Analysis of Factors Affecting Electronic Money Transactions in Indonesia

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Abstract
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Electronic money is money that is a new and attractive way of payment system in Indonesia. However, cashless transactions in Indonesia still lag behind other countries in the Southeast Asian region. Currently, the increase in electronic money transactions in Indonesia has not been accompanied by a decrease in banknotes. This study aims to analyze and determine the effect of destroyed banknotes / money unfit for circulation, economic growth, the amount of time deposits, credit interest rates, and the Consumer Price Index (CPI) on electronic money transactions in Indonesia. This study uses Autoregressive Distributed Lag analysis using time series data. The results show that destroyed banknotes / money unfit for circulation has a negative and significant effect to electronic money transactions in the short run and in the long run. Economic growth has a positive effect in the short run and in the long run. The amount of time deposits has an effect in the short run and in the long run. Credit interest rates have no effect in the short run but have a negative and significant effect in the long run. And the CPI does not have a significant effect both in the short and long run.

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INTRODUCTION

In line with the rapid development of technology in the era of the industrial revolution 4.0, it encourages changes in society towards a more modern and digital direction. The World Bank (World Bank) notes that internet users in Indonesia continue to increase every year. Until 2018 internet users in Indonesia amounted to 39.90 % of the total population of Indonesia. A significant increase occurred in the last eight years since 2010, which reached 10.92 % of internet users and continues to increase sharply every year. The rapid development of technology has also changed the aspects of life, including existing transaction patterns and payment systems. Technological advances have shifted the role of cash as a means of payment in economic transactions towards more efficient and economical non-cash payments (Pramono & Yanuarti, 2006).

In general, the payment system is a set of rules and mechanisms used to transfer funds to meet existing obligations due to economic activity (Bank Indonesia, 2014). In Indonesia, there are two payment systems, namely cash payment systems and non-cash payments. Cash payments are made using banknotes and coins. This payment requires a person to have physical money when transacting. The use of currency has several obstacles and drawbacks, especially in terms of efficiency. This can occur because the costs of procuring and managing money, distributing, and destroying money that have been damaged and are no longer fit for circulation (cash handling) are fairly expensive. Besides that, it also concerns the inefficiency factor in making transactions when making payments.

Nowadays, payment systems with modern technology-based methods have begun to emerge which function the same as cash, namely electronic money or often called e-money (electronic money). Several e-money products such as Go-pay, OVO, Dana, Link Aja, and others are starting to be favored by the public and are often used in transactions. Of course, the presence of e-money has made an innovation in the field of payment instruments in Indonesia. The emergence of electronic money also complements the previous electronic transaction instruments, namely credit cards and debit / ATM cards. Technological innovation has changed the horizon of the payment system, drifting towards e-World (Oyewole et al., 2013).

Many countries in the world whose citizens have started to switch to using electronic money transactions (e money). According to Soseco (2016) by reducing the use of banknotes, transactions will run faster and be bigger and more efficient. Based on research conducted by Zandi (2016) there are several advantages to using electronic transactions, namely the first to provide benefits for traders and buyers. Electronic payments provide access to financial resources. Consumers using cash or checks may be limited in the amount of funds they hold at the time of a particular transaction. With cash, consumers are limited to their funds on hand. However, by using electronic transactions the transaction value can be much larger and unlimited according to the amount of funds required. The second advantage is that using a card or electronically can provide a guarantee of security in transactions so that it will strengthen consumption and is easy by simply swiping the card. Third, provide comfort. Cards provide convenience and lower business costs. Consumers have the convenience of electronic payments, that means they don't have to visit an ATM to get cash or don't bother counting cash at the point of transaction. This convenience is beneficial for traders too. For example, when consumers use cards in transactions at gas stations, supermarkets, and so on, it will reduce labor costs for traders. The last benefit and advantage of electronic transactions is transparency. Electronic payments reduce the cost of banks providing currency. In addition to reducing paper transactions, electronic payments

can reduce the fees for central banks providing banknotes and coins. Thereby increasing the overall efficiency in trade and economy.

In Indonesia, the use of electronic money was initially regulated together with the Card-Based Payment Instrument (AMPK). However, as the development of electronic money was very fast, the use of electronic money (e-money) was further regulated separately starting from 2009 in accordance with PBI No.11/12/PBI/2009. Then the regulation was revoked and updated in accordance with Surat Edaran Bank Indonesia No.16/11/DKSP dated July 22, 2014. Then currently the regulation regarding electronic money refers to the regulation issued on May 3, 2018 regarding Peraturan Bank Indonesia No. 20/6/PBI/2018 regarding electronic money. This regulation describes all the basics of electronic money, both in the form of general definitions and definitions, administration, licensing, supervision, security and technology improvement, as well as sanctions and protection for consumers.

The development of electronic money transactions continues to experience a very significant increase every year. Based on Bank Indonesia's publication in 2019, electronic money transactions have reached a nominal value of IDR. 145,165,468 million. The development of online businesses or start-ups such as Go-jek, Grab, and so on also affects the increase in electronic money transactions. The reason is that these start-ups are not only competing for business but also competing for business supporting components in the electronic financial sector such as Go-pay, OVO, Dana, and others.

Bank Indonesia itself as the financial authority continues to strive to increase its role in providing licensing access to banks, companies, and other parties to issue electronic money. As of 27 May 2020, there were 55 electronic money providers in Indonesia. This certainly makes electronic money more likely to be used as future money. The following Table 1 shows electronic money transactions in Indonesia.

Table 1. Electronic Money Transactions in Indonesia

Year	Electronic Money Transactions (IDR Million)
2013	2.907.432
2014	3.319.556
2015	5.283.018
2016	7.063.689
2017	12.375.469
2018	47.198.616
2019	145.165.468

Source: Bank Indonesia, 2020 (Processed)

Table 1 shows that electronic money transactions are experiencing a very fast positive trend. In 2013, electronic money transactions only amounted to IDR. 2.971.550 million, then continued to increase sharply until it reached IDR 145. 165. 468 million in 2019. Although electronic money is relatively new in Indonesia, electronic money has the highest growth compared to previous non-cash payment instruments, namely credit cards and debit / ATM cards. The value of electronic money transactions was able to grow by 281,389% yoy in 2018 and became the highest growth in the last five years. Following Figure 1 shows the growth of debit cards, credit cards and electronic money in Indonesia.
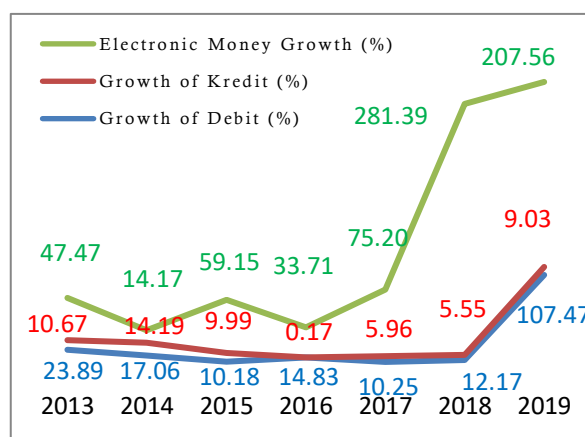
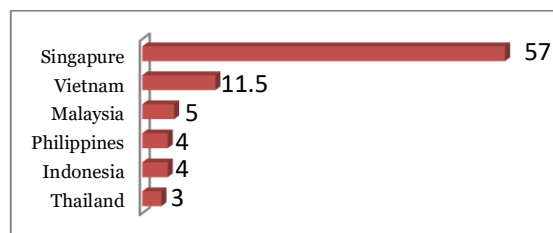**Figure 1.** Growth of Non-Cash Transactions in Indonesia

Source: Bank Indonesia, 2020 (Processed)

It can be seen from Figure 1 that the growth in electronic money transactions has the highest trend compared to credit cards and debit

/ ATM cards. This indicates that electronic money is increasingly in demand by the public. Although it is still relatively new, the increase in electronic money has the potential to shift the role of cash circulating in society (Sova, 2013). In addition, electronic money transactions will also accelerate the circulation of money, which will have a substitution effect on the decline in currency (Lu, 2017).

Bank Indonesia as the financial authority together with the government has also implemented the Gerakan Nasional Non Tunai (GNNT) which has been implemented since 2014. To realize the Gerakan Nasional Non Tunai (GNNT) the government has implemented several policies, such as the movement to pay for non-cash toll roads (e-toll). In this way, it will reduce the number of banknotes (currency) circulating in society and encourage a cashless society. This program is also believed to be one of the factors that influenced the increase in transactions and the amount of electronic money. Moreover, the trend of electronic money transactions is getting higher after this program is promoted.

Electronic money transactions in Indonesia are experiencing a positive trend, however, when compared to countries in Southeast Asia (ASEAN), Indonesia is still lagging behind in the use of non-cash transactions. Based on the Grab For Good report entitled Social Impact Report 2018-2019, cashless transactions in Indonesia only reached 4 % of total transactions. Indonesia is still lagging behind Vietnam and Singapore. Total non-cash transactions in Vietnam reached 11.5 % of total transactions, while in Singapore cashless transactions reached 57 % of total transactions. The following are non-cash transactions in Southeast Asian countries (2018-2019).

Figure 2. Comparison of the use of non-cash transactions in the ASEAN
Source: Social Impact Report Grab, 2019

Figure 2 above shows that Indonesia is still lagging behind in terms of non-cash transactions from neighboring countries such as Malaysia, Vietnam and Singapore. Non-cash transactions in Indonesia are only 4 % of total transactions. The Philippines also accounts for 4 % of total transactions. Malaysia accounts for 5 % of the total transactions. Vietnam 11.5 % of total transactions. As well as Singapore with the highest 57 % of total transactions.

Indonesia is only better than Thailand, whose non-cash transactions are only 3 %. This means that Indonesia's readiness towards cashless society has not been fully maximized, there are still many uses of cash transactions with banknotes in Indonesia. In addition, factors such as macroeconomic conditions, such as economic growth, bank interest rates, and rising prices of goods (inflation) are also determinants in influencing electronic money transactions in Indonesia.

Transactions using cash (currency) in Indonesia are still high, so Indonesia's readiness to become a cashless society is still difficult. Apart from lagging behind other countries in the Southeast Asia region, the ratio of electronic money transactions to banknotes is also very small. Even the ratio of electronic money transactions to the number of banknotes in circulation (M1) is still below one %. The following table shows the ratio of electronic money transactions to currency (M1).
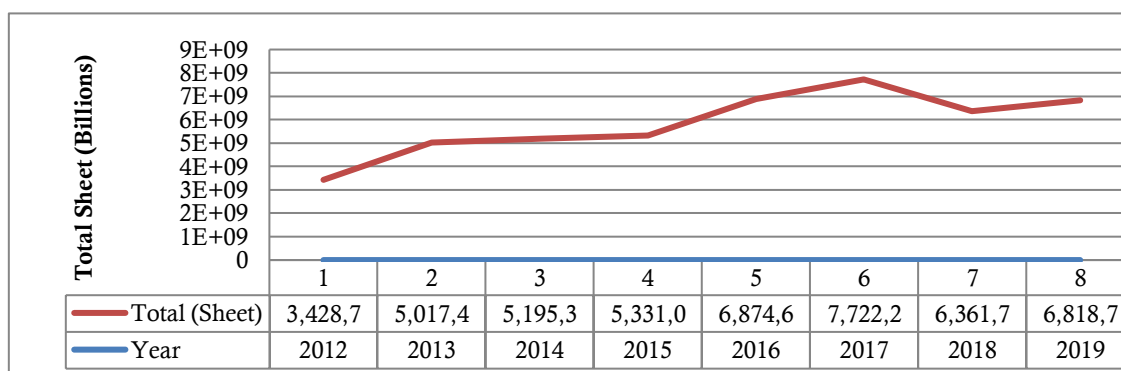
Table 2. Ratio of Electronic Money Transactions to Total Currency in Circulation (M1)

Year	Total Currency Supply (M1)	Electronic Money Transactions	Ratio (%) of Electronic Money Transactions to Currency Circulation (M1)
2012	IDR.9.101.225.000.000.000	IDR.1.971.550.000.000	0,02
2013	IDR.10.115.205.000.000.000	IDR.2.907.432.000.000	0,03
2014	IDR.10.865.276.000.000.000	IDR.3.319.556.000.000	0,03
2015	IDR.12.047.526.000.000.000	IDR.5.283.018.000.000	0,04
2016	IDR.13.508.109.000.000.000	IDR.7.063.689.000.000	0,05
2017	IDR.15.394.043.000.000.000	IDR.12.375.469.000.000	0,08
2018	IDR.16.721.125.000.000.000	IDR.47.198.616.000.000	0,28
2019	IDR.17.761.723.000.000.000	IDR.145.165.468.000.000	0,82

Source: Bank Indonesia, 2020

Table 2 shows that electronic money transactions in Indonesia continue to increase, however, these electronic money transactions are still smaller than the amount of currency in circulation (M1). In 2012 the ratio of electronic money transactions to the amount of currency in circulation (M1) was 0.02 % then slowly continued to increase to 0.82 % in 2019. We can see that the ratio of electronic money transactions in Indonesia is still below one % of the amount of currency in circulation (M1).

The high use of cash will impose a burden on the procurement of money and cash handling. Bank Indonesia must spend IDR. 3.5 trillion to print and distribute currency (detik.com, 2015). Therefore, Bank Indonesia encourages the use of electronic money in order to reduce banknotes in circulation. Despite this, there was still currency in circulation in the community. Even banknotes that were worn, torn, damaged and unfit for circulation were still high. The following is data on the destroyed money or Money Not Fit for Circulation.

	1	2	3	4	5	6	7	8
Total (Sheet)	3,428,7	5,017,4	5,195,3	5,331,0	6,874,6	7,722,2	6,361,7	6,818,7
Year	2012	2013	2014	2015	2016	2017	2018	2019

Figure 3. Destroyed Banknotes / Money Unfit for Circulation
Source: Peraturan Bank Indonesia (PBI) in *Lembaran Negara Republik Indonesia*, 2020 (Processed)

Banknotes that were destroyed or money unfit for circulation in Indonesia were still high. Based on Figure 3. above shows a trend that tends to increase every year. In 2012, the destroyed banknotes amounted to 3,428,775,123 sheet and then continued to increase to

7,722,298,760 sheets in 2017. Although there was a decline in 2018 of 6,361,734,496 sheet, it increased again in the year after 2019 to 6,818,720,687 sheets. The destruction of money unfit for circulation, which is still high, will certainly become a financing burden for central

banks in managing currency. This then becomes one of the triggers in switching to using electronic transactions. A study conducted by Zandi (2016) said that non-cash transactions can reduce the burden on bank fees in providing currency, also reduce paper transactions, electronic payments can reduce costs for central banks providing banknotes and coins. A study by Tazkiyyaturrohmah (2018) also states that electronic money is able to reduce cash handling costs. But it is a study by Fujiki and Migiwa (2010) states that electronic money will not completely replace paper money. Another factor that is an indicator of the increasing use of electronic money is people's income. People's income can be seen from the economic growth of a country. The higher the economic growth, the higher the level of welfare of the community. Slozko and Pelo (2014) state that "On the one hand, higher level of well-being and development of the financial system in richer countries encourages cashless transactions." Economic growth, according to Putri (2019), has a positive and significant effect on electronic money transactions in Indonesia. Akhmadi (2019) also states that Gross Domestic Product (GDP) has a positive and significant effect in the long run, and Sumolang (2015) says that per capita income also has a significant positive effect on electronic money transactions. But in contrast, Khrisna A. (2020) and Abraham, Kumaat, & Mandeij, (2018) suggest that per capita income has no effect on electronic money transactions.

Nopirin (2014:150) infers that the demand for money will be very large if people have a slight variety of forms of wealth. On the other hand, when the amount of wealth of the people becomes very large, for example, such as savings, securities and deposits, the demand for money tends to be small. Time deposit is a form of public wealth, it means that deposits are also able to influence the money supply, including the amount of electronic money.

Bank interest rates can also affect transactions and demand for electronic money in Indonesia. The higher the interest rate, the lower the public's willingness to carry out transactions and speculation, the high interest rates make the cost of borrowing money more expensive so that people will tend to save. Likewise, on the other hand, when interest rates are low, people are more likely to make transactions (consumption) rather than save. Research from (Dou, 2018) and research (Safitri & Militina, 2018) found that interest rates have a negative and significant effect on electronic money.

The last factor that affects electronic money transactions is the Consumer Price Index (CPI), which is a change in the price of an item that reflects the inflation rate. If the price of a good increases continuously, someone will reduce the transaction (consumption) and will choose to buy goods and services when they are cheap or tend to hold their money to be saved or saved in the bank. The increase in the price of goods (inflation) causes the real value of money to fall so that a sufficient amount of money is required to make transactions. This means that the Consumer Price Index (CPI) can also affect transactions from electronic money in Indonesia. Akhmadi (2019), in his inflation has no significant effect on electronic money. (Kipkemboi & Bahia, 2019), in their research, stated that inflation has no effect on cellular money in Nigeria.

This paper makes a significant contribution to present literature by adding a new variable named the Destroyed money or Money Not Fit for Circulation, to explaining its impact on the electronic money transaction. To the best of our knowledge, there is no studies to discuss the impact of Destroyed money or Money Not Fit for Circulation on the electronic money transaction, so this study offers unique empirical evidence to fill the gap in the literature.

RESEARCH METHODS

This type of study is a quantitative study using an econometric approach. Quantitative research is research that is used to examine populations or samples using research instruments in the form of quantitative data to test predetermined hypotheses (Sugiyono, 2017:8).

This study intends to determine the effect of destroyed money/money unfit for circulation, economic growth, time deposits, interest rates, and the Consumer Price Index (CPI) on electronic money transactions (e-money) in Indonesia in 2011: Q2 to 2019: Q4. The method used is Autoregressive Distributed Lag (ARDL).

The data source used is secondary data obtained from the publication of Bank Indonesia, Indonesia Statistic Agency (BPS), and the Peraturan Bank Indonesia (PBI) in the *Lembaran Negara Republik Indonesia Kementrian Hukum dan Hak Asasi Manusia* (*KEMENKUMHAM RI*).

One form of econometric analysis is the Autoregressive Distributed Lag (ARDL) method. The ARDL model is a regression model that includes a variable value that explains the present value or the past value (lag) of the dependent variable as one of the explanatory variables (Gujarati, 2003). This method can estimate the long-run and short-run effects of time series variables simultaneously which will avoid autocorrelation problems. In economics, the dependence of variable Y (dependent variable) on another variable X (explanatory variable) rarely occurs instantaneously. Very often, Y responds to X at intervals. Such time lapse is called lag (Gujarati, 2003:658).

In general, the steps taken in this study are Starting, Collecting the necessary research data from several related sources, Conducting descriptive analysis to describe each research variable, Conducting stationary tests on each variable to ensure the level of data stationarity, Conducting a cointegration test to find out whether there is a long-run relationship between the independent and dependent variables, Performing the optimal lag test to determine the best lag length with the Akaike Information Criteria (AIC) method, then performing the classical assumption test, and finally drawing conclusions and completing.

This study aims to determine the effect of damaged money / money unfit for circulation (X1), economic growth (X2), deposits (X3), interest rates (X4), and the Consumer Price Index (X5) on electronic money transactions in Indonesia. Indonesia (Y). In general, the ARDL model should be written in the following equation:

$$Y = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \dots \mu t \dots (1)$$

While the ARDL model in this study is transformed into a logarithmic form and the lag is as follows:

$$LnEMT_t = \beta_0 + \beta_1 DM_{t-i} + \beta_2 EG_{t-i} + \beta_3 LnDEPOSIT_{t-i} + \beta_4 INTEREST_{t-i} + \beta_5 CPI_{t-i} + \mu_t \dots (2)$$

Where, EMT is electronic money transactions (e-money); DM is Destroyed money / money not fit for circulation; EG is Economic growth; DEPOSIT is Deposit; INTEREST is Interest rate; CPI is Consumer price index; Ln is Natural logarithm; αis a Constant; β1, β2, β3, β4, β5 is the coefficients of the independent variables; t-I is Time period I; and μt is residual/error.

RESULTS AND DISCUSSION

The first stage in this study is to test the stationarity of the data (Rosadi, 2012). This aims to determine whether the data is stationary or not. Because if there are variables that are stationary in difference 2 then the ARDL method is not suitable for use. The stationarity test in this study was carried out with the unit root test proposed by Dickey and Fuller, or commonly known as the Augmented Dickey Fuller (ADF) test. The following are the results of the stationary test in this study.

Table 3. Stationarity Test Results at Level I (0)

Variable	t-statistic	Prob.	Explanation
Electronic money transactions	2.093967	0.9998	Not significant
Destroyed money / money not fit for circulation	-1.610684	0.4653	Not significant
Economic growth	-2.252630	0.1925	Not significant
Total Time Deposit	-2.849549	0.0621	Not significant
Credit Interest Rates	0.003316	0.9524	Not significant
Consumer Price Index (CPI)	-2.048898	0.2657	Not significant

Source: Data Processed, 2022

Based on the stationarity test for all the research variables above, none of them passed or were stationary at level I (0). Then the next step is to carry out the stationarity test in first difference I (1).

Table 4. Stationarity Test Results on First Difference I (1).

Variable	t-statistic	Prob.	Explanation
Electronic money transactions	-4.985878	0.0003	Significant
Destroyed money / money not fit for circulation	-14.65090	0.0000	Significant
Economic growth	-6.995969	0.0000	Significant
Total Time Deposit	-4.531547	0.0010	Significant
Credit Interest Rates	-4.953422	0.0003	Significant
Consumer Price Index (CPI)	-5.502445	0.0001	Significant

Source: Data Processed, 2022

Based on the results, in the stationary test at the first different level, all variables are stationary. And because nothing is stationary at the second different level I (2), the ARDL model is feasible to use.

The next stage is to carry out the cointegration test to determine whether or not there is a long-run relationship between the independent variables and the dependent variable. In this study, using the Bound-Testing Cointegration Test (Bounds test) to determine the cointegration between variables in the long run. The following are the results of the Bound-Testing Cointegration Test (Bounds test) in this study:

Table 5. Bound-Testing Cointegration Test (Bounds test)

Test Statistic	Value	K	
F-statistic	5.204702	5	
Critical Value Bounds			
Significance	I0 Bound	I1 Bound	
10%	2.26	3.35	
5%	2.62	3.79	
2.5%	2.96	4.18	
1%	3.41	4.68	

Source: Data Processed, 2022

In the bound-testing cointegration test above, the F-statistic value of 5.204702 is greater than the value of the upper bound I (1) at the 5% level, namely 3.79. In fact, the F-statistic value is also greater than the critical upper bound I (1) value at the 1% level, namely 4.68. This shows that all variables have cointegration in the long run or it can be said that the three variables move together in the long run.

The results of model testing using the Akaike Info Criterion (AIC) method indicate that the Autoregressive Distributed Lag (ARDL) model with lag (2,2,4,4,4,2) is the best model. So that the model estimate is obtained as follows:

$$\text{LNEMT} = -132.9499 - 0.308410 \text{ LNEMT(t-1)} - 0.713179 \text{ LNEMT(t-2)} - 0.647959 \text{ LDM} - 0.410459 \text{ LDM(t-1)} - 0.182341 \text{ LDM(t-2)} - 0.287213 \text{ EG} + 0.816502 \text{ EG(t-1)} + 0.705373 \text{ EG(t-2)} + 0.758123 \text{ EG(t-3)} + 0.761821 \text{ EG(t-4)} - 0.018784 \text{ LDEPOSIT} + 2.300295 \text{ LDEPOSIT(t-1)} + 0.963419 \text{ LDEPOSIT(t-2)} + 5.896820 \text{ LDEPOSIT(t-3)} + 3.378211 \text{ LDEPOSIT(t-4)} - 0.003616 \text{ INTEREST} - 0.001125 \text{ INTEREST(t-1)} - 0.004570 \text{ INTEREST(t-2)} - 0.002696 \text{ INTEREST(t-3)} - 0.004149 \text{ INTEREST(t-4)} + 0.000125 \text{ CPI} + 0.000121 \text{ CPI(t-1)} - 6.14\text{E-}05 \text{ CPI(t-2)} + \mu t \ldots\ldots\ldots(3)$$

Meanwhile, the models that only have significant value are:

$$\text{LNEMT} = -132.9499 - 0.647959 \text{ LDM} - 0.410459 \text{ LDM(t-1)} + 0.705373 \text{ EG(t-2)} + 5.896820 \text{ LDEPOSIT(t-3)} + \mu t \ldots\ldots(4)$$

The results of the output from the ARDL model (2,2,4,4,4,2) are as follow

Table 6. ARDL Output Estimation Results

Variable	Coefficient	t-Statistic	Prob.*	Explanation
Selected Model: ARDL(2, 2, 4, 4, 4, 2)				
LNEMT(-1)	-0.308410	-0.844705	0.4262	Not significant
LNEMT(-2)	-0.713179	-2.177625	0.0659	Not significant
LDM	**-0.647959**	**-3.665607**	**0.0080**	Significant
LDM(-1)	**-0.410459**	**-2.433980**	**0.0452**	Significant
LDM(-2)	-0.182341	-1.518616	0.1727	Not significant
EG	-0.287213	-0.737466	0.4848	Not significant
EG(-1)	0.816502	2.105622	0.0733	Not significant
EG(-2)	**0.705373**	**2.444985**	**0.0444**	Significant
EG(-3)	0.758123	1.894790	0.1000	Not significant
EG(-4)	0.761821	1.509273	0.1750	Not significant
LDEPOSIT	-0.018784	-0.008467	0.9935	Not significant
LDEPOSIT(-1)	2.300295	0.939138	0.3789	Not significant
LDEPOSIT(-2)	0.963419	0.413489	0.6916	Not significant
LDEPOSIT(-3)	**5.896820**	**2.398831**	**0.0475**	Significant
LDEPOSIT(-4)	3.378211	1.760507	0.1217	Not significant
INTEREST	-0.003616	-1.424879	0.1972	Not significant
INTEREST(-1)	-0.001125	-0.410572	0.6937	Not significant
INTEREST(-2)	-0.004570	-1.770180	0.1200	Not significant
INTEREST(-3)	-0.002696	-1.008451	0.3468	Not significant
INTEREST(-4)	-0.004149	-1.272363	0.2439	Not significant
CPI	0.000125	1.906642	0.0982	Not significant
CPI(-1)	0.000121	1.362282	0.2153	Not significant
CPI(-2)	-6.14E-05	-0.809613	0.4448	Not significant
C	**-132.9499**	**-3.002227**	**0.0199**	
R-squared				0.997556
Adjusted R-squared				**0.989527**
F-statistic				124.2444
Prob(F-statistic)				0.000000

Source: Data Processed, 2022

According to the output of the ARDL model (2,2,4,4,4,2) in table 6 above, it can be seen that variable banknotes that are destroyed / money unfit for circulation have a significant effect in the short run at this time on electronic money transactions in Indonesia. The variable banknotes that are destroyed / money unfit for circulation have a coefficient value of -0.647959 with t-statistic -3.665607 and prob. 0.0080 <α (0.05). This means that the destroyed banknotes / money unfit for circulation accepts hypothesis H1 and rejects hypothesis H0. The influence relationship of the destroyed banknotes / money unfit for circulation is negative, which means that every banknote destroyed / money unfit for circulation has decreased by one %, so electronic money transactions will increase by 0.64 % at the

present time. Other variables are considered constant.

The destroyed paper variable / money not fit for circulation also has a significant effect on electronic money transactions in Indonesia in the short run in the previous period. In the previous period (t-1) the variable banknotes which were destroyed / money unfit for circulation has a coefficient value of -0.410459 with t-statistic -2.433980 and prob. 0.0452 <α (0.05). This means that when banknotes that are destroyed / money unfit for circulation decrease by one %, electronic money transactions will increase by 0.41 % in the previous period (t-1). Other variables are considered constant.

The economic growth variable only has a significant effect on electronic money

transactions in Indonesia in the short run in the two previous periods (t-2). The economic growth variable has a coefficient value of 0.705373 with a t-statistic of 2.444985 and prob. 0.0444. This means that the economic growth variable accepts H1 and rejects H0. The relationship between the influence of the economic growth variable is positive (unidirectional), this means that every economic growth has increased by one %, so electronic money transactions in Indonesia also increased by 0.70 % in the previous two periods (t-2). Other variables are considered constant.

The variable amount of time deposits only has a significant effect on electronic money transactions in Indonesia in the short run in the previous three periods (t-3). The variable amount of time deposits has a coefficient value of 5.896820 with t-statistic 2.398831 and prob. 0.0475 $<\alpha$ (0.05). This means that the variable amount of time deposits accepts H1 and rejects H0. The relationship between the influence of the number of time deposits is positive (unidirectional), this means that each time deposit amount has increased by one %, so electronic money transactions in Indonesia also increased by 0.04 % in the previous three periods (t-3). Other variables are considered constant.

The credit interest rate variable does not have a significant effect on electronic money transactions in Indonesia in the short run. There is no credit interest rate variable that has a significant value in all periods (lag). This means that the credit interest rate variable rejects H1 and accepts H0.

The Consumer Price Index (CPI) variable also does not have a significant effect on electronic money transactions in Indonesia in the short run. There is no variable Consumer Price Index (CPI) that has a significant value in all

periods (lag). This means that the Consumer Price Index (CPI) variable rejects H1 and accepts H0.

The stability test of the Autoregressive Distributed Lag (ARDL) model of this study used the CUMSUM. This test is used to determine whether the model is in stable condition or not. The test results are as follows:

Table 7. CUMSUM & CUMSUMQ ARDL Test
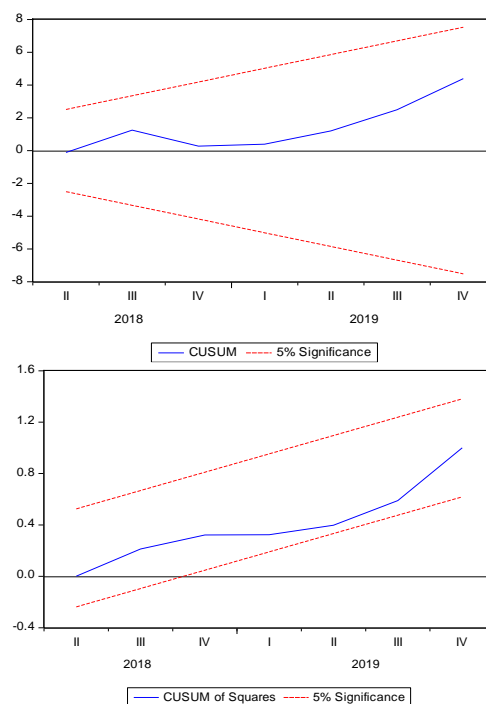
Source: Data Processed, 2022

Based on the results of the CUMSUM test and CUMSUMQ test, it can be seen that the blue line is still between the two red 5% significance lines, meaning that the model in this study is in a stable state. After it is known that the model has long-run cointegration in the bound-test, it can be seen that the estimation model in the long run is known. The results are as follows:

Table 8. Long Run Estimation Model, Dynamic Cointegration and Speed of Adjustment

Cointegrating Form

Variable	Coefficient	t-Statistic	Prob.	Explanation
CointEq(-1)	-2.021589	-3.840737	0.0064	Significant

Cointeq = LNEMT - (-0.6138*LDM + 1.3626*EG + 6.1931*LDEPOSIT -0.0080*INTEREST + 0.0001*CPI -65.7650)

Long Run Coefficients

Variable	Coefficient	t-Statistic	Prob.	Explanation
LDM	-0.613754	-4.349679	0.0034	Significant
EG	1.362595	4.794782	0.0020	Significant
LNDEPOSIT	6.193128	16.005563	0.0000	Significant
INTEREST	-0.007992	-15.009694	0.0000	Significant
CPI	0.000091	1.735903	0.1262	Not Significant
C	-65.765028	-7.851350	0.0001	

Source: Data Processed, 2022

Based on the Autoregressive Distributed Lag (ARDL) model above, it can be seen that the CointEq coefficient value will be used to measure the speed of adjustment or the speed of adjustment in response to changes. The CointEq value in the estimated model table 4.17 above is -2.021589 with a t-statistic of -3.840737 and prob. 0.0064 $<\alpha$ (0.05) or significant at the 5% level, which means that the model in this study has cointegration in the short run. In addition, the CointEq value of -2.021589 with a probability of 0.0064 and a negative value indicates that the model will head towards equilibrium at a rate of 2.02 % per quarter.

Based on table 8, it can also be seen that the long-run coefficient value (Long Run Coefficients), the output produced from the estimated model is for long-run results according to table 4.18 above, it can be seen that in the long run the variable banknotes that are destroyed / money unfit for circulation have a negative and significant effect on electronic money transactions in Indonesia with a coefficient value of -0.613754 and t-statistic -4.349679 and prob. 0.0034 $<\alpha$ (0.05). This means that it is in line with the hypothesis and accepts H0 and rejects Ha. In the long run, if the destroyed banknotes / money unfit for circulation increase by one %, electronic money transactions in Indonesia will decrease by 0.61 %. Other variables are considered constant.

The economic growth variable also has a positive and significant effect on electronic money transactions in Indonesia with a coefficient value of 1.362595 and t-statistic 4.794782 and prob. 0.0020 $<\alpha$ (0.05). This means that it is in line with the hypothesis and accepts Ha and rejects H0. In the long run, if Indonesia's economic growth increases by one %, electronic money transactions in Indonesia will also increase by 1.36 %. Other variables are considered constant.

The variable amount of time deposits (time deposit) has a positive and significant effect on electronic money transactions in Indonesia in the long run with a coefficient value of 6.193128 and t-statistic 16.005563 and prob. 0.0000. This means that it is in line with the hypothesis and accepts Ha and rejects H0. In the long run, if the amount of time deposits increases by one %, electronic money transactions in Indonesia will also increase by 6.19 %. Other variables are considered constant.

Credit interest rate variable has a negative and significant effect on electronic money transactions in Indonesia in the long run with a coefficient value of -0.007992 and t-statistic -15.009694 and prob. 0.0000. This means that it is in line with the hypothesis and accepts Ha and rejects H0. In the long run, if the credit interest rate increases by one %, electronic money

transactions will decrease by 0.007 %. Other variables are considered constant.

In the long run, only the Consumer Price Index (CPI) variable has no effect on electronic money transactions in Indonesia.

Based on the results of data testing with the Autoregressive Distributed Lag model using eviews-9, this study shows that the model has a long-run effect as indicated by a significant CointEq or ECT value of -2.021589. In the short run the model will head towards equilibrium at a rate of 2.02 % per quarter. In addition, this model also has a long-run effect and also has bound-testing cointegration.

Based on the results, it shows that the cash handling variable which is reflected in the amount of money destroyed / money unfit for circulation has a negative and significant effect on the amount of electronic money in Indonesia. The variable of destroyed banknotes / money unfit for circulation has a negative effect in the short and long run. In the short run, the variable of destroyed banknotes / money unfit for circulation has an effect on the current period and the previous period (t-1). Each with a coefficient value of -0.6479 for the current period and -0.4104 for the previous period (t-1). This means that when banknotes that are destroyed / money unfit for circulation increase by one %, electronic money transactions in Indonesia in the short run will decrease by 0.64 % at this time and decrease by 0.41 % in the previous period (t- 1). Meanwhile, in the long run, if the destroyed banknotes / money unfit for circulation increase by one %, electronic money transactions in Indonesia will decrease by 0.61 %.

If paper money that is destroyed increases by one %, then electronic money transactions will decrease by 0.61 %. If people more often use transactions with banknotes, the circulation of banknotes is very fast and large, so that the banknotes will be easily worn, torn, and damaged. In this way, the money destroyed will increase in line with the number of banknotes used. But if people switch to using electronic money transactions (cashless), the money destroyed will be reduced. Therefore, the relationship between destroyed money and electronic money transactions is negative or inversely proportional.

In Indonesia, the use of paper money is still quite high. Until now, the use of paper money is still the main choice in society. The characteristics of Indonesia as an archipelagic country that are separated from each other between regions mean that paper money is still widely used compared to electronic money. In addition, infrastructure factors such as internet access or electronic money infrastructure are not evenly distributed throughout the region, making people not optimally use electronic money transactions. On the other hand, the high use of banknotes will result in high costs incurred by Bank Indonesia. Therefore, the government and Bank Indonesia have never stopped campaigning for the use of electronic money in Indonesia.

Bank Indonesia continues to strive for the public to switch to electronic transactions to make it faster, more effective and efficient. Until now, Bank Indonesia has always encouraged various parties to realize a cashless payment system, some of which include making rules regarding electronic money mechanisms, both licensing, supervision and others. Improving electronic money infrastructure facilities such as improving Electronic Data Capture (EDC) machines, making regulations and encouraging the Gerakan Nasional Non Tunai (GNNT), and most recently making the Quick Response Code Indonesian Standard (QRIS) as an effort to simplify and streamline the national payment system.

This result is consistent with study conducted by Zandi (2016) which states that non-cash transactions can reduce the burden on bank fees in providing currency, also reduce paper transactions, electronic payments can reduce costs for central banks providing banknotes and coins. This study is also in accordance with Tazkiyyaturrohma (2018) which states that electronic money is able to reduce cash handling costs. This result is not in line with study by Fujiki and Migiwa (2010) which states that electronic money will not completely replace banknotes.

The economic growth variable based on the results of study has a significant effect on electronic money transactions in Indonesia. Economic growth has an effect in the short run, namely in the two previous periods (t-2), and also has a positive and significant effect in the long run. In the short run, economic growth has a coefficient value of 0.705373 in the two previous periods (t-2). This means that when economic growth has increased by one %, electronic money transactions in Indonesia will increase by 0.70 %. Whereas in the long run the coefficient value is 1.362595 with prob. 0.0020. This means that when economic growth increases by one %, the use of electronic money transactions in Indonesia also increases by 1.36 %.

The higher the economic growth reflects the state of a country's economy in good condition. High economic growth also identifies that people's income or Gross Domestic Product (GDP) is also high, so that it will encourage consumption activities (transactions). If consumption (transactions) is high, it will also require a lot of money. Therefore, according to the results, in the short or long run when economic growth increases, electronic money transactions will also increase.

This result is in line with studies by Putri (2019), Akhmadi (2019), Sumolang (2015), as well as Slozko and Pelo (2014). According to Slozko and Pelo (2014) a high level of welfare and the development of the financial system can encourage cashless transactions. In addition, Keynes also argues that the demand for money for the purpose of transactions depends on income. The higher the income, which can also be reflected by the economic growth of a country, the greater the desire of the people to make transactions. Other studies that are different and not in line with the result are studies by Krisna A. (2020) and Abraham et al. (2018).

The amount of time deposit based on the results of study has a significant effect on electronic money transactions both in the long and short run. In the short run, the variable amount of time deposits has an influence on the previous three periods (t-3) on electronic money transactions in Indonesia. Meanwhile, in the long run, the amount of time deposits also has a positive and significant effect. The coefficient value of the number of short-run time deposits is 5.896820. This means that when the number of time deposits increases by one %, electronic money transactions in Indonesia will also increase by 5.89 %. Then in the long run the coefficient value of the variable amount of time deposits is 6.193128 with prob. 0.0000. This means that when the amount of time deposits increases by one %, electronic money transactions will increase by 6.19 %.

The amount of time deposit is an alternative to wealth, a society that is getting richer can be estimated / expected the greater the demand for money, and the more consumption (transactions), so that when the number of time deposits increases, electronic money transactions also increase. However, even so, with the increasing number of alternative wealth that can be easily exchanged for cash, it is not necessarily that the increase in wealth can affect the demand for cash, it is possible that wealth can be realized in other forms (Nopirin, 1992:149).

Based on the results, in the short run credit interest rates have no effect on electronic money transactions in Indonesia, but in the long run interest rates have a negative and significant effect with a coefficient value of -0.007992 and prob. 0.0000. This means that when interest rates increase by one %, electronic money transactions will decrease by 0.007 %.

The relationship between interest rates and electronic money transactions in Indonesia based on the research results is inversely proportional (negative). This means that according to the theory stated by Keynes, one of the motives for a person to hold money is also based on the bank interest rate. People will put their money in the bank when the interest given by the bank is high. Because when the bank interest rates are high, holding money does not produce anything, but if it is stored in the bank, you will get a profit, namely in the form of interest. The higher the interest rate, the lower the people's desire to hold money, and vice versa (Nopirin, 1992:119-122).

According to research results, when interest rates increase by one %, electronic money transactions in Indonesia will experience a decrease of 0.007 %. People prefer to keep their money in the bank or make transactions based on what the interest rate is. This research is in line with studies by Dou (2018) and Safitri and Militina (2018).

The Consumer Price Index (CPI) is one of the bases for calculating the inflation rate. Based on the result, it shows that the Consumer Price Index has no effect on electronic money transactions in Indonesia both in the short run and in the long run. Inflation in Indonesia during the last ten years has been relatively stable and small, even in the last five years inflation has only been around three %. Prices of goods and services in Indonesia are well maintained. This stable inflation cannot be separated from the policy of Bank Indonesia and the government in providing stock of goods and always maintaining the stability of prices of goods. Therefore, the Consumer Price Index (CPI) does not have any influence on consumption (transactions), including transactions with electronic money. This result is in line with Akhmadi (2019), in his study, inflation has no effect on electronic money. Kipkemboi & Bahia (2019) in their study state that inflation has no effect on electronic money in Nigeria.

CONCLUSION

This study offers a new by introducing a new variable named the Destroyed money or Money Not Fit for Circulation, to explaining its impact on the electronic money transaction. Based on the results of the study, it is evidence that banknotes that are destroyed / money unfit for circulation have a significant negative effect on electronic money transactions in Indonesia in the short run. In the long run, the variable of destroyed banknotes / money unfit for circulation also has a negative and significant effect on electronic money transactions in Indonesia.

The popularity of electronic money is becoming increasingly worldwide because it makes payments easier and also reduces the problems involved with the physical delivery of payments. The study indicates that Indonesian society still depends on cash in financial transactions. High numbers of money destroyed lead to lower electronic money transactions. It is also important to attract society to keep their money in banks in form of deposits, because it will lead society to use electronic money for their financial transactions.

Therefore, by the mean of medium of payment, the Central Bank of Indonesia should develop the continuous technological advancement in payment systems using electronic money.

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