

Effect Cashless Payment on Inflation with Velocity of Money as Intervening Variable

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and velocity of
money.

Abstract

This study aims to examine the effect of debit cards, credit cards, e-money on inflation and the velocity of money as an intervention. Data in this study were obtained from trusted sources and the official websites of BI and BPS for the 2016-2020 period. The research data is secondary data in the form of time series data. This research uses the method of path analysis or path analysis and the data will be processed using SPSS. Test methods include classical assumption test, hypothesis test and test of the coefficient of determination R^2 . The significance level of this study is 5%. The results of this study state that in the first equation directly e-money has no significant effect on the velocity of money but credit cards and debit cards have a significant effect on the velocity of money, in the second equation directly debit cards and e-money have no effect on inflation, while credit cards and the velocity of money have a significant influence on inflation, indirectly the velocity of money is able to be an intervening between credit cards, debit cards, and e-money on inflation.

Kata Kunci

Kata Kunci:
kartu kredit,
kartu debit,
uang
elektronik,
inflasi, dan
perputaran
uang.

Abstrak

Penelitian ini memiliki tujuan untuk menguji pengaruh dari kartu debit, kartu kredit, e-money terhadap inflasi dan velocity of money sebagai intervening. Data pada penelitian ini didapatkan dari sumber terpercaya dan website resmi BI dan BPS dengan periode 2016-2020. Data penelitian ini data sekunder berupa data time series. Penelitian ini menggunakan metode analisis jalur atau path analysis dan data akan diolah menggunakan SPSS. Metode pengujiannya meliputi uji asumsi klasik, uji hipotesis dan uji koefisien determinansi R^2 . Tingkat signifikansi penelitian ini adalah sebesar 5%. Hasil penelitian ini menyatakan bahwa pada persamaan pertama secara langsung e-money tidak memiliki pengaruh signifikan terhadap velocity of money akan tetapi kartu kredit dan kartu debit berpengaruh signifikan terhadap velocity of money, pada persamaan kedua secara langsung kartu debit dan e-money tidak memiliki pengaruh terhadap inflasi, sedangkan kartu kredit dan velocity of money memiliki pengaruh signifikan terhadap inflasi, secara tidak langsung velocity of money mampu menjadi intervening antara kartu kredit, kartu debit, dan e-money terhadap inflasi.

1. PENDAHULUAN

Advances in technology are able to provide a lot of convenience in people's economic activities. Where, the economic activity is certainly not far from buying and selling activities by using payment instruments both in cash and non-cash in transactions. There are 2 types of non-cash payment instruments in Indonesia, namely APMK (Card-Based Payment Instruments) and electronic money or e-money. With this innovation in the payment system, it will certainly have a lot of positive impacts, the impact of this non-cash payment instrument is able to show a positive

relationship to the velocity of money. The increase in electronic money has an impact on increasing the velocity of money (Abednego Priyatama & Apriansah, 2010). In addition, an increase in the use of non-cash payment instruments will reduce transaction costs and then make the economy more efficient (efficiency effect). With this efficiency effect, it will then have an impact on price declines, in addition to the efficiency effect other hand there is also a substitution effect. When non-cash payment instruments as a means of substitution have increased, it will increase the velocity of money so that an economic activity,

the prices of goods and services will also increase (Syarifuddin et al., 2009).

The same thing was also stated by (Popovska-Kamnar, 2014) various countries in Europe also stated that the use of this electronic money, the transaction costs were considered cheaper and allowed for an increase in the velocity of money and also an increase in the number of transactions. According to (Pelletier et al., 2020) when a technological advance is able to reduce the demand for money, the money supply that has been determined by the central bank in principle can be used intensively in facilitating an economic transaction, this is referred to as an increase in the velocity of money. The velocity of money is able to cause inflation when the velocity of money increases, on the contrary it will experience deflation when the velocity of money decreases (Arewa & Nwakanma, 2013). The same thing was also stated by (Abednego Priyatama & Apriansah, 2010) which stated that Velocity of money is one of the variables claimed to be able to determine inflation in Indonesia.

So that with the increase in the use of non-cash payment instruments, its development and movement must be monitored and controlled properly. The purpose of this study is to find out that the Cashless Payment System in Indonesia has a direct or indirect effect on inflation with the velocity of money as the intervening variable.

2. LITERATURE REVIEW

2.1 Money

Money is a tool that can be exchanged for other objects, and is also able to provide value from these other objects, besides that money is a tool that can be stored (Solikin & Suseno, 2002). So that money can be interpreted as a tool that can be used in an activity that the public can believe will become a means of payment in transactions. The function of money has finally become diverse, namely as a medium of exchange, store of value, unit of account and standard for deferred payment (Solikin & Suseno, 2002). According to

economists, wealth does not only refer to the amount of money that exists or is owned, but money will only be one type of wealth (Mankiw, 2007).

2.2 Money

Based on the KBBI or the Big Indonesian Dictionary, the velocity of money is a measure of the velocity of the velocity of money in the economy. According to (Mankiw, 2007) Velocity of money provides information to us how much money will change hands in a certain period of time.usually The velocity of money uses a comparison of gross national income with the money supply.

2.3 Non-cash

payment system Non-cash payment system is a means of payment used by the public without using existing cash, but the instruments used are Card-Based Payment Instruments (APMK), checks, bilyet giro, debit notes, and electronic money (card based and server based) (www.bi.go.id). Bank Indonesia has a very important role in non-cash transaction activities, as the authority in supervising activities in the payment system.

2.4 Inflation

Inflation is a macroeconomic factor capable of becoming a benchmark in the economy. Where the meaning of inflation is an increase in the price of goods and services widely in a certain period. In the long term, inflation is able to reduce aspects of economic development and also change the level of people's prosperity. Inflation which is classified as high will of course also disrupt banking activities and also the efforts of banks to control real interest rates to remain low.

Indonesia uses the CPI or the Consumer Price Index as one of the inflation calculations, by counting 43 cities with a coverage of 249-353 commodities which will be calculated through a regular survey of life conducted in several cities. In addition, inflation can also be measured using the IHPB or the Wholesale Price Index.



2.5 Irving Fisher's Quantity Theory of Money

Classical theory or commonly known as the quantity theory of money by Irving Fisher. The formula in this theory is as follows:

$$M \times V = P \times T$$

Information:

M	= Amount of money
V	= Turnover of money
P	= Price
T	= Volume of goods

Based on this theory of quantity of money when a price level increases it will cause the velocity of money to increase which will then approach inflation. From this theory, it can be concluded that inflation or an increase in inflation can be caused by the amount of money and the velocity of money, when the amount of money increases, the velocity of money will be faster so that with an increase in these two aspects, which is finally able to make prices also increase so that inflation will occur.

2.6 Hypothesis

- H1: Credit cards have a positive influence on the velocity of money in Indonesia
- H2: Debit cards have a positive influence on the velocity of money in Indonesia
- H3: Electronic money has a positive effect on the velocity of money in Indonesia
- H4: Credit cards have a positive effect positive significant effect on inflation in Indonesia
- H5: Debit cards have a significant positive effect on inflation in Indonesia
- H6: Electronic money has a positive significant effect on inflation in Indonesia
- H7: velocity of money has a significant positive effect on inflation
- H8: credit cards have a positive effect not significant on inflation through the velocity of money
- H9 : Debit cards have an insignificant positive effect on inflation through the velocity of money
- H10: Electronic money has an insignificant positive effect on inflation through velocity of money.

3. RESEARCH METHODS

This study uses a quantitative approach, quantitative research is a research data analysis in the form of numbers or numeric. The focus of this research is to know the effect of cashless payment systems such as credit cards (X1), debit cards (X2), and e-money (X3) against inflation (Z) with velocity of money (Y) as intervening. cashless payment system or non-cash payment instrument is a means of payment used by the public without using currency or cash, but using Card-Based Payment Instruments (APMK), checks, bilyet giro, debit notes, and electronic money (card based and server based). (www.bi.go.id). Velocity of money will provide information on how much money will change hands in a certain period (Mankiw, 2007). Inflation is an increase in the price level that occurs continuously which will affect individuals, entrepreneurs and the government (Mishkin, 2008).

The data used in this study is secondary data in the form of time series. The scope of the year in this study is from 2016 to 2020, with the types of data used, namely credit card transaction volume, debit card transaction volume, e-money, inflation and velocity of money. The data in this study were taken from sources and the official website of Bank Indonesia and also BPS (Central Bureau of Statistics) Indonesia. The data collection method in this study uses statistical datasets, in which data on each variable in this study were obtained from trusted sources and also official websites that have high credibility.

Analysis of the data used in this study using the method of inferential analysis. Inferential analysis in this study consisted of classical assumption test of path analysis or path analysis of hypothesis testing and determination of coefficient test . The classical assumption test in this study includes normality test, heteroscedasticity test, multicollinearity test, autocorrelation test. The normality test is used to see whether the independent variable on the dependent variable has data that is normally distributed

or not (Gujarati & Porter, 2009). Heteroscedasticity test, problems with heteroscedasticity will arise when the disturbance variable has a variant that is not constant (Gujarati & Porter, 2009). Multicollinearity test is a linear relationship that occurs in the independent variables (Gujarati & Porter, 2009). The purpose of the autocorrelation test is to do this autocorrelation test to find out whether in period t there is a problem that interferes with the previous period (Gujarati & Porter, 2009). Meanwhile, the hypothesis test consists of a partial t test and a Sobel test. The t -test was used in this study to test whether the hypothesis of the sample yielded truth or error (Gujarati & Porter, 2009). Sobel test is used to test the indirect effect between the independent variable (X) on the dependent variable (Z) through the intervening variable or (Y) (Ghozali, 2018).

4. RESULTS AND DISCUSSION

4.1 Research Results

Inferential analysis in this study includes classical assumption test, path analysis, hypothesis testing and determinant coefficient test. The results of the normality test of this study indicate that the data are normally distributed, as seen from the Kolmogorov-Smirnov test which illustrates that in equations 1 and two the Asymp values. Sig (2-tailed) above 0.05 is equal to 0.091 (equation one) and 0.200 (equation two). The results of the heteroscedasticity test in this study stated that the research data did not have heteroscedasticity problems. Judging from the glejser test which states that in the first place credit cards, debit cards, and electronic money are above 0.05, the significance values are 0.841, 0.490, and 0.541. In the second equation, credit cards, debit cards, electronic money, and money cycles show results above the 0.05 significance level, namely 0.44, 0.476, 0.635 and 0.549.

The results of the multicollinearity test of this study show that in the first and second equations the tolerance value is more than 0.01

and the Vif value is below or not more than 10. So it can be stated that the independent data does not have multicollinearity problems in equation one and equation two. The results of the autocorrelation test of this study stated that in the first and second equations the data did not experience autocorrelation problems. Judging from the run test which states that in the first equation the value of asymp.sig (2tailed) is 0.068 which is greater than 0.05, as well as in the second equation that the value of asymp.sig (2tailed) is 0.118 which is greater than 0.05.

Path analysis The results of the path analysis of this research are as follows:

Table 1. The results of the path analysis of the first equation

variabel	std error	standardized coef beta	sig	keterangan
x1	0.001	0.758	0.000	signifikan
x2	0.001	(-0.810)	0.000	signifikan
x3	0.001	0.198	0.291	tidak signifikan

Source : proceed data (2022)

Table 2. The results of the path analysis of the second equation

variabel	std error	standardized coef beta	sig	Keterangan
x1	0.001	0.437	0.001	Signifikan
x2	0.001	(-0.315)	0.110	tidak signifikan
x3	0.001	(-0.272)	0.103	tidak signifikan
y	0.099	0.274	0.023	signifikan

Source: processed data (2022)

Based on the results of path analysis in the table above, 2 equations are formed, namely:

the first regression equation,

$$Y = P_{yx1}x1 + P_{yx2}x2 + P_{yx3}x3 + e1$$

$$Y = 0.756x1 + (-0.810)x2 + 0.198x3 + 0.606$$

the second regression equation

$$Z = P_{zx1}x1 + P_{zx2}x2 + P_{zx3}x3 + P_{zy1}y1 + e1$$

$$Z = 0.437x1 + (-0.315)x2 + (-0.272)x3 + 0.274y + 0.525$$

The following are the results of the path analysis in the form of a diagram:

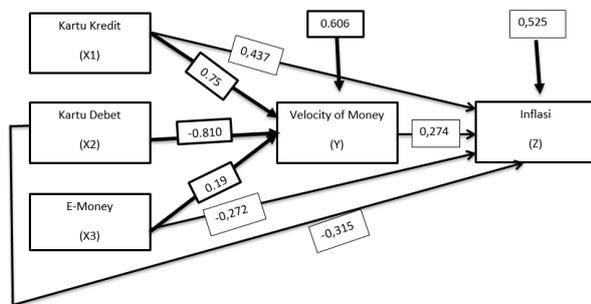


Figure 1. The results of the path analysis

Based on the results above, it can be explained that the direct influence of credit cards on the Velocity of money is 0.756 or 75.6% with a significance value of $0.000 < 0.05$, which means that the credit card variable has a positive effect. significant to the velocity of money. The effect of the debit card on the velocity of money is -0.810 or -81% with a significance value of $0.000 < 0.05$, which means that the debit card variable has a significant negative effect on the velocity of money. The effect of E-money on the Velocity of money is 0.198 or 19.8% with a significance value of $0.291 > 0.05$, which means that the e-money has no significant effect on the velocity of money.

Then, the direct effect of credit cards on inflation is 0.437 or 43.7% with a significance value of $0.001 < 0.05$, which means that the credit card variable has a significant positive effect on inflation. The effect of debit cards on inflation is -0.315 or 31.5% with a significance value of $0.110 > 0.05$, which means that the debit card variable has no significant effect on inflation. The effect of E-money on inflation is -0.272 or 27.2% with a significance value of $0.103 > 0.05$, which means that the e-money has no significant effect on inflation. The effect of Velocity of money on inflation is 0.274 or 27.4% with a significance value of $0.023 < 0.05$, which means that the variable velocity of money has a significant positive effect on inflation.

The indirect effect of Credit Cards on inflation through Velocity of money is $0.756 \times 0.274 = 0.207$ or 20.7% with a total influence value of $0.437 + 0.119 = 0.556$. The effect of Debit Card on inflation through Velocity of money is $-0.810 \times 0.274 = -0.222$ or -22.2% with

a total effect value of $-0.315 + (-0.086) = -0.401$. The effect of E-money on inflation through Velocity of money is $0.198 \times 0.274 = -0.076$ or 7.6% with a total effect value of $-0.272 + (-0.074) = -0.346$.

The following hypothesis tests are the results of the t-test in this study:

Table 3. The results of the t-test

	pers.1	pers.2
Variabel	t	T
x1	8.345	3.682
x2	-4.182	-1.624
x3	1.066	-1.660
Y	-	2.348

Source: processed data (2022) The t-test is said to have a significant effect if it has a value with a significance value of < 0.05 , to find the magnitude of the value, a calculation will be carried out using the following

$$t \text{ formula : } t_{\text{tabel}} = (a/2:n-k-1)$$

First equation

$$\begin{aligned} t_{\text{tabel}} &= 0.025 : 60 - 3 - 1 \\ &= 0.025 : 56 \\ &= 2.00324 \text{ atau } 2.003 \end{aligned}$$

Second equation

$$\begin{aligned} t_{\text{tabel}} &= 0.025 : 60 - 4 - 1 \\ &= 0.025 : 55 \\ &= 2.00404 \text{ atau } 2.004 \end{aligned}$$

With a significance value of $0.000 < 0.05$. Which means credit card (x1) has a significant effect on Velocity of money so H1 is accepted. The debit card (x2) has $4,182 > 2,003$ with a significance value of $0.000 < 0.05$. Which means the debit card (x2) has a significant effect on Velocity of money so H2 is accepted. E-money (x3) has $1,066 < 2,003$ with a significance value of $0.291 > 0.05$. Which means that e-money (x3) has no significant effect on Velocity of money so H3 is Rejected.

Credit card (x1) has $3,682 > 2,004$ with a significance value of $0.001 < 0.05$. Which means credit card (x1) has a significant effect on inflation so H4 is accepted. The debit card (x2) has a $1,624 < 2,004$ with a significance value of $0.110 > 0.05$. Which means the debit card (x2) has no significant effect on inflation so H5 is Rejected. E-money (x3) has $1,660 < 2,004$ with a significance value of $0.103 > 0.05$.

Which means that e-money (x_3) has no significant effect on inflation so H_6 is Rejected. Velocity of money (y) has a value of $2,348 > 2,004$ with a significance value of $0.023 < 0.05$. Which means the velocity of money (y) has no significant effect on inflation so H_7 is accepted. Next is the Sobel test, the formula used in the Sobel test in this study is:

So the results of the first Sobel test are the regression coefficients from credit cards to the velocity of money (a) is 0.756, the regression coefficient for velocity of money on inflation (b) is 0.233, the standard error a (SE_a) is 0.001, and the standard error b (SE_b) is 0.99. the Sobel test above produces a Z value of $7.6322 > 1.96$ with a significance level of 0.05, so this value proves that the velocity of money variable is able to mediate the credit card variable on inflation. Then H_8 is accepted. regression coefficient of debit card to velocity of money (a) of -0.810, the regression coefficient of velocity of money on inflation (b) of 0.233, standard error of a (SE_a) of 0.001, and standard error of b (SE_b) of 0.99. the Sobel test above produces a Z value of $7.6316 > 1.96$ with a significance level of 0.05, so this value proves that the velocity of money variable is able to mediate the debit card variable on inflation. Then H_9 is accepted. regression coefficient of e-money on velocity of money (a) is 0.198, the regression coefficient for velocity of money on inflation (b) is 0.233, the standard error a (SE_a) is 0.001, and the standard error b (SE_b) is 0.99. the Sobel test above produces a Z value of $1.9999 > 1.96$ with a significance level of 0.05, so that this value proves that variable velocity of money is able to mediate the e-money on inflation. Then H_{10} is accepted.

The last is the coefficient of determination test. In equation 1 the value of R square contained in the "model summary" is 0.632, this shows that the contribution of the influence of x_1, x_2, x_3 to Y is 63.2% while the remaining 36.8% is a contribution from other variables not included in the study. In the second equation the value of R square contained in the "model summary" is 0.724, this shows that the contribution of the

influence of x_1, x_2, x_3, y to z is 72.4% while the remaining 27.6% is a contribution from other variables that are not included in the study.

4.2 Research Discussion

4.2.1 The effect of credit cards on the velocity of money

An increase in the use of credit cards can provide a positive increase in the velocity of money or the velocity of money. This study is in line with research conducted by (Lukmanulhakim & Djambak, 2016) which states that credit card variables in the long term have an influence on the velocity of money in Indonesia. In addition, according to (Geanakoplos & Dubey, 2011) states that when the use of credit cards increases it will provide efficiency in trading and make the velocity of money faster.

With the development of society that is becoming more modern, the use of credit cards is increasing, coupled with the Covid-19 pandemic, which is one of the reasons people use credit cards to increase. In accordance with the results of the study that when the use of credit cards increases, the velocity of money in Indonesia will also increase. An increase in the velocity of money means an increase in consumption transactions in the community.

4.2.2 The effect of debit cards on the velocity of money

An increase in the use of debit cards can have a negative effect on the velocity of money. Which means that when the debit card increases, the velocity of money will decrease. This study is in line with research conducted by (Lukmanulhakim & Djambak, 2016) which states that the debit card variable in the long term has an influence on the velocity of money in Indonesia.

The use of debit cards by people in Indonesia has a positive trend, coupled with the Covid-19 pandemic which has also led to an increase in the use of debit cards by the public. Not much different from credit cards, the results of the study show that when using a debit card in Indonesia in the 2016-2020

period, it will increase the velocity of money in a significant positive manner. An increase in the velocity of money means an increase in consumption transactions in the community.

4.2.3 The effect of e-money on the velocity of money

The use of electronic money in this study did not show any effect on changes in the velocity of money in Indonesia. The results of this study are also in line with research conducted by (Rahmawati et al., 2018) which states that the variable volume of electronic money transactions has no significant effect on the velocity of money. Research from (Ginting & Djambak, 2018) shows that the e-money does not have a significant effect on the velocity of money.

The use of e-money in Indonesia is experiencing a positive trend, but it is also possible that there are still many people who have not utilized this electronic money-based non-cash payment instrument. In addition, the use of electronic money is also still on a small scale of transactions, so these things can be the reason that makes electronic money not have a significant effect on the velocity of money.

4.2.4 Effect of credit cards on inflation

An increase in the use of credit cards can affect changes in inflation in Indonesia. so that an increase in credit cards will also negatively increase inflation. This study is in line with the results of research by (Safitri & Ariza, 2021) which says that an increase in credit cards will also affect inflation conditions in Indonesia. Research by (Yuwono, 2017) states that in the long term and also in the short term have a significant influence on inflation. The same thing is also found in research (Widyanita, 2018) which also states that credit card variables in the long and short term have a significant influence on inflation in Indonesia.

The increase in the use of credit cards has a positive trend in Indonesia. This study supports research conducted by (Geanakoplos & Dubey, 2011) which states that an increase in credit cards is able to create efficiency in

trading and is also able to increase velocity of money theinflation. The significant positive effect of credit cards on inflation is included in a substitution effect. Credit cards themselves are only as a means of non-cash payment as a substitute for currency, when the use of credit cards increases it will increase the velocity of money which then also increases inflation, with this increase the prices of goods and services will also increase.

4.2.5 The effect of debit cards on inflation

Changes in the increase or decrease in debit cards do not have any effect on inflation. so the increase in debit cards does not have any effect on inflation. This study is in line with research conducted by (Widyanita, 2018) which states that debit card variables in the long and short term do not have a significant effect on inflation in Indonesia.

Although the increase in the use of credit cards is experiencing a positive trend and also with the convenience offered by the use of debit cards in withdrawing funds or in transactions and making some people reluctant to carry cash. However, the value of using a debit card is still smaller than the use of cash, so debit cards tend not to have an effect on inflation but cash.

4.2.6 Effect of e-money on inflation

This increase in the use of electronic money does not affect changes in inflation in Indonesia. so that the increase in e-money does not have any effect on inflation. This study is in line with research conducted (Kalbuadi et al., 2021) which states that the e-money does not have a significant effect on inflation in Indonesia.

The use of electronic money by the public in Indonesia is still small, with the scale of electronic money transactions that are still small and still not maximal, being able to be the cause or factor that the variable e-money does not have a direct significant effect on inflation, according to Zunaitin et al. , 2017) electronic money itself cannot directly affect inflation, but

through the money supply first and then it will affect inflation.

4.2.7 Effect of velocity of money on inflation

An increase in the velocity of money can provide changes to inflation. so that the increase in the velocity of money has a significant positive effect on inflation. This research is also in line with research conducted by (Safitri & Ariza, 2021) which says that the velocity of money or the velocity of money has a significant positive effect on inflation.

An increase in the velocity of money is caused by an increase in people's behavior in utilizing their income or using the money they have. Where when the velocity of money increases it is able to affect changes in inflation (Zunaitin et al., 2017).

4.2.8 The effect of credit cards, debit cards, -money on inflation through velocity of

4.2.8 money . emoney against inflation. For now, there is still no finding similar research using this path analysis method, however, there are several previous studies that are considered capable of reinforcing the results of this study. This study is in accordance with the findings put forward by (Abednego Priyatama & Apriansah, 2010) which said that the increase in electronic money that occurred in Indonesia had an impact on increasing the velocity of money, besides Velocity of money or the velocity of money was one of the variables that claimed to be able to determine inflation in Indonesia. In addition, according to (Yuwono, 2017) in his research states that the increase in debit card transactions is able to affect changes in the velocity of money.

(Arewa & Nwakanma, 2013) in their research also states that the circulation of money can cause inflation when it increases. Different research from (Geanakoplos & Dubey, 2011) also said that an increase in the use of credit cards can increase the velocity of money and can cause inflation. So this study is able to prove from the quantity theory of money from

Irving Fisher which states in his theory that changes in the increase or decrease in the money supply will have an effect on changes in the velocity of money which will then cause changes or increases in price levels that can cause inflation. This statement is also reinforced by research from (Zunaitin et al., 2017) which states that electronic money will first affect the Money Supply or JUB which will then affect inflation.

5. CLOSING

5.1 Conclusion

Based on the results of the analysis and discussion of the research data above, it can be concluded that credit cards have a significant positive effect on the velocity of money. debit cards have a significant positive effect on the velocity of money. e-money has no significant effect on the velocity of money.

Credit cards have a significant positive effect on inflation. debit cards have no significant effect on inflation. e-money has no significant effect on inflation. velocity of money has a significant effect on inflation.

Velocity of money is proven to be an intervening variable or able to mediate independent variables of credit cards, debit cards, and e-money on inflation.

5.2 Suggestions

Based on the results of this study, it is recommended for monetary policy makers to determine appropriate and appropriate regulations for non-cash payment instruments. Because although there are several variables that do not have a direct influence on the velocity of money and inflation, indirectly the velocity of money is able to mediate non-cash payment instruments against inflation. So that it requires intervention from monetary policy to regulate and monitor this so that the possibility of an increase in inflation caused by non-cash payment instruments will also be reduced.

For future researchers, if they have an interest in conducting the same research, it is hoped that they will be able to add other



variables and also increase the range of periods so that they can find out the update of the existence of the same research and also get better research results.

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