The Impact of BI Rate, Exchange Rate, and Inflation on Broad Money in Indonesia

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Abstract: *The purpose of this study is to develop a model and research the effect of macroeconomics which includes the BI rate, exchange rate, and inflation on the development of the broad money (M2) by using data from the last ten years from 2011-2020 and obtaining 120 data. The method used in this research is quantitative research using SPSS software as a data processing tool. The results show that the variable BI rate, exchange rate, and inflation simultaneously have a significant effect on the amount of money circulating in Indonesia in the 2011-2020 period. In addition, the inflation variable and the BI rate have a negative relationship with the broad money (M2). Meanwhile, the exchange rate has a significant positive effect on broad money (M2).*

Keywords: BI Rate; Exchange Rate; Inflation; Broad Money (M2); Macroeconomics

INTRODUCTION

Money plays a big role in human life as a tool for economic transactions. Money always has a part in the monetary process of a country. Money is also very important in the country's economy because all economic activities, namely production, distribution, and consumption are closely related to money (Ichwani & Nisa, 2021). Every country in the world must be able to manage the amount of money circulating in that country. If the amount of money circulating in the community has a large amount from Bank Indonesia, it is feared that the country will experience what is called inflation. The amount of money that will circulate in the community can be analyzed or determined by the amount of money supply from the central bank and the amount of money demanded from the public.

Currently, the price of raw materials soared very high, the raw material is cooking oil. Not only cooking oil, but vehicle fuel also feels the impact (Kumparan, 2022). Osabuohien *et al*. (2018) revealed that there was an insignificant negative effect between the money supply and inflation in the short term due to the effect of time deposits. However, these two variables have a significant positive effect on each other in the long term.

Leasiwal and Subhan (2021), Ningsih and Kristiyatnti (2018), and Sahadudheen I (2015) argue that there is an effect of inflation on the money supply in the long term. This is caused by an increase in the price of the product which causes the money supply to increase as well. People will need more money if consumer prices increase. This is also supported by Ichwani and Nisa (2021) who reveal that the biggest influence on the money supply is inflation itself.

Khanom (2019), Firmansyah (2016), and Jumhur *et al*. (2017) argue that the results of the research carried out show that there is an effect of inflation on the money supply. Inflation reduces real income and people's purchasing power which increases the money supply and the impact of exports and imports that affect the movement of the money supply. This is also obtained through the explanation that an increase in the money supply will have a major impact on increasing inflation in the country. Therefore, for policymakers such as a monetary policy that must be expansive with loose money policies, they must be wiser in increasing the amount of money in circulation, because the results will greatly impact on increasing inflation in Indonesia.

The research of Susmiati *et al*., (2021) explained that inflation has a significant negative effect on the money supply, the results obtained from the money supply amounted to -5,090 and the resulting significance level amounted to 0.001. This is supported by Luwihadi and Arka (2019), and Utami and Soebagiyo (2013), that inflation does not have a significant effect on the money supply, and vice versa. To reduce the money supply, the government is expected to cooperate with the Central Bank to increase interest rates on deposits and loans. This can be an incentive for people to save and vice versa. The same opinion was expressed by Langi *et al. (*2014), that there is a relationship between the money supply and inflation which has a positive effect, but the results are not significant in Indonesia.

The government must have a way to deal with this so that inflation does not occur in the country. One of the government policies made to control inflation is called monetary policy. This policy is carried out by the authorities to control macro variables such as money supply, exchange rates, and interest rates (Susmiati *et al*.,2021). Broad money (M2) is a measure of the amount of money or known as the money supply. This amount of money in circulation is an obligation of the monetary system. In a narrow sense, the money supply is the currency in circulation plus demand deposits owned by individuals, companies, and government agencies (Ichwani & Nisa, 2021).

To control the money supply, the government issued the BI 7-Days (Reverse) Repo Rate in 2016. In the previous year, the system was known as the BI Rate. The regulation was made to strengthen the monetary framework by implementing a new benchmark interest rate or interest rate policy. Ichwani and Nisa (2021) conducted a study that could explain the BI 7-day reverse repo rate helping several banking institutions and no longer waiting for one year to withdraw funds deposited with Indonesian banks. Within 14 days, 21 days, and so on. The interest rate earned is undoubtedly much lower than the BI rate due to the shorter drawdown range. The result is very significant because it can affect the smooth distribution of credit to the public.

According to Putri and Mubin (2021), to overcome this problem, the government took a policy of increasing the BI rate to 9.25% so that the money supply in the community could be absorbed. The positive impact of the policy of increasing the BI rate was only felt in 2009 with M2 growth of only 12.95%. However, Leasiwal and Subhan (2021) conducted a study that explains that domestic interest rates have a significant and negative effect on the money supply in Indonesia which shows that the money supply in Indonesia is determined by domestic interests in the opposite direction. If interest rates increase, the money supply will also decrease. This is supported by research by Luwihadi and Arka (2019), who argue that the BI rate has a significant negative effect on the money supply. This can be done by the government by encouraging people to actively save in banks and inviting people to stop borrowing, as a result, the money owned by the community can be absorbed by the bank.

Apart from the BI 7-Days (Reverse) Repo Rate rule, some factors also influence the broad money, namely, the exchange rate. In general, the reference currency exchange rate is the value of the United States Dollar (USD). For now, the exchange rate of the Rupiah against the USD is Rp. 14,275.55. The influence of the exchange rate on the amount of money in circulation has a large impact on the Rupiah against the United States Dollar. This happens when the amount of money in circulation is very dependent on how much the amount of money is demanded. If the supply of Rupiah increases, its value will depreciate. On the other hand, if the value of the offer against the Rupiah decreases, the value will appreciate.

Murad *et al*. (2021), Leasiwal and Subhan (2021), Carissa and Khoirudin (2020), *Sean et al*. (2018), Ningsih and Kristiyatnti (2016), Ichwani and Nisa (2021), Susmiati *et al*. (2021), argues that currency exchange (exchange rate) has a positive relationship and has a significant effect on the money supply. The amount of money in circulation is seen through the supply of money, if the supply of money in a currency increases, then the exchange rate will decrease, on the other hand, if the supply of money decreases, the exchange rate will increase. The exchange rate is also known as the dominant variable that affects the money supply.

This is supported by research conducted by Adeshola *et al*. (2020), which shows the results that the relationship between exchange rates and interest rates on the money supply is positively significant. According to the researchers, the amount of money cannot be ascertained by analyzing exchange rates and interest rates but is analyzed for all macroeconomic variables including investors in these currencies.

Research conducted by Antwi *et al*., (2020), Sulikova *et al*. (2019), and Langi *et al*. (2014) show the results that the money supply, inflation, and interest rates on loans have an indirect influence on exchange rates. An increase in the money supply can have a positive effect on economic growth, but this will still happen if inflation is controlled. The same thing is found in the research of Yulianti (2014) and Awaludin and Khairunnisa (2020), who argue that in the long term, the money supply has a positive effect through an increase in the exchange rate of the rupiah to USD. This is evidenced through the research of Eris *et al*. (2017) which uses multiple linear regression analysis which results in 87.2% and 12.8% is the remainder that can be determined through other

driving factors.

Hoang *et al.*, (2020) conducted a study on the impact of money exchange on inflation and economic development in Vietnam by analyzing six variables, one of which is the bilateral real exchange rate and the money supply. The results show that an increase in the exchange rate encourages the growth of the money supply and is almost irreplaceable. Firmansyah (2016), and Luwihadi and Arka (2017), argue that the exchange rate between the rupiah/US dollar has a positive effect on the movement of the money supply and is influenced by imports and exports in the country.

Therefore, the researcher is motivated to conduct a study entitled "Analysis of the Impact of the BI Rate, Exchange Rate, and Inflation on the Amount of Money in circulation". The purposes of this study are (1) to determine the impact of the BI rate on the money supply, (2) to determine the impact of the exchange rate on the money supply, (3) to determine the impact of inflation on the money supply. The reasons for conducting this research are (1) To find out what factors can affect the money supply in the community, (2) To study and provide feedback on the important role of the government in managing finances in Indonesia, (3) To inform the public to fully understand the financial policies that have been made by the government.

METHODOLOGY

The approach that has been used in this research is quantitative research. Based on the data collected in this study, the researcher uses secondary data where the data is collected from previous studies or data that has been collected by other people for certain purposes (Sekaran & Bougie, 2016). Reliable data sources have been collected from several separate official government websites, namely broad money (M2) sourced from the official BPS website (www.bps.go.id), exchange rate data from the official website of the Ministry of Trade (www.kemendag.go.id).), inflation data and BI rate are from the official BI website (www.bi.go.id) and BPS starting from January 2011 to December 2020 per month with a period of the last 10 years. The data processing carried out in this study is processed with the SPSS software application. With this software, it can explain the data quantitatively and effectively. The model used in this study is a multiple regression model which is specifically linear based and also recalls that this research variable has one dependent variable and three independent variables. The dependent variable in this study is the money supply originating from BPS in as many as 120 samples from the period 2011 to 2020. The following data can be obtained through www.bps.go.id which is a component of the money supply consisting of currencies owned by the public (excluding commercial banks and rural banks) (Ichwani & Nisa, 2021). The independent variables in this study are the BI rate, exchange rate, and inflation. BI can help several banking institutions that no longer have to wait up to a year to withdraw funds deposited with Bank Indonesia. Within 7 days and multiples thereof (14 days, 21 days, and so on). The interest rate is the reference interest rate issued by Bank Indonesia and the data used are data from 2011 to 2020 (Ichwani & Nisa, 2021). The exchange rate is the price at which one currency is exchanged for another in the foreign exchange market. The exchange rate variable has a nominal unit, the exchange rate used is the nominal exchange rate of the Rupiah against the USD from 2011 to 2020 (Putri & Mubin, 2021). Inflation is a general continuous increase in prices as measured by the inflation rate based on the consumer price index. The data is taken from 2011 to 2020 (Leasiwal & Subhan, 2021).

RESULTS

Descriptive Statistics Test

This research was conducted quantitatively using secondary data in the form of broad money, BI rate, exchange rate, and inflation. Data is taken monthly from January 2011 to December 2020 so the total data used in this study is 120 data. For the variables of the broad money and the exchange rate, the researcher performs a logarithmic transformation so that the data can meet the assumptions underlying the analysis of variance. The following table shows the minimum, maximum, mean, and standard deviation values of each research variable.

Table 1. Descriptive Statistics Test

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Broad Money	120	6.38	6.84	6.6369	0.12589
BI Rate	120	0.0375	0.0775	0.059042	0.0117805
Exchange Rate	120	3.93	4.21	4.0863	0.07774
Inflation	120	0.0132	0.0879	0.045028	0.0183792

Source: Data Processed (2022)

Classic Assumption Test

The classical assumption test was carried out to show the data studied were consistent and unbiased. This test consists of a normality test (One Sample Kolmogorov-Smirnov), multicollinearity test, and autocorrelation test.

Table 2. Normality Test Results

Description	Test Results
N	120
Sig.	0.063

Source: Data Processed (2022)

The results of the normality test showed that the research data had a normal distribution. This can be seen from the test value of 0.063 which has met the test criteria, namely the test value must reach above 0.05.

Table 3. Multicollinearity Test Results

Independent Variable	Collinearity Tolerance	Statistics VIF
BI Rate	0.390	2.565
Exhange Rate	0.824	1.213
Inflation	0.361	2.769

Source: Data Processed (2022)

The multicollinearity test above shows the VIF results and the tolerance values of all variables have reached the criteria. This is evidenced by the VIF value which is smaller than 10 and the tolerance value is greater than 0.1 so there is no correlation between the independent variables.

Table 4. Autocorrelation Test Results

Model	Durbin-Watson
1	0.370

Source: Data Processed (2022)

A good regression model is if there is no autocorrelation in the model. The result of the autocorrelation test above shows the Durbin-Watson value of 0.370. This test must have a value higher than 0.05 so that it can be said that the research model has reached the criteria.

Hypothesis Testing

Hypothesis testing is a test to see whether the research hypothesis is accepted or rejected. This test consists of the t test (partial) and F test (simultaneous).

Table 5. t Test Results

Independent Variable	Coefficients	t-Statistic	Sig.	Conclusion	Hypothesis
(Constant)	0.129	9.249	0.000		
BI Rate	0.296	-6.777	0.000	Significant (-)	Proven
Exchange Rate	0.031	44.311	0.000	Significant (+)	Proven
Inflation	0.197	-3.493	0.001	Significant (-)	Proven

Source: Data Processed (2022)

t test (Partial) is a test that shows the effect of each independent variable partially. If the probability value (significance) is less than 0.05 then the variable is declared to have a significant effect. For the direction of the effect, it can be seen from the t value which shows positive or negative results. The results of the tests conducted by the researchers showed that the exchange rate variable had a significant positive effect, while the inflation variable and the BI rate had a significant negative effect on the broad money.

Table 6. F Test Results

Dependent Variable	Sig.	Conclusion
Broad Money	0.000	Significant

Source: Data Processed (2022)

F test (simultaneous) is used to show the effect of the independent variable on the dependent variable simultaneously. Based on the table above, the probability value obtained is 0.000 where the value is less than 0.05. This result can be interpreted that the BI rate, exchange rate, and inflation variables have a significant effect on broad money simultaneously.

Table 7. Coefficient of Determination Results (R Square)

Dependent Variable	R Square	Adjusted R Square

Broad Money	0.965	0.964

Source: Data Processed (2022)

The result of the coefficient of determination test (Adjusted R Square) above shows that the influence of the independent variable on the dependent variable of this research model is 0.964. This means that the BI rate, exchange rate, and inflation have an effect of around 96.4% on broad money, while 3.6% is influenced by other factors.

DISCUSSION

Based on the tests that have been carried out by researchers, it is known that the BI Rate has a significant negative effect on the money supply. The BI rate variable has a t value of -6.777 with a probability value (significance) of 0.000 so the BI rate has a significant negative effect on the money supply. This result is proven by the previously assumed hypothesis and can be supported by research conducted by Leasiwal and Subhan (2021) and Luwihadi and Arka (2019). According to Leasiwal and Subhan (2021), if interest rates increase, the money supply will decrease. This is because people will tend to deposit money in banks to generate profits if the BI rate increases.

The exchange rate has a significant positive effect on the money supply. The exchange rate variable was obtained at a value of 44,311 with a probability value (significance) of 0.000. Therefore, it can be concluded that the exchange rate has a significant positive effect on the money supply so this result is proven by the previously assumed hypothesis. The results of this study are consistent with the study by Murad *et al*. (2021), Leasiwal and Subhan (2021), Carissa and Khoirudin (2020), Sean *et al*. (2019), Ningsih and Kristiyatnti (2018), Ichwani and Nisa (2021), Susmiati *et al.* (2021), and Adeshola *et al*. (2020). According to Carissa and Khoirudin (2020), the amount of money in circulation is seen through the supply of money, if the supply of money in a currency increases, the exchange rate will decrease. On the other hand, a decrease in the money supply will cause the exchange rate to increase. The exchange rate is also known as the dominant variable that affects the money supply.

Inflation has a significant negative effect on the money supply. The inflation variable has a t value of -3.493 with a probability value (significance) of 0.001 so inflation has a significant negative effect on the money supply. This result is proven by the hypothesis assumed by previous researchers. The results of this study obtained the same results as the research conducted by Susmiati *et al*. (2021), Khanom (2019), Firmansyah (2016), and Jumhur *et al*. (2018). An increase in the money supply will have a major impact on increasing inflation in the country. The reason is that there is a large amount of money in circulation but the number of goods on the market does not change. Too much money supply will cause an increase in the price of goods in the market. On the other hand, economic growth will decline when the money supply is too small (Jumhur *et al*., 2018).

CONCLUSION

Based on the results of the analysis and discussion of the analysis of the Impact of BI Rate, Exchange Rate, and Inflation on Broad Money in Indonesia for the period 2011 to 2020, it can be concluded as follows:

1. The variable BI rate, exchange rate, and inflation simultaneously have a significant effect on the amount of money circulating in Indonesia in the 2011-2020 period.
2. In addition, the exchange rate variable has a significant positive effect, while the inflation variable and the BI rate have a significant negative relationship with the broad money.
3. Recommendations that can be given by researchers are to add several new variables related to macroeconomics from data and phenomena as drivers of increasing broad money.

REFERENCES

Adeshola, F. G., Ajang, J. D., Bwonlu, B. M., & Zumba, Y. I. (2020). *Interest Rate And Exchange Rate In An Oil Dependent Economy : The Case Of Nigeria*. *4*(5).

Antwi, S., Issah, M., Patience, A., & Antwi, S. (2020). The effect of macroeconomic variables on exchange rate: Evidence from Ghana. *Cogent Economics and Finance*, *8*(1). https://doi.org/10.1080/23322039.2020.1821483

Awaludin, R. C., & Khairunnisa, K. (2020). Pengaruh Jumlah Uang Beredar (m2), Nilai Tukar Rupiah Terhadap Dolar (usd), Dan Bi 7 Day (reverse) Repo Rate Terhadap Return Jakarta Islamic …. *EProceedings of Management*, *7*(1), 787–794.

Carissa, N., & Khoirudin, R. (2020). The factors affecting the rupiah exchange rate in Indonesia. *Jurnal Ekonomi Pembangunan*, *18*(1), 37–46. https://doi.org/10.29259/jep.v18i1.9826

Eris, I., Putro, T., & Kornita, S. (2017). Pengaruh Tingkat Suku Bunga Bi Rate, Jumlah Uang Beredar Dan Neraca Pembayaran Terhadap Nilai Tukar Rupiah Tahun 2006-2015. *Jurnal Online Mahasiswa Fakultas Ekonomi Universitas Riau*, *4*(1), 393–404.

Firmansyah. (2016). Inflasi, Nilai Tukar Rupiah, Ekspor dan Impor yang Mempengaruhi Terhadap Jumlah Uang Yang Beredar di Indonesia 2010-2014. *Jurnal Wira Ekonomi Mikroskil*, *6*(01), 45–54.

Hoang, T. T., Thi, V. A. N., & Minh, H. D. (2020). The impact of exchange rate on inflation and economic growth in Vietnam. *Management Science Letters*, *10*(5), 1051–1060. https://doi.org/10.5267/j.msl.2019.11.004

Ichwani, T., & Nisa, C. (2021). *Determinants of BI 7 – Days Reverse Repo Rate , GDP , and Exchange Rate Against the Money Supply*. *3*(2), 92–99.

Jumhur, J., Nasrun, M. A., Agustiar, M., & Wahyudi, W. (2018). Pengaruh Jumlah Uang Beredar, Ekspor dan Impor Terhadap Inflasi (Studi Empiris Pada Perekonomian Indonesia). *Jurnal Ekonomi Bisnis Dan Kewirausahaan*, *7*(3), 186. https://doi.org/10.26418/jebik.v7i3.26991

Khanom, M. S. (2019). Economic Transformation in Bangladesh and the Income Velocity of Broad Money: An Econometric Analysis. *The Journal of Social Sciences Research*, *5*(52), 408–417. https://doi.org/10.32861/jssr.52.408.417

Kumparan. (2022). *Faktor-Faktor yang Memengaruhi Jumlah Uang yang Beredar di Masyarakat*. https://kumparan.com/kabar-harian/faktor-faktor-yang-memengaruhi-jumlah-uang-yang-beredar-di-masyarakat-1xIejGINjlR

Leasiwal, T. C., & Subhan, M. (2021). *Factors That Influence Money/M2 Money In Indonesia (Data Period Q1.2001-Q4.2015)*.

Luwihadi, N. L. A., & Arka, S. (2017). Determinan Jumlah Uang Beredar dan Tingkat Inflasi di Indonesia Periode 1984-2014. In *Fakultas Ekonomi dan Bisnis* (Vol. 6, Issue 4).

Manuela Langi Theodores ,Masinambow Vecky, S. H. (2014). *Analisis Pengaruh Suku Bunga Jml Uang Beredar Kurs Thdp Inflasi Indonesia*. *14*(2).

Murad, S. M. W., Salim, R., & Kibria, M. G. (2021). Asymmetric Effects of Economic Policy Uncertainty on the Demand for Money in India. *Journal of Quantitative Economics*, *19*(3), 451–470. https://doi.org/10.1007/s40953-021-00235-1

Ningsih, S., & Kristiyatnti, L. (2016). Analisis Pengaruh Jumlah Uang Beredar, Suku Bunga , Dan Nilai Tukar Terhadap Inflasi Di Inodnesia Periode 2014-2016. *Jurnal Ekonomi Manajemen Sumber Daya*, *20*(1), 96–103.

Personal, M., & Archive, R. (2015). *A cointegration and error correction approach to the determinants of inflation in India*. *65561*.

Putri, N. V. K., & Mubin, M. K. (2021). Financial Deepening Relationship With Economic Growth in Indonesia. *Jurnal Ilmu Ekonomi Terapan*, *6*(1), 133. https://doi.org/10.20473/jiet.v6i1.26220

Sciences, A. E. (2018). *Volume XIII Editorial Board Editor in Chief*. *XIII*(4).

Sean, M., Pastpipatkul, P., & Boonyakunakorn, P. (2019). Money Supply, Inflation and Exchange Rate Movement: The Case of Cambodia by Bayesian VAR Approach. *Journal of Management, Economics, and Industrial Organization*, *December 2018*, 63–81. https://doi.org/10.31039/jomeino.2019.3.1.5

Sekaran, U., & Bougie, R. (2016). *Research Methods for Business*.

Šuliková, V., Siničáková, M., & Štiblárová, Ľ. (2019). Does inflation affect the relationship between broad money and economic growth?: a threshold model. Ekonomický časopis, 67(6), 569-586.

Susmiati, S., Giri, N. P. R., & Senimantara, N. (2021). Pengaruh Jumlah Uang Beredar dan Nilai Tukar Rupiah (Kurs) Terhadap Tingkat Inflasi di Indonesia Tahun 2011-2018. *Warmadewa Economic Development Journal (WEDJ)*, *4*(2), 68–74. https://doi.org/10.22225/wedj.4.2.2021.68-74

Utami, A., & Soebagiyo, D. (2013). Penentu Inflasi Di Indonesia; Jumlah Uang Beredar, Nilai Tukar, Ataukah Cadangan Devisa? *Jurnal Ekonomi & Studi Pembangunan*, *14*(2), 144–152.

Wirtschaft, Z. B. W. L. (1999). Digitales Archiv. *Materials Testing*, *41*(7–8), 307–307. https://doi.org/10.1515/mt-1999-417-807

Yulianti, I. N. (2014). Pengaruh Jumlah Uang Beredar (M2), Tingkat Suku Bunga SBI, Impor, Dan Cadangan Devisa Terhadap Nilai Tukar Rupiah / Dolar Amerika Tahun 2001 - 2013. *Economics Development Analysis Journal*, *3*(2), 284–292.