate and CPI did not respond to BI Rate shocks. However, in the following period, the response of DepRate was positive and increasing. On the other hand, the CPI response to BI Rate shocks was negative.

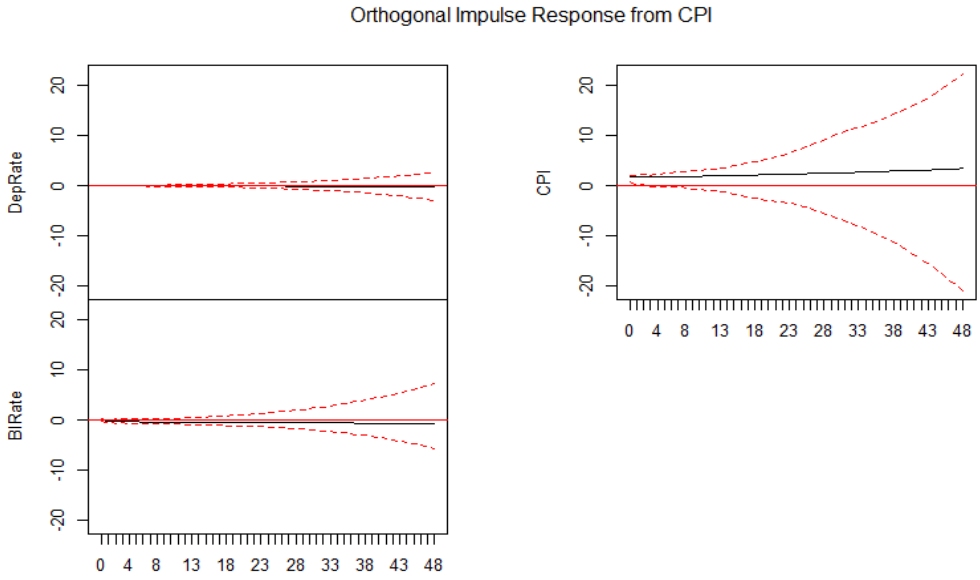

Figure 3. Impulse response from CPI

Based on figure 3, if a shock or random shock/impulse occurs in the CPI, then the CPI itself responds positively and increases from the first period onwards. In contrast, the deposit rate and BI rate respond negatively to even small CPI shocks.

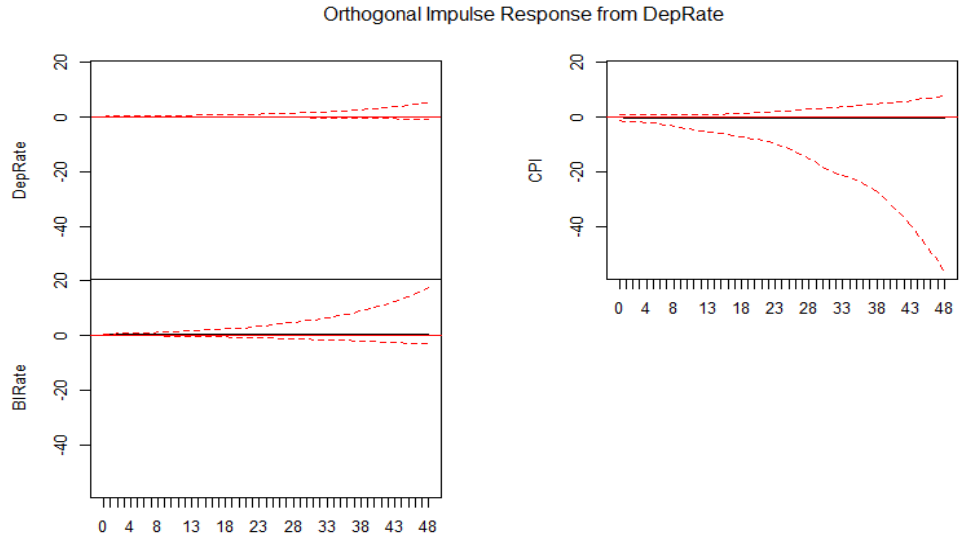

Figure 4. Impulse response from DepRate

Based on figure 4, if a shock or random shock/impulse occurs in the deposit rate, then the BI rate and the deposit rate itself respond positively and increase from the first period onwards. On the other hand, the CPI response to deposit rate shocks is negative.

3.4 Variance Decomposition

Variance Decomposition analysis provides an overview of the proportion of movements sequentially resulting from the shock of the variable itself compared to the shock of other variables. In Figures 5, 6 and 7, it can be seen that the contribution of one variable to another is known as variance decomposition. Figure 5 is the contribution of each variable to itself, and the contribution of the 'CPI' and 'deprate' variables to changes in the 'birate' variable. Based on figure 5, the BI Rate variability is dominantly influenced by the BI Rate itself in the first period, which is 87.78%. Followed by the influence of the CPI of 10.75% and the deposit rate of 1.47%. In the next period, the influence of the

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

CPI increased to 39.63% in the fifth period. After the fifth period, the influence of the CPI on the BI rate decreased. In period 48, the effect of the CPI is 11%, the effect of the deposit rate is 0.48%, and the influence of the BI Rate itself is 88.52%.

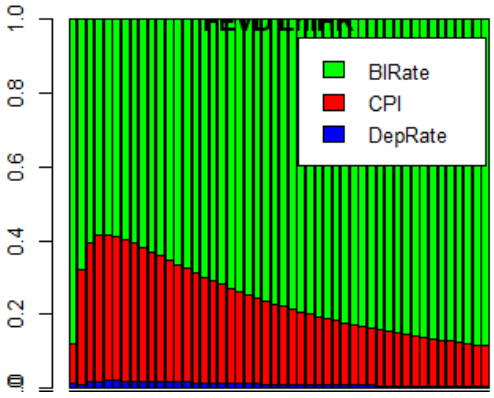

Figure 5. FEVD BIRate

Figure no. 6 is the contribution of each variable to itself, and the contribution of the 'birate' and 'deprate' variables to changes in the 'CPI' variable. Based on figure 6, the dominant CPI variability is influenced by the CPI itself in the first period, which is 97.71%. In the following period, the influence of the CPI decreased, and conversely the influence of the BI rate grew. In the 48th period, the effect of the CPI became 19.39%, the effect of the deposit rate became 0.96%, and the influence of the BI Rate was 79.64%.

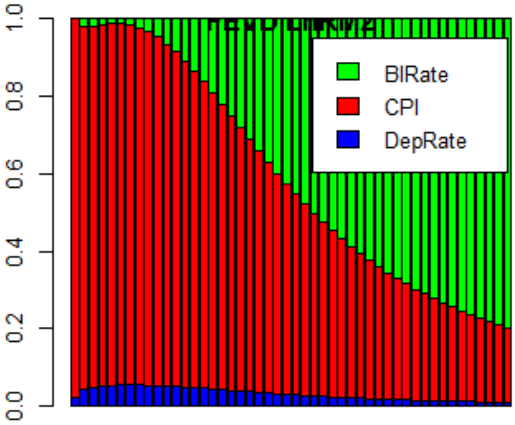

Figure 6. FEVD CPI

Figure 7 is the contribution of each variable to itself, and the contribution of the 'birate' and 'CPI' variables to changes in the 'deprate' variable. Based on figure 7, the deposit rate variability is very dominantly influenced by the deposit rate itself in the first period, which is 100%. In the next period, the effect of the deposit rate decreases, and conversely the influence of the BI rate increases. In the 48th period, the effect of the deposit rate became 0.56%, the influence of the BI Rate became 96.19%, and the effect of the CPI was 3.24%.

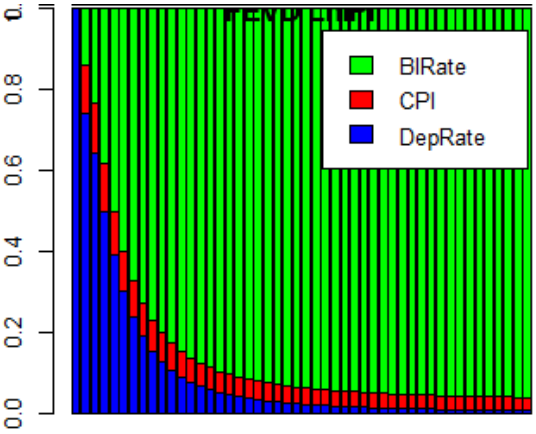

Figure 7. FEVD DepRate

Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)
Vol 3, No 3, Februari 2022, Hal 401−407
ISSN 2685-869X (media online)
DOI 10.47065/ekuitas.v3i3.1108

4. CONCLUSIONS

Based on the quantitative discussion using the VAR approach, several conclusions can be drawn: (i) The effect of the BI rate on several economic variables such as inflation (CPI) and Deposit Rate (DR) is quite strong (significant). This means that the policy of changing the BI rate has an effect on the rise and fall of the inflation rate (CPI and fluctuations in the deposit rate (deprate). (ii) the BI rate is also influenced by two other variables (CPI and Deprate), but the biggest influence is from the variable BI Rate itself, namely the influence of the previous BI rate (lag of the BI rate variable) (iii) CPI and Deprate are mutually influencing (causality effect), but like the BI rate, the most influential variable is the lag variable of each of these variables. Although currently Bank Indonesia has set a 7-day BI Repo Rate, the role of the BI rate is still needed in long-term monetary policy in order to achieve the ultimate goal of monetary policy, namely controlled inflation and sustainable economic growth. Bank Indonesia does not need to abolish or stop or eliminate the BI rate in their future policies The BI rate will complement BI's monetary policy m through the use of a 7-day repo rate aimed at setting short-term monetary policy.

ACKNOWLEDGMENTS

Acknowledgments, the author goes to the board of IAEI DPW DKI Jakarta for organizing a workshop on writing and publishing scientific economic and sharia financial articles in Indonesia.

REFERENCES

Crosse, Howard D. Dan George H.Hempel. (1973). Management Police for Commercial Bank. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1973.
Dendawijaya, Lukman. (2003). Manajemen Perbankan. Jakarta: Ghalia Indonesia.
Dwiastuti, Febri. (2006). Analisis Faktor-faktor yang Mempengaruhi Suku Bunga Deposito pada Bank- bank Umum Pemerintah di Indonesia. Skripsi Institut Pertanian Bogor
Firdaus, H. Rachmat dan Maya Ariyanti. (2009). Manajemen Perkreditan Bank Umum. Bandung: Alfabeta.
Stanley Fischer & Franco Modigliani. (1978). "Towards an understanding of the real effects and costs of inflation," Review of World Economics (Weltwirtschaftliches Archiv). Springer, vol. 114(4), pages 810-833.
Gujarati, N. Damodar. (2004). Basic Econometrics fourth edition. Mcgraw-Hill
Hamzah, A. L., Hanim, A., & Cahyo, H. (2019). Pengaruh Investasi Dan Inflasi Terhadap Jumlah Penduduk Miskin di Kabupaten Jember Tahun 2000-2015. e-Journal Ekonomi Bisnis dan Akuntansi, 6(1), 81–84
Hasibuan, M.S.P. (2001). Manajemendasar, Pengertian dan Masalah. Jakarta: Bumi Aksara.
Irham, F. (2015). Manajemen Investasi Teori dan Soal Jawab (2 ed.). Salemba Empat.
Kuncoro dan Suhardjono. (2002). Manajemen Perbankan (Teori dan Aplikasi). Edisi Pertama, Penerbit BPFE, Yogyakarta.
Latumaerissa, Julius R. (1999). Mengenal Aspek-Aspek Operasi Bank Umum. Bumi Aksara, Jakarta. Lubis, I.
Fahmi. (2014). Analisis Hubungan Antara Inflasi Dan Pertumbuhan Ekonomi: Kasus Indonesia. Program Pascasarjana Universitas Negeri Medan Sumatera Utara, Indonesia. QE Journal │Vol.03 - No.01.
Mishkin Frederic. F. (2007). The Economic of Money, Banking, and Financial Markets. Alternate Edition, Pearseon Addison Wesley, Boston-USA.
Mishkin, Frederic S. (2009). Ekonomi Uang, Perbankan dan Pasar Keuangan. Penerbit Salemba Empat.
Mubin, M. Khoirul. (2009). Pengaruh BI Rate terhadap Tingkat Bunga Perbankan Nasional. Kabarindonesia.com.
Nasution, Chairuddin. (2002). Analisis Posisi Likuiditas. Fakultas Ekonomi Jurusan Manajemen Universitas Sumatera Utara.
Pratama, Billy Arma. (2010). Analisis Faktor-Faktor Yang Mempengaruhi Kebijakan Penyaluran Kredit Perbankan. Program Studi Magister Manajemen Program Pasca Sarjana Universitas Diponegoro Semarang.
Reed, Edward W dan K Gill. (1955). Bank Umum. Edisi Keempat, Jakarta.
Riyadi, Selamet. (2006). Banking Assets and Liability Management. Edisi Ketiga. Penerbit Fakultas Ekonomi Universitas Indonesia: Jakarta.
Siamat, Dahlan. (2005). Manajemen Lembaga Keuangan. Kebijakan Moneter dan Perbankan. Fakultas Ekonomi Universitas Indonesia, edisi kesatu.
Sinkey, Joseph F. (2002) Commercial Bank Financial Management. In the Financial-Services Industry. Sixth Edition. Prentice Hall; 6 edition (January 15, 2002).
Taylor, J.B. (1995). The Monetary Transmission Mechanism: An Empirical Framework. The Journal of Economic Perspectives, 9(4).