

Impact of Monetary Policy on Consumption and Investment in Indonesia

Tiara Nirmala, Catur Sugiyanto, M.Edhie Purnawan
Faculty of Economics and Business, Gajah Mada University, Indonesia

E-mail:tiaranirmala@yahoo.co.id

Received: April 13, 2022; Revised: September 9, 2022; Accepted: October 11, 2022
Permalinks/DOIs: <http://dx.doi.org/10.17977/um002v14i22022p243>

Abstract

Monetary policy transmission mechanism has a complex process since its implementation it involves changes on banking sector, economic actors, the length of time in implementing policies, as well as changes in monetary policy transmission channels according to economic condition of the country. This study aims to examine how consumption and investment respond to monetary shocks that occur in Indonesia. These results indicate that the impact of monetary policy on consumption due to changes in interest rates is larger and more sensitive than investment, according to the impulse response test. The main channel of the effect of policy shocks obtained from consumption is transmitted to output. Therefore, the monetary policy issued by Bank Indonesia will have a greater impact on household spending than corporate spending. This means that channel consumption is the main mechanism of transmission.

Keywords: *Monetary Policy; Consumption; Investment; Demographic Change; Impulse Response*

JEL Classification: C22; E52; E21; E22; J11

INTRODUCTION

Bank Indonesia has monetary authority implements monetary policy through the financial market with the main objective of maintaining and maintaining the stability of the Rupiah exchange rate as reflected in a low and stable inflation rate (Bank Indonesia, 2020a, 2020c). The implementation of monetary policy is a complicated process, namely through the transmission mechanism of monetary policy. Warjiyo & Juhro (2019) argued that the monetary policy transmission mechanism has a complex process because in its implementation it will involve changes in behavior in the central bank, banking sector and economic actors, the length of time in implementing policies, as well as changes in monetary policy transmission channels according to conditions the country's economy.

In the implementation process, the implementation of monetary policy strategies will vary from country to country, depending on the objectives to be achieved and the transmission mechanisms deemed applicable to the economy in question. Monetary policy transmission mechanisms can play a role through

multiple channels, including interest rates, exchange rates, the money supply, asset prices, credit, and expectations (Warjiyo, 2002).

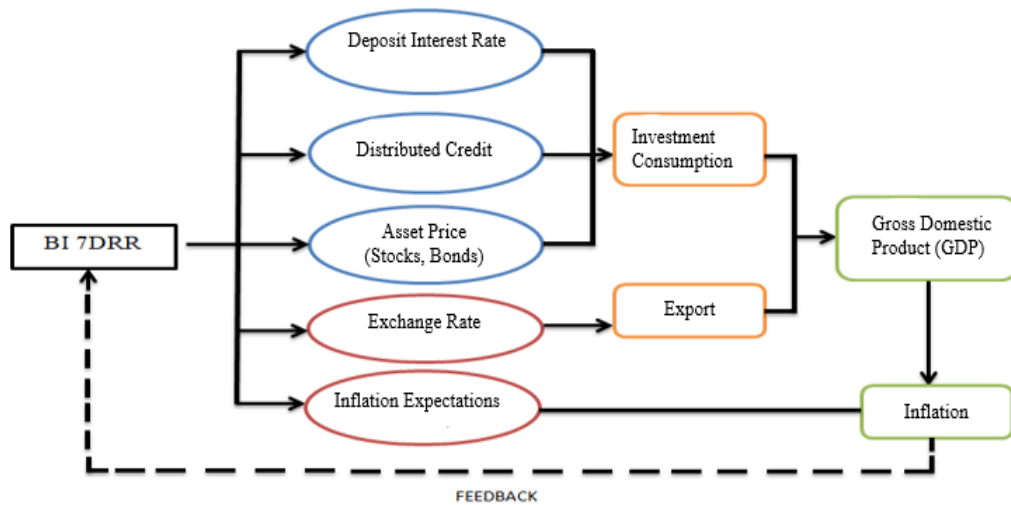


Figure 1. Monetary Policy of Indonesia
Source: (Bank Indonesia, 2020b)

The monetary transmission mechanism is the process by which monetary policy actions are translated into changes in income and inflation variables (Taylor, 1995). The traditional view is that the transmission mechanism is the process by which monetary factors move through asset market equilibrium to influence output and asset prices, which in turn influences desirable consumption and business investment (Purvis, 1992). However, in other literature, there are two main views surrounding the discussion of transduction mechanisms. The first emphasizes the role of money (the view of money) in the process of transmission mechanisms. The second emphasizes the role of credit (credit view) Bernanke (1993), Gertler & Gilchrist (1994), and Kashyap & Stein (1994, 1997).

First, tighter monetary policy increases interest payments to firms, thereby reducing their cash flow and net worth. Second, an increase in interest rates can cause stock prices to fall and the company to lose value. The unexpected drop in share prices has led to an increase in the debt burden and exacerbated problems for government agencies. Proponents of this channel argue that adverse financial shocks make external financing more expensive than internal funding. A firm's net worth is inversely proportional to the external funding premium over the amount of funding required, so a decrease in net worth reduces borrower spending and output (Bernanke et al., 1996).

The impact of the shock will increase significantly when there is no substitute for bank loans, especially for households and small companies that rely heavily on banks for external financing. The link between the two transmission mechanisms from a credit perspective is the bank credit channel, which focuses on the potential impact of policy actions on lending by the banking system. The bank credit channel is a tightening monetary policy that limits interbank credit and reduces the supply of bank credit. In credit theory, policy effectiveness depends on

capital market imperfections. This makes it easier for some companies to raise capital than others.

A more important issue of information asymmetry and moral hazard of the transmission mechanism itself is that some firms depend on banks for funding, and monetary policy can affect the supply of bank credit. A reduction in reserves will force a reduction in the savings rate, which must be offset by a reduction in borrowing. Lower bank lending rates affect the real economy if some firms have no alternative sources of investment (Cecchetti & Krause, 2001).

Extensive empirical evidence supports the importance of capital market imperfections and an over-reliance on bank loans. Kashyap & Stein (1997) outline two types of studies. The first type indicates that banks rely heavily on funding and deposits, so reducing reserves will cause banks to shrink their balance sheets and reduce their credit supply. The second type assumes that there are a large number of bank-dependent firms that cannot be funded by other bank credit sources, resulting in reduced savings and credit deterioration.

Empirical evidence clearly shows that the nature of transmission mechanisms is influenced by the structure of a country's financial system. Following Cecchetti (1995), he examined the importance of corporate bank lending to the effectiveness of policy change. He examines how differences in the size, concentration, and strength of banking systems are most likely to affect the impact of monetary policy in a sample of 16 countries, and finds that there are many small banks pointing out not healthy, poorer direct access to capital means they are more policy sensitive than countries with large, healthy banks and deep, well-developed capital markets. Allen & Gale (2001) examined the evidence for differences in mean fiscal structure and growth across countries over time. They found that financial structure affects the overall real economy variables. On the other hand, Cecchetti & Krause (2001) observed from 23 developed and developing countries showing that the monetary structure will affect the effectiveness and performance of monetary policy itself.

The economic landscape of inflation targeting and monetary policy transmission has changed gradually over the past three decades. In particular, real and nominal interest rates have declined moderately and sharply when a financial crisis or recession sets in. This has important implications for central banks. This is because the opposite shock is likely to cut policy rates to the effective lower bound, leaving less room for policy rate cuts to stimulate demand. One of the main effects on long-term real interest rates is demographic change. Population growth is slowing in developed countries, and labor force growth is slowing. Slower population growth means lower long-term equilibrium real interest rates. In addition, demographic changes could have a fundamental impact on the effectiveness of monetary policy, as interest rate changes affect different age groups differently. This means that the age distribution of the population is important in responding to changes in central bank interest rates. This is primarily due to the fact that personal and household wealth is not constant throughout its life cycle.

The world is currently in a phase of demographic change. Most developed countries are currently experiencing a continuous aging of their population, which is expected to continue in this century. For example, in Japan, people over the age of 60 now make up 30% of the population. The proportion of the population over the age of 60 has tripled since 1970 and is projected to increase to over 40% by

2050. Similarly, in the US, the share of the population over the age of 60 is expected to increase from 18 percent to 28 percent by 2050. On the other hand, there are countries with a larger youth population, such as in India, where more than 50 percent of the population is under 25 years of age. In China, the implementation of the one-child policy may change the age distribution significantly in the future. Given the lifecycle patterns of many economic activities, such as savings, home buying, education, and retirement, it is interesting to understand how changes in the age distribution affect the performance of economic policies.

Looking at the demographic conditions in Indonesia, based on age group, the population of productive age (15-65 years) reaches 185.22 million people or about 68.7% of the total population. Meanwhile, the unproductive age group (0-14 years) is 66.05 million people or 24.5%, and the unproductive age group (over 65 years) is 18.06 million people or 6.7% of the total population. So that the dependency rate of the Indonesian population is 45%. This means that Indonesia is still in the era of demographic bonus where the number of productive age population is greater than the number of unproductive population.

Indonesia's Population by Age Group and Gender (2019)

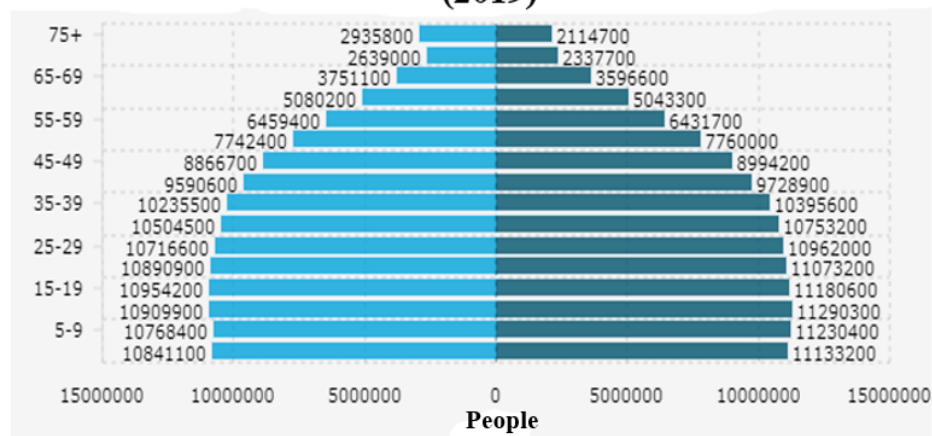


Figure 2. Demographic Conditions in Indonesia (Million People)

Regarding the relationship between demographics and monetary policy, it is important to determine the optimal monetary policy (Wong, 2021). Assessing the impact of monetary policy changes across demographic groups is also relevant for distinguishing between different macromodels and economic frictions. These different models each emphasize different channels and have different policy implications. An important reason for focusing on these monetary policy shocks is that different models respond differently to these shocks. About 40% of the difference in consumer behavior between young and old can be traced back to the type of financing (refinancing). The rest comes through income and substitution effects, wealth effects, and other channels. This is emphasized in the literature on the redistributive effects of monetary policy Auclert (2017), Meh & Terajima (2011), and Sterk & Tenreyro (2015).

Berg et al. (2019) examine how consumer spending in different age groups reacts to monetary policy shocks. This study describes the responses of aggregate consumption to monetary policy shocks in household contributions at different

stages of the life cycle. This study empirically shows that monetary policy shocks have a greater impact on consumer spending among older households. Consumers' overall reaction to monetary policy shocks for older households also increases with income. As consumption is the largest component of Indonesia's GDP, a better understanding of age-related heterogeneity in consumption responses to monetary policy shocks will help us gain knowledge about the overall transmission pathways and most affected population groups. may improve. through monetary policy.

METHOD

This study uses secondary data obtained from various official government sources, namely the Indonesian Economic and Financial Statistics on Bank Indonesia Statistics (SEKI-BI), the Central Statistics Agency (BPS), the Financial Services Authority (OJK), IMF and World Bank. This study uses quarterly data for the period 2005.I-2020.IV. The most important sources of data are the International Monetary Fund (IMF) Global Financial Statistics, Global Financial Statistics, and the World Bank's World Development Indicators. Specifically, quarterly price data (P) measured by the consumer price index (base 2000). Loan rate (R), interest rate measured in credit (cr) is measured in domestic credit. The exchange rate (x) is measured at the nominal effective exchange rate. Output (y) is measured in real gross domestic product (rGDP), investment (inv) in real gross fixed capital formation, and consumption (con) in real household consumption expenditure. In this estimation, the data is represented logarithmically and the length of the delay is determined using the Akaike Information Criterion (AIC) information criteria.

The purpose of this study is to discuss the process of knowing the monetary shock policy and predicting the response to the shock. The macroeconomic VAR model used in this study. Several variables are usually considered when studying monetary policy. output, prices, money, and short-term interest rates. This corresponds to the standard variables in the IS-LM model (Sims, 1992). The endogenous variable vectors used for estimation are:

$$V = [vt \ pt \ rt \ crt \ xt] \tag{1}$$

where v is the macroeconomic variable, , r is the short-term interest rate, p is the price level, x is the exchange rate, and cr is credit.

In this study, the two macroeconomic variables investigated were consumption (con) and investment (inv). The estimation process uses these two macroeconomic variables separately in the regression equation. The impulse responses of monetary policy shocks to consumption and investment are examined separately.

1. Monetary Policy Shock

$$u_t = \Gamma_0 + \Gamma^+ \epsilon_t^+ + \Gamma^- \epsilon_t^- + \psi_t$$

where $+t = \max(\epsilon_t, 0)$ and $-t = \min(\epsilon_t, 0)$ indicate expansionary and contractionary monetary policy shocks.

2. Consumption Response

Calculates the consumption impulse response function as a proportion of the average change in consumption given an interest rate shock. Formally, the impulse response after period k is calculated based on the standard deviation of the distention shock at time t :

$$\text{IRF}(k) = E_t [\ln C_{t+k} | t = -, t = 0] - E_t [\ln C_{t+k} | t = 0, t = 0] \quad (2)$$

The data used in this study are data sourced from the Central Statistics Agency, Bank Indonesia, Susenas and the Indonesian Family Life Survey (IFLS).

The analytical method used in this research is the non-structural Vector Autoregression (VAR) method. The analytical method that is quantitative in nature encourages us to use a lot of numbers, both since data collection, interpreting data, showing data, estimating data, as well as estimation results which will be the core of the discussion. Several variables in time series data research often have dependence on each other. Based on this, it is necessary to conduct an analysis that can explain the dependence between variables in time series data (Widarjono, 2018). The general equation form of the VAR model is as follows.

$$Y_{nt} = \beta_0 + \sum_{i=1}^p \alpha_{in} Y_{1t-i} + \sum_{i=1}^p \alpha_{in} Y_{2t-i} + \dots + \sum_{i=1}^p \alpha_{in} Y_{nt-i} + e_{nt} \quad (3)$$

Information :

Y_{nt}	= Variable vector elements
Y_{1t-i}	= Elements of endogenous variables in the previous year
β_0	= Constanta
$\alpha_{in}, \dots, \alpha_{in}$	= Endogenous variable coefficient
e_{nt}	= Error Term

According to Widarjono (2018) that by using the VAR method, it is enough to focus on two things, namely:

1. There is no need to distinguish between intrinsic and exogenous variables. All of these variables are assumed to have relationships that should be included in the model. However, it is possible to put those variables in the VAR.
2. The relationship between the variables in the VAR can be seen if there is a number of lags in the existing variables to obtain the effect of these variables on other variables in the model.

The formation of the VAR model is closely related to the problem of stationarity in the data and cointegration between variables in the model. First of all, in the formation of the VAR model, it is necessary to do a stationarity test on the data. If the data is stationary, then a VAR model is used, but if it is not stationary at the level, a cointegration test is necessary. If there is cointegration, it is necessary to do a Vector Error Correction Model (VECM). The formation of the VAR model can be illustrated by the following chart.

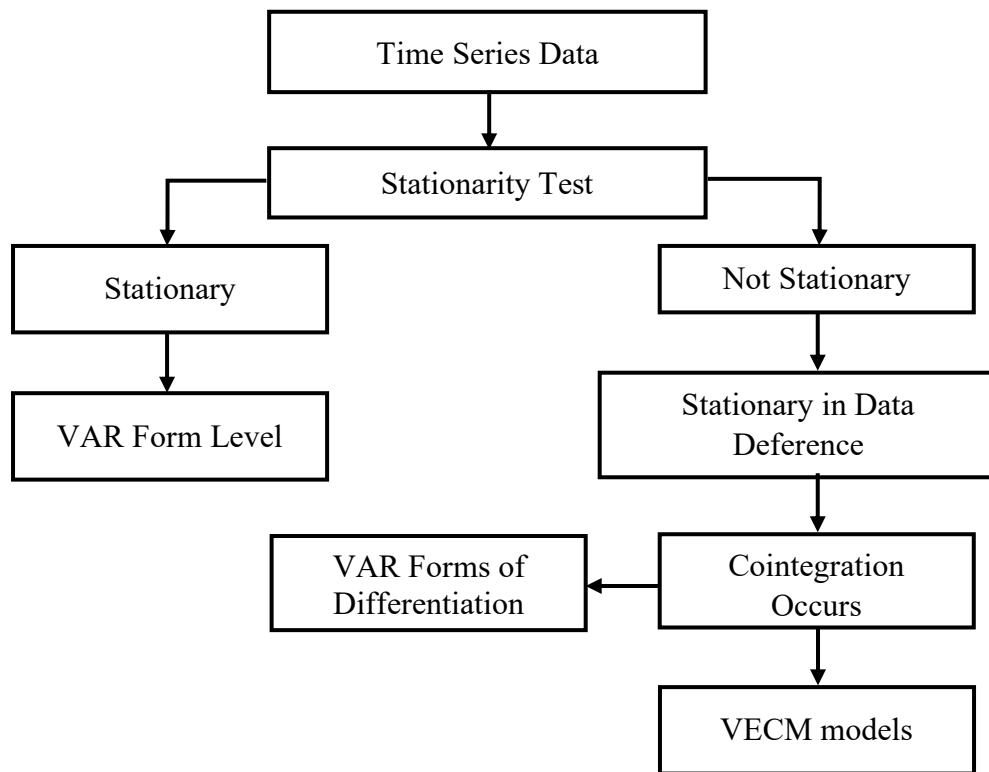


Figure 3. VAR Model Forming Process

The use of the VAR model in this study is a non-structural VAR model that is formed based on the dependence between economic variables. Time series data which often shows that it is not stationary at the level level, but allows stationary and cointegrated data to show that there is a theoretical relationship between variables, so this model is referred to as the restricted VAR model or VECM (Vector Error Correction Model). The VECM model which is an restricted VAR model which will show the existence of cointegration which means that there is a long-term relationship between variables in the VAR model (Riyanto & Mulyono, 2019). In this study, an impulse response function test was carried out to see how the endogenous variables in the VAR model were due to shocks in the error term and a variance decomposition test to analyze how important each independent and dependent variable in the VAR model was due to shocks.

The impulse response function and decomposition variance tests were conducted to measure the impact of policy shocks on consumption and investment in Indonesia. Indicators used to determine the effectiveness of a monetary policy transmission can be seen through two indicators, namely how fast the time lag of variables in responding to monetary policy instrument shocks obtained from the impulse response function test results and how strong the variables in the transmission line respond. shocks of monetary policy instruments in achieving the final target which can be seen from how big the percentage of contribution given by the variables based on the results of the variance decomposition test.

RESULTS AND DISCUSSION

Stationarity Test Results

The stationarity indicator or not in this stationarity test is carried out through the Phillips-Perron (PP) test. In this study, the research was conducted by comparing the PP-statistical value with the PP-test critical value of 10%. The following are the results of the stationarity test at the level through the ADF-test on each variable through Eviews 10.

Table 1. Stationarity Test Results through PP-test at Level

Variable	Level Level			
	PP-statistics	Critical values 10%	Prob	Information
vconst	-3.648621	-3.189732	0.0372	Stationary
vinst	-3.373347	-3.189732	0.0685	Stationary
pt	-1.804549	-3.189732	0.6852	Not Stationary
rt	-2,410414	-3.189732	0.3693	Not Stationary
crt	-0.082367	-3.189732	0.9936	Not Stationary
xt	-3.559620	-3.189732	0.0456	Stationary

The results based on the stationarity test through the Phillips Perron (PP) test at the level level indicate that there are several variables that contain unit roots in the research model. Based on Table 1 which shows the results of the stationarity test through the PP-test that the PP-statistics value is -3.648621 and -3.373347 on the variable *lv*, as well as the PP-statistic value which is -3.559620 on the variable *lx*, shows the PP-statistics value is greater than the critical value 10% at the level of -3.189732 which means the variable consumption, investment and exchange rate has been stationary at the level level. While the variable *lpt* with the PP-statistical value of -1.804549, on the variable *lrt* with the PP-statistical value of -2.410414 and the variable *lcr* with the PP-statistical value of -0.082367 which indicates that the PP-statistical value is smaller than the critical value of 10% at the level of -3.189732 which means that the price, interest rate, and credit variables are not stationary at the level level.

Based on the results of the stationary test at these levels, it is necessary to carry out a stationarity test at the first difference level through the Phillips Perron (PP) test to obtain stationary data on the variables to avoid a spurious regression. The following are the results of the stationarity test through the ADF-test at the first difference level. Table 2 shows the results of the stationarity test through the Phillips Perron (PP) test at the first difference level that all data on the variables in the research model have shown that they do not contain unit roots, which means the data is stationary at the first difference level. PP-statistical values for each variable in the research model shows that all variables have a PP-statistical value that is greater than the critical value of 10% of -3.191277.

Table 2. Stationarity Test Results through PP-test at First Difference Level

Variable	PP-statistics	First Difference Tingkat		Information
		Critical values10%	Prob	
D(vconst)	-11,46013	-3.191277	0.0000	Stationary
D(vinst)	-4.021197	-3.191277	0.0154	Stationary
D(pt)	-7.054254	-3.191277	0.0000	Stationary
D(rt)	-5.808418	-3.191277	0.0001	Stationary
D(crt)	-14,48981	-3.191277	0.0000	Stationary
D(xt)	-8.669386	-3.191277	0.0000	Stationary

After the stationarity of the variable data used is known, the next stage is a cointegration test to see whether the research variable has a steady-state effect in the long term. However, before running the cointegration test, we first need to determine the optimal lag in the research model.

Optimum Lag Determination Test Results

Determination of the optimum lag in the VAR model is needed to determine the length of the time period on how the influence of a variable on other variables in the previous period is needed to find the right lag to provide the best prediction (Widarjono, 2018). Determination of the optimum lag interval in the VAR model using the Lag Leg Criteria method which in this study uses the minimum Akaike Information Criteria (AIC) criteria by taking the absolute value. The following are the results of determining the optimum lag in the research model through the Eviews10 data processing tool.

Table 3. Optimum Lag Test Results using AIC kriteria criteria

lag	LogL	LR	FPE	AIC	SC	HQ
0	-176.2700	NA	2.25e-05	9.163500	9.459054*	9.270363*
1	-124.1072	83.46044	2.00e-05	9.005362	11.36979	9.860265
2	-65.46927	73,29745*	1.55e-05*	8.523463	12.95677	10.12641
3	-5.268815	54.18041	1.77e-05	7.963441*	14.46563	10.31443

Table 3 shows the test results for determining the optimum lag, which can be seen that based on the Akaike Information Criteria (AIC) the optimum lag occurs in lag 3 with a minimum AIC value of 7.963441. Based on this, it means that lag 3 is the optimum lag that can be used in research. After obtaining the optimum lag in the study, it is necessary to carry out a VAR stability test.

3. VAR Model Stability Test Results

Stability tests on the VAR or VECM models to support the Impulse Response function (IRF) and variance decomposition are valid. The stability test of the VAR model was carried out by checking the stability of the roots of characteristic polynomial in the AR Root Table (Basuki & Prawoto, 2019). The following are the results of the stability test of the VAR model in research through Eviews10 data processing.

Table 4. VAR . Model Stability Test Results

Root	Modulus
-0.995563	0.995563
0.024701 + 0.953801i	0.954121
0.024701 - 0.953801i	0.954121
-0.804189 - 0.422165i	0.908264
-0.804189 + 0.422165i	0.908264
0.078788 + 0.853645i	0.857273
0.078788 - 0.853645i	0.857273
0.796429 + 0.156288i	0.811619
0.796429 - 0.156288i	0.811619
-0.149768 + 0.782955i	0.797151
-0.149768 - 0.782955i	0.797151
0.641341 - 0.445855i	0.781092
0.641341 + 0.445855i	0.781092
-0.759058	0.759058
0.476730 - 0.538870i	0.719480
0.476730 + 0.538870i	0.719480
-0.384548 + 0.587927i	0.702520
-0.384548 - 0.587927i	0.702520
-0.571200 + 0.1624i	0.605741
-0.571200 - 0.201624i	0.605741
0.236544	0.236544

If the value of the root and the modulus value is less than one (root and modulus < 1), then the variables in the research conducted have been stable to continue testing the impulse response function and variance decomposition. Based on the results of the stability test of the VAR model in Table 4.4, it shows that the root and modulus values in the study have a value of less than one, then based on this it indicates that the VAR model has met the stability conditions, which means that the variables in the study can be used for testing the VAR model.

Johansen Cointegration Test Results

Long-term effects between variables within the study model are obtained after confirming that the data within the variables are equally well integrated (Widarjono, 2018). Whether or not there is a long-term effect can be determined through the cointegration test, which in this study is the Johansen cointegration test. In the VAR model, if it is proven that there is a cointegration effect, the estimation model used is the VECM model, but if it is not proven, the estimation model used is the ordinary VAR model.

The cointegration test will show the results of the trace test value and the max-eigenvalue which explains the presence or absence of cointegration in the equation model. The Johansen cointegration test in this study was carried out by comparing the trace test values with the critical value of 10%. If the trace test value is greater than the critical value of 10% then there is cointegration, but if the trace test value is less than the critical value of 10% then there is no cointegration. Based on the five assumptions in Johansen's cointegration test, the chosen deterministic

assumption is the fourth assumption, namely the series has a quadrant trend and the cointegration equation has a linear trend. The following are the results of Johansen's cointegration test.

Table 5. Johansen Cointegration Test Results

<i>Hypothesized</i>	<i>Eigenvalue</i>	<i>Trace Statistics</i>	<i>0.1 Critical Value</i>	<i>Max-Eigen Statistics</i>	<i>0.1 Critical Value</i>
<i>None*</i>	0.953017	266.3454	144,8730	119.2605	47.56527
<i>At most 1*</i>	0.808377	147.0849	112.6525	64,43685	41.59634
<i>At most 2</i>	0.644578	82.64804	84,37817	40.34355	35.58124
<i>At most 3</i>	0.409077	42,30449	60.08629	20.51673	29.54003
<i>At most 4</i>	0.252806	21.78776	39,75526	11.36578	23,44089
<i>At most 5</i>	0.170923	10,42199	23,34234	7,310249	17,23410
<i>At most 6</i>	0.076688	3.111737	10.66637	3.111737	10.66637

Source: Results of data processing on Eviews10 (2021)

Based on Table 5 shows that there are two cointegrations based on the trace test-statistic value which is greater than the critical value of 10% with a 90% confidence level. The existence of this cointegration indicates that there is a long-term relationship between variables in the equation model in the study. It can be seen that the trace test-statistic value of 266.3454 which is greater than the critical value of 10% which is worth 144.8730 indicates that there is one cointegration in the research equation model. Then the trace test-static value of 147.0849 which is greater than the critical value of 10% which is worth 112.6525 indicates that there are two cointegrations in the research equation model. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which means that there is cointegration which indicates a long-term relationship between one variable and other variables in the equation model. Due to this cointegration, the next analysis model that needs to be done is the VECM (vector error correction model) estimation model.

Impulse Response Function (IRF) Test Results

To test the response variable of the endogenous VAR model to changes in the variable (et), an analysis was carried out with an impulse response function test (Widarjono, 2018). This section presents impulse response function results obtained from the VECM approach. This approach first uses the method of Johansen (1995) to estimate the number of cointegration equations in the model. After performing some cointegration tests, the next step is to estimate his VECM and, based on these estimates, generate the impulse response of interest rate shocks to investment and consumption. The size of the surprise is one standard deviation of the rate hike. The impact on investment and consumption occurred over 20 quarters. The estimated parameter does not exist because the focus is on the impulse response function.

Analysis of impulse results to determine relative monetary effectiveness by comparison of magnitude and speed of adjustment. In terms of magnitude, comparisons are made based on the largest negative impact of tribal shocks on consumption and investment. This is consistent with the theoretical argument that the expected impact of rate hikes on this second variable is negative. The speed of adjustment, on the other hand, is measured by how quickly interest rate shocks

affect investment and consumption, and how long it takes to remove the negative effects of these variables.

Impact of interest rate shocks on investment

Figure 4 shows the impulse function of the investment response to a positive surprise in the interest rate. The impulse response function in the figure above shows that changes in the interest rate in Indonesia on investment have a negative impact that is only seen after Q4. This study shows evidence that the effect of changes in monetary policy on investment is relatively small, so the impact can be ignored.

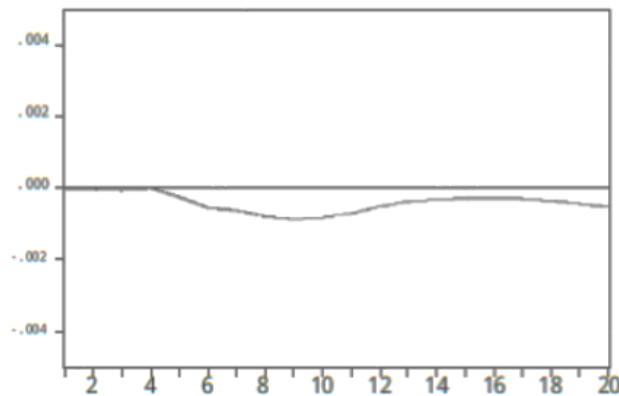


Figure 4. Investment Response Impulse Function

Impact of interest rate shocks on consumption

The impulse function in responding to interest rate shocks has a positive effect, this can be seen in Figure 4.2. It can be seen that the impact of consumption in Indonesia after Q4. The initial impact on the interest rate shock on consumption was influential, but this temporary positive impact will turn negative after Q7. Figure 4.2 also shows that in Indonesia the negative impact disappeared. after quarters 12, 14, and 15, respectively. Regarding the magnitude of the impact, it was found that monetary policy shocks on consumption had a relatively small impact.

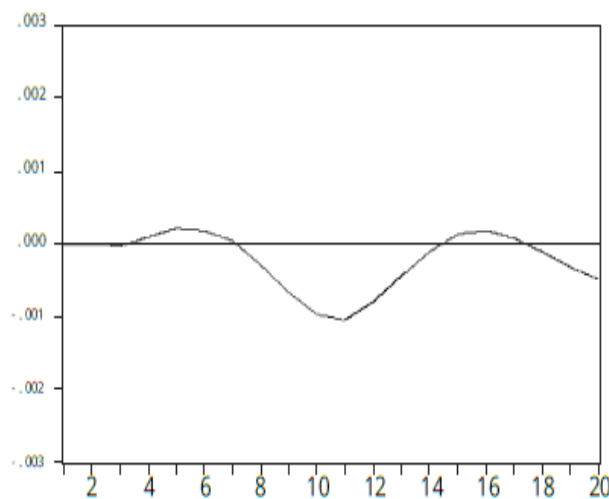


Figure 5. Consumption Response Impulse Function

The study found that the impact of interest rate shocks on investment is relatively small compared to the impact on consumption. Another finding suggests that consumption is the main channel through which the effects of monetary policy shocks are transmitted to Indonesian production. In this case, national monetary policy affects household spending more than business spending, making consumption the dominant channel of the transmission mechanism.

There are two main views about the delivery mechanism. (2) The Role of Credit (Money Vision). In addition, the discussion of the monetary policy spillover theory has another effect. Tighter monetary policy increases interest payments to companies, which can reduce the cash flow and net worth of companies. If interest rates go up, the stock price can go down and the value of the company can go down. Financial shocks will be felt even more when there is no alternative to bank credit, especially for homes and small businesses that rely heavily on banks for external impacts (Bernanke et al., 1996). According to credit theory, the effectiveness of measures to address capital market imperfections makes it easier for some companies to raise funds from other sources. A decline in bank credit levels will affect the real economy if there are companies that do not have alternative sources of investment funds (Cecchetti & Krause, 2001).

The findings of this study indicate that changes in interest rate policy in the case of Indonesia have more impact on consumption behavior than investment. This is quite relevant to the character of Indonesia as a developing country where aggregate consumption factors are more easily affected even though changes in interest rates at the same time will have an impact on investment behavior. Thus, expansionary monetary policy is still relevant to promote better economic conditions. This is very relevant to the very large population with a larger composition of the productive age group (demographic bonus) compared to the young and retired age group. Countries with many small banks, less healthy banking systems, and poorer access to direct capital show greater sensitivity to changes in monetary policy than large healthy banks and deep and well-developed capital markets (Cecchetti, 1995).

CONCLUSION

This study examines the effectiveness of monetary policy in Indonesia. To this end, we use impulse response functions to examine the effects of shocks on investment and consumption in monetary policy measures approximated by rising interest rates. The study explains that interest rate shocks have a small impact on investment and less responsive. In Indonesia, where the stock market is relatively more developed, companies have alternative sources of financing, and this can reduce the impact of changes in monetary policy. On consumption, this study explains that interest rate shocks on consumption have a relatively stronger impact on interest rate changes than investment.

This finding shows that in this country, consumption is the main channel of transmission mechanism, through consumption macro variables, the effects of monetary policy shocks are transmitted to output. This is because the country's monetary policy country has more impact on household spending than corporate spending. Bank Indonesia can pay more attention to changes in consumption in Indonesia to make monetary policy more effective, considering that the impact of changes in monetary policy is more responsive to the consumption variable than

investment. Further research can use other variables such as government spending, exports and imports, as a response to the effectiveness of monetary policy carried out by Bank Indonesia.

REFERENCES

- Allen, F., & Gale, D. M. (2001). Comparative financial systems: A survey. In *Center for Financial Institutions Working Papers* (Issue April).
- Auclert, A. (2017). Monetary policy and the redistribution channel. *CEP Working Paper, 2017/6*, 1–106. <https://doi.org/10.1257/aer.20160137>
- Bank Indonesia. (2020a). *BI 7-Day (Reserve) Repo Rate*. www.bi.go.id
- Bank Indonesia. (2020b). *Indonesian Financial Economic Statistics*. *Indonesian Financial Economic Statistics*. www.bi.go.id
- Bank Indonesia. (2020c). *Monetary Policy Transmission*. www.bi.go.id
- Basuki, A. T., & Prawoto, N. (2019). Analisis Regresi dalam Penelitian Ekonomi dan Bisnis. In *Analisis Regresi dalam Penelitian Ekonomi dan Bisnis* (Ketiga). PT Rajagrafindo Persada.
- Berg, K. A., Curtis, C. C., Lugauer, S., & Mark, N. C. (2019). Demographics and Monetary Policy Shocks. *NBER Working Paper Series, 25970*, 1–20. www.nber.org/papers/w25970
- Bernanke, B. S. (1993). Credit in the Macroeconomy. *Federal Reserve Bureau of New York Quarterly Review, Spring 1993*, 50–70. <http://ideas.repec.org/a/fip/fednqr/y1993isprp50-70nv.18no.1.html>
- Bernanke, B. S., Gertler, M., & Gilchrist, S. (1996). The Financial Accelerator and the Flight to Quality The Review of Economics and Statistics. *The Review of Economics and Statistics, 78*(1), 1–15.
- Cecchetti, S. G. (1995). Distinguishing theories of the monetary transmission mechanism. *Review, May*, 83–97. <https://doi.org/10.2307/2314362>
- Cecchetti, S. G., & Krause, S. (2001). *Financial structure, macroeconomic stability and monetary policy* (Working Paper 8354). www.nber.org/papers/w8354
- Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics, 109*(2), 309–340. <https://doi.org/10.2307/2118465>
- Johansen, S. (1995). Identifying restrictions of linear equations with applications to simultaneous equations and cointegration. *Journal of Econometrics, 69*(1), 111–132. [https://doi.org/10.1016/0304-4076\(94\)01664-L](https://doi.org/10.1016/0304-4076(94)01664-L)
- Kashyap, A. K., & Stein, J. C. (1994). *Monetary Policy and Bank Lending* (A chapter in Monetary Policy). <http://www.nber.org/chapters/c8334.pdf>
- Kashyap, A. K., & Stein, J. C. (1997). The role of banks in monetary policy: a survey with implications for the European Monetary Union. *Economic Perspectives, Federal Reserve Bank of Chicago, 22*(Sep), 2–18. http://www.chicagofed.org/digital_assets/publications/economic_perspective

s/1997/epsepoc97a.pdf

- Meh, C. A., & Terajima, Y. (2011). Inflation, nominal portfolios, and wealth redistribution in Canada. *The Canadian Journal of Economics*, 44(4), 1369–1402. <http://www.jstor.org/stable/41336412>
- Purvis, D. D. (1992). Commentary in Monetary Seminar 90. *Proceedings of a Conference Held by the Bank of Canada, May 1990*, 455–459.
- Riyanto, & Mulyono, S. (2019). *Peramalan Bisnis dan Ekonometrika* (Ketiga). Penerbit Mitra Wacana Media.
- Sims, C. A. (1992). Interpreting the macroeconomic time series facts : The effects of monetary policy. *European Economic Review*, 36(5), 975–1000. <https://cowles.yale.edu/sites/default/files/files/pub/d10/d1011.pdf>
- Sterk, V., & Tenreyro, S. (2015). *The Transmission of Monetary Policy Through Redistributions and Durable Purchases* (No. DP10785). <https://ssrn.com/abstract=2652155>
- Taylor, J. B. (1995). The Monetary Transmission Mechanism: An Empirical Framework. *Journal of Economic Perspectives*, 9(4), 11–26. <https://doi.org/10.1257/jep.9.4.11>
- Warjiyo, P. (2002). Overview Kebijakan Moneter dan Aktivitas Ekonomi. *Buletin Ekonomi Moneter Dan Perbankan*, 5(3), 3–8. <https://doi.org/10.21098/bemp.v5i3.316>
- Warjiyo, P., & Juhro, S. M. (2019). *Central Bank Policy: Theory and Practice*. Emerald Publishing Limited.
- Widarjono, A. (2018). *Ekonometrika Pengantar dan Aplikasinya* (Kelima). UPP STIM YKPN.
- Wong, A. (2021). Refinancing and The Transmission of Monetary Policy to Consumption. *R&R American Economic Review*. https://static1.squarespace.com/static/576576adbe659449f97e0d35/t/5c92e982e5e5f0adbc943f1a/1553131909216/Paper_AERrevision1.pdf