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ANALYSIS OF MONETARY INDICATOR VARIABLES ON THE STABILITY OF PRICES OF GOODS AND SERVICES BEFORE AND DURING THE COVID- 19 PANDEMIC

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Abstract**:** *This study aims to analyze the contributions of the variable interactions of monetary policy in the stability of goods and services prices. Where is the monetary policy variable (inflation, kurs, consumer price index, gross domestic products, the money supply, and interest rates). Research in conducted in the country of Indonesia and uses secondary data or time series from 2008 to 2021. The data analysis model in this study is Simultaneous Model and Different Test. Simultaneous equations to analyze the relation between independent and variable variables found in the research country. Whereas different tests examine the different monetary policy variables before and during the covid-19 pandemic. Simultaneous analysis of equations on statistical test common equation 1 suggests that variable interest rates, money distribution, exchange rates and consumer price indexes have significant adverse effects on the INF. Whereas in the same equation 2, it suggests that gross domestic product variables have a positive relationship that is significant to the CPI. And inflation has a negative relationship significantly insignificant t CPI. And different test results show that inflation movement, kurs, money supply, interest rates and CPI before and during the covid-19 pandemic in Indonesia indicate significant results. For this reason, the researcher hopes that the monetary authority, namely Bank Indonesia, can improve monetary stability and maintain the BI rate in regulating the money supply so that it can suppress the inflation rate as an effort to stabilize the prices of goods and services.*

Keywords**:** *Inflation, Monetary Policy, Exchange Rate, Price Index*

INTRODUCTION

Economic stability is a benchmark for the development of a country's economy. However, the issue of financial stability is also an exemplary issue, especially for developing countries. Almost every country, both developed and developing, deals with security issues and monetary development issues. One issue that gets special attention in every country is the inflation rate. Indonesia as a developing country where its financial life is highly dependent on money-related frameworks and the world economy.

Economic growth that is more appropriately estimated using the development of per capita payments requires an increase in GDP or national income. Total national output is unconstrained by the utilization of the elements of job creation, capital (public reserve funds, taxes, government credit, unemployment job utilization, expansion, and foreign capital), fixed assets and innovation.

This tends to be seen from the perspective of the Classical economic development hypothesis and Keynes' hypothesis of economic growth. The classical economic growth hypothesis looks at the direction of financial progress from the supply side. However, Keynes' hypothesis of economic growth asserts that from the demand side, demand forces determine the equilibrium level and public payments. Consumption by families, business visionaries, and public authorities as well as foreign areas can increase total

demand and national income.
Economic growth is also used to measure progress, which, if improvement is to succeed, requires substantial monetary development. One of these victories can be estimated utilizing the consumer price index. This consumer price index is an important data in economic activities on the grounds that the increase or reduction in costs obtained from the list of customer values can be utilized to decide the turnaround of economic development.
The change in information made from the consumer price index is a significant macroeconomic indicator to provide an outline of the inflation rate and can illustrate examples of public utilization because the consumer price index estimates the change in the weighted normal cost of labor and products consumed by a household or society over a period of time. The value of the consumer price index shows the average change in prices paid by consumers (the public) of a particular group of goods and services.
The issue of financial dependency has also become a classic problem, especially for developing countries. Almost every country, both developed and developing, deals with financial stability and development issues. One issue that has received tremendous attention in every country is expansion. Indonesia as a developing country whose financial life is highly dependent on the money framework and the world economy, has consistently dealt with this issue. If the prices of goods and services are stable, it will cause inflation to be more controlled so that the macroeconomic state of a country will be great.
Inflationary events in Indonesia were also triggered by the weak rupiah against the US dollar on August 14, 1997. Because the exchange rate system adopted by Indonesia is a floating exchange rate system, and that means that the rupiah conversion standard will be understood and left entirely to the public authority. market system or in view of the law of supply interests in the market. The downscaling of the exchange rate of the rupiah against an unknown foreign currency brings the value of the product. Cheaper costs for domestic products attract foreign encounters to establish how much interest for their products will gradually increase and cause inflation (Amrini, 2012).
The covid-19 pandemic has affected human diseases as well as disrupted the world's economic health. Due to the Covid-19 pandemic, Indonesia has been hit hard by the spread of Covid-19. The high level of development due to the end of business, there is no room for development which causes the stagnation of the economy, a decrease in individual salaries, popularity, and even food supplies. This condition causes the rate of expansion and the occurrence of financial shocks in a questionable period of time.

LITERATURE REVIEW

1. Theories of Inflation

Monetarists state that inflation is a peculiarity of finance where the inflation rate is caused by the development of the cash supply, where changes in the total supply are answered directly by changes in the total interest, causing an increase in the prices of goods (Hervino, 2011). Meanwhile, the Keynesians have a somewhat comparative view to the monetarists in favor of total interest and regarding currency markets and product markets which should also be seen as cash supplies. Nonetheless, Keynesians also have a view on unsteadiness in the economy, considering that in terms of combating expansion and unemployment, financial strategies other than money-related are also needed which are highly planned between the two, according to Keynes, dynamic government mediation is also expected to defeat macroeconomic problems (Case, 2010). According to (Mankiw N. G., 2003) the Inflation rate is all price increases in the price level of both goods, services and factors of production. Inflation occurs when there is an imbalance between aggregate demand and supply where aggregate demand is greater than aggregate supply.

2. Gross Domestic Product Theory

In developing countries, which most of the time is also the idea of the "Third World" the idea of Gross Domestic Product is the main idea when compared to the idea of different public payments. According to (Sukirno S., 2013) in the book Introduction to Macroeconomics, Gross Domestic Product (GDP) can be interpreted as the value of goods and services produced in the country in a given year. Gross Domestic Product or in English Gross Domestic Product (GDP) is the value of goods and services in a country

produced by factors of production belonging to citizens and foreign countries (Sukirno S., 2013). Gross domestic product is the value of labor and products in a country created by factors of creation that have a place with residents of that country and outside countries (Sukirno, 1999). According to Mankiw (2007), Gross Domestic Product (GDP) is the market value of all goods and services created in an economy over a period of time. Gross domestic product is a financial variable that involves the main place of various macroeconomic factors that exist to measure a country's monetary exhibition.
To measure the predominant cash value of economic results is called real GDP, while genuine GDP estimates results valued at fixed costs. The GDP deflator estimates the cost of a comparative result by its cost in the base year (Mankiw, 2003).

3. Exchange Rate Theory

According to Munthe & Hamdi, (2015) in Zakiah, and Umaruddin Usman (2019) Exchange rate is the price of local currency against foreign currency. So, the exchange rate is the value of rupiah converted into other countries' cash. The exchange rate approaching Luwihadi et al (2017) is the speed of achieving economic growth in a country, development costs, the value of the strategy level or bank income, and the balance of support, as well as approval to arrive at work. According to Kristiawati, (2013) in Zakiah, states that the development of value clearly affects public payments, and means that if the scale of swapping increases, public salaries will also increase, unless the condition of the state's obligations is high. However, public payments from local financial results will decrease because an increase in the scale of rupiah conversion will reduce the increase in the price of goods to make the economy more useful.

4. Interest Rate Theory

Suhardi (2007) states that interest rates are economic indicators that play a role in linking money-related areas with original areas, furthermore, control of borrowing costs is a tool for financial strategy and business environment. Borrowing costs are part of the speculation profits that can be obtained by financial supporters from risk-free resources, or are also part of the capital costs that must be incurred by the organization to utilize assets from financial supporters. Bodie, Kane, and Marcus (2002) in Suhardi 2007 revealed that the relationship between borrowing costs and stock costs is negative. If there is an increase in borrowing costs, the development of inventory costs will decrease, but if there is a decrease in borrowing costs, inventory costs will rise. The higher the borrowing costs of finance, the more financial backers will direct their speculation to interests in banking, bonds or fixed payment monetary resources. As financial backers reduce their stock portfolios by delivering stocks, the supply inventory on stock trading increases and will consequently lead to a decrease in stock prices.

5. JUB Theory

According to Rahardja and Manurung (2008), JUB is the total amount of money in the hands of the public. The money supply in a narrow sense (narrow money) is the amount of money in circulation consisting of currency and demand deposits.
Rahardja and Manurung (2008) revealed that the actual cash supply is cash owned by the public in general. The progress of cash supply reflects economic improvement. A developing and emerging economy causes the cash supply to also increase. Assuming the economy is more advanced, the share of cash use (banknotes and coins) is getting simpler, replaced by demand stores. The more developed the economy, the smaller the structure of M1 in cash distribution because most of it is semi-cash. The relationship between cash supply and expansion makes sense in the sum hypothesis put forward by Irving Fisher (Nugroho and Maruto, 2012). In this hypothesis, Fisher states that the expansion of cash supply will animate inflation, with the expectation that the speed of cash supply and the volume of production in the economy are consistent.

6. Theory. Consumer Price Index (CPI)

The Consumer Price Index (CPI) or more commonly known as the Consumer Price Index (CPI) is a file that shows the cost of labor and products continuously used by buyers or families that is usually used to measure the inflation rate.
The Consumer Price Index (CPI) is a relative comparison of the prices of a bundle of goods and services at a point in time compared to the prices of those goods and services in the base year. The Consumer Price Index (CPI) is also defined as a measure or comparison of the price of a certain period with the price of the base period of the commodity demanded by consumers, where the price of this commodity is influenced by

the cost of production, the value of money and the value of goods, public income, the amount of demand for goods, policies carried out by the government, and economic, social, political, and trade developments with foreign countries (export-import).

RESEARCH METHOD

This research approach is associative/quantitative research. According to (Rusiadi N. S., 2017) "Associative/quantitative research is research that aims to determine the degree of relationship and pattern/form of influence between two or more variables, where with this research a theory will be built that serves to explain, predict and control a symptom," In supporting quantitative testing, a simultaneous equation model is used, where this model can interpret complementary relationships drawn from economic factors as endogenous factors. As well as examining the relationship between independent factors and dependent variables spread in a panel in the study country. Meanwhile, the difference test is used to examine the significant differences in the stability of goods prices before and during Covid-19 in Indonesia.

RESULTS AND DISCUSSION

1. Simultaneous Equation Capital Analysis Results

1.1. Classical Assumption Test

- Normality Test

Table 1. Data Normality Test

System Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 06/20/22 Time: 01:37
Sample: 1 14
Included observations: 14

Component	Skewness	Chi-sq	df	Prob.
1	0.578341	0.780450	1	0.3770
2	-0.437236	0.446076	1	0.5042
Joint		1.226525	2	0.5416

Component	Kurtosis	Chi-sq	df	Prob.
1	2.886074	0.007571	1	0.9307
2	2.625009	0.082027	1	0.7746
Joint		0.089598	2	0.9562

Component	Jarque-Bera	df	Prob.
1	0.788021	2	0.6743
2	0.528103	2	0.7679
Joint	1.316124	4	0.8586

- Autocorrelations Test

Table 2. Data Autocorrelations Test

System Residual Portmanteau Tests for Autocorrelations
Null Hypothesis: no residual autocorrelations up to lag h
Date: 06/20/22 Time: 02:04
Sample: 1 14
Included observations: 14

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	3.103112	0.5407	3.341813	0.5023	4
2	9.085764	0.3351	10.32157	0.2432	8
3	11.20421	0.5115	13.01778	0.3677	12
4	13.39301	0.6438	16.08210	0.4472	16
5	14.63216	0.7971	18.00967	0.5868	20
6	18.70011	0.7678	25.12857	0.3988	24
7	20.74044	0.8360	29.20923	0.4020	28
8	24.82253	0.8132	38.73411	0.1918	32
9	25.46980	0.9044	40.54648	0.2767	36
10	27.25012	0.9378	46.77757	0.2141	40
11	27.56162	0.9751	48.23125	0.3057	44
12	27.90461	0.9910	50.63220	0.3701	48

*The test is valid only for lags larger than the System lag order.
df is degrees of freedom for (approximate) chi-square distribution

1.2. Simultaneous Equation Model

Table 3. Two-Stage Least Squares Equation Estimation Results

System: SIMULTANANTONIUS
Estimation Method: Two-Stage Least Squares
Date: 06/20/22 Time: 01:19
Sample: 1 14
Included observations: 14
Total system (balanced) observations 28

	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	-266.5150	2242.930	-0.118824	0.9066
C(11)	2.662653	11.22084	0.237295	0.8148
C(12)	4.898705	40.19499	0.121874	0.9042
C(13)	0.008273	0.070623	0.117145	0.9079
C(14)	0.806305	7.036222	0.114593	0.9099
C(20)	111.8115	8.278460	13.50632	0.0000
C(21)	4.190653	1.799560	2.328710	0.0305
C(22)	-1.501683	1.520867	-0.987386	0.3352

Determinant residual covariance 1168.373

Equation: INF=C(10)+C(11)*SB+C(12)*JUB+C(13)*KURS+C(14)*IHK
Instruments: C SB JUB KURS PDB Observations: 14

R-squared	-5.893340	Mean dependent var	4.643571
Adjusted R-squared	-8.957047	S.D. dependent var	2.861854
S.E. of regression	9.030520	Sum squared resid	733.9527
Durbin-Watson stat	1.166633		

Equation: IHK=C(20)+C(21)*PDB+C(22)*INF
Instruments: C SB JUB KURS PDB Observations: 14

R-squared	0.277354	Mean dependent var	124.7200
Adjusted R-squared	0.145964	S.D. dependent var	12.40392
S.E. of regression	11.46297	Sum squared resid	1445.395
Durbin-Watson stat	1.408434		

2. Model Analysis Results of Difference Test

2.1. T-test of Inflation variable

Ho: There is no significant difference in Inflation before and during the covid 19 pandemic in Indonesia.

Ha : There is a significant difference in Inflation before and during the covid 19 pandemic in Indonesia.

Table 4. Differential Test Output of Inflation Before and During the Covid-19 Pandemic

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before Pandemic Covid-19	.2412	24	.25589	.05223
	During Pandemic Covid-19	.1483	24	.18308	.03737

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before Pandemic Covid-19 - During Pandemic Covid-19	.09292	.23652	.04828	-.00696	.19279	1.925	23	.067

- Ho is rejected and Ha is accepted if sig (2-tailed) $\leq \alpha = 0.05$
- Ho is accepted and Ha is rejected if sig (2-tailed) $\geq \alpha = 0.05$

Table 5. Output of Differential Test of Exchange Rate (Kurs) Before and During the Covid-19 Pandemic

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before Pandemic Covid-19	112.5196	24	3.08595	.62992
	During Pandemic Covid-19	112.3583	24	2.91239	.59449

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before Pandemic Covid-19 - During Pandemic Covid-19	.16125	4.04222	.82512	-1.54563	1.86813	.195	23	.847

- Ho is rejected and Ha is accepted if sig (2-tailed) ≤ α = 0.05
- Ho is accepted and Ha is rejected if sig (2-tailed) ≥ α = 0.05

Table 6. Output Test of Differential Money Supply (JUB) Before and During the Covid-19 Pandemic

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before Pandemic Covid-19	101.2462	24	5.11371	1.04383
	During Pandemic Covid-19	136.9092	24	58.72434	11.98705

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before Pandemic Covid-19 - During Pandemic Covid-19	-35.66292	58.20835	11.88173	-60.24215	-11.08369	-3.001	23	.006

- Ho is rejected and Ha is accepted if sig (2-tailed) ≤ α = 0.05
- Ho is accepted and Ha is rejected if sig (2-tailed) ≥ α = 0.05

Table 7. Output of Interest Rate Differential Test (SB) Before and During the Covid-19 Pandemic

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before Pandemic Covid-19	6.5575	24	.90085	.18388
	During Pandemic Covid-19	4.1938	24	.52881	.10794

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before Pandemic Covid-19 - During Pandemic Covid-19	2.36375							.000

- Ho is rejected and Ha is accepted if sig (2-tailed) ≤ α = 0.05
- Ho is accepted and Ha is rejected if sig (2-tailed) ≥ α = 0.05

Table 8. Output of Differential Test of Consumer Price Index (CPI) Before and During the Covid-19 Pandemic

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before Pandemic Covid-19	2.9150	24	.28488	.05815
	During Pandemic Covid-19	1.7983	24	.51448	.10502

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before Pandemic Covid- 19 - During Pandemic Covid-19	1.11667	.42816	.08740	.93587	1.29746	12.777	23	.000

- Ho is rejected and Ha is accepted if sig (2-tailed) $\leq \alpha = 0.05$
- Ho is accepted and Ha is rejected if sig (2-tailed) $\geq \alpha = 0.05$

3. Simultaneity Analysis of Interest Rate, Money Supply, Exchange Rate, Consumer Price Index on Inflation in Indonesia.

Based on the results of data analysis variable Interest Rate (SB) has a positive relationship insignificant effect on INF. This means that if the interest rate increases, it will increase inflation in Indonesia. This research is not in line with Marseto's research, (2014) which states that the SBI interest rate has no significant effect on the level of Inflation. This is because the ups and downs of inflation are temporary and only caused by certain situations and conditions such as the fasting month, Eid and the increase in the Consumer Price Index.

4. Simultaneity Analysis of Interest Rates, Money Supply, Inflation on Exchange Rates in Indonesia.

The GDP variable has a positive relationship with a significant effect on the CPI. This is if like interest increases it will reduce the consumer price index. This research is in line with research (Hismendi, 2013) which states that GDP has a significant effect on JCI.
Inflation variable (INF) has a negative relationship with an insignificant effect on CPI. This is Inflation increases by an amount that will reduce the Consumer Price Index. This study is consistent with research (Gudono, 2007) stating that inflation has no impact at all on stock returns. It can be well explained that the inflation rate in the period 2007-2011 does not affect stock returns which also does not affect stock prices.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the analysis and discussion that has been carried out using the Simultaneous Equation Method, it can be concluded that:

1. In equation I, the interest rate variable (SB) has a positive and insignificant relationship to INF. Variable Money Supply (JUB) has a positive and insignificant relationship to INF. The Exchange Rate (KURS) variable has a positive and insignificant relationship to INF. And the Consumer Price Index (CPI) variable also has a positive and insignificant relationship to INF in Indonesia.
2. In equation II, Gross Domestic Product (GDP) has a negative and significant relationship with CPI. INF variable has a negative and insignificant relationship to CPI in Indonesia.
3. Conclusion of the Differential Test of the Inflation variable (INF)
   During the pandemic Inflation (INF), has decreased and the results also show that

there is a significant difference in Inflation (INF) before and during the covid-19 pandemic in Indonesia.

4. Conclusion of the Differential Test of the Exchange Rate variable (KURS)
   During the pandemic Exchange Rate (KURS), has increased and the results also show that there is a significant difference in Exchange Rate (KURS) before and during the covid-19 pandemic in Indonesia.
5. Conclusion Differential Test of the variable Money Supply (JUB)
   During the pandemic, the amount of money in circulation (JUB), has increased and the results also show that there is a significant difference in the amount of money in circulation (JUB) before and during the covid-19 pandemic in Indonesia.
6. Conclusion of the Differential Test of the Interest Rate (SB) variable
   During the pandemic, the Interest Rate (SB), has increased and the results also show that there is a significant difference in the Interest Rate (SB) before and during the covid-19 pandemic in Indonesia.
7. Conclusion of Differential Test of Consumer Price Index (CPI) variables
   During the pandemic, the Consumer Price Index (CPI) has decreased and the results also show that there is a significant difference in the Consumer Price Index before and during the covid-19 pandemic in Indonesia.

Based on the results of the discussion and conclusions, the suggestions that the author needs to describe are as follows:

1. 1.For this reason, researchers expect the monetary authority, namely Bank Indonesia, to be able to increase monetary stability, maintain the BI rate in regulating the money supply so as to reduce the inflation rate as an effort to stabilize the prices of goods and services.
2. For further researchers, it is hoped that they can add variables and develop research methods in order to get better and relevant results related to the title of this study.

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