The nexus of monetary policy and economic growth: Empirical study from Indonesia

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Abstract

This study investigates the short and long-term relationships between monetary policy and economic growth in Indonesia. The vector error correction model (VECM) applies to tackle the research objective and use quarterly data from 2004 to 2019. The result shows a significant negative effect of inflation in the short term, and other variables are insignificant. Inflation and exchange rate have a significant positive impact in the long term, and money supply has a negative coefficient. Besides, interest rates do not significantly affect Indonesia's economic growth. Findings of the negative long-term impact of the money supply on growth are not a good indication; we argue that this anomaly needs to be taken seriously by the authorities to maintain economic stability and sustainable growth.

Keywords: Inflation; interest rate; exchange rate; money supply; economic growth

Introduction

Economic growth is one of the macroeconomic indicators in a country that has a vital role in making monetary policy. The performance of several other macroeconomic fundamentals, such as inflation, money circulation, exchange rates, and the determination of interest rate policies, is strongly influenced by movements in economic growth and vice versa. Specifically, inflation, both a reflection of price stability and a macroeconomic instrument, has substantial implications for economic growth and income distribution (Ayyoub et al., 2011). In addition, exchange rate management is critical as a determinant of the direction of other macroeconomic policies, such as the supporting system for economic growth instruments to stabilize inflation and maintain global competitiveness (Razzaque et al., 2017). Another macroeconomic variable is the money supply. Money supply affects price stability, GDP, unemployment, and exchange rates (Mahara, 2020). If the money supply is out of control and exceeds demand, inflation will rise and become out of control, as happens in highly monetized countries. However, suppose that the money supply is low, it will cause economic sluggishness and suppress aggregate demand, which triggers lower economic growth (Nizhegorodtsev & Goridko, 2015). In the end, economic development and the money supply have a mutually sustainable role in creating economic stability (Ogunmuyiwa & Ekon, 2010).

Do Van (2020) confirmed that the incrasing money supply in the long term can reduce economic growth due to higher inflation. Meanwhile, the money supply policy by the portion of the country's needs in the long term can stimulate investment, expand the country's productivity, and increase the country's economic growth (Bista, 2016; and Gnawali, 2019). According to Bista (2016) and Gnawali (2019), to support high investment, savings, and economic growth, it is necessary to create a "circle condition" as a reflection of price stability, exchange rate stability, interest rate stability, and financial stability. In Indonesia's context, the movement of inflation was very volatile from 2010 to 2019, as shown in Figure 1. The uptrend in the monthly series is seen frequently from the third quarter of 2015 to the third quarter of 2019. Meanwhile, the money supply showed a stable trend in the 2009-2019 period.

Furthermore, Kamal (2015) confirms his findings that there is a positive relationship between exchange rates and economic growth, whereas Habib et al. (2017) find that exchange rate appreciation reduces economic growth. Various internal and external factors can cause these results because the research samples used are different, which means that each country has different economic characteristics. According to finding Syameh & Orabi (2013), other monetary instruments such as interest rates show a positive impact on economic growth due to increased savings that encourage investment. Meanwhile, Hansesn & Seshadri (2014) found an inverse relationship between interest rates and output growth, reflecting economic growth components.

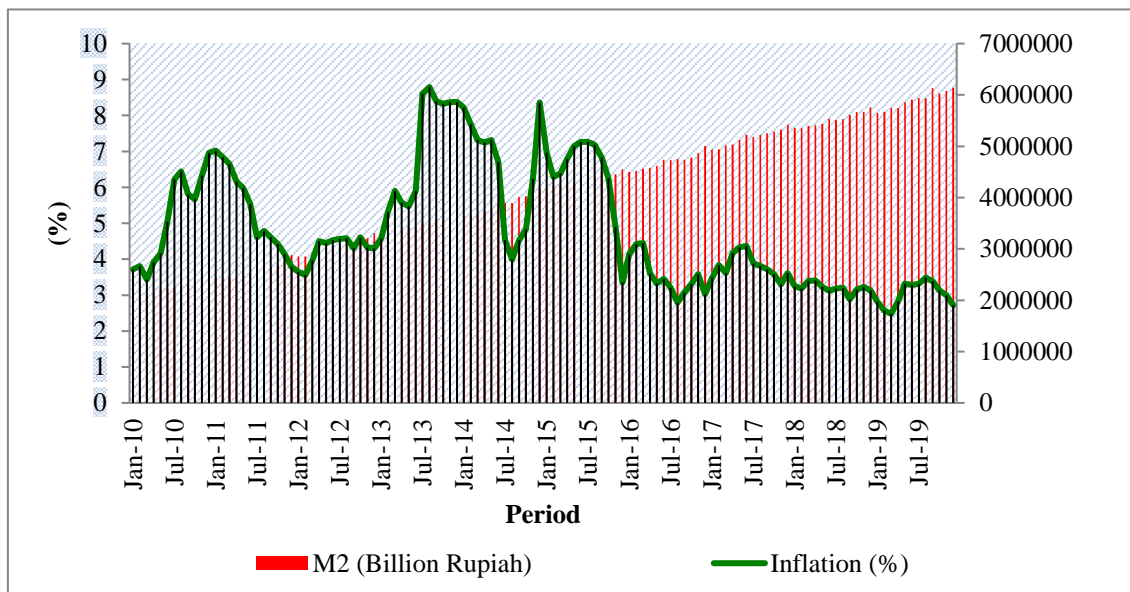[1]E-mail: idahzuhroh.umm@gmail.com

Figure 1. Inflation and M2

In the absence of consensus from several previous empirical studies, this study aims to understand the interaction of monetary instruments in Indonesia. All economic policy instruments, including interest rates, inflation, exchange rates, and the money supply, are used to see their effect on growth. This comprehensive research can serve as a reference for future policymaking to support sustainable growth. Moreover, this study also includes a time lag to investigate endogeneity. We also contribute to the existing monetary policy and economic growth literature in developing countries with similar economic patterns.

Literature Review

The exchange rate is an essential aspect in global trade. Empirical study in Bangladesh using the ECM method revealed that the exchange rate has a positive and significant relationship to economic growth (Kamal, 2015). Meanwhile, Jamil et al. (2012) found that the use of a common currency as a reflection of the exchange rate in the form of the Euro reduces the risk of exchange rate volatility (Thorsten & Daniel, 2015). In contrast to the empirical findings made by Habib et al. (2017), they find that real appreciation reduces annual real GDP growth significantly; this result is also confirmed in several cases in developing countries. Osama (2004) shows a positif effect of inflation on economic growth. On the other hand, the Ayyoub et al. (2011) found a different direction of the coefficient, namely inflation has a significant negative coefficient on economic growth in Pakistan. These results confirm that inflation at a certain threshold is detrimental to the economy in Pakistan. Uncontrolled inflation will reduce economic growth because an increase in the price of goods in a certain period can reduce aggregate demand and slow down economic growth.

Saymeh & Orabi (2013) research in Jordan found that interest rates and inflation impact economic growth in the long term (Saymeh & Orabi, 2013). Moyo & Le Roux (2018) found that an increase in deposit interest rates will increase savings, increases the amount of investment and encourages growth. Meanwhile, the research results by Hansen & Seshadri (2014) found an inverse relationship between interest rates and productivity growth because when interest rates are low in the long term. Meanwhile, research using the VECM method and causality tests in Nepal reveal that the money supply is significantly positive for economic development (Gnawali, 2019).

Khabo (2002) and Michael et al. (2020), as Keynesian supporters, argue that money is not the leading center in the economy, and economic growth cannot be said to affect the money supply in transactions in society significantly. Keynesians say that interest rates and investment as intermediaries in influencing production through monetary policy. On the other hand, monetarists argue that a prolonged decline in the money supply has the effect of a continuing recession and depression due to the absence of an expansion in the number of currencies. Doan Van (2020) found that the money supply would lead to higer inflation in long run and resulting in a decrease in economic growth.

Several existing studies show inconsistencies in results between studies in one country and

another. Therefore, we argue that the role of the central bank in determining the direction of the coefficients of macroeconomic variables, such as exchange rates, inflation, and interest rates, on growth is vital. As previously explained, the appreciation of the exchange rate will provide more bargaining power and create opportunities for a decline in exports and interest rates, money supply, and inflation. This study focuses on Indonesia's monetary policy over the past two decades; using the VECM method, we analyze the historical short-term and long-term effects of the central bank's policy.

Research Method

The data used is quarterly data for the period 2004-2019. This research method uses the Vector Error Correction Model (VECM), one of the popular dynamic modeling techniques in monetary policy studies (Arin and Jolly, 2008). The estimation of this VECM model includes several pre-estimated tests as a prerequisite to proceed to the VECM estimation test stage itself. Several VECM pre-estimated tests consist of data stationarity, optimum lag, cointegration, Granger causality, and VECM estimation tests. Then there are properties in the VECM estimation to see the response between variables when other variables change by looking at the Impulse Response Function (IRF) and Factor Error Variance Decomposition (FEVD). In detail, the following are the steps in testing the VECM model estimate:

1. Stationarity test (unit root test)

This test aims to see whether the data used in each variable is stationary or not. In analyzing time series data, the unit root test can be performed using the Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP test) approaches. This test is also carried out to avoid false regressions, resulting in biased analysis results (Gudjarati and Porter, 2009). There are three levels in the data stationarity test, namely level, first difference, and second difference. To see whether the data is stationary or not, it can be seen by comparing the probability value of static data with an alpha of 1%, 5%, or 10%. If the probability of the data is less than the alpha value, then the information is said to be stationary, and vice versa. If the probability value of the data is more significant than alpha, then the data is not stationary.

2. Cointegratrion test

The next pre-estimation test is the degree of integration test. This test aims to see whether the variables used in the research model have a consistent long-term relationship. This test must ensure that all the variables used have the same degree of integration and the error term does not contain a trend or a unit root. Several tests can be performed, including the Johansen, Engle-Granger, and Durbin Watson tests. This study uses the Johansen test by looking at the value of the trace statistic and t-table or critical importance. If the trace statistic is significant, the cointegration exists, which means a long-term relationship in the research model used and vice versa.

3. Optimal Lag Test

This test aims to determine the optimum lag of the VAR or VECM models used in the study. This test is done by finding the optimum lag by looking at the stability of the model. This optimum lag test can be carried out using several approaches, including Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quiin Information Criterion (HQ). These results can be seen through the lowest AIC, SC, and HQ values from the first lag to the maximum lag (Rosadi, 2012).

4. Granger Causality

Testing This test assumes that the disturbances contained in error terms 1 and 2 are not correlated so that between variables can have interrelated relationships. From the Granger causality test results, it can be seen that there is a causal relationship between variables in the model.

5. Impulse Response (IRF) Function

After estimating the VECM model, it is necessary to explain the dynamic structure generated by VECM. The Impulse Response Function (IRF) helps explain the dynamic system of the VECM model by showing the presence of shock between the endogenous variables and the variables themselves. The dependent variable will respond to this shock on the shock or shock that occurs with the standard deviation value in the VECM model (Gudjarari, 2004).

6. Variance Decomposition (VD)

If IRF describes the response of other variables when shock occurs in other variables, VD shows the proportion of shock responses in the form of percentage figures.

The research model follows equation (1)-(6) with delta is change in the variable period in the VECM model; GDP is real GDP in billions of rupiah; ER is the exchange rate with rupiah units; Inf is inflation that reflects prices; IR is the reference interest rate of Bank Indonesia with the proxy BI7DRR (BI 7 day repo rate) as a reflection of the policy of the Central Bank; M2 is the amount of money circulating in

the community consisting of currency and demand deposits with units of billions of rupiah; the log is an alternative to linearize the model because several data have different departments; $\beta_0; \beta_1; \beta_2; \beta_3; \beta_4$ is an adjustment of the short-term model in the VECM model to reach the equilibrium point in the long run.

$$logGDP = \alpha + \beta_1 LogER_t + \beta_2 Inf_t + \beta_3 IR_t + \beta_4 LogM2_t + e_t \tag{1}$$
$$\Delta logGDP_t = \beta_0 + \beta_1 \Delta logER_{t-1} + \beta_2 \Delta Inf_{t-1} + \beta_3 \Delta IR_{t-1} + \beta_4 \Delta logM2_{t-1} + ECT + \varepsilon_t \tag{2}$$
$$\Delta logER_t = \beta_0 + \beta_1 \Delta logGDP_{t-1} + \beta_2 \Delta Inf_{t-1} + \beta_3 \Delta IR_{t-1} + \beta_4 \Delta logM2_{t-1} + ECT + \varepsilon_t \tag{3}$$
$$\Delta Inf_t = \beta_0 + \beta_1 \Delta logER_{t-1} + \beta_2 \Delta IogGDP_{t-1} + \beta_3 \Delta IR_{t-1} + \beta_4 \Delta logM2_{t-1} + ECT + \varepsilon_t \tag{4}$$
$$\Delta IR_t = \beta_0 + \beta_1 \Delta logER_{t-1} + \beta_2 \Delta Inf_{t-1} + \beta_3 \Delta logGDP_{t-1} + \beta_4 \Delta logM2_{t-1} + ECT + \varepsilon_t \tag{5}$$
$$\Delta logM2_t = \beta_0 + \beta_1 \Delta logER_{t-1} + \beta_2 \Delta Inf_{t-1} + \beta_3 \Delta IR_{t-1} + \beta_4 \Delta logGDP_{t-1} + ECT + \varepsilon_t \tag{6}$$

Result and Discussion

Based on the unit root test results with the Augmented Dickey-Fuller approach as shown in Table 1, all variables used are stationary at the level of first difference. Based on the results of the Lag Length Criteria in Table 2, the optimal lag suggested by the SC and HQ criteria is lag one; this shows that the response of a variable to changes that occur in other variables takes place within one quarter after the change occurs, according to the data used in this study in the form of a quarterly series. The next pre-estimation test is a cointegration test to see the long-term relationship using Johansen's test. Based on Table 3, economic growth, inflation, exchange rates, interest rates, and the money supply correlate in the long run. These results confirm that the VECM test was carried out as a further test of the estimation of the research model because it met the prerequisites. In observing the results of the Granger causality test (Table 4), it can be concluded that there are groupings. The grouping consists of the relationship between one-way and two-way variables (see Table 5).

Table 1. Unit root test

Variable	Prob (level)	Note	Prob (1st difference)	Note
LogGDP	0.9142	Not stationery	0.0000	Stationer
INF	0.0000	Not stationery	0.0000	Stationer
LogER	0.6424	Not stationery	0.0000	Stationer
IR	0.1531	Not stationery	0.0023	Stationer
LogM2	1.0000	Not stationery	0.0054	Stationer

Table 2. Optimum lag test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1232.578	NA	2.65e+33	66.17232	66.36575	68.33918
1	-1063.553	310.7334*	3.76e+25	58.24667	59.66756*	59.81343*
2	-1069.536	37.55685	3.55e+69*	58.24967	60.55883	59.88354
3	-955.5226	33.21221	3.76e+88	57.92537*	61.53572	60.34588

For Granger Causality analysis, it can be concluded that the money supply and the rupiah exchange rate have a two-way relationship, which means that the money supply and the exchange rate have a mutual relationship. Then, the variable of economic growth has a one-way relationship with the exchange rate; Furthermore, the money supply has a one-way relationship with economic growth. Inflation and interest rate have a one-way relationship; inflation also shows a one-way relationship with the exchange rate, meaning that inflation affects the rupiah exchange rate. On the other hand, the results show that the exchange rate and inflation have no relationship with economic growth. Also, the exchange rate and interest rate; and the money supply with inflation have no ties.

The results of the short-term estimation in VECM show that 3.4% of non-conformities can be corrected in the short term against the long term. The estimation results in Table 6 also find that only the inflation variable shows a significant effect with a negative coefficient direction on economic growth in the short term. Long-term estimates show different results; inflation, exchange rates, and the money supply significantly affect Indonesia's economic growth, as shown in Table 7. The long-term equation shows that the inflation variable and the money supply have a significant adverse effect on GDP, and a 1% increase in inflation will reduce GDP by 0.26% in the long term.

Table 3. Johansen cointegration test

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.944612	253.2265	69.81889	0.0000
At most 1 *	0.402076	79.62276	47.85613	0.0000
At most 2 *	0.323717	48.76530	29.79707	0.0001
At most 3 *	0.225571	25.29672	15.49471	0.0012
At most 4 *	0.152939	9.958958	3.841466	0.0016

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4. Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
IR does not Granger Cause logGDP	62	0.07540	0.9275
logGDP does not Granger Cause IR		0.24542	0.7832
Inf does not Granger Cause logGDP	62	0.68564	0.5079
logGDP does not Granger Cause Inf		0.08766	0.9162
ER does not Granger Cause logGDP	62	0.69215	0.5047
logGDP does not Granger Cause ER		3.64175	0.0325
M2 does not Granger Cause logGDP	62	7.27406	0.0015
logGDP does not Granger Cause M2		13.5162	2.E-05
Inf does not Granger Cause IR	62	6.09854	0.0040
IR does not Granger Cause Inf		0.28926	0.7499
ER does not Granger Cause IR	62	0.22962	0.7956
IR does not Granger Cause ER		0.74643	0.4786
M2 does not Granger Cause IR	62	0.18737	0.8296
IR does not Granger Cause M2		0.95327	0.3915
ER does not Granger Cause Inf	62	0.61105	0.5463
Inf does not Granger Cause ER		7.72196	0.0011
M2 does not Granger Cause Inf	62	2.02791	0.1410
Inf does not Granger Cause M2		2.23552	0.1162
M2 does not Granger Cause ER	62	2.50347	0.0908
ER does not Granger Cause M2		3.71965	0.0303

The money supply variable confirms a decrease of 1% will reduce GDP by 0.53% and vice versa. It means that an increase in the money supply will decrease economic growth in the long term. Monetization behavior in Indonesia as a developing country is still at a critical level so that the circulation of money can reduce economic growth. In addition, when the response of the real sector does not match the policy of increasing the money supply, it can also lead to economic sluggishness, which results in higher prices, and suppress demand in the real sector. This condition is an anomaly to the theoretical framework of the monetarist school, which argues that an increase in the money supply will increase the growth through the real sector. Another argument from Fischer's view on monetary and money theory is that the velocity of money in a certain period that is not responded to in a balanced way by the real sector will weaken demand, which will impact decreasing economic growth; the money supply that is not controlled and does not match these needs will experience an overheating. The money supply will reduce demand in the real sector at a certain

point, which cannot respond appropriately. The speed of money movement is also a factor that affects the effectiveness of money circulation, so this is an important note because the speed of money movement is a reflection of the response of the real sector based on the conclusions of Irving Fisher's theory of money quantity (Laidler, 2011).

Table 5. One-way and two-way granger causality test

Two-way causality	One-way causality)	No causality
logM2 to logER	logGDP to logER	IR to logGDP
	logM2 to logGDP	INF to logGDP
	INF to IR	LogER toIR
	INF to logER	logM2 to IR
		logM2 to INF

Table 6. VECM estimation

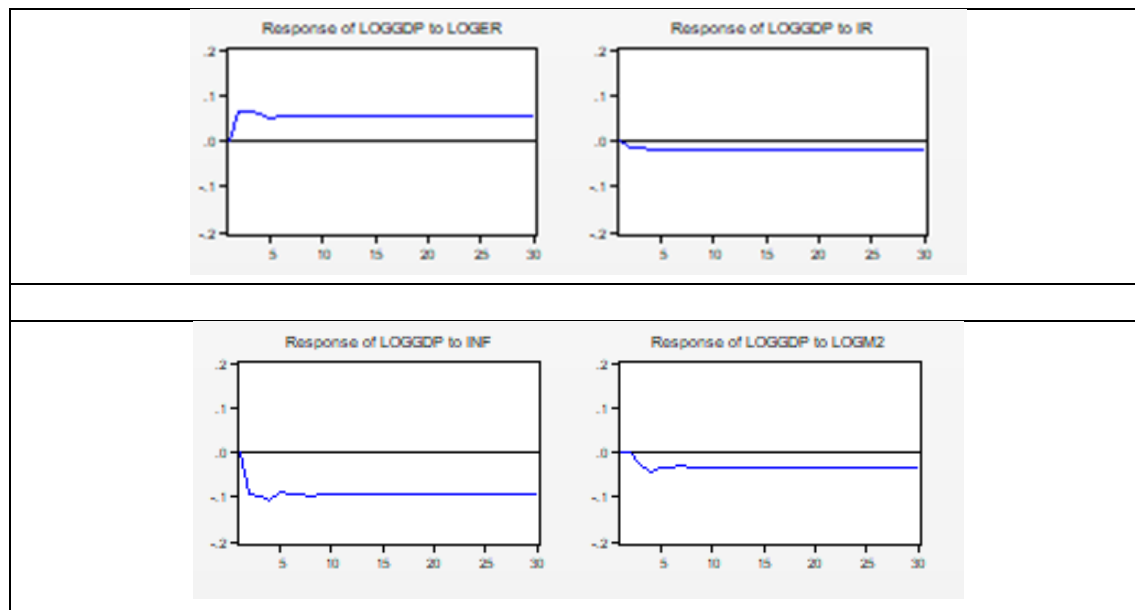| Variable	Short-term	Long-term
D(inf(-1)	-0.0076*	-0.260623*
D(logER(-1))	-0.0627	0.675765*
D(IR(-1))	-0.0004	-0.53116
D(logM2(-1))	0.1197	-9.42072*
Cointeg1	-0.0343	
Constant		-21.16255

Note: * is significant level at alpha 0.05

Figure 2. Impulse Response Function

The exchange rate variable also shows a significant effect with a positive coefficient direction. An increase in the rupiah exchange rate of 1% will increase economic growth by 3.18531. The exchange rate appreciation will increase the prices of export commodities in the global market, improving Indonesia's balance of payments. On the other hand, this condition can reduce the volume of exports. This condition will affect production output in the export sector, reducing economic growth. On the other hand, inflation or global price stability also plays a role in fluctuations in exchange rates against foreign currencies. In addition, government intervention in the form of policies on the money market and balance of payments will also affect the condition of the exchange rate itself.

The interest rate variable does not significantly affect economic growth; these results indicate an anomaly in Indonesia's monetary policy related to determining interest rates as an instrument of monetary policy. Deposit facility interest rates are often not as expected or relatively slow because banks need to consider liquidity and risk. The assumption is that financial stability will not be achieved due to low

demand for credit, and in the end, it will not have a significant impact on economic growth. In other words, the adjustment of loan interest rates to interbank money market rates in Indonesia experienced an incomplete pass-through (Hamzah & Handri, 2017).

The Impulse Response Function (IRF) reveals the response between variables when there is a change in other variables. Figure 2 shows the reaction shown by GDP when there is a change in the independent variables consisting of exchange rates, interest rates, inflation, and the money supply. The response shown by GDP to changes in each variable shows different variations. At the beginning of the period, GDP showed a high tendency to shocks caused by changes in the exchange rate in the third quarter of 2005 with a positive response. Still, the movement tended to be stable until the end of the period, although it did not reach a steady-state.

On the other hand, GDP response to policy changes in interest rates, inflation, and money supply showed an adverse reaction with a different pattern from the beginning to the end of the period. The GDP response to interest rates experienced a shock at the beginning of the period up to the first quarter of 2005 with a negative response movement. However, it began to show a stable response in the sixth quarter, although it had not yet reached the steady-state point until the end of the research period. The reaction of GDP shows the same to changes in inflation. GDP showed a significant response in a negative direction to the shock that occurred in price dynamics. However, in the second quarter of 2006, GDP began to establish a stable reaction, although it did not reach a steady state until the end of the period. GDP also shows a similar response to shocks in the money supply.

Our findings align with Pradhan et al. (2015), which explains the relationship between economic growth, inflation, and stock market developments in 34 OECD countries by testing these three variables simultaneously in the short and long term. According to Bittencourt (2012), the activities of the real sector and an open and competitive financial industry are also important in contributing to the economy. Still, they also do not rule out the role of macroeconomic stability, namely a low inflation rate and institutional framework. It is also strengthened so that sustainable growth and prosperity can occur. Furthermore, research conducted by Bostan et al. (2018) in Romania found that the exchange rate is an essential determinant of competitiveness when it is stable because it can attract high confidence in using the currency. Research by Morina et al. (2020) in 14 CEE countries during the period 2002–2018 also showed that the exchange rate is a macroeconomic factor that affects international trade and the real economy in each country. The significant effect of the exchange rate on economic growth is reinforced by research from Jamil et al. (2012).

The transmission of monetary policy with interest rate instruments does not directly affect economic growth because fluctuations tend to lower. After all, prudent monetary policy factors in maintaining and controlling price and exchange rate stability are the main reasons. So, when there is a change in interest rates, economic growth does not immediately respond. However, stable interest rates can maintain price stability in the hope that this price stability can be adequately answered by aggregate demand and supply to reflect economic growth. Based on classical theory, interest rates are determined by the intersection of supply and demand from capital or investment flows, so interest rate determination is directed at controlling prices and exchange rates and an instrument to encourage investment. Optimal investment flows will promote the real sector and the financial sector. This condition helps maintain economic stability in the financial industry and real sector. Based on this theory, the role of interest rates cannot directly affect economic growth. However, it affects aggregate demand, which can directly affect economic growth.

Conclusion, Suggestions and Limitations

The results of this study indicate that in the short term, the inflation variable has a significant effect on Indonesia's economic growth with a negative coefficient direction. At the same time, other variables do not show a significant impact. On the other hand, inflation, exchange rate, and money supply variables substantially affect economic growth in the long run. However, interest rates do not significantly affect Indonesia's economic growth. The anomaly occurs in the long-term relationship when the money supply can weaken growth; this is related to money overheating, which causes price volatility and thus cuts aggregate demand. We argue that monetary policy, which is very important to pay attention is no longer related to money circulating in the market but stressing interest rate management policies that can attract investors to drive market mechanisms, the real sector, and the financial industry. When stability in the real sector and the financial industry can occur, the sustainability of the economy will be able to grow massively.

References

Adusei, M. (2012). Financial Development and Economic Growth: Is Schumpeter Right? British Journal of Economics, Management & Trade, 2(3), 265–278. https://doi.org/10.9734/bjemt/2012/1865

Adusei, M. (2013). Financial development and economic growth: Evidence from Ghana. The International Journal of Business and Finance Research, 7. https://doi.org/10.1016/j.chieco.2005.09.003

Ayyoub, M., Chaudhry, I. S., & Farooq, F. (2011). Does Inflation Affect Economic Growth? The case of Pakistan. Pakistan Journal of Social Sciences (PJSS), 31(1), 51–64.

Bittencourt, M. (2012). Financial development and economic growth in Latin America: Is Schumpeter right? Journal of Policy Modeling, 34(3), 341–355. https://doi.org/10.1016/j.jpolmod.2012.01.012

Bostan, I., Toderaşcu (Sandu), C., & Firtescu, B.-N. (2018). Exchange Rate Effects on International Commercial Trade Competitiveness. Journal of Risk and Financial Management, 11(2), 19. https://doi.org/10.3390/jrfm11020019

Chaudhry, I. S., Qamber, Y., & Farooq, F. (2012). Monetary policy, inflation and economic growth in Pakistan: Exploring the co-integration and causality relationships. Pakistan Journal of Commerce and Social Sciences, 6(2), 332.

Chirwa, T. G., & Odhiambo, N. M. (2019). The nexus between key macroeconomic determinants and economic growth in Zambia: a dynamic multivariate Granger causality linkage. Empirical Economics, 57(1), 301–327. https://doi.org/10.1007/s00181-018-1439-2

Doan Van, D. (2020). Money supply and inflation impact on economic growth. Journal of Financial Economic Policy, 12(1), 121–136. https://doi.org/10.1108/JFEP-10-2018-0152

Gnawali, L. (2019). Money supply and economic growth of Nepal. International Journal of Economics, Business and Management Research, 03(09). https://doi.org/10.3126/craiaj.v4i1.32732

Habib, M. M., Mileva, E., & Stracca, L. (2017). The real exchange rate and economic growth: Revisiting the case using external instruments. Journal of International Money and Finance, 73, 386–398. https://doi.org/10.1016/j.jimonfin.2017.02.014

Hamzah, R. A., & Handri, H. (2017). Analisis Interest Rate Pass-Through Pada Mekanisme Transmisi Kebijakan Moneter Indonesia. EKONOMIS : Journal of Economics and Business, 1(1), 125. https://doi.org/10.33087/ekonomis.v1i1.13

Hansen, B. E., & Seshadri, A. (2014). Uncovering the Relationship between Real Interest Rates and Economic Growth. Working Paper SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2391449

Jamil, M., Streissler, E. W., & Kunst, R. M. (2012). Exchange rate volatility and its impact on industrial production, before and after the introduction of common currency in Europe. International Journal of Economics and Financial Issues, 2(2), 85–109.

Kamal, K. M. M. (2015). An ECM Approach for Long Run Relationship Between Real Exchange Rate and Output Growth: Evidence from Bangladesh. Dhaka University Journal of Science, 63(2), 105–110. https://doi.org/10.3329/dujs.v63i2.24444

Bank Indonesia. 2020. Laporan Perekonomian Indonesia Tahun 2020. https://www.bi.go.id/id/publikasi/laporan/Pages/LPI_2020.aspx

Laidler, D. (2011). 2011-1 Professor Fisher and the Quantity Theory - A Significant Encounter. Economic Working Papers Archive.

Michael, A., Owusu Oppong, E., & Gulnabat, O. (2020). Effects of Monetary Policy on Economic Growth; Evidence from Five (5) African Countries (Mauritius, Nigeria, South Africa, Namibia and Kenya) from 1980 to 2019. Scholars Journal of Economics, Business and Management, 7(9), 293–298. https://doi.org/10.36347/sjebm.2020.v07i09.002

Morina, F., Hysa, E., Ergün, U., Panait, M., & Voica, M. C. (2020). The Effect of Exchange Rate Volatility on Economic Growth: Case of the CEE Countries. Journal of Risk and Financial Management, 13(8), 177. https://doi.org/10.3390/jrfm13080177

Nizhegorodtsev, R., & Goridko, N. (2015). The impact of money supply on economic growth: theory, experience, modelling. Handbook on the Economics, Finance and Management Outlooks, 3, 66–72.

Ogunmuyiwa, M. S., & Ekone, A. F. (2010). Money Supply - Economic Growth Nexus in Nigeria. Journal of Social Sciences, 22(3), 199–204. https://doi.org/10.1080/09718923.2010.11892802

Osama, D. S. (2004). Does Inflation Harm Economic Growth in Jordan?. An Econometric Analysis for the Period 1970-2000. International Journal of Applied Econometrics and Quantitative Studies, 1(2), 41–66.

Pradhan, R. P., Arvin, M. B., & Bahmani, S. (2015). Causal nexus between economic growth, inflation, and stock market development: The case of OECD countries. Global Finance Journal, 27, 98–111.

https://doi.org/10.1016/j.gfj.2015.04.006

Razzaque, M. A., Bidisha, S. H., & Khondker, B. H. (2017). Exchange Rate and Economic Growth: An Empirical Assessment for Bangladesh. Journal of South Asian Development, 12(1), 42–64. https://doi.org/10.1177/0973174117702712

Saymeh, A. A. F., & Orabi, M. M. A. (2013). The Effect Of Interest Rate , Inflation Rate , GDP , On Real Economic Growth Rate In Jordan. 3(3), 341–354.

Thorsten, J., & Daniel, R.-C. (2015). Real Exchange Rate Volatility, Economic Growth and the Euro. Journal of Economic Integration, 30(1), 148–171.