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The Influence of E-Money Usage, Card-Based Payment Instruments, EDC Machines, and Interest Rates on Velocity of Money in Indonesia

Muhammad Fauzan[1], Dian Prehatin[2], Miftahus Surur[3]
[1]Islamic Economic and Bussiness Faculty, UIN Sunan Kalijaga Yogyakarta, Indonesia
[2] Islamic Economic and Bussiness Faculty, UIN Sunan Kalijaga Yogyakarta, Indonesia
[3] Islamic Economic and Bussiness Faculty, UIN Sunan Kalijaga Yogyakarta, Indonesia
E-mail: Muhammadfauzan092001@gmail.com[1], dianprehatin334@gmail.com[2], miftahusur695@gmail.com

ABSTRAK
Tujuan dan pembahasan penelitian ini adalah untuk mengetahui pengaruh uang elektronik, APMK (alat pembayaran dengan menggunakan kartu), mesin EDC, dan suku bunga terhadap peredaran uang di Indonesia (tahun 2017 sampai dengan 2021). Penelitian ini menerapkan pendekatan kuantitatif dengan jenis penelitian deskriptif. Data yang digunakan adalah data sekunder yang berbentuk time series. Data tersebut bersumber dari Bank Indonesia dan Badan Pusat Statistik. Metode analisis yang digunakan adalah analisis regresi berganda. Berdasarkan penelitian yang dilakukan, penelitian ini menunjukkan bahwa variabel volume transaksi uang elektronik berpengaruh negatif dan signifikan terhadap variabel peredaran uang, artinya jika volume transaksi menurun maka peredaran uang meningkat. Variabel volume transaksi APMK tidak berpengaruh dan tidak signifikan terhadap variabel peredaran uang. Dan selanjutnya, variabel volume transaksi mesin EDC berpengaruh negatif dan signifikan terhadap variabel peredaran uang. Variabel volume transaksi suku bunga berpengaruh signifikan terhadap peredaran uang.

***Kata Kunci**: APMK, EDC, Peredaran Uang, Suku Bunga, Uang Elektronik*

ABSTRACT
The aim and discussion of this research is to determine the influence of e-money, APMK (cards-based payment instruments), EDC machines, and interest rates on the circulation of money in Indonesia (from 2017 to 2021). This study applies a quantitative approach with a descriptive research type. The data used is secondary data in the form of time series. The data is sourced from Bank Indonesia and the Central Bureau of Statistics. The analytical method used is multiple regression analysis. Based on the research conducted, this study shows that the e-money transaction volume variable has a negative and significant effect on the money circulation variable, meaning that if the transaction volume decreases, money circulation increases. The APMK transaction volume variable has no effect and is not significant on the money circulation variable. And then, EDC machine transaction volume variable has a negative and significant effect on the money circulation variable. The interest rate transaction volume variable has a significant effect on money circulation.

***Keyword**: APMK, EDC, E-Money, Interest Rate, Money Circulation*

INTRODUCTION

Technological advancements in the payment sector have significantly influenced modern society's way of life. Payment systems, which initially only accepted cash as a means of payment, have gradually evolved into non-cash payments. Along with technological progress, payment systems have also advanced. This development provides an opportunity for the banking sector to compete in the non-cash payment market. E-money, in particular, has the potential to offer efficiency to bankers through convenient microbanking services that enhance customer comfort. Moreover, the introduction of electronic money is expected to boost economic activities and increase national income (Mubin & Pambudi, 2020).

Along with the increasing use of this technology, it is naturally supported by features that are becoming more effective and efficient, making it very easy to understand and use. The advancements in technology, which bring new innovations, are expected to provide solutions to existing problems, such as rejecting money due to its being worn out, torn, or unfit for circulation. Additionally, these advancements improve transaction efficiency by reducing the need for people to carry large amounts of cash. Consequently, transaction effectiveness can be enhanced, meaning that individuals can avoid

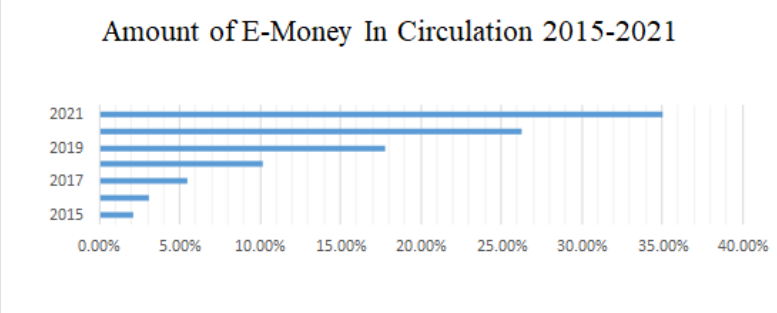
calculation errors or other human errors.(Indonesia, 2022)

In general, the cashless payment system does not use money in its physical form, also known as fiat money. The cashless payment system initially began with the use of paper-based instruments as its payment tools, such as checks, promissory notes, *giro* slips, and debit/credit notes. According to Joseph, the cashless payment system is referred to as a "*system*" because it employs electronic money and other tools to operate it.(Okifo & Igbunu, 2015) The payment system then evolved to adopt a card-based payment system, also referred to as card-based electronic money, with instruments such as debit/credit cards and electronic money. It later progressed to the use of platforms such as web, mobile, SMS, and others (Sriekaningsih, 2020).

According to Fimansyah, e-money is defined as a stored-value product (stored monetary value) or a prepaid product in which the amount of money is stored in an electronic medium owned by the consumer. (Firmansyah & Dacholfany, 2018) According to Danarto, electronic money is a prepaid product that holds monetary value for consumers to complete payment transactions (Sasongko et al., 2022). E-money itself emerged as a result of Bank Indonesia Regulation Number 11/12/PBI/2009, which was later updated to Bank Indonesia Regulation Number 20/6/PBI/2018 concerning Electronic Money (Sasongko et al., 2022). E-money refers to a payment instrument that represents a monetary value deposited by the cardholder. The deposited or stored monetary value is held in a medium, either a server or a chip.The value of electronic money managed by the issuer is not considered a deposit as defined in the laws regulating banking. E-money as a payment instrument differs from other card-based payment tools such as credit or debit cards. Credit and debit cards are "*access products*," characterized by transactions conducted online with the issuer's computer. In contrast, e-money is a non-cash payment instrument in the form of a prepaid product, where transactions are carried out offline at the merchant's terminal. (Firmansyah & Dacholfany, 2018)

In general, the characteristics of access products (APMK) include the absence of recorded funds on the card instrument, complete management of funds by the bank, and the use of the card instrument to access the issuer's computer online during transactions. Technological advancements, particularly the internet, have significantly influenced human life. Out of a total population of 272,682,600 people, as many as 210,026,769 Indonesians were connected to the internet in 2021 alone. The internet penetration rate was 64.80% in 2018, increased to 73.70% in 2019-2020, and further rose to 77.02% in 2021-2022. This indicates that the level of internet usage has consistently increased. (APJII et al., 2014) As of 2021, there were 63 electronic money issuers with a total of 575.32 million electronic money cards or instruments in circulation (Indonesia, 2022).

Figure 1: Number of Electronic Money in Circulation



Source: Bank of Indonesian

Based on Figure 1 above, it is evident that there has been a consistent increase every year. This indicates a growing preference among the general public for non-cash payment systems, as reflected in the continuous rise in the amount of electronic money in circulation. From 2015 to 2016, there was an increase of 1.03%, followed by a 2.36% increase from 2016 to 2017. The growth continued with a 4.70% rise from 2017 to 2018, a 7.62% increase from 2018 to 2019, an 8.52% rise from 2019 to 2020, and an 8.71% increase from 2020 to 2021.

Interest rates are the cost charged for borrowing money or the return earned on savings, typically expressed as an annual percentage of the principal amount (Metzler, 1951). In banking or financial contexts, interest rates have two main forms: loan interest rates and deposit interest rates. Loan interest rates refer to the charges imposed by financial institutions on individuals or businesses borrowing money, whereas deposit interest rates are the returns provided by banks to customers for their saved funds.(Saunders & Schumacher, 2000).

Table 1 Number of Electronic Money Readers

Year	Number of Electronic Money Readers
2015	281.988
2016	374.861
2017	691.331
2018	923.624
2019	516.642
2020	608.739
2021	668.567

Source: Bank of Indonesian

The growth in the circulation of electronic money is also supported by the expansion of infrastructure such as electronic money machines/readers. In 2018, the number of electronic money readers was at its highest, as that year saw a 209.8% surge in electronic money transaction volume, reaching 2.9 billion transactions compared to 943.3 million transactions in 2017. This increase in the value and volume of electronic money transactions was driven by the quality of services and infrastructure favored by users.

Table 2. Number of E-Money Transactions

Period	Electronic Money (E-Money) Transactions	
	Volume (Transaction)	Nominal (Million)
2015	535.579.528	5.283.017,65
2016	683.133.352	7.063.688,97
2017	943.319.933	12.375.468,72
2018	2.922.698.905	47.198.616,11
2019	5.226.699.919	145.165.467,60
2020	4.625.703.561	204.909.170
2021	5.450.400.276	305.435.828,86

Source: Bank of Indonesia

Based on data obtained from the official website of Bank Indonesia, it can be concluded from Table 12 that transactions conducted using electronic money consistently show an increase in both transaction volume and transaction value. The largest increase occurred in 2019, with a rise of approximately 97.9 million in transaction value and a transaction volume of 5,226,699,919 transactions compared to the previous year, and it continued to grow until 2021. This indicates that the public has a high level of trust in electronic money. This aligns with research conducted by Islamia & Ivon, which states that higher levels of public trust correlate with increased usage frequency (Putri, 2022)

Table 3. Money Circulation in Indonesian

Year	GDP	Money Supply	Money Turnover
2017	9.912.928,1	1.390.807	7,13
2018	10.425.851,9	1.457.150	7,15
2019	10.949.155,4	1.565.439	6,99
2020	10.722.999,3	1.855.693	5,78
2021	11.120.077,9	2.282.200	4,87

Source: BPS and Bank of Indonesia

Based on the table above, from 2017 to 2021, GDP and the amount of money in circulation showed consistent annual increases. However, this contrasts with the decline in the velocity of money over the same period. The velocity of money is closely related to the payment system. According to Mishkin, the velocity of money refers to the average number of times a unit of currency is used annually to purchase the total goods and services produced in the economy. This theory serves as a method to measure the level of national income by comparing spending behavior, which integrates money with the purchase of goods and services. The velocity of money can be expressed as the ratio of gross national income (GDP) to the money supply (Mubin & Pambudi, 2020). The circulation of money reflects transactions of goods and services occurring between individuals. The relationship between transactions and money is illustrated in the quantity equation mentioned by Fisher in Mishkin. A diverse payment system influences money movement, making it challenging for the government to determine monetary policies, particularly in regulating the money supply. One method to calculate the circulation of money in society is by using the concept of the velocity of money. Changes in money supply and money demand within the economy and the velocity of money highlight the importance of having a concept to measure the circulation of money within the community (Tama, 2021).

Based on research Rahmawati,Rahmawati et al., (2020) there are still several aspects of e-money usage that need further research. First, its impact on the money circulation in Indonesia has not been widely discussed. Second, the security and infrastructure of the cashless payment system require more in-depth investigation. Additionally, the influence of socio-economic factors such as income and education on e-money usage has not been sufficiently explored. Research could also compare e-money with other payment systems, such as credit or debit cards. Lastly, there is a need for research on how much e-money can contribute to financial inclusion.

Literature Review

Development of Electronic Money (E-Money)

Progress technology information has revolutionize system global payments, Anbukarasi, (2024) including in Indonesia. One of innovation important is electronic money (*e-money*), which is defined as instrument payment issued on base amount of money deposited moreover formerly to publisher , and stored in a way electronic For future transactions (Bank Indonesia, 2022). According to Shirai & Sugandi (2019), cash substitution by non-cash instruments can influence request towards money and ultimately impact on the amount of money in circulation. In the Indonesian context, research by Rahmi et al., (2024) show that growth *e-money* contribute to efficiency transactions and deductions cash circulation, especially in the sector retail and transportation.

Payment Instrument Using Cards (APMK)

Payment Tools Using Cards, such as debit and credit cards, are an integral part of system modern payments. (Nathan, nd) Study by Ozili (2022) mention that APMK has increase inclusion finance with give access more wide to public to service banking. Some research, such as by MacKay (2002) find that use card credit and debit have connection negative to the amount of paper money in circulation , along with decrease need public against cash. This is show the role of APMK in push digitalization transaction economy and influence dynamics monetary.

The Role of EDC (Electronic Data Capture) Machines

EDC machines play a role important as infrastructure Supporter in the non- cash transaction process (Rachman, Julianti, & Arkoyah, 2024). With increasing number of merchants using EDC, the community tend choose transaction use card compared to cash. Research by Ediputra and Amalyah, (2022) show that EDC distribution correlates positive with increasing volume of non- cash transactions in Indonesia. This show that widespread adoption of EDC participate strengthen system digital payments and reduce dominance of paper money in economy.

Amount of Money in Circulation (Money Supply) in Monetary Economics Perspective

Money supply or money supply is variable important in economy macro that influences inflation , interest rates and growth economy. According to theory classical quantity of money Fisher, Dawson et al (2016) that MV = PT, the amount of money in circulation (M) is

very important mark transaction economy (PT). In the modern context, the role of digital instruments in affecting M1 and M2 more and more noted . Research by Ma et al., (2024) confirm that digitalization system payment impact to change behavior public in holding money, which in the end influence structure and volume of money in circulation.

METHOD

This study uses a quantitative approach with multiple linear regression analysis to examine the effects of E-money, APMK, EDC machines, and interest rates on the Velocity of Money (VOM) in Indonesia. The research design aims to analyze the relationship between several independent variables is E-money (electronic money), APMK (us of debit, credit, and card transactions), EDC machines, and interest rates) and the dependent variable (VOM) (measured using data on GDP, M1 and M2) in the Indonesian economy. The sample of this study is based on secondary data obtained from annual report of Bank Indonesia, the Financial Services Authority (OJK), and other official statistical institutions during the period 2017–2021. The sample selection is based on the availability of data related to the variables being studied. To analyze the data, this study uses multiple linear regression analysis with the following equation model:

$$VOM = \alpha + \beta_1 Emoney + \beta_2 APMK + \beta_3 EDC + \beta_4 IR + e$$

Where:

VOM : Velocity of Money Circulation
E-money : Circulating Electronic Money
APMK : Circulating Payment Card Instruments
EDC : Number of EDC Machines in Circulation
IR : Interest Rate
α : Constans
β1…..β4 : Regression Coeffecients
e : Standars Error

RESULT

Descriptive Statistic

Table 4. Descriptive Statistic Result

	E-Money	APMK	EDC	Interes Rate	VOM
Mean	319.480	576.658	1.233.688	4.608.333	6.384.000
Maximum	602.293	682.560	1.761.930	6.000.000	7.237.118
Minimum	51.970	429.861	929.479	3.500.000	4.540.764
Std. Dev.	153.048	56,979.24	183,143	837.883	940.647
Observations	60	60	60	60	60

Source: Eviews 12 (2025)

Based on the table above, it can be observed that the mean value of E-money is 319.480, the minimum value is 51.970 and the maximum value is 602.293, while the standard deviation is 153.048. The mean value of APMK is 576.658, the minimum value is 429.861, the maximum is 682.560, and the standard deviation is 56.979. The mean value for EDC Machines is 1.233.688, the minimum value is 929.479, the maximum value is 1.761.930 and the standard deviation is 183.143. The mean value for interest rates is 4.608.333, the minimum value is 3.500.000, the maximum value is 6.000.000, and the standard deviation is 837.883. The mean value of VOM (Velocity of Money) is 6.384.000, the minimum value is 4.540.764, the maximum value is 7.237.118, and the standard deviation is 940.647.

Classical Assumption Test

Table 5. Classical Assumption Test Result

Variable	Multicollinearity	Autocorrelation	Normality	Heteroscedasticity
	VIF	*Lagrange Multiplier*	*Jarque-Bera*	*Glejser*
E-Money	3.109262			0.3706
APMK	3.084536	0.1410	0.119852	0.0655
EDC	1.123143			0.2046
Interes Rate	1.291546			0.1369

Source: Eviews 12 (2025)

According to table 3, it can be seen that the results of multicollinearity using the VIF (*Variance Inflation Factor*) test, on the E-Money variable of 3.109262, APMK of 3.084536, EDC is 1.123143 and interes rate of 1.291546. These results prove that the value is smaller than 10.00 and this can be stated that the data in the study do not have symptoms of multicollinearity. Then, the results of autocorrelation using the *Lagrange Multiplier method* are 0.141, this means that the value is greater than 0.05 (0.1410 > 0.05). These results indicate that the data in this study do not have autocorrelation.

The results of the normality test using the *Jarque-Bera method* show that the probability value for all variables is 0.119852, which means that this value is greater than 0.05 (0.119 > 0.05). This means that the data in this study are normally distributed. Then, the results of the heteroscedasticity test using the *Glejser method* show that the E-Money variable is 0.3706, the APMK is 0.0655, EDC is 0.2046 and interest rate is 0.1369, this means that the value is greater than 0.05. So, it can be stated that the data does not experience heteroscedasticity and the model is suitable for use.

Multiple Linear Regression

Table 6. Multiple Linear Regression Result

Variable	Coefficient	Std.Error	t-statistic
C	5389211	991852.3	5.43481
E-Money	-3.144933	0.563514	-5.580934
APMK	0.386112	1.496406	0.258026
EDC	-0.961221	0.355448	-2.704253
Interest Rate	642906.1	75598.20	8.504252

Source: Eviews 12 (2025)

Based on the data from the table above, the following regression equation can be obtained:

$$Y = \mathbf{5389211.} - \mathbf{3.144933} + \mathbf{0.386112} - \mathbf{0.961221} + \mathbf{642906.1}$$

From the equation, the model can be interpreted as follows:

1. The constant value in the table above is 15,389,211. This means that if all the independent variables, namely the volume of electronic money transactions, APMK transaction volume, and the number of EDC machines, have a coefficient of zero (0), the velocity of money will increase by 15,389,211 times.
2. E-Money coefficient (−3.144933), each increase of 1 unit in E-Money will decrease VOM by 3.144933, assuming other variables remain constant.
3. APMK coefficient (0.386112), each increase of 1 unit in APMK will increase VOM by 0.386112, assuming other variables remain constant.
4. EDC coefficient (−0.961221), each increase of 1 unit in EDC will decrease VOM by 0.961221, assuming other variables remain constant.
5. Interest Rate coefficient (642906.1), each increase of 1 unit in X4 will increase VOM by 642,906.1, assuming other variables remain constant.

Parsial Test, Simultan Test and Coefficient of Determination

Table 7. Parsial, Simultan, Coefficient of Determination Result

Variable	t-Statistic	Prob.
E-Money	-5.580934	0.0000
APMK	0.258026	0.7973
EDC	-2.704253	0.0091
Interest Rate	8.504252	0.0000
F-statistic		102.9642
Prob (F-statistic)		0.000000
R Squared		0.882191
Adjusted R-Squared		0.873623

Source: Eviews 12 (2025)

Based on the table above, the results are as follows, given that the *t-table* value from the table above is 2.00324, it can be concluded that the independent variables e-money, EDC, and interest rates are statistically significant and have a real effect on the velocity of money. However, variable APMK is not significant, so its contribution to the model is considered negligible. Further evaluation is needed to understand its role or to consider removing it from the model. This model highlights the important role of payment technology (e-money and EDC) and interest rate policies in influencing the velocity of money, with a significant shift from cash transactions to non-cash transactions.

The F-statistic value of 102.9642 indicates that simultaneously, the independent variables in the model make a strong contribution to the dependent variable (velocity of money). The Prob. (F-statistic) value of 0.000000 (very small, below 0.05) shows that the result is significant at the 5% confidence level. Therefore, it can be concluded that, collectively, the independent variables (E-money, APMK, EDC Machines, and interest rates) have a significant effect on the dependent variable (velocity of money). And Then, the coefficient of determination (Adjusted R-squared) is 0.873623, which, when expressed as a percentage, is 87.36%. This means that e-money, APMK, EDC machines, and interest rates contribute a combined simultaneous effect of 87.36% on the velocity of money, while the remaining 12.64% is influenced by other factors.

DISCUSSION

This study aims to determine the effect of e-money, APMK, and the number of EDC machines on the velocity of money in Indonesia. The data for this research includes the number of e-money transactions, the number of APMK transactions, the number of EDC machines, and the money supply, which is sourced from the official website of Bank Indonesia, Meanwhile, the GDP data for the velocity of money calculation is taken from the official website of the Central Bureau of Statistics (BPS), covering the period from 2017 to 2021.

The Effect of E-money on the Velocity of Money from 2017 to 2021

Based on the results of the t-test calculation conducted earlier regarding the effect of e-money on the velocity of money from 2017 to 2021 (monthly), it was found that the t-statistic value for the number of e-money transactions is -3.66, while *the t-table* value is 2.04. The profitability value of the transaction volume variable is 0.01, which is smaller than 0.05 (α value). Therefore, it can be concluded that the number of e-money transactions has a negative and significant effect on the velocity of money, which is consistent with the hypothesis. This negative effect occurs because the increasing transaction volume each year causes the velocity of money to decrease.

The results of this study are in line with the research conducted Rahmaniar et al., (2021) where one variables in their study showed that e-money has a significant negative effect on the velocity of money. The increased use of e-money transactions occurs because the lifestyle of society today has become more modern, supported by the advancement of increasingly sophisticated technology, including developments in payment systems. Initially, payment systems used cash-based methods, but now they have shifted to electronic payments. This technological advancement has provided opportunities for the banking sector, which then launched electronic payment systems. Currently, the Indonesian public, especially the younger generation, is increasingly interested in using e-money. This practical digital payment tool is becoming more popular. The presence of e-money offers convenience and flexibility in

conducting financial transactions, not only for online purchases but also for toll payments, commuter lines, Trans-Jakarta, parking, and various other public facilities(Raineven, 2023). This is what causes the volume of e-money transactions to increase, which in turn leads to a decrease in the velocity of money (M1).

The Effect of Payment Instruments Using Cards (APMK) on the Velocity of Money from 2017 to 2021

Based on the results of the t-test calculation conducted earlier regarding the effect of APMK on the velocity of money from 2017 to 2021 (monthly), it was found that the t-statistic value for APMK transactions is 0.45, while the t-table value is 2.04. The profitability value for the APMK transaction volume variable is 0.64, which is greater than 0.05 (α value). Therefore, it can be concluded that the number of APMK transactions has an effect on the velocity of money, but it is not significant. This result does not align with the hypothesis, so H2 is rejected. The results of this study are in line with the research conducted Adawiyah, (2020) where results show that, partially, VKREDIT does not significantly affect M1 or M2. Additionally, the research conducted by Salimah & Wahyuningsih (2022) found that estimates using the ARDL showed that the variables TKD, TKK, and TKE do not significantly affect the velocity of money, both in the short term and long term.

Technological advancements have indeed been rapid, but societal habits and desires have also evolved. Progress in banking technology has made transaction processes easier and faster for the public. As a result, current information shows that people are more likely to use digital or electronic payment methods rather than debit or credit cards. However, there is now a possibility that card-based payment methods, such as debit or credit cards, will become less commonly used and eventually abandoned by most of the population in Indonesia. For example, data from 2019 shows that the number of ATM card users in Indonesia was only about 6,980, while credit card usage reached 17,487. Meanwhile, the usage of ATM and debit cards reached 174,445. On the other hand, non-bank electronic payment methods are estimated to be around 292,299. Rico explains that when comparing payments through ATM and transactions with ATM plus debit cards, it is observed that ATM card usage tends to be stable, as does credit card usage. While the use of ATM plus debit cards has increased, it now faces competition from electronic money usage (Iswadi et al., 2023).

Theoretically, the use of non-cash payment methods, such as debit/ATM cards, has the potential to reduce the amount of cash in circulation. However, based on empirical research conducted in various countries, the conclusions obtained vary. In practice, the impact of using non-cash payment instruments on the amount of cash in circulation cannot be uniformly concluded. Studies conducted in different countries have shown different results. However, in general, previous research has found a negative impact related to the use of non-cash payment instruments. There are also studies that show a positive impact, or even no significant effect, as seen in this study. The differences in the results of this study can be influenced by several factors, such as differences in the years of data used or the analytical methods applied in the research.

The Effect of EDC Machines on the Velocity of Money from 2017 to 2021

Based on the results of the t-test calculation conducted earlier regarding the effect of EDC machines on the velocity of money from 2017 to 2021 (monthly), it was found that the t-statistic value for the number of EDC machines is -8.43, while the t-table value is 2.04. The profitability value for the number of EDC machines is 0.00, which is smaller than 0.05 (α value). Therefore, it can be concluded that the number of EDC machines has a negative and significant effect on the velocity of money, which aligns with the hypothesis (H3 is accepted).The results of this study are in line with the research conducted Iswadi et al., (2023) where show that has a negative and significant effect on the demand for electronic money.

The rapidly developing technology has also influenced the daily habits of society, such as in the use of EDC machines. In early 2022, there was a growth in the payment business through Electronic Data Capture (EDC) machines owned by banking institutions. Bankers recorded a two-digit increase in transactions in January. Thomas Wahyudi, Senior Vice President of Transaction Banking Retail Sales at Bank Mandiri, revealed that the highest transaction volume was seen in the Hotel and Restaurant segment. Meanwhile, according to Santoso Liem, Director of Bank BCA, he

observed that transactions through BCA's EDC machines had experienced a significant increase, in line with the lifestyle of the public adopting cashless payment systems (Zahra & Tunnisa, 2024).

Rapid technology not only has developed in the world of shopping payments, but the Pekanbaru City Transportation Department (Dishub) is currently focused on improving street-side parking services. They are collaborating with third parties to actively promote the use of Electronic Data Capture (EDC) machines as a cashless payment tool. The Head of Dishub Pekanbaru, Yuliarso, through the Head of UPT Parking, Radinal Munandar, stated that the use of EDC tools is a step in supporting Pekanbaru's efforts to become a digitalized city. Currently, there are hundreds of EDC machines installed at various locations on the streets of Pekanbaru (Fandiyanto, 2019). Considering the two phenomena mentioned earlier, it can be concluded that as payment systems advance, people are more likely to choose practical payment methods rather than carrying cash when making transactions outside. This shift has led to a decrease in the velocity of money in Indonesia, as more people prefer to conduct cashless transactions.

The Effect of Interest Rates on the Velocity of Money from 2017 to 2021

Based on the results of the t-test calculation conducted earlier regarding the effect of interest rates on the velocity of money from 2017 to 2021, it was found that the t-statistic value for interest rates is 5.67, while the t-table value is 2.04. The profitability value for the interest rate variable is 0.00, which is smaller than 0.05 (α value). Therefore, it can be concluded that interest rates have a positive and significant effect on the velocity of money, which aligns with the hypothesis proposed earlier (H4 is accepted).

The results of this study are in line with the research Oyadeyi & Olajide, (2024) which found that higher interest rates encourage an increase in the velocity of money because people tend to save more in the form of deposits that offer higher interest rates. The continuous fluctuations in interest rates also reflect monetary policies that influence consumer spending patterns. For example, with an increase in interest rates, people tend to restrain their spending and choose to save their money in the form of deposits or other investments. This leads to a slower circulation of money in the market. As stated by several economists, high interest rate policies can reduce household consumption and business investment due to higher borrowing costs. Thus, even though inflation may be controlled, the velocity of money is likely to decrease.

On the other hand, when interest rates are low, more people become involved in economic transactions due to lower borrowing costs, which encourages increased consumption and investment. For example, the real estate sector in Indonesia experienced rapid growth when Bank Indonesia lowered interest rates in 2020. People were more inclined to buy homes and took advantage of the low-interest rates as an opportunity.Therefore, the effect of interest rates on the velocity of money can be seen as a reflection of monetary policy that influences consumer behavior and investment in Indonesia, which in turn can either decrease or increase the liquidity of money circulating in the market.

CONCLUSION

The effect of e-money usage, which includes the number of e-money transactions, the number of APMK transactions, the number of EDC machines, and interest rates on the velocity of money from 2017 M1 to 2021 in Indonesia. Based on the analyzed data, the following conclusions can be drawn, the variable of e-money and EDC machine has a negative and significant effect on the velo city of money. Then, variable of APMK has an effect, but it is not significant on the velocity of money. Meanwhile, the interest rate variable has a significant effect on the velocity of money in Indonesia, where changes in interest rates can influence the speed of money circulation in the economy.

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