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Analysis of monetary policy response during normal period and during covid-19 pandemic to inflation in Indonesia

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ABSTRACT

The purpose of this study is to analyze the effect of Money Supply, Interest Rates and Exchange Rates on Inflation during the Covid-19 pandemic and see the differences in monetary policy responses during normal times and during the Covid-19 pandemic in Indonesia.The method used in this study is Markov Switching Autoregressive by Hamilton which is a model of combining Markov and Autoregressive chains that can explain structural changes in time series data. The variables used in this study are Inflation as the dependent variable and Jub, Interest Rates, and Exchange Rates as independent variables, and are processed using RStudio 4.2.1 and Eviews 10 software. The results show that in regime 1, Jub, Interest Rate, and Exchange Rate have no significant influence on Inflation. While in regime 2, Jub, Interest Rate, and Exchange Rate have a significant influence on Inflation. The response of monetary policy during normal times to the development of macroeconomic conditions, especially at the level of inflation, Jub, interest rates, and the rupiah exchange rate is that Bank Indonesia is aware of the risks that will occur in the macroeconomic balance in Indonesia by ensuring adequate liquidity, maintaining monetary and financial system stabilization so that stimulus in the economy can run effectively. Meanwhile, during the crisis period including the Covid-19 pandemic, Bank Indonesia has coordinated very closely with the Financial Services Authority (OJK) and also with the Government to formulate policies to mitigate the impact of the Covid-19 pandemic so that macroeconomic and financial system stability is well maintained to maintain the momentum of Indonesia's economic growth.

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1. INTRODUCTION

The financial crisis that Indonesia experienced during 1997 to 1998 resulted in market failures that adversely affected economic conditions in Indonesia. The financial crisis started with the Rupiah exchange rate depreciating against the US Dollar, damaging the foundation of the Indonesian economy, especially at the banking level. The implication of a prolonged monetary crisis in a country is inflation. Inflation is defined as an event of increasing prices on goods and services as a whole and continuously over a certain period of time (Bank Indonesia, 2020).

After the monetary crisis, at the end of 2019 the world was again shocked by a global crisis caused by a viral disease outbreak, namely SARS-CoV2 with the scientific name "Severe Acute Respiratory Syndrome Coronavirus 2" but more familiar as "corona virus" (Mohanty et al., 2020). The Covid-19 pandemic has also had an impact on macroeconomic variables in Indonesia, namely inflation. Mankiw (2009:80) explains that inflation is an increase in the average price level, which is the rate of exchange of money for goods and services. Inflation is one of the most important indicators to achieve financial system stability in every country, especially Indonesia (Rusydiana et al., 2019). Economic growth in a country will also increase if it has a stable inflation rate or tends to be low, where economic growth is the increase in production activities for goods and services in society as a result of the development of a country's economy (Aulianda, 2019).

In Indonesia, the inflation rate is influenced by several factors, namely the amount of money in circulation, interest rates, and exchange rates. However, the measure that is usually used in analyzing the impact of money on the economy is using the analysis of the circulation of the amount of money, both M1 in a narrow sense and M2 in a broad sense. According to Bank Indonesia (2020), M1 includes currency and demand deposits, including electronic money issued by banks, while M2 consists of M1 plus securities other than shares and quasi-money issued by banks. Economists say that M1 is an asset that is dominated as a store of value (Mankiw et al., 2009). In controlling inflation, Bank Indonesia (BI) has set an interest rate policy. Where, the condition of interest rates is very influential on Indonesia's economic growth. Furthermore, the amount of investment and savings in a country's economy is also influenced by interest rates (Sukirno, 2011).

The condition of the Bank Indonesia interest rate is closely related to investment activities in a company. It aims to determine the expectations of future interest rates, in order to create accuracy in the planning carried out by a company and can also convince investors (Surachmad, 2021). In addition, there are many impacts caused by the Covid-19 pandemic, one of which is stock market movements. During the Covid-19 pandemic, some investors had doubts about investing in stocks, because many industries and companies were affected by the Covid-19 pandemic, so many investors sold their shares. Amidst the uncertainty of global financial markets and seeing the Covid-19 pandemic impacting economic conditions in Indonesia, the government has issued several policies in order to overcome the risks of the spread of Covid-19, especially in the economic sector. In maintaining and encouraging economic growth, Bank Indonesia has controlled stability in the financial markets and financial system in Indonesia. The Covid-19 pandemic is an extraordinary event, so extraordinary measures are also needed to maintain economic conditions in a country. Overall, the emergence of the Covid-19 pandemic has created extreme uncertainty, which has caused a weakening of monetary policy transmission.

Inflation is one of the economic variables in the form of time series data. Time series data is a series of observational data organized by time, generally at equally long intervals. Time series data modeling usually uses Autoregressive Integrated Moving Average (ARIMA), Autoregressive Conditional Heteroskedastic (ARCH), and Generalized Autoregressive Conditional Heteroscedastic (GARCH) models, but these three models do not take into account structural changes. Structural change is a change in the pattern that occurs in time series data. Suppose the first period shows an upward trend pattern, then the next period forms a seasonal pattern and in the next period forms a new type of pattern again so that conditions like this are called structural changes. One model that can be used to model data experiencing structural change problems is the Markov Switching Autoregressive (MSAR) model. Therefore, given that the Covid-19 pandemic has various impacts and causes uncertainty in economic conditions, it is important to further analyze the effect and effectiveness of monetary policy to frame policy actions both for the present and the future.

Based on the explanation described above, it is very important for researchers to examine how the influence of the Money Supply, Interest Rate on the inflation rate during the Covid-19 pandemic. The importance for researchers to examine this is because the relationship between inflation and the circulation of money, interest rates and exchange rates is a topic of long debate and there are still gaps in previous research (Joof and Jallow, 2020). Then, the results obtained later the author hopes that it can also help the government to overcome economic problems in Indonesia, especially in economic recovery after the Covid-19 pandemic. Therefore, this thesis is submitted with the research title "Analysis of Monetary Policy Response During Normal Times. Therefore, researchers are interested in examining the research "Analysis of Monetary Policy Response During Normal Times and During the Covid-19 Pandemic Against Inflation in Indonesia".

2. RESEARCH METHOD

This research belongs to the quantitative type, using numerical data or numbers and analyzed using statistical analysis techniques. To analyze data on the impact of money supply, interest rates and exchange rates on inflation during the Covid-19 pandemic in Indonesia from January 2010 to April 2022, we will analyze using the Markov Switching Autoregressive (MSAR) method with time series data to analyze changes in fluctuations in the data, calculate transition opportunities, and calculate the average duration for each state (Aulianda, 2019). Time series data is a type of data whose use is often carried out in economic analysis between times, so many analytical methods can be used to explore the information contained in the time series data. A series of time series data observations can be symbolized by (Yt), where t is the time sequence of observations (Ekananda, 2022). The model and analysis techniques refer to (Munawwaroh, 2020), (Bartolomius & Aprizkiyandari, 2021), (Nurfalah & Rusydiana, 2021), (Asmaranda, 2018), and (Wizsa, 2019).

The data sources used are Inflation Data in Indonesia from 2010 to 2022, Money Supply Data in Indonesia from 2010 to 2022, Interest Rate Data in Indonesia from 2010 to 2022, Rupiah currency exchange rate data against the US Dollar from 2010 to 2022. The purpose of this study is to determine the effect of the amount of money in circulation, interest rates in Indonesia in 2010 to 2022, and the exchange rate of the Rupiah against the US dollar in 2010 to 2022.

3. RESULTS AND DISCUSSIONS

a. Monetary Policy Responses in Normal Times

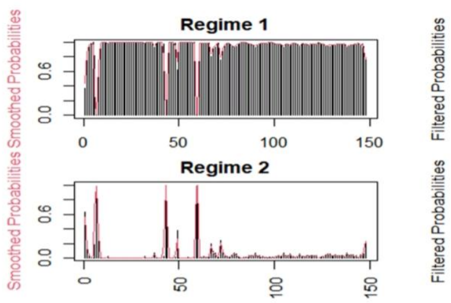
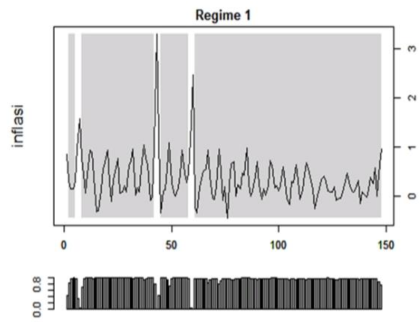


Figure 1. Filtered and Smoothed Probabilities of MSAR Model
Source: Filtered and Smoothed, processed with Rstudio (2022)

Based on Figure 1 which is the condition in regime 1. The development of macroeconomic conditions, especially at the level of inflation, jub, interest rates, and the rupiah exchange rate during the study period often fluctuated. Where, this is caused by various conditions that occur at home and abroad that can disrupt the stability of the country's economy and financial system. The weakening of global economic growth conditions experienced by Indonesia due to the high uncertainty of debt and fiscal problems in Europe and the US that took place during the period from the fourth quarter of 2011 to the third quarter of 2013 will have an impact on domestic economic growth conditions. Thus, during this period Bank Indonesia will be aware of the risks that occur in the macroeconomic balance in Indonesia by ensuring adequate liquidity, maintaining monetary and financial system stabilization, and optimizing interest rate cuts so that stimulus in the economy can run effectively. Increased uncertainty in global economic growth due to the settlement of debt and fiscal issues between Europe and the US, led to a depreciation in the rupiah exchange rate. For this reason, Bank Indonesia strives to maintain the balance of the foreign exchange market so that the stability of the rupiah exchange rate can be maintained and in line with the movement of currency rates in the Asian region. In addition, the response of interest rate policy remains directed at controlling inflation based on the estimated future macroeconomic prospects. Given the weakening of domestic economic growth due to problems between Europe and the US, Bank Indonesia, the Government and OJK will coordinate with each other to strengthen the monetary policy mix in controlling inflation and strengthening the management of Foreign Debt (ULN) in order to maintain sustainable economic growth going forward. In addition, Bank Indonesia also optimizes the management of rupiah exchange rate stability by strengthening the management of rupiah liquidity in the money market, the adequacy of foreign exchange reserves, and the management of forex supply and demand. Thus, monetary policy will always be directed continuously to maintain stability at the inflation rate by managing risks so that financial system stability and monetary stability can be maintained properly.

b. Monetary Monetary Policy Responses during the Covid-19 Pandemic



Picture 2. Response Variable Regime 1
Source: Regime 1 Response Variables, processed with Rstudio (2022)

Figure 2 is the observation area of the response variable in regime 1 in normal times. Based on the figure above, it explains that the gray highlighted area is the area of the switching regression model which explains that the time series is in its own regime and is the condition of the inflation variable as the dependent variable outside the crisis period. The condition of the inflation rate, jub, interest rate, and exchange rate in regime 1 is relatively maintained besides experiencing fluctuations in each month. With the development of economic conditions that continue, Bank Indonesia continues to coordinate with the Government in managing liquidity, adjusting the BI-7 Day Reverse Repo Rate (BI7DRR), managing the exchange rate and continuing to be aware of the pressure on the inflation rate to be in the target range that has been set.

Based on Figure 2., it explains that there were several periods of crisis during the study period, be it in July 2010, July 2013, December 2014, and during the Covid-19 pandemic. The increase in the inflation rate during this period certainly requires various policies to regulate macroeconomic and financial system stability. During the Covid-19 pandemic, Bank Indonesia has coordinated very closely with the Financial Services

Authority (OJK) and also with the Government to formulate policies to mitigate the impact of the Covid-19 pandemic in order to maintain the stability of the macroeconomic and financial system financial system is well maintained to maintain the momentum of Indonesia's economic growth. In mitigating the impact of the Covid-19 pandemic, Bank Indonesia will strengthen the policy mix instruments in order to control inflation, maintain rupiah exchange rate stability, and promote the stability of the country's financial system. During the Covid-19 pandemic, various policy measures were issued to maintain macroeconomic and financial system stability, namely lowering interest rates by considering the high uncertainty of global financial markets, the condition of the rupiah exchange rate, and future inflation estimates.

In order to encourage the National Economic Recovery (PEN) program, close coordination between the Government and the Financial System Stability Committee (KSSK) is needed including coordination between monetary and fiscal policies to encourage exports, as well as economic and financial inclusion. In addition, in an effort to recover the economy, Bank Indonesia is also accelerating the digitalization of the payment system to facilitate the community in carrying out MSME activities through economic and financial services. Table 4.6 explains the effect of variables on the dependent variable during the crisis, where during the Covid-19 pandemic jub, interest rates, and exchange rates had a significant effect on the inflation rate. The results of this study are supported by the research of (Yuliani & Irwan, 2021), (Joof & Jallow, 2020), (Ridha & Mutia, 2021), (Prasasti & Slamet, 2020), and (Suginam et al., 2021), where the money supply has a positive and significant effect on the inflation rate during the Covid-19 pandemic in Indonesia. Then, research conducted by (Dawood & Anjalia, 2017), (Maharani, 2022), (Agusmianata et al., 2017), and (Dwijayanti, 2021), where the interest rate has a positive and significant effect on the inflation rate. In addition, according to Budiman (2021), (Rumondor et al., 2021), (Azizah et al., 2020), (Qing & Kusairi, 2019), where the study explains that the exchange rate affects inflation during the Covid-19 pandemic in Indonesia.

4. CONCLUSION

Based on the description of the results and discussion above, this study is used to measure the impact of JUB, Exchange Rates, Interest Rates, and the Covid-19 Pandemic both in the short and long term in Indonesia during January 2010 to April 2022. The variables in this study were measured using the Markov Switching Autoregressive (MSAR) method with the aim of knowing the development of the conditions of money circulation, exchange rates, interest rates and inflation in Indonesia both before and during the Covid-19 pandemic took place based on the study period. The estimation results in regime 1 of the MSAR model explain that the jub, interest rate, and exchange rate variables have no significant effect on the inflation rate. In regime 2, the MSAR model explains that the jub, interest rate, and exchange rate variables have a significant influence on the inflation rate during the crisis period. The transition probability of the MSAR model remaining in regime 1 is about 95.5330% and the transition probability from regime 1 to regime 2 will move by 4.4669%. Then, the transition probability of the regime remaining in regime 2 is 4.4777% and the transition probability from regime 2 to regime 1 moves by 5.5222%. The response of monetary policy during normal times to the development of macroeconomic conditions, especially at the level of inflation, jub, interest rates, and the rupiah exchange rate during the study period tends to fluctuate and be under control. Where, this is caused by various conditions that occur at home and abroad that can disrupt the stability of the country's economy and financial system. Meanwhile, during the crisis period including the Covid-19 pandemic, Bank Indonesia has coordinated very closely with the Financial Services Authority (OJK) and also with the Government to formulate policies to mitigate the impact of the Covid-19 pandemic so that macroeconomic and financial system stability is well maintained to maintain the momentum of Indonesia's economic growth.The limitations in this study that need to be addressed in the future such as, the coverage area is not so large, so the data cannot display the best and maximum results. It is hoped that future researchers will use the findings in this study as literature in carrying out future research on the same topic of discussion, increase the number of variables, increase the amount of data, and use other methods to obtain accurate research results. With the aim of identifying other variables that are considered to also affect the inflation rate in Indonesia.

REFERENCES

Agusmianata, N., Militina, T., & Lestari, D. (2017). Pengaruh jumlah uang beredar dan tingkat suku bunga serta pengeluaran pemerintah terhadap inflasi di indonesia. *Forum Ekonomi*, *19*(2), 188–200.

Asmaranda, N. (2018). Pemodelan Sektor Saham Perusahaan Jakarta Islamic Index dengan Pendekatan Markov Chain dan Markov Switching Model. *Institut Teknologi Sepuluh Nopember, Surabaya*.

Aulianda, F. A. (2019). *Pengaruh Inflasi dan Suku Bunga Terhadap Pertumbuhan Ekonomi di Aceh*. UIN AR-RANIRY.

Azizah, N. M., Anggraeni, L., & Irawan, T. (2020). Pengaruh kinerja keuangan dan makroekonomi terhadap harga saham sektor industri konsumsi. *Jurnal Ekonomi*, *25*(2), 304–319.

Bank Indonesia. (2020). *Indonesia Economic Report 2020 "Synergy to Build Optimism for Economic Recovery."* Bersinergi Membangun Optimisme Pemulihan Ekonomi. https://www.bi.go.id/id/publikasi/laporantahunan/perekonomian/Documents/9_LPI2020.pdf

Bartolomius, S. M., & Aprizkiyandari, S. (2021). Pemodelan Markov Switching Autoregressive (MSAR) pada Data Inflasi di Indonesia. *Bimaster: Buletin Ilmiah Matematika, Statistika Dan Terapannya*, *10*(4).

Dawood, T. C., & Anjalia, E. (2017). Analisis pertumbuhan ekonomi, suku bunga, jumlah uang beredar, harga minyak dunia dan inflasi di Indonesia. *Jurnal Ilmiah Mahasiswa Ekonomi Pembangunan*, *2*(4), 554–565.

Dwijayanti, N. M. A. (2021). Pengaruh Nilai Tukar dan Inflasi Terhadap Harga Saham Perbankan Pada Masa Pandemi COVID-19. *Jurnal Bisnis Dan Kewirausahaan*, *17*(1), 86–93.

Ekananda, M. (2022). Role of macroeconomic determinants on the natural resource commodity prices: Indonesia futures volatility. *Resources Policy*, *78*, 102815.

Joof, F., & Jallow, O. (2020). The Impact of Interest Rate and Inflation on the Exchange Rate of the Gambia. *International Journal of Economics, Commerce and Management, United Kingdom*, *8*.

Maharani, P. (2022). *Determinan Inflasi Di Indonesia Periode 1995-2020*. Universitas Muhammadiyah Surakarta.

Mankiw, N. G., Bandyopadhyay, D., & Wooding, P. (2009). *Principles of macroeconomics in New Zealand*. Cengage Learning.

Mohanty, S., Rashid, M. H. A., Mridul, M., Mohanty, C., & Swayamsiddha, S. (2020). Application of Artificial Intelligence in COVID-19 drug repurposing. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(5), 1027–1031.

Munawwaroh, N. A. (2020). *Penerapan Model Markov Switching Autoregressive pada data inflasi (Indeks Harga Konsumen)*. Universitas Islam Negeri Maulana Malik Ibrahim.

Nurfalah, I., & Rusydiana, A. S. (2021). the regime switching of cycle instability of Islamic banking and the economy: evidence from Indonesia, Malaysia, and Pakistan. *Journal of Islamic Monetary Economics and Finance*, *7*(2), 233–262.

Prasasti, K. B., & Slamet, E. J. (2020). Pengaruh Jumlah Uang Beredar Terhadap Inflasi Dan Suku Bunga, Serta Terhadap Investasi Dan Pertumbuhan Ekonomi Di Indonesia. *Jurnal Ekonomi Dan Bisnis Airlangga*, *30*(1).

Qing, Y. K., & Kusairi, S. (2019). The Effect of money supply, exchange rate, and interest spread toward the performance of stock market in Malaysia. *Widyakala Journal*, *6*(2), 142–149.

Ridha, A., & Mutia, R. (2021). Analisis Permintaan Uang di Indonesia: Pendekatan Autoegressive Distributed lag (Ardl). *Jurnal Samudra Ekonomika*, *5*(2), 152–160.

Rumondor, N., Kumaat, R. J., & Tumangkeng, S. Y. L. (2021). Pengaruh Nilai Tukar dan jumlah uang beredar terhadap inflasi di Indonesia Pada Masa Pandemic COVID-19. *Jurnal Berkala Ilmiah Efisiensi*, *21*(3).

Rusydiana, A. S., Rani, L. N., & Hasib, F. F. (2019). Manakah Indikator Terpenting Stabilitas Sistem Keuangan?: Perspektif Makroprudensial. *Jurnal Ekonomi Dan Pembangunan*, *27*(1), 25–42.

Suginam, S., Siska, E., & Hidayat, S. (2021). Pengaruh Nilai Tukar Uang, Jumlah Uang Beredar dengan Kegiatan Export Terhadap Inflasi Pada Masa Pandemic Covid-19. *Ekonomi, Keuangan,* *Investasi Dan Syariah (EKUITAS)*, *3*(2), 33–38.

Sukirno, S. (2011). Makro ekonomi teori pengantar edisi ketiga. *Rajawali Pers, Jakarta*, *90*.

Surachmad, S. (2021). ANALISIS PENGARUH INFLASI, HARGA EMAS, KURS RUPIAH TERHADAP SUKU BUNGA BANK INDONESIA SAAT PANDEMI COVID-19 (ANALYSIS OF THE EFFECT OF INFLATION, GOLD PRICE, RUPIAH EXCHANGE ON BANK INDONESIA INTEREST RATE DURING COVID-19 PANDEMIC). *JPIM (Jurnal Penelitian Ilmu Manajemen)*, *6*(3), 241–255.

Wizsa, U. A. (2019). Bayesian Approach to The D-Optimal for Mixture Experimental Design. *Jurnal Riset Dan Aplikasi Matematika (JRAM)*, *3*(2), 109–115.

Yuliani, A., & Irwan, I. (2021). ANALISIS INFLASI DI INDONESIA SEBELUM DAN SETELAH PANDEMI COVID-19 DENGAN MENGGUNAKAN ECM. *PROSIDING SENDIKA*, *7*(1).