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THE EFFECT OF CARD PAYMENT INSTRUMENTS, FLOAT FUNDS, AND POLICY INTEREST RATES ON THE VELOCITY OF MONEY IN INDONESIA IN 2014-2023 WITH THE COVID-19 PANDEMIC AS A DUMMY VARIABLE

Shofa Shidqi Fi Ardhillah
Email: shofardhillah@gmail.com
Faculty of Economics and Business, Universitas Negeri Jakarta, Indonesia

Prof. Harya Kuncara Wiralaga, M.Si
Email: harya_kuncara@unj.ac.id
Faculty of Economics and Business, Universitas Negeri Jakarta, Indonesia

Dr. Karuniana Dianta A. S, S.IP., M.E.
Email: dianta.sebayang@unj.ac.id
Faculty of Economics and Business, Universitas Negeri Jakarta, Indonesia

Abstract:
The purpose of this study is to see the effect of credit cards, debit cards, floating funds, policy interest rates on money circulation in Indonesia in 2014-2023 with the Covid-19 pandemic as a dummy variable. The research method used is a quantitative method using secondary data in the form of time series. The research data was obtained from the pages of Bank Indonesia, the Central Statistics Agency, and the Indonesian Ministry of Trade. The analysis used a multiple regression model with the Two-Stage Least Square (TSLS) method which was tested using Eviews software version 12. Based on the results of the study, it was found that inflation and money circulation had a significant effect on policy interest rates. Then, floating funds did not affect money circulation. However, other variables have an effect and some have a negative direction on money circulation.

Keywords: Credit Cards, Debit Cards, Floating Funds, Interest Rates, Covid-19, Inflation, Money Circulation

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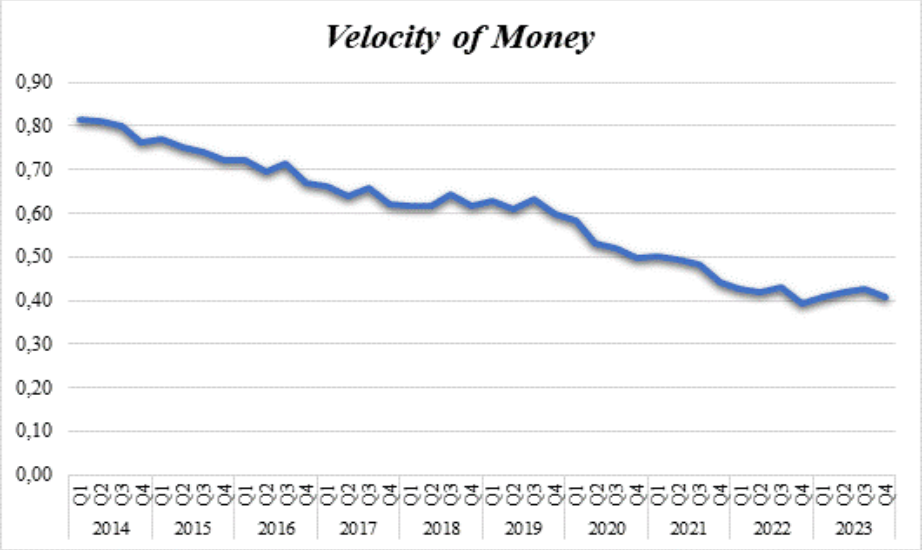
BACKGROUND

In the era of globalization and rapid technological development, the use of non-cash payment instruments such as credit and debit cards is increasing in every country, especially in Indonesia. In addition, the practice of floating funds carried out by large companies also affects the circulation of money in society. On the other hand, the interest rate set by the central bank also plays an important role in determining the speed of money circulation in a country. The velocity of money or what is commonly called the velocity of money is an important indicator in measuring how fast money circulates in an economy. The higher the turnover of money, the more it will increase economic activity and economic growth in a country.

On the other hand, current economic development and growth have caused changes in economic structures that can disrupt economic stability in every country, especially Indonesia. One of the causes of disrupted economic stability in Indonesia is the COVID-19 virus. This

virus was first discovered in China and has spread rapidly throughout the world since 2020, precisely on March 2, 2020 in Indonesia (Azzahra 2023). This condition will disrupt economic activities in Indonesia which will most likely result in a decrease in each transaction or even interest rates in Indonesia. The central bank's policy towards the Indonesian economy which has been affected by the COVID-19 pandemic tends to be accommodative which has increased the optimism of economic actors.

Graph 1
Velocity of Money in Indonesia (percent)



Graph 1.1 above is data on money circulation or velocity of money in Indonesia from 2014 to 2023 with quarterly calculations. In accordance with existing theory, to find the value of money circulation, namely by dividing the value between gross domestic product by the value of the amount of money in circulation (M1). In this case, the results obtained each quarter in each year have fluctuating or fluctuating values. However, if we look at it annually, it clearly has a value that decreases each year, especially in 2020 where the COVID-19 virus began to occur in Indonesia. At that time, Bank Indonesia made efforts to create an efficient liquidity situation with monetary policy in synergy with the government to restore the national economy. However, this was not optimal when it was carried out because domestic demand was not yet strong (Warjiyo 2021).

In addition, there are factors that influence the circulation of money according to Irving Fisher (Mishkin 2017), namely technological progress and government in the country. Technological progress in the velocity of money here is related to technological progress in the payment system or transaction system. With the development of technology from traditional to modern, this can also develop a sophisticated payment system, originally in the form of cash, now available in non-cash payments, namely with card media or servers. This latest system is considered practical and easy in terms of payment (Sasikarani, Andrian, and Ciptawaty 2022).

In addition, with the existence of non-cash transactions at this time, there is a deposit of funds by the issuer which will later be deposited in securities. The deposit of funds in question is the float fund which is the amount of electronic money that has been received by the issuer from the results of issuing money and/or refilling money on electronic money (top

up) and this is still an obligation of the issuer to the holder and merchant. A decrease in the value of float funds in Indonesia can be caused by several factors that are quite complex and interrelated. The value of float funds usually decreases with a shift in the behavior of society or consumers in the use of payment instruments that are usually in cash to non-cash. In addition, a decrease can also occur due to a community's economic condition, for example when the economy is less stable in society, people will tend to be careful in using electronic money and prefer to save money in a more liquid form such as cash.

In addition, there is also a reference interest rate of Bank Indonesia which will be linked to the circulation of money in Indonesia. In this case, Bank Indonesia maintains the stability of the country's economy by implementing a reference interest rate or BI Rate. The value of this reference interest rate always goes up and down or fluctuates depending on the condition of the country at that time (Taufik 2021). Unreasonable fluctuations in interest rates will also make it difficult for businesses to pay interest and obligations, because high interest rates will increase the company's burden, thereby reducing the company's profits. On August 19, 2016, the interest rate in Indonesia has been set a new reference, called the BI-7 Day Reverse Repo Rate (BI7DRR). This instrument is the latest reference interest rate in Indonesia and has a closer relationship with money market interest rates, and will encourage the deepening of financial markets, banking and the real sector. The impact of implementing the BI7DRR instrument interest rate is that it can strengthen the relationship between monetary policy in Indonesia and BI7DRR in the financial market.

The decline in interest rates in Indonesia is partly due to low inflation. Usually low inflation is caused by a decline in people's purchasing power. When people's income decreases, demand for goods or services will tend to be weak. In addition, interest rate declines can also be caused by excess money. The amount of money circulating in the community is usually very excessive, and the central bank will also lower the existing interest rate to reduce excess money. if inflation occurs, the demand for goods or services exceeds the production limit, meaning it can increase aggregate demand. On the other hand, it can reduce aggregate supply if there is a decrease in production capacity, resulting in prices continuing to rise.

In addition, the Covid-19 pandemic has indeed had a major impact on the circulation of money, resulting in drastic changes. The main change during the pandemic was the shift to the digital economy. With online transactions, people prefer to carry out sales and purchases online because they are more adequate and more efficient. Then, it will also have an impact on the decline in cash transactions. Still related to the digital economy, people choose to use non-cash transactions such as online purchases and sales, payments using cards, or QRIS.

This study aims to examine the effect of credit cards, debit cards, floating funds, policy interest rates on money circulation in Indonesia in 2013-2022 with the COVID-19 pandemic as a dummy variable. Previous studies have shown that card transaction values have a positive impact on short-term and long-term currency turnover in Indonesia. The amount of floating funds (JDF) has a negative effect on short-term currency turnover in Indonesia, and interest rates have no significant impact on short-term and long-term currency turnover in Indonesia (Sasikarani et al., 2022).

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THEORETICAL FRAMEWORK

Grand Theory

According to Irving Fisher, this classical quantity theory can be further developed to find the formula for the magnitude of money acceleration (V). Where this accumulation of money (V) is expressed as the sum of existing expenditures divided by the amount of money in circulation (M1) (Gintting, Djambak, and Mukhlis 2019). The equation for this money circulation can be expressed as follows:

$$\boldsymbol{V = \frac{PY}{M}\ atau\ V = \frac{PDB}{M1}}$$

Description:

V : Velocity of Money
P : Price Level (price index)
Y : Aggregate Output (finished goods)
M : Money Supply

Credit Cards

According to Bank Indonesia Regulation (Bank Indonesia 2012), a credit card is a payment instrument using a card that can be used in terms of payment for obligations that have arisen from transaction activities, including purchases, withdrawals, and others. The cardholder's payment obligation is fulfilled first by the issuer and the cardholder has an obligation to pay funds at a specified time.

Debit Cards

ATM card is a payment instrument with a card used in economic activities by a bank customer. This card is usually also used for checking balances, transfers, cash deposits, and others. Institutions other than banks also have the authority to collect funds in accordance with applicable laws and regulations (Bank Indonesia 2018). This card is a tool for making payments for obligations arising from shopping transactions where the cardholder is fulfilled immediately by directly reducing the savings in the bank (Awusi 2022).

Floating Funds

In the Bank Indonesia Regulation that regulates all aspects related to float funds, it must basically be carried out within the framework of carrying out tasks in the smooth running of the payment system (Bank Indonesia 2018). Float funds here must be guaranteed for their security in terms of liquidity, credit risk, legal risk, and operational risk. The fairly strict and comprehensive regulations are also based on the consideration that the electronic money issuer can manage funds safely.

Policy Interest Rates

Interest rates can involve comparisons between amounts of money at different times (Mankiw 2009). The interest rate variable here is a variable that is also widely observed in economic activities. According to classical theory, savings and deposits are a function of interest rates. The higher the interest rate, the higher the public's desire to save money in the bank. While in the definition of interest is a price of loanable funds or as funds that are available to be

borrowed. Because in this theory, the existing interest is the price that occurs in the investment market (Yusuf et al. 2022).

The second theory is developed in The General Theory of interest rates. Keynes considers interest rates as the price of money and the non-neutrality of money that has been explained by the fact that interest rates are also determined by public demand. This theory is also determined by the existence of demand and supply of money that has three motives in a person's willingness to hold cash. Of the three existing motives, that is the source of the demand for money that has been given the term liquidity preference.

Inflation

In Keynesian theory, inflation is more focused in general on the size of an economy's activity and the fluctuation of the price level of goods and services. Keynes has also observed that a market mechanism does not always achieve a balance between demand and supply in economic activities. In this theory, there is an aggregate demand curve and an aggregate supply curve, the curve has explained the relationship between inflation and economic growth. However, it has been realized that inflation is indeed caused by the excessive desire of the community itself for the availability of goods and services (Meiriza et al. 2024).

Covid-19 Pandemic

The beginning of Covid-19 came from one of the countries in the eastern region, namely Wuhan, China. Precisely on December 31, 2019, the WHO China Country Office has provided information that there are cases of pneumonia. China has explained on January 7, 2020, that pneumonia is a new type of virus called coronavirus and has also been given the right name, namely Coronavirus Disease 2019 (Covid-19). And. On January 30, 2020, WHO has also determined the status of Public Health Emergency of International Concern (PHEIC). The spread of Covid-19 cases has also increased rapidly and has involved many countries.

In this case, the relationship or connection between the Covid-19 pandemic and money circulation in Indonesia has had a significant impact on various aspects of life. The existing impacts provide positive and negative values. The positive impact or value between the Covid-19 pandemic and money circulation is an increase in the use of digital transactions. Where people at that time preferred to use non-cash payments, such as credit cards, debit cards, or QRIS. The negative impact or value between the Covid-19 pandemic and money circulation is a decrease in consumption. Usually there is a decrease in income in several industrial sectors due to the increasingly low level of people's purchasing power.

Velocity of Money

According to Irving Fisher, this classical quantity theory can be further developed to find the formula for the magnitude of money acceleration (V). Where this acceleration (V) is expressed as the sum of existing expenditures divided by the amount of money in circulation (M1) (Gintting, Djambak, and Mukhlis 2019). The equation for this money circulation can be expressed as follows:

$$\boldsymbol{V = \frac{PY}{M}\ atau\ V = \frac{PDB}{M1}}$$

Description:

V : Velocity of Money
P : Price Level (price index)
Y : Aggregate Output (finished goods)
M : Money Supply

In this case, it explains that the velocity of money circulation (V) can change at any time if there is a demand for money that also changes (Hidayati 2006). According to Irving Fisher who discussed the relationship between the amount of money in circulation (M) and the total expenditure of goods and/or services produced (PY). The PY value in the formula contains the same thing as nominal GDP. We know that nominal GDP is the final value of goods and services that have been produced by a country in a certain period.

Research Hypothesis

Based on literature review and previous research, the hypotheses proposed in this study are as follows:

H1 : money circulation affects policy interest rates
H2 : inflation affects policy interest rates
H3 : credit cards affects velocity of money
H4 : debit cards effects velocity of money
H5 : floating funds effects velocity of money
H6 : policy interest rates effects velocity of money
H7 : covid-19 pandemic effects velocity of money

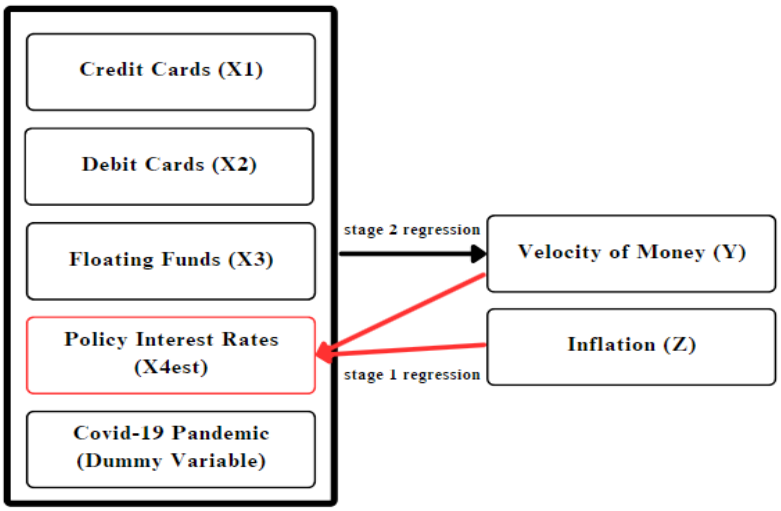

Figure 1. Thinking Framework

METHOD

In this study, the type of approach that will be used is a quantitative research approach. The quantitative method is a scientific approach that looks at a condition that can be classified between variables. Data in the form of numbers and their analysis will later be in the form of statistics and will be causal (Saifuddin 2007).

In this study, the type of data used is secondary data and this data is collected in the form of time series data, namely data that has been collected sequentially at different times

during the period Q1 2014 to Q4 2023 using the Covid-19 pandemic as a dummy variable. And, the data obtained comes from data from Bank Indonesia, the Central Statistics Agency, and the Ministry of Trade.

In this study, the analysis tool used is using a multiple linear regression equation model to test an independent variable against a dependent variable using Eviews 12 software. In this study, researchers used the Two-Stage Least Square (TSLS) method. This method is a simultaneous equation method that estimates the existence of a two-way relationship between variables. A variable in the TSLS method equation can make this variable an independent variable and in another equation it becomes a dependent variable (Irfan and Yulyanti 2020). The regression equation that can be used is the multiple regression equation. The equation model used in this study to analyze data is as follows (Irfan and Yulyanti 2020):

$$\boldsymbol{SB = \alpha + \beta_1 VOM_1 + \beta_2 INF_2 + \epsilon} \text{.....(1)}$$
$$\boldsymbol{VOM = \alpha + \beta_1 KK_1 + \beta_2 KD_2 + \beta_3 DF_3 + \beta_4 SB_{est} + DMY + \epsilon} \text{.....(2)}$$

Description,
VOM : velocity of money,
α : constant
$\beta_1 \ldots B_4$: regression coefficient
KK : credit cards
KD : debit cards
DF : floating funds
SB : policy interest rates
INF : inflation
DMY : dummy pandemic covid-19
ϵ: standard error

RESULT

Normality Test Stage 1

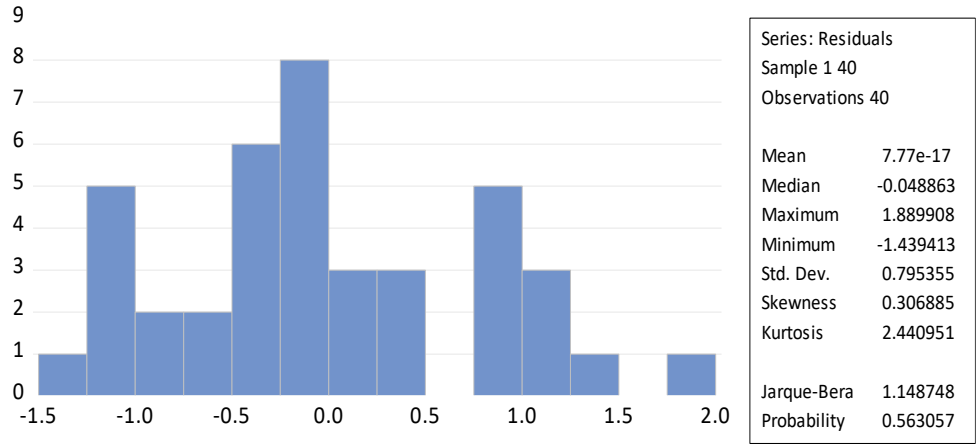

Figure 2. Normality Test Stage 1

In the normality test of this study, the Jarque-Bera Test method was used, processed with Eviews 12 software. Using this method, the minimum probability value or value that must be met by the data in order to state that the data is normally distributed is when the value of a probability exceeds the significance value, which is 0.05. Based on the results of the normality

test above, it is stated that the probability value produced by the Eviews 12 software is greater than the significance value, which is 0.563057> 0.05. So the data in this study is normally distributed.

Multicollinearity Test Stage 1

Variance Inflation Factors			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.388977	23.33454	NA
Velocity of Money	1.487960	33.25051	1.436760
Inflation	0.008299	8.575500	1.436760

Table 1. Multicollinearity Test Stage 1

The next test is a multicollinearity test that uses an estimate of Variance Inflation Factors (VIF). In this case, data to meet the requirements of the multicollinearity test is the value of the Centered VIF which is less than 10. Based on the test table above, the value of the Centered VIF which is the velocity of money variable (Y) and the inflation variable (Z) is less than 10, which means that the value obtained from the processed data is free from multicollinearity symptoms.

Autocorrelation Test Stage 1

Durbin-Watson stat	0.445025

Table 2. Autocorrelation Test Stage 1

On the existing data, the next step is to test for autocorrelation. This autocorrelation test uses the Durbin-Watson Test. The value of the Durbin-Watson Test autocorrelation or the probability value that must be met in order to be free from autocorrelation symptoms is if a value of -2 < Durbin-Watson < 2. In the results of this study, the Durbin-Watson Statistic value is at 0.445025, meaning that the value is more than -2 and less than 2 (-2 < 0.445025 < 2). This value can also be interpreted that the research data can be free from autocorrelation symptoms.

Heteroscedasticity Test Stage 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.347624	0.574976	2.343792	0.0246
Velocity of Money	-1.314054	1.124561	-1.168504	0.2501
Inflation	0.014166	0.083984	0.168670	0.8670

Table 3. Heteroscedasticity Test Stage 1

Heteroscedasticity test using the Breusch-Pagan-Godfrey Test, the probability value that must be met to be free from heteroscedasticity symptoms is a significance value or probability greater than 0.05. Based on this test, all probabilities of the velocity of money (Y) and inflation (Z) variables exceed the significance value, which is 0.05. So in this stage 1 research model, it has been free from heteroscedasticity symptoms.

Normality Test Stage 2

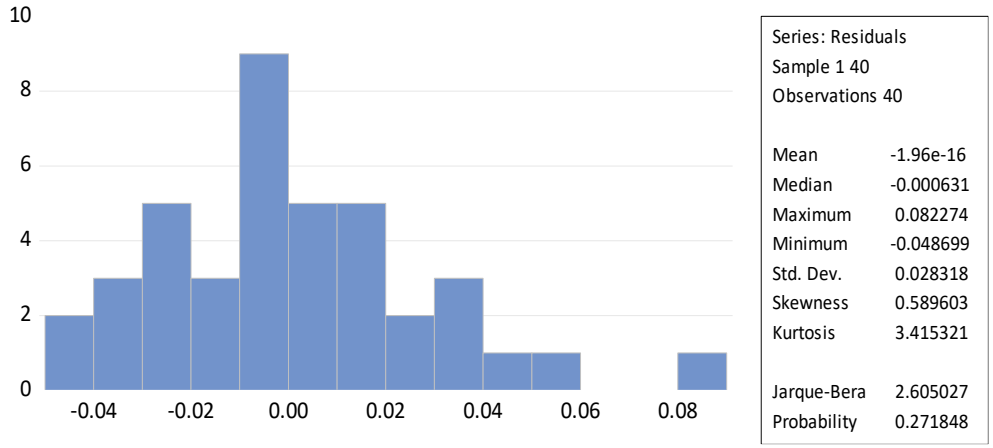

Figure 3. Normality Test Stage 2

In the normality test of this study, the Jarque-Bera Test method was used, processed with Eviews 12 software. Using this method, the minimum probability value or value that must be met by the data in order to state that the data is normally distributed is when the value of a probability exceeds the significance value, which is 0.05. Based on the results of the normality test above, it is stated that the probability value produced by the Eviews 12 software is greater than the significance value, which is 0.271848> 0.05. So the data in this study is normally distributed.

Multicollinearity Test Stage 2

Variance Inflation Factors

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.062615	2722.971	NA
Credit Cards	0.027012	1091.536	1.978988
Debit Cards	1.45E-15	176.6670	5.853190
Floating Funds	6.49E-05	1.222252	1.146559
Policy Interest Rate	0.002225	272.7307	4.141323
COVID-19	0.000204	3.111809	2.022676

Table 4. Multicollinearity Test Stage 2

The next test is a multicollinearity test that uses an estimate of Variance Inflation Factors (VIF). In this case, data to meet the requirements of the multicollinearity test is the value of the Centered VIF which is less than 10. Based on the test table above, the value of the Centered VIF which is a credit card variable (X1), debit card (X2), float funds (X3), policy interest rate (X4), covid-19 (dummy) is less than 10, which means that the value obtained from the processed data is free from multicollinearity symptoms.

Autocorrelation Test Stage 2

Durbin-Watson stat	0.688614

Table 5. Autocorrelation Test Stage 2

On the existing data, the next step is to test for autocorrelation. This autocorrelation test uses the Durbin-Watson Test. The value of the Durbin-Watson Test autocorrelation or the probability value that must be met in order to be free from autocorrelation symptoms is if a value of -2 < Durbin-Watson < 2. In the results of this study, the Durbin-Watson Statistic value is at 0.688614, meaning that the value is more than -2 and less than 2 (-2 < 0.688614 < 2). This value can also be interpreted that the research data can be free from autocorrelation symptoms.

Heteroscedasticity Test Stage 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003957	0.010181	-0.388672	0.6999
Credit Cards	0.001653	0.006687	0.247198	0.8062
Debit Cards	1.67E-09	1.55E-09	1.076884	0.2891
Floating Funds	-7.05E-05	0.000328	-0.215004	0.8310
Policy Interest Rate	0.002056	0.001919	1.071311	0.2916
COVID-19	0.000488	0.000582	0.839306	0.4072

Table 6. Heteroscedasticity Test Stage 1

Heteroscedasticity test using the Breusch-Pagan-Godfrey Test, the probability value that must be met to be free from heteroscedasticity symptoms is a significance value or probability greater than 0.05. Based on this test, all probabilities of the credit card variables (X1), debit cards (X2), float funds (X3), policy interest rates (X4), covid-19 (dummy) exceed the significance value, which is 0.05. So in this stage 2 research model, it has been free from heteroscedasticity symptoms.

Multiple Linear Regression Analysis Stage 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.149062	0.623680	1.842388	0.0734
Velocity of Money	4.289388	1.219820	3.516412	0.0012
Inflation	0.448650	0.091098	4.924935	0.0000

Table 7. Multiple Linear Regression Analysis Stage 1

Based on the table above regarding the multiple linear regression analysis stage 1, the regression equation is obtained, namely Policy Interest Rate = 1.1490616245 + 4.28938831049*Velocity of Money + 0.448649515847*Inflation.. The equation has the following meaning:

a. The constant value obtained is 1.149062. This can be explained that if all velocity of money (Y) and inflation (Z) variables have a value of 0, then the value of a policy interest rate (X4) is 1.149062.
b. The regression coefficient value for the velocity of money (Y) variable is 4.289388. This means that if the velocity of money (Y) variable increases by one percent, then the policy interest rate variable (X4) increases by 4.289388, and vice versa. If the velocity

of money (Y) variable decreases by one percent, then the policy interest rate variable (X4) will decrease by 4289388.

c. The regression coefficient value for the inflation variable (Z) is 0.448650. This means that if the inflation variable (Z) increases by one percent, then the policy interest rate variable (X4) increases by 0.448650, and vice versa. If the inflation variable (Z) decreases by one percent, then the policy interest rate variable (X4) will decrease by 0.448650..

Multiple Linear Regression Analysis Stage 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.422770	0.250230	-1.689524	0.1003
Credit Cards	-1.011356	0.164353	-6.153570	0.0000
Debit Cards	-1.09E-07	3.80E-08	-2.870765	0.0070
Floating Funds	-0.007331	0.008059	-0.909612	0.3694
Policy Interest Rate	0.160834	0.047166	3.409986	0.0017
COVID-19	-0.117499	0.014299	-8.217565	0.0000

Table 8. Multiple Linear Regression Analysis Stage 2

Based on the table above regarding the stage 2 multiple linear regression analysis, the regression equation is obtained, namely Velocity of Money = -0.422769779727 – 1.0113562004*Credit Card – 1.09222879003e-07*Debit Card – 0.00733060901825*Float Fund + 0.160834283118*Policy Interest Rate – 0.117498897842*COVID-19. The equation has the following meaning:

a. The constant value obtained is -0.422770. This can be explained that if all credit cards (X1), debit cards (X2), float funds (X3), policy interest rates (X4) and covid-19 (dummy variable) are worth 0, then the value of a velocity of money (Y) is -0.422770.
b. The regression coefficient value for the credit card variable (X1) is -1.011356. This means that if the credit card variable (X1) increases by one percent, then the velocity of money variable (Y) decreases by -1.011356, and vice versa. If the credit card variable (X1) decreases by one percent, then the velocity of money variable (Y) will increase by -1.011356.
c. The regression coefficient value for the debit card variable (X2) is -1.09E-07. This means that if the debit card variable (X2) increases by one percent, then the velocity of money variable (Y) decreases by -1.09E-07, and vice versa. If the debit card variable (X2) decreases by one percent, then the velocity of money variable (Y) will increase by -1.09E-07.
d. The regression coefficient value for the float fund variable (X3) is -007331. This means that if the float fund variable (X3) increases by one percent, then the velocity of money variable (Y) decreases by -0.007331, and vice versa. If the float fund variable (X3) decreases by one percent, then the velocity of money variable (Y) will increase by -0.007331.
e. The regression coefficient value for the policy interest rate variable (X4) is 0.160834. This means that if the policy interest rate variable (X4) increases by one percent, then the velocity of money variable (Y) increases by 0.160834, and vice versa. If the policy interest rate variable (X4) decreases by one percent, then the velocity of money variable (Y) will decrease by 0.160834.

f. The regression coefficient value for the covid-19 variable (dummy) is -0.117499. This means that if the covid-19 variable (dummy) increases by one percent, then the velocity of money (Y) variable decreases by -0.117499, and vice versa. If the covid-19 variable (dummy) decreases by one percent, then the velocity of money (Y) variable will increase by -0.117499.

Hypothesis Test of Policy Interest Rate Variable (X4)

Statistical t-Test

With a confidence value reaching 95% or 0.05, there are also degrees of freedom of n – k = 120 – 2 = 118, so it can be seen from two sides that the test value for the t-table is 1.980272249.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.149062	0.623680	1.842388	0.0734
Velocity of Money	4.289388	1.219820	3.516412	0.0012
Inflation	0.448650	0.091098	4.924935	0.0000

Table 9. Statistical Test (T Test) Stage 1

The influence of independent variables on dependent variables can be partially explained as follows :

a. The results of the t-test on the velocity of money (Y) variable show that the velocity of money (Y) variable has a t-statistic of 4.516412, greater than the t-table of 1.980272249 with a probability value of 0.0012 smaller than the significance value of 0.05. So it can be concluded that the velocity of money (Y) variable has a significant effect on the Policy Interest Rate variable (X4)..
b. The results of the t-test on the inflation variable (Z) obtained that the inflation variable (Z) has a t-statistic of 4.924935, greater than the t-table of 1.980272249 with a probability value of 0.0000 smaller than the significance value of 0.05. So it can be concluded that the inflation variable (Z) has a significant effect on the Policy Interest Rate variable (X4).

Model Feasibility Test (F Test)

In the F test, it is used as evidence for all independent variables whether they simultaneously affect or not the dependent variable. With the same level of confidence as the T test of 95% or α of 0.05. With a degree of freedom (degree of freedom) 1 of k - 1 = 2 - 1 = 1, and a degree of freedom (degree of freedom) 2 of n - k = 120 - 2 = 118, the value of the F-table is 3.921478181.

F-statistic	40.02589
Prob(F-statistic)	0.000000

Table 10. Model Feasibility Test (F Test) Stage 1

Based on the table above, it can be obtained that the F-Statistic value of 40.02589 is greater than the F-table, with a Prob (F-Statistic) of 0.000000 smaller than the significance value of 0.05. So it can be concluded that the velocity of money (Y) and inflation (Z) variables can have a significant effect simultaneously (at the same time) on the policy interest rate variable (X4).

Detemination Coefficient Test (R^2)

R-squared	0.683901
Adjusted R-squared	0.666814

Table 11. Detemination Coefficient Test (R^2) Stage 1

In the determination coefficient test or R2, it was obtained that the adjusted r-squared value was 0.683901 or it can be said that the value is 68.39%. This means that the large variation of the velocity of money (Y) and inflation (Z) variables is able to explain the policy interest rate variable (X4) by 68.39%, while the remaining 31.61% can be explained by other variables outside this research model.

Hypothesis Test of Velocity of Money (Y)

Statistical t-Test

With a confidence value reaching 95% or 0.05, there are also degrees of freedom of n – k = 240 – 2 = 238, so it can be seen from two sides that the test value for the t-table is 1.96998153.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.422770	0.250230	-1.689524	0.1003
Credit Cards	-1.011356	0.164353	-6.153570	0.0000
Debit Cards	-1.09E-07	3.80E-08	-2.870765	0.0070
Floating Funds	-0.007331	0.008059	-0.909612	0.3694
Policy Interest Rates	0.160834	0.047166	3.409986	0.0017
COVID-19	-0.117499	0.014299	-8.217565	0.0000

Table 12. Statistical Test (T Test) Stage 2

The influence of independent variables on dependent variables can be partially explained as follows :

a. The results of the t-test on the credit card variable (X1) obtained that the credit card variable (X1) has a t-statistic of -6.153570, smaller than the t-table of 1.96998153 with a probability value of 0.0000 smaller than the significance value of 0.05. So it can be concluded that the credit card variable (X1) has a significant effect and has a negative direction on the Velocity of Money variable (Y).
b. The results of the t-test on the debit card variable (X2) obtained that the debit card variable (X2) has a t-statistic of -2.870765, smaller than the t-table of 1.96998153 with a probability value of 0.0070 smaller than the significance value of 0.05. So it can be concluded that the debit card variable (X2) has a significant effect and has a negative direction on the Velocity of Money variable (Y)..
c. The results of the t-test on the float fund variable (X3) obtained that the float fund variable (X3) has a t-statistic of -0.909612, smaller than the t-table of 1.96998153 with a probability value of 0.3694 greater than the significance value of 0.05. So it can be concluded that the float fund variable (X3) does not have a significant effect on the Velocity of Money variable (Y).
d. The results of the t-test on the policy interest rate variable (X4) obtained that the policy interest rate variable (X4) has a t-statistic with a value of 3.409986, greater than the t-table of 1.96998153 with a probability value of 0.0017 smaller than the significance

value of 0.05. So it can be concluded that the policy interest rate variable (X4) has a significant effect on the Velocity of Money variable (Y).

e. The results of the t-test on the covid-19 variable (dummy) obtained that the covid-19 variable (dummy) has a t-statistic of -8.217565, smaller than the t-table of 1.96998153 with a probability value of 0.0000 greater than the significance value of 0.05. So it can be concluded that the covid-19 variable (dummy) has a significant effect and has a negative direction on the Velocity of Money (Y) variable.

Model Feasibility Test (F Test)

In the F test, it is used as evidence for all independent variables whether they simultaneously affect or not the dependent variable. With the same level of confidence as the T test of 95% or α of 0.05. With degrees of freedom 1 of k - 1 = 5 - 1 = 4, and degrees of freedom 2 of n - k = 240 - 5 = 235, the value of the F-table is 2.410057813.

F-statistic	133.1947
Prob(F-statistic)	0.000000

Table 13. Model Feasibility Test (F Test) Stage 2

Based on the table above, the f-statistic obtained is 133.1947 which is greater than the F-table value of 2.410057813, with Prob (F-Statistic) or a significance value of 0.000000, smaller than the significance value of 0.05. So it can be concluded that the variables of credit cards (X1), debit cards (X2), float funds (X3), policy interest rates (X4), and covid-19 (dummy) have a significant effect simultaneously (simultaneously) on the velocity of money variable in Indonesia (Y).

Detemination Coefficient Test (R^2)

R-squared	0.951427
Adjusted R-squared	0.944284

Table 11. Detemination Coefficient Test (R^2) Stage 2

In the determination coefficient test or R2, it was obtained that the adjusted r-squared value was 0.944284 or it can be said that the value is equal to 94.42%. This means that the large variation in the variables of credit cards (X1), debit cards (X2), float funds (X3), policy interest rates (X4), and covid-19 (dummy) is able to explain the velocity of money variable in Indonesia (Y) by 94.42%, while the remaining 5.58% can be explained by other variables outside this research model..

DISCUSSION

The Influence of Velocity of Money (Y) on Policy Interest Rates (X4)

In the velocity of money (Y) variable, it can be concluded that the research results obtained have a significant influence on the policy interest rate variable (X4). The resulting coefficient value of 4.289388 can be interpreted that a value if there is an increase of 1%, there will be an increase in the policy interest rate of 4.289388 percent. However, at the probability value of the velocity of money variable has a value of 0.0012 <0.05, it can be concluded that this variable has a significant influence on the policy interest rate in Indonesia (X4).

In this case, it is clear that money circulation is closely related to interest rates in Indonesia. When this money circulation occurs continuously, the money will quickly change hands. This can also trigger aggregate demand. Aggregate demand itself, if not accompanied by an increase in production, will cause inflation in the country. This can make Bank Indonesia assume that to control inflation caused by money circulation itself by raising the existing policy interest rate. This increase can trigger a reduction in people's purchasing power, so that aggregate demand will decrease and inflationary pressure will subside (Benati 2020).

The Effect of Inflation (Z) on Policy Interest Rates (X4)

In the inflation variable (Z) it can be concluded that the research results obtained have a significant influence on the policy interest rate variable (X4). The resulting coefficient value of 0.448650 can be interpreted that a value if there is an increase of 1% then there will be an increase in the policy interest rate of 0.448650 percent. However, the probability value of the credit card variable has a value of 0.0000 <0.05, it can be concluded that this variable has a significant influence on the policy interest rate in Indonesia (X4).

It is clear that inflation does have a close relationship with policy interest rates. An increase in inflation can trigger the central bank to raise interest rates. Because the central bank aims to maintain price stability. Bank Indonesia has its own way of working to raise policy interest rates, including by reducing people's purchasing power. By raising interest rates, borrowing costs will be more expensive, this will affect aggregate demand which will decrease. Then, an increase in interest rates can also make financial assets more attractive, so that it will encourage the flow of funds to the deficit sector, which will result in a decrease in real sector investment (Lukman Nugraha et al. 2023).

The Influence of Velocity of Money (Y) and Inflation (Z) on Policy Interest Rates (X4)

Based on the test results presented in table 4.10, it can be concluded that there is a significant relationship between the velocity of money (Y) and inflation (Z) variables on the policy interest rate (X4). The results of the simultaneous test or F test on the velocity of money (Y) and inflation (Z) variables on the policy interest rate (X4) show an F-statistic value of 40.02589 and a probability of 0.000000 which is smaller than 0.05

The test results that have been conducted by researchers have also shown in table 4.11, that the determination coefficient value (R2) is 0.683901 with a probability value of 0.000000. These results have shown that the relationship between the velocity of money (Y) and inflation (Z) variables has a contribution value of 68.39%. This coefficient value has proven that there is a significant influence together from the velocity of money (Y) and inflation (Z) variables on the policy interest rate (X4). And, the results of this test are in accordance with the theory explained previously.

This is in line with existing regulations, that money circulation and inflation are indeed two main factors that can affect policy interest rates. In this case, when this money circulation increases, it has been said before that money will change hands faster. This can increase aggregate demand which will cause inflation if not balanced with increased production. In addition, the central bank or Bank Indonesia raising interest rates will make financial assets more attractive, so that it can encourage the flow of funds from the real sector to the financial sector. This will result in a decline in the real sector.

The Influence of Credit Cards (X1) on Velocity of Money (Y)

On the credit card variable (X1) it can be concluded that the research results obtained have a significant influence with a negative direction on the velocity of money variable in

Indonesia (Y). The resulting coefficient value of -1.011356 can be interpreted that a value if there is an increase of 1% then there will be a decrease in the velocity of money in Indonesia by -1.011356 percent. However, on the probability value of the credit card variable has a value of 0.0000 <0.05, it can be concluded that this variable has a significant influence with a negative direction on the velocity of money in Indonesia.

In the interpretation results that are in accordance with the research, it can also be In the interpretation results that are in accordance with the research, it can also be concluded that the results are in accordance with the theory put forward by Irving Fisher, where it has been stated that money circulation can be influenced by technological advances. One of these technological advances is by introducing non-cash payment instruments, namely credit cards as one of the non-cash payment instruments. However, in this study, credit cards have a negative direction towards money circulation in Indonesia. Where if there is an increase in money circulation, then the use of credit cards will not increase.

The Influence of Debit Cards (X2) on Velocity of Money (Y)

On the debit card variable (X2) it can be concluded that the research results obtained have a significant and negative influence on the velocity of money variable in Indonesia (Y). The resulting coefficient value is -1.09E-07, which means that if a value increases by 1%, there will be a decrease in the velocity of money in Indonesia by -1.09E-07 percent. However, the probability value of the debit card variable has a value of 0.0070 <0.05, it can be concluded that a variable has a significant influence with a negative direction on the velocity of money in Indonesia.

The impact that occurs with the negative and significant relationship of debit cards to the circulation of money will be a decrease in the value of money circulation, especially in paper money in Indonesian society. Therefore, there is a negative and significant relationship between the value of debit card transactions and the velocity of money in Indonesia. We already know that not all Indonesian people use non-cash transactions, for example, most rural communities still use cash transactions.

The Influence of Floating Funds (X3) on Velocity of Money (Y)

In the float fund variable (X3) it can be concluded that the research results obtained do not have a significant effect on the velocity of money variable in Indonesia (Y). The resulting coefficient value is -0.007331, which means that if a value increases by 1%, there will be a decrease in the velocity of money in Indonesia by -0.007331 percent. However, the probability value of the debit card variable has a value of 0.3694> 0.05, it can be concluded that this variable does not have a significant effect on the velocity of money in Indonesia.

For example, in Indonesia today, many people use demand deposits or transactions using cards, QRIS and other types of non-cash payments. This results in funds being deposited on the owner's card, which will affect the circulation of money in Indonesia. For example, the circulation of money in Indonesia with these deposited funds will slow down or could speed up.

The Influence of Policy Interest Rates (X4) on Velocity of Money (Y)

On the policy interest rate variable (X4) it can be concluded that the research results obtained have a significant influence on the velocity of money variable in Indonesia (Y). The coefficient value produced is 0.160834, which means that if a value increases by 1%, there will be an increase in the velocity of money in Indonesia by 0.160834 percent. However, on the probability value of the policy interest rate variable has a value of 0.0017 <0.05, it can be

concluded that this variable does have a significant influence on the velocity of money in Indonesia.
According to the existing theory, it is true that if there is an increase in interest rates in Indonesia, there will be a decrease in money circulation in Indonesia and vice versa. This is because Bank Indonesia often uses an interest rate policy as a tool to control inflation and economic growth. Bank Indonesia can also design a more effective monetary policy later.

The Influence of Covid-19 Pandemic (dummy) on Velocity of Money (Y)

In the covid-19 pandemic variable (dummy), it can be concluded that the research results obtained have a significant and negative influence on the velocity of money variable in Indonesia (Y). The resulting coefficient value of -0.117499 can be interpreted that a value if there is an increase of 1%, there will be a decrease in the velocity of money in Indonesia by -0.117499 percent. However, the probability value of the covid-19 pandemic variable has a value of 0.0000 <0.05, it can be concluded that this variable has a significant and negative influence on the velocity of money in Indonesia.

At the coefficient value obtained of -0.117499, it means that during the Covid-19 pandemic, money circulation in Indonesia was smaller than the money circulation in Indonesia before Covid-19. This shows that it can result in a decrease in money circulation in Indonesia. Because people's consumption power during the Covid-19 pandemic prefers to pay using cards or the like.

In addition, the positive impact of the Covid-19 pandemic on money circulation is an increase in digital transactions. Through the pandemic, it can encourage people to transition from shopping directly to shopping online, so that it can increase the value of digital transactions and accelerate money circulation in Indonesia. However, in Bima Savero's research in 2022 (Dewanto 2022), the Covid-19 pandemic had a negative impact on money circulation. This is due to the coercive nature of society in limiting their movements, which results in slowing down transactions in society. In addition, urban communities may be familiar with non-cash or cashless transactions. However, in contrast to rural communities, conventional transactions are still the main method used.

The Influence of Credit Cards, Debit Cards, Float Funds, Policy Interest Rates, and the Covid-19 Pandemic (Dummy) on the Velocity of Money

Based on the test results presented in table 4.13, it can be concluded that there is a significant relationship between the variables of credit cards, debit cards, float funds, policy interest rates, and the Covid-19 pandemic on the velocity of money in Indonesia. The results of the simultaneous test or F test on the variables of credit cards, debit cards, float funds, policy interest rates, and the Covid-19 pandemic (dummy variables) on the velocity of money show an F value of 133.1947 and a probability of 0.000000 which is less than 0.05.

The results of the tests conducted by the researcher have also shown in table 4.14, that the coefficient of determination (R2) value is 0.951427 with a probability value of 0.000000. These results have shown that the relationship between the variables of credit cards, debit cards, float funds, policy interest rates, and the Covid-19 pandemic (dummy variables) has a contribution value of 94.42%. This coefficient value has proven that there is a significant influence together starting from the variables of credit cards, debit cards, float funds, policy interest rates, and the Covid-19 pandemic (dummy variables) on the velocity of money in Indonesia. And, the results of this test are in accordance with the theory explained previously.
In addition, the positive impact of the Covid-19 pandemic on money circulation is an increase in digital transactions. Through the pandemic, it can encourage people to transition from

shopping directly to shopping online, so that it can increase the value of digital transactions and accelerate money circulation in Indonesia. However, in Bima Savero's research in 2022 (Dewanto 2022), the Covid-19 pandemic had a negative impact on money circulation. This is due to the coercive nature of society in limiting its movements, which results in a slowdown in transactions in society.

CONCLUSION

The purpose of this study is to determine the extent of the influence of credit cards, debit cards, floating funds, policy interest rates and the Covid-19 pandemic on money circulation in Indonesia in 2014-2023 using quantitative methods in this study. Secondary data were obtained from the pages of Bank Indonesia, the Central Statistics Agency, and the Indonesian Ministry of Trade. Multiple linear regression models using the Two-Stage Least Square (TSLS) method using Eviews software version 12. Based on the results of hypothesis testing, the findings of this study can be concluded as follows: (1) money circulation affects policy interest rates; (2) inflation affects policy interest rates; (3) credit cards affect money circulation; (4) debit cards affect money circulation; (5) floating funds does not affect money circulation; (6) policy interest rates affect money circulation; (7) the Covid-19 pandemic affect money circulation. Further research can expand the data used, for example by comparing it with several countries.

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