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Effectiveness of Monetary Policy Transmission Path on Usecashless Paymentt and Amount of Money Supply on the Increasing Inflation Rate in Indonesia

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A B S T R A C T

The use of cashless payments and the money supply can influence inflation and monetary policy. Modernization of payment instruments carried out by monetary policy in the financial system can control the inflation rate. The aim of this research is to determine the effect of cashless payments and money supply on inflation with other variables such as e- money, debit cards and interest rates. Using the vector autoregression (VAR) analysis method, it is found that e-money has an effect on the amount of money in circulation and debit cards. Then inflation is also influenced by debit cards, e-money and the amount of money in circulation

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INTRODUCTION

Increasingly sophisticated technological advances in payment systems have become a habit of modern society where payment instruments continue to develop which were initially cash-based (cash based) to be non-cash based (non-cash). Non-cash payment tools based on cards and electronic networks are referred to as electronic money (Amalia, 2021). The non-cash payment system that is widely used by people in Indonesia is electronic money (e-money). The value of money is stored electronically on application media or in the form of currency which is used as a legal means of payment (Chandrawati, 2020). Electronic money (e-money) which is a means of paymentpaperlesswhich uses internet facilities as an intermediary tool with the aim of reducing the growth rate of the money supply (Daulay, 2019).

Table 1. Data on Money Supply and Cashless Use

Year	Debit Card	E-Money	JUB
2015	112.29	535.579	4.548.800
2016	127.78	683.133	5.004.977
2017	155.66	943.319	5.419.165
2018	152.48	2.922.699	5.760.046
2019	174.44	5.226.700	6.136.777
2020	204.19	4.625.704	6.905.939
2021	221.29	5.451.471	7.870.453
2022	251.46	6.925.778	8.271.838

Source: World Bank and Financial Acses Survey

This data shows that transactions using cash and non-cash payment instruments continue to increase. Increase in nominal amount of electronic money transactions caused by increasing growth in online transactions, both at offline and online merchants (Ibrahim, 2021). The increasing use of non-cash transactions by the public is driven by the ease of transactions which drives down costs and stimulates economic growth. Apart from making transactions easier, non-cash payment instruments can also reduce demand for money by central banks and reduce the implementation of monetary policy control (Eno, 2020). The monetary authority estimates that non-cash transactions will create transparency in the circulation of money, slowing down money circulation. This means that the more non-cash transactions there are, the greater the demand for money will be (Hendriana, 2021).

A country with a stable economy is reflected in a low inflation rate. Indonesia is a developing country with an economic life that depends on monetary policy and the world economy, so inflation problems also often occur (Pramaisela, 2021). In Indonesia, the inflation rate shows a low and stable condition. This is based on Indonesian inflation data as follows:

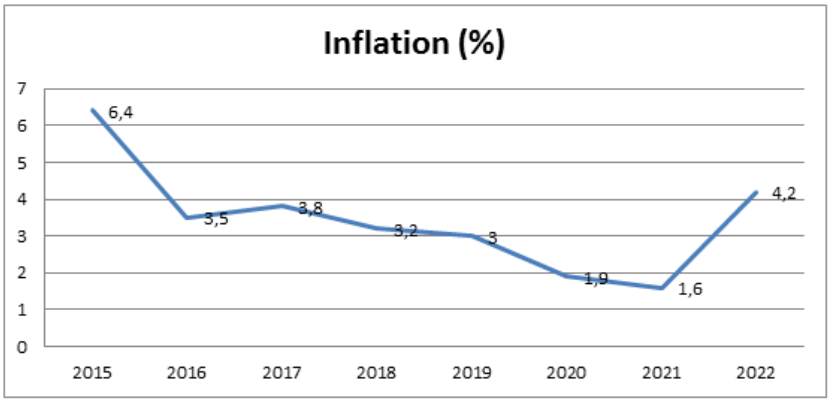

Figure 1. Graph of Inflation Development Data in Indonesia

The cause of low and stable inflation in Indonesia is influenced by good monetary policy coordination between the central bank, central government and regional governments which makes market conditions in line with demand. Apart from that, the consistency of monetary policy by Indonesian banks in maintaining the rupiah exchange rate (Watulingas, 2016). Many views state that prolonged inflation is caused by the money supply continuing to increase, which can increase the high prices of goods and services, especially if output growth has reached maximum capacity (Kalbuadi, 2019).

The theoretical opinion above regarding inflation in Indonesia shows that money circulation has a quite important role. In this case, Bank Indonesia as a monetary authority in maintaining the stability of the financial system sets monetary targets, one of which is through the money supply which can control the inflation rate (Chandrawati, 2020). This shows that Indonesian people are starting to switch to using electronic money instead of cash, which will have an impact on the money supply and inflation.

The development of non-cash payment tools, especially related to electronic money (e-money) which continues to increase needs to be taken into account so that the impact is not negative on monetary policy objectives. The author is interested in researching non-cash payment instruments as a means of modernization that can cause inflation indirectly, but must be done through the money supply. So thatcashless paymentin relation to money supply and inflation with monetary policy control, this research is entitled "Effectiveness Of Monetary Policy Transmission Path On Usecashless Paymentt And Amount Of Money Supply On The Increasing Inflation Rate In Indonesia"

LITEATURE REVIEW

1. Quantity Theory of Money

The popular quantity theory of money was proposed by Irving Fisher in the bookThe Purchasing Power of money, New York (1991). Fisher stated that to understand the relationship between the money supply and the general price level which is related to the purchasing power of money, it can be seen in the following formula:

$$\mathbf{MVT = PT}$$

Information:
M = Money Supply
VT = Transaction Velocity of Circulation
P = Price
T = Volume of Trade

2. Monetary Policy Transmission

The monetary policy transmission mechanism is the process of how monetary policy by the central bank influences economic and financial activities so that it can achieve its final goals. The ultimate goal of monetary policy is to maintain and maintain the stability of the value of the rupiah which can be achieved by the flow of interest rates orinterest rate, asset price flow or asset priceand credit flow (Warjiyo, 2016).

3. Cashless Payment

Cashless is a term used to carry out financial transactions that no longer use cash. Cashless payments are all financial transactions whose activities do not involve cash such as currency, checks and giro, but are used through electronic means such as automated teller machines (ATM), credit card, debit card and high-tech transactions such as m-banking, e- commerce and epayment (Marlina, 2020).

4. Money Supply

According to (Boediono, Microeconomics, 2000) the money supply in the narrow sense (M1) is money in the form of demand deposits and currency which is held and used by the public as a means of daily payment transactions. The relationship between the money supply and the exchange rate is that the money supply depends on the supply of money, if the supply of the rupiah increases then its value will depreciate (weaken), whereas if the supply of the rupiah decreases then the value of the rupiah currency will appreciate (strengthen), so the relationship the amount of money in circulation has a negative influence on the exchange rate (Muhclas & Alamsyah, 2015).

5. Inflation

Initially, inflation was defined as an increase in the money supply or an increase in liquidity in an economy. This understanding refers to the general symptoms caused by an increase in the money supply which is thought to have caused an increase in prices (M.Natsir, 2014). Inflation is a general and continuous increase in the price of goods. This definition is in line with the definition put forward by (Suseno & Astiyah, 2009). Inflation is a tendency to increase the prices of goods and services generally and continuously.

METHODOLOGY

This research is quantitative descriptive in nature which describes the country's economy with its variables. Examining the effectiveness of monetary policy transmission channels on usagecashless paymentand the amount of money in circulation against inflation in Indonesia with time series data for 2003-2022 sourced from world bank and financial access survey. The data analysis model uses Vactor Autoregression(VAR) for short-term and long-term restrictions (Rydland, 2018). Method Vector Autoregressionis a form that describes the relationship between variables with (1) Stationary Test which is

known asunit root test (Gujarati, 2003), (2) Optimum Lag Selection based on Akaike Information Criterion (AIC) and Schwarz Information Criterion (SC) (Rangkuty & Nasution, 2018), (3) Cointegration Test to see long-term balance. (4) Causality Test can show the causal relationship between variables over a long period of time (Basuki, 2016), (5) Estimation Test Vector Autoregressionto see the biggest contribution of each variable, (6) Impulse Response see the response (shock) of each variable, (7) Variance Decomposition decomposing variations between variables.

RESULT AND DISCUSSION

1. Stationary Test

Test the unit root test withaugmented dicky-fuller(ADF) t-statistic value at a confidence level of 5% and a probability value smaller than 0.05 (Gujarati, 2003).

Table 2. ADF Unit Root Test Results

Variable	Root Unit	ADF test statistic	Prob.	Information
E-Money	Level	1.531931	0.9987	Not stationary
	1st difference	-2.843068	0.0721	Not stationary
	2nd difference	-5.293089	0.0001	Stationary
Inflation	Level	-1.214939	0.6439	Not stationary
	1st difference	-6.526919	0.0000	Not stationary
	2nd difference	-	-	Stationary
JUB	Level	1.619665	0.9988	Not stationary
	1st difference	-3.231851	0.0003	Stationary
	2nd difference	-	-	-
Debit Card	Level	3.149696	1.0000	Not stationary
	1st difference	-2.846806	0.0716	Not stationary
	2nd difference	-5.675867	0.0004	Stationary
Interest Rate	Level	-3.342151	0.0272	Not stationary
	1st difference	-5.991728	0.0001	Stationary
	2nd difference	-	-	-

Source: Data Processed by Eviews, 2024

It is explained in the table above that the value of prob. fromaugmented dicky-fuller (ADF) on variables e-money, inflation and debit cards < 0.05, meaning they are stationary at 2nd differencesand the inflation and interest rate variables are stationary at 1st differences with prob < 0,05.

2. Optimum Lag Selection

Approach vector autoregression sensitive to quantity lagused, it is necessary to determine the length lag optimal by looking at the value Akaike Information Criterion (AIC).

Table 3. Lag 1 Determination Test

Determinant resid covariance (dof adj.)	1.62E+25
Determinant resid covariance	2.43E+24
Log likelihood	-668.2220
Akaike information criterion	73.49706
Schwarz criterion	74.98828
Number of coefficients	30

Source: Data Processed by Eviews, 2024

Table 4. Lag 2 Determination Test

Determinant resid covariance (dof adj.)	1.14E+23
Determinant resid covariance	1.01E+21
Log likelihood	-562.9902
Akaike information criterion	68.66558
Schwarz criterion	71.38616
Number of coefficients	55

Source: Data Processed by Eviews, 2024

The table explains that the results lag used with values Akaike Information Criterion (AIC) of 73.49706 on lag 1 is bigger than 68.66558 on lag 2, so this research uses lag 1 for the analysis.

3. Cointegration Test

This test is carried out to determine the occurrence of balance in the long term with the same movement and stability between variable relationships.

Table 5. Cointegration Test Results

Trace statistic	>	Critical Value	Prob.
139.0403		69.81889	0.0000
Max-eigin statistic	>	Critical Value	Prob.
57.37942		33.87687	0.0000

Source: Data Processed by Eviews, 2024

Based on the table it can be seen that the value trace statistics and max-eigen ststistic with a confidence level of 5% greater than critical value. So the test results identified that among the movements of the research variables, namely e-money, inflation, money supply, debit cards and interest rates have a long-term stability or balance movement relationship.

4. Causality Test (Granger Causality Test)

This causality test is to see the relationship between variables as seen in the following table:

Table 6. Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
INFLASI does not Granger Cause E_MONAY	18	0.91514	0.4248
E_MONAY does not Granger Cause INFLASI		0.28439	0.7570
JUMLAH_UANG_BEREDAR_JUTA_ does not Granger Cause E_MONAY	18	2.28215	0.1414
E_MONAY does not Granger Cause JUMLAH_UANG_BEREDAR_JUTA_		1.92907	0.1847
KARTU_DEBIT does not Granger Cause E_MONAY	18	6.16403	0.0131
E_MONAY does not Granger Cause KARTU_DEBIT		0.38335	0.6890
SUKU_BUNGA___ does not Granger Cause E_MONAY	18	0.41412	0.6693
E_MONAY does not Granger Cause SUKU_BUNGA___		0.36526	0.7009

JUMLAH_UANG_BEREDAR_JUTA_ does not Granger Cause INFLASI	18	3.08700	0.0800
INFLASI does not Granger Cause JUMLAH_UANG_BEREDAR_JUTA_		0.24893	0.7833
KARTU_DEBIT does not Granger Cause INFLASI	18	1.05981	0.3746
INFLASI does not Granger Cause KARTU_DEBIT		1.13758	0.3505
SUKU_BUNGA___ does not Granger Cause INFLASI	18	4.28115	0.0373
INFLASI does not Granger Cause SUKU_BUNGA___		1.09486	0.3635
KARTU_DEBIT does not Granger Cause JUMLAH_UANG_BEREDAR_JUTA_	18	1.11213	0.3582
JUMLAH_UANG_BEREDAR_JUTA_ does not Granger Cause KARTU_DEBIT		2.41327	0.1284
SUKU_BUNGA___ does not Granger Cause JUMLAH_UANG_BEREDAR_JUTA_	18	0.05670	0.9451
JUMLAH_UANG_BEREDAR_JUTA_ does not Granger Cause SUKU_BUNGA___		3.05654	0.0817
SUKU_BUNGA___ does not Granger Cause KARTU_DEBIT	18	1.19574	0.3337
KARTU_DEBIT does not Granger Cause SUKU_BUNGA___		0.56553	0.5814

Source: Data Processed by Eviews, 2024

All research variables, namely e-money, inflation, money supply, debit cards and interest rates do not have a reciprocal or two-way relationship at the 5% significance level with the prob value. > 0.05. This means that each research variable in the previous period was unable to significantly influence other variables.

5. VAR Estimation Results

The VAR estimation test is carried out after testing assumptions, namely stationary, cointegration, causality and optimal lag tests. The aim is to determine the relationship or contribution of variables.

Table 7. VAR Estimation Results

Variable	Contribution 1	Contribution 2
E-Money	Interest Rate (2.473120)	Debit Card (1.390256)
Inflation	Inflation (4.760008)	Interest Rate (0.241108)
JUB	Debit Card (3.605135	JUB (0.036692)
Debit Card	E-Money (1.540006)	Debit Card (1.135042)
Interest Rate	JUB (2.030007)	Interest Rate (0.415812)

Source: Data Processed Eviews, 2024

The largest contribution is one and the largest contribution is two to the variablee-moneyshown by interest rates and debit cards, inflation and interest rates also contribute to the inflation variable. The amount of money in circulation is also influenced by debit cards and the variables themselves and debit cards are also contributed bye-moneyand debit cards and interest rates are influenced by the interest rates themselves and the money supply.

6. Function Impulse Response VAR

Estimated against impulse response done to see shocked between research variables. Picture impulse response shows the response of a variable as a result of the response (shocked) other variables in a certain period. If the image shows movement approaching the equilibrium point (convergence) then the response will leave a permanent influence on that variable (Basuki & Prawoto, 2016).

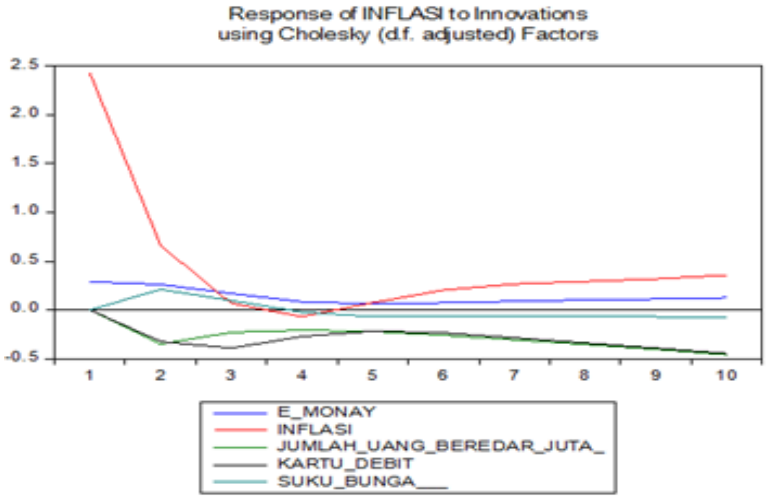

Figure 2. Impulse Response Research Variable

In the picture it can be seen that the influence between the variables e-money, inflation, money supply, debit cards and interest rates have the same movement approaching the 0 (zero) line.

7. Variance Decomposition

After dynamic analysis byimpulse responsethen next look at the characteristics of the model withvariance decomposition. The results can be seen in the following table:

Table 8. Variance Decomposition Results

Effectiveness Of Monetary Policy Transmission Path On Usecashless Paymentt And Amount Of Money Supply On The Increasing Inflation Rate In Indonesia	Recommendation		
	Short-term	Medium-term	Long-term
E-Money	E-Money	E-Money	JUB
	-	JUB	Debit Card
Inflation	Inflation	Inflation	Inflation
	E-Money	Debit Card	Debit Card
JUB	JUB	JUB	JUB
	Debit Card	Debit Card	Debit Card
Debit Card	Debit Card	Debit Card	JUB
	JUB	JUB	Debit Card
Interest Rate	Inflation	Inflation	Inflation
	Debit Card	Debit Card	Debit Card

Source: Data Processed by Eviews, 2024

In the short term e-money effective recommended by e-money itself, while in the medium and long term by the amount of money in circulation and debit cards. Likewise, the amount of money in circulation and debit cards in the short term, medium term and long term is also recommended by the variable itself. The rise and fall of the money supply is influenced by the large amount of money used or transactions, both cash and non-cash, by debit cards and e-money (Rasyida & Yuliana, 2019). Inflation and interest rates are also influenced by the inflation itself and the debit card. This is appropriate if the use of debit cards increases then interest rates will also increase so that they can control the inflation rate (Safitri, 2021).

CONCLUSION AND RECOMENDATION

The influence on the five variables due to changes in one variable on other variables varies. Shocks continue to occur and increase until then decrease and vice versa. Each variable provides a different contribution shown by the variable e-money which mutually influence the money supply and debit cards. Then inflation is also influenced by debit cards, e-money and money supply. From this research it can be seen that monetary policy on usage cashless payment and the money supply can affect inflation.

FURTHER STUDY

This research still has related limitations, so it is necessary to carry out further research on the topic of the Effectiveness of Monetary Policy Transmission Channels on Usecashless Payments and the Money Supply on Increasing Inflation Rates in order to perfect this research and increase insight for readers

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