

**The Effect of Non-Cash Payments and Interest Rates on Currency Demand in Indonesia 2018-2021****Erna Sintia Royani<sup>1\*</sup>, Yuni Prihadi Utomo<sup>1</sup>**<sup>1</sup>Universitas Muhammadiyah Surakarta

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\*Email: [b300190054@student.ums.ac.id](mailto:b300190054@student.ums.ac.id)**ABSTRACT**

This study aims to measure the direction and magnitude of the influence of the amount of electronic money, debit card transactions, credit card transactions and interest rates on the demand for currency in Indonesia in 2018-2021. The type of data used in the study was to use secondary data in the form of time series from January 2018 to December 2021. The data in the study was obtained from Bank Indonesia and the Central Statistics Agency. This research method uses the Ordinary Least Square (OLS) regression analysis approach, using classical assumption tests, model specification tests, and model goodness tests. The results showed that the variable amount of electronic money and debit card transactions had a positive and significant effect on the demand for currency in Indonesia, while credit card transactions and interest rates had a negative and significant effect on the demand for currency in Indonesia.

**Keywords:** Interest Rates, Currency Demand, Non-Cash Payments

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### INTRODUCTION

The economic development in Indonesia is currently very rapid and brings change, along with technological developments. These developments are very helpful and make it easier for humans to carry out various kinds of activities. One of the changes that exist is in the payment system, originally from cash payments now there is a cashless payment system (electronic payment), with the emergence of these payments the role of cash used for transactions began to shift (Ismanda, 2019).

In Law Number 3 of 2004, the payment system is a system that includes a set of institutional rules and mechanics used to carry out the transfer of funds to fulfill an obligation arising from economic activity. In general, payment systems are grouped into two, namely cash payment systems (currency money) and non-cash payment systems (electronic payments). Some countries have mobilized the use of cashless payment systems. On August 14, 2014, Bank Indonesia officially informed it of the National Non-Cash Movement (GNNT). The National Non-Cash Movement is expected to reduce printing and money distribution costs which can reach IDR 3.5 trillion per year (Wasiaturrahma et al. 2019). The issuance of this program aims to train people to use cashless payment instruments (Less Cash Society / LCS) (Khairi & Gunawan, 2019).

The instruments used in the non-cash payment system are APMK (debit cards / ATMs, credit cards), checks, current accounts, and electronic money (Bank Indonesia, 2020). B Using cashless payment instruments to speed up the payment process makes it more efficient and safer at a relatively cheaper cost than electronic goods. So to accelerate the program, electronification and financial inclusion are carried out.

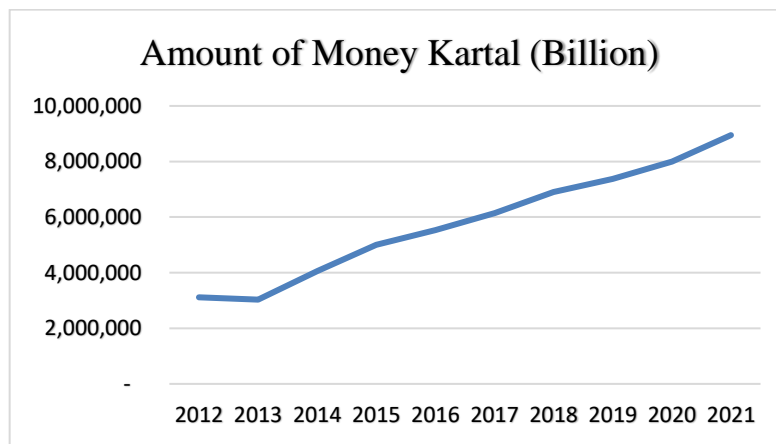
Like cash payments, cashless payment instruments can affect the demand for currency amounts. Moreover, cashless payment instruments have a fast procedure so that they can have an impact on the demand function of a currency, where the demand for money has an important role for the central bank in determining monetary policy in maintaining the economic stability system. Monetary policy is a form of stabilization policy that can affect the achievement of economic goals in developing countries (Bank Indonesia, 2015). According to Friedman (1968), economic stabilization is achieved by adjusting monetary policy and controlling uncontrollable amounts of money. This stabilization of monetary policy is reflected in the balance between the demand for money and the supply of money, each of which can be influenced by different independent variables or the same independent variables.

The demand for money can be interpreted as the entire amount of money that the community wants to hold as an intermediary tool to hold exchange activities (Sukirno, 2001). There is 3 money circulating in the community: Kartal money, quasi-money, and giral money. Currency is a banknote and coin issued and circulated by Bank Indonesia and used as legal tender in the territory of the Republic of Indonesia which functions as a monetary authority (Solikin & Suseno, 2006). Along with the development of the money supply in Indonesia, it is possible to experience an increase or decrease in the money supply. Figure 1 shows the development of demand for currency in Indonesia from 2012 to 2021.

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**Figure 1.** Demand for Currency in 2012-2021

**Source:** Bank Indonesia, processed

From Figure 1, it can be seen that the demand for the currency has increased every year. In 2012 the amount of currency was Rp 3,114,700 billion and in 2021 the amount of currency in Indonesia was Rp 8,949,236 billion. The increase that occurred in 2012 and 2021 was IDR 5,834,536. By looking at the development of the amount of demand for money in the community in the last 10 years, it shows that developments in banking from year to year since the global economic crisis in 2008 have shown quite good work efficiency, especially for person people banks that have reached the point of 100% efficiency in 2007 which was then followed by national private banks (BUSN) in 2011 (Wardana, 2011). This can show that the need for money requested by the community continues to increase every year. In the element of its use, the development of money is influenced by people's behavior when using the currency in line with the progress of the country's economy, especially in the financial sector.

The theory of demand for money is divided into two parts, namely the stock concept theory (created by Marshall-Pigou of Cambridge school, and Keynesian) and the flow concept theory (created by Irving Fisher, Friedman, and the Monetarists) (Rukhstad, 1992). The concept of money according to Cambridge's theory, money is a stock concept, due to factors of interest rates and future expectations. While the concept of money according to Irving Fisher's theory, money is a flow concept, and this is in line with the view of Islamic economics, which is found in the thought of Imam al-Ghazali.

According to Friedman, the demand for money is determined by several factors, namely interest rates, bond interest rates, physical capital, wealth, and equities interest rates (Sukirno, 2000). Regarding the role of price in determining the demand for money, Friedman argues that holding money is a way to store wealth. How to store it can be in the form of bonds, deposits, and stocks. According to classical theory, the occurrence of demand for money is determined by the speed of turnover of money, this theory is known as the quantity theory of money, and the cash residual theory or known as the cash-balance theory (Rahardja & Manurung, 2008). Meanwhile, the Keynesian Theory, states that the demand for money occurs due to the demand for money from one individual to another for speculation (Sukirno, 2010). The demand for money used for this speculation depends on the interest rate, because the higher the interest rate, the lower the demand for cash requested by the public.

From the use of APMK and electronic money which has increased every year, this

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increase in the cashless payment transaction process should reduce the demand for currency. According to Friedman, the development of information technology will have implications for reducing base money in payment transactions.

According to Sitorus (2020); Wijaya et al., (2021); Puspitasari et al., (2021); Afifah (2017), and Sutoto (2019) found that the variable amount of electronic money and debit card transactions had a positive effect on the money supply in Indonesia, while according to Fauzukhaq (2019) and Luthfan (2018) found that the variable amount of electronic money negatively affects the turnover of money in Indonesia. Meanwhile, credit card transaction variables were found to harm the demand for money in Indonesia by Sitorus (2020). According to research conducted by Sancaya & Wenagama (2010); Priscylia (2014); Safitri et al., (2018); Mukhtar et al., (2018), and Polontalo et al., (2018) found that variable interest rates negatively affect the demand for money in Indonesia, but according to Sutoto (2019) the variable interest rate was found to have a positive effect on the money supply in Indonesia.

Based on the background in advance, researchers are interested in conducting further analysis on whether there is an influence of the amount of electronic money, debit card transactions, credit card transactions and interest rates on the demand for currency in Indonesia for the period January 2018 to December 2021. This research was studied under the title “The Effect Of Non-Cash Payments And Interest Rates On Currency Demand In Indonesia 2018-2021”.

### METHOD

This research uses quantitative methods. In this study, to analyze the effect of the Amount of Electronic Money (JUE), Debit Card Transactions (KD), Credit Card Transactions (KK), and Interest Rates (BIRATE) on Demand for Currency (PUK) in Indonesia, an Ordinary Least Square (OLS) regression analysis tool with the following econometric model was used:

$$\ln(PUK_t) = \beta_0 + \beta_1 \ln(JUE_t) + \beta_2 \ln(KD_t) + \beta_3 \ln(KK_t) + \beta_4 BIRATE_t + \varepsilon_t$$

Information:

|                         |   |
|-------------------------|---|
| <i>PUK</i>              | : Demand for Currency, Rupiah                 |
| <i>JUE</i>              | : Amount of Electronic Money, Rupiah          |
| <i>KD</i>               | : Debit Card Transactions, Transaction        |
| <i>KK</i>               | : Credit Card Transactions, Transaction       |
| <i>BIRATE</i>           | : Interest Rates, %                           |
| <i>ln</i>               | : Natural logarithm operations                |
| $\varepsilon_t$         | : Error term                                  |
| $\beta_0$               | : Constant                                    |
| $\beta_1 \dots \beta_4$ | : Independent variable regression coefficient |
| <i>t</i>                | : Year to-t                                   |

The data used is time series data from January 2018 to December 2021, which will be obtained from several sources, including Bank Indonesia and the Central Statistics Agency.

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**RESULT AND DISCUSSION**

**Table 1.** Econometric Model Estimation Results

|  |  |
|--|--|
| $\ln(PUK_t) = 3,55637 + 0,03407 \ln(JUE_t) + 0,71213 \ln(KD_t) - 0,27831 \ln(KK_t) - 0,02910 (BIRATE_t)$ |  |
|  | $(0,0074)^* \quad (0,000)^* \quad (0,0002)^*$                            |
|  | $(0,0024)^*$   |
| $R^2 = 0,8782; DW\text{-Stat.} = 1,1031; F\text{-Stat.} = 77,5753; Prob. F\text{-Stat.} = 0,0000$        |  |
| Diagnostic Tests   |  |
| (1) Multicollinearity (VIF)  | $\ln(JUE) = 2,6450; \ln(KD) = 2,5766; \ln(KK) = 2,8397; BIRATE = 2,0205$ |
| (2) Residual Normality   | $JB(2) = 1,9505; Prob. JB(2) = 0,3771$                                   |
| (3) Autocorrelation  | $\chi^2(5) = 8,8667; Prob. \chi^2(5) = 0,1145$                           |
| (4) Heteroscedasticity   | $\chi^2(12) = 19,9228; Prob. \chi^2(12) = 0,0686$                        |
| (5) Linearity  | $F(1,42) = 0,8837; Prob. F(1,42) = 0,3525$                               |

**Source:** Bank Indonesia and BPS, processed.

**Description:** \* Significant on  $\alpha = 0,01$ ; \*\* Significant on  $\alpha = 0,05$ ; \*\*\* Significant on  $\alpha = 0,10$ . The number in parentheses is an empirical probability (p-value) of t-statistics.

The results of the estimation of the econometric model above and its complementary tests are summarized in Table 1.

Diagnostic tests showed the estimated model did not appear to have any problems with classical assumption test violations at all. The entire VIF value  $< 10$ , so the estimated model is free of multicollinearity problems. The statistical empirical probability values of the Residual Normality, Otokorelation, Heteroskedasticity, and Linearity tests, which are 0.3770 ( $> 0.10$ ), 0.1145 ( $> 0.10$ ), 0.0686 ( $> 0.05$ ) and 0.3525 ( $> 0.10$ ), indicate that the estimated model has a normal residual distribution, free from problems of autocorrelation and heteroskedasticity, with exact (linear) model specifications.

The goodness of fit statistics show that the model exists, as seen from the empirical probability of the F statistic, which is 0.0000 ( $< 0.01$ ), with  $R^2$  moderate predictability, which is 0.8782. This means that overall the independent variables, the Amount of Electronic Money (JUE), Debit Card Transactions (KD), Credit Card Transactions (KK), and Interest Rates (BIRATE), can explain 87.82 percent of the variation or the rise and fall of the variable Demand for Currency (PUK).

Separately, the variables of Electronic Money Amount, Debit Card Transactions, Credit Card Transactions, and Interest Rates have a significant influence on Demand for Currency, with empirical probabilities t of 0.0074 ( $< 0.01$ ), 0.0000 ( $< 0.01$ ), 0.0002 ( $< 0.01$ ) and 0.0024 ( $< 0.01$ ).

The Electronic Money Amount variable has a regression coefficient of 0.03407. The pattern of the relationship between the amount of Electronic Money and the Demand for Currency is a logarithmic-logarithmic (log-log), so if the Amount of Electronic Money increases by 1 percent then the Demand for Currency will increase by 0.03407 percent. Conversely, if the amount of electronic money decreases by 1 percent, the demand for currency will decrease by 0.03407 percent.

The Debit Card Transaction variable has a regression coefficient of 0.71213. The pattern of the relationship between Debit Card Transactions and Demand for Currency is

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logarithmic-logarithmic (log-log), meaning that if Debit Card Transactions increase by 1 percent, Demand for Currency will increase by 0.71213 percent. Conversely, if Debit Card Transactions increase by 1 percent then Demand for Currency will increase by 0.71213 percent.

The Credit Card Transaction variable has a regression coefficient of -0.27831. The pattern of the relationship between Credit Card Transactions and Demand for Currency is logarithmic-logarithmic (log-log), so if Credit Card Transactions increase by 1 percent, Demand for Currency will decrease by 0.27831 percent. Conversely, if Credit Card Transactions decrease by 1 percent, Demand for Currency will decrease by 0.27831 percent.

The Variable Interest Rate has a regression coefficient of -0.02910. The pattern of the relationship between interest rates and demand for currency is logarithmic-linear (log-lin), so if the interest rate increases by 1 percent, the demand for currency will decrease by 0.02910 percent. Conversely, if the Interest Rate falls by 1 percent, the Demand for Currency will increase by 0.02910 percent.

**DISCUSSION**

Demand for Currency, during the period from January 2018 to December 2021, was influenced by the amount of Electronic Money, Debit Card Transactions, Credit Card Transactions, and Interest Rates.

**The Effect of Amount of Electronic Money on Currency Demand**

The amount of Electronic Money has a positive influence, showing that if the amount of Electronic Money increases then the Demand for Currency will increase. The payment system in Indonesia is currently growing the payment system continues to be developed to make it easier for economic actors to make transactions so that it can support people's economic activities and even support financial stability and monetary policy implementation. This is to the objectives of Bank Indonesia, which is related to creating non-cash payment instruments. Thus, it can be said that more and more people are using e-money in a countr indicating that people in that country have sufficient income and le are very open to technology. Suseco (2016), states that electronic money will be used more as the economy grows. If this happens, then people's tpeople's electronic money transactions. In addition, Suseco also stated that in developed countries such as Indonesia, e-money has a positive and strong relationship with economies of scale. This is because the convenience and benefits provided make more and more people switch to using the cashless payment system. After all, it is encouraged by the ease of access to transactions so that the higher the use of electronic money, the higher the expenditure will be, and will affect the demand for money. The results of this study are in line with that conducted by (Fauzukhaq, 2019) in a study that states that the variable amount of electronic money in circulation affects the turnover of money in Indonesia. Another study (Wijaya et al., 2021) also found the same result that the e-money variable affects the money supply in Indonesia in 2015-2020.

**The Effect of Debit Card Transactions on Currency Demand**

Debit Card transactions have a positive influence, showing that if Debit Card Transactions increase, the demand for currency will increase. The development of debit card transactions reflects economic development because many people save money, and the economy will develop. According to Cambrige Theory, if the interest rate is high, then people will reduce the money they want to hold and choose to keep it because the returns people receive on debit cards will be greater. The use of debit cards that are based on savings can be withdrawn at any time, as well as (M1) giral deposits, which originally should have

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been deposited whose function could not be withdrawn at any time (Purmono et al., 2016). In addition, the existence in the community related to the use of debit cards is good, because debit cards have been widely used by people in Indonesia. Many companies already provide and also use debit cards to pay employees or use them for other transactions. This is because the transaction process in a debit card is easier and can be used for transfer transactions to all regions, both domestic and foreign. Friedman's theory says that the development of information technology, it will increasingly have implications for the reduction of currency in payment transactions. This research is in line with what was conducted by (Puspitasari et al., 2021) which stated that the volume of debit cards affects the money supply in Indonesia.

### **The Effect of Credit Card Transactions on Currency Demand**

Credit Card Transactions have a negative influence, showing that if Credit Card Transactions increase then the Demand for Currency will decrease. Based on the theory of Irving Fisher (Mishkin, 2008), states that if people use credit cards to transact, then the cash needed or requested by the community to transact will decrease or decrease. This is because the use of credit cards today is not out of necessity but has become part of the urban lifestyle. Modern lifestyles encourage the use of credit cards for consumptive things. This happens because the use of credit cards in Indonesia is a non-cash payment that delays the payment at the end of the period. With the new variations and innovations that occur in the cashless payment system, it can reduce public demand for the money represented by the volume in the real currency. This is because the size of the transaction volume is determined by the nature of the transaction process that applies in the community in a period. This research is in line with that conducted by (Sitorus, 2020) who research found that credit transaction variables affect the demand for currency in Indonesia. Another study (Afifah, 2017) also found the same result that credit card variables affect the money supply in Indonesia.

### **The Effect of Interest Rates on Currency Demand**

Interest Rate, has a negative influence on the Demand for Currency Money. This means that an increase in interest rates affects a decrease in demand for currency and vice versa, a decrease in interest rates will encourage an increase in demand for currency. This is to Keynes' monetary theory of money demand speculation motive, it is assumed that the demand for money affects interest rates. The higher the interest rate, the fewer people desire to hold cash for speculation, which means that people will hold less money and prefer to keep the money in the bank in the form of savings or deposits. People can speculate on interest rates in the future, by buying or selling bonds that are expected to make a profit (Boediono, 1998). This is because bonds are considered to provide income or profits in the form of a certain amount of money in each period, while cash is considered not to provide income. This research is in line with that conducted by (Safitri, 2018) in her research states that interest rates influence the demand for money in Indonesia. Another study (Sancaya & Wenagama, 2010) also produced the same result that interest rates affect the money supply in Indonesia.

## **IMPLICATIONS**

This study implies that in the future the demand for currency in Indonesia will be greatly influenced by the cashless payment system which includes the amount of electronic money, debit cards, and credit cards. So that in the future the Indonesian government must better prepare facilities and infrastructure related to the service of the cashless payment system, so that it can provide convenience for users. In addition, it adds to the development of electronic payment infrastructure, especially in areas that still lack electronic media

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payment infrastructure. However, it seems that credit cards have a negative influence on the demand for currency, therefore the issuer (Bank Indonesia) in the future to provide information or warnings to credit card holders related to the use of the card so that they do not use credit cards that exceed the credit limit and must be used according to their needs.

An increase in interest rates will reduce the demand for currency in Indonesia. Therefore, Bank Indonesia as the central bank in the future needs to be careful in issuing policies in raising or lowering interest rates so that money stability is maintained. If the amount of demand for money in society rises not within reasonable limits, then the policy that must be issued by the central bank is to raise the interest rate so that people prefer to keep the money instead of holding money.

The widespread use of non-cash payments has implications for reduced demand for money spent by the central bank which may affect the implementation of the central bank's duties in carrying out monetary policy in the future, especially in controlling monetary amounts. Thus, in the future, the payment method or transaction will change to non-cash payments, and cash payments will be replaced or shifted.

### CONCLUSION

The conclusions obtained in this study are that the variable number of electronic money has a positive and significant effect on the demand for currency, the variable debit card transactions have a positive and significant effect on the demand for currency, the variable credit card transactions have a negative and significant effect on the demand for currency, and the variable interest rate has a negative and significant effect on the demand for currency. The implications obtained in this study are that according to Friedman, the demand for money is determined by several factors, namely interest rates, bond interest rates, physical capital, wealth, and equities interest rates (Sukirno, 2000). Regarding the role of price in determining the demand for money, Friedman argues that holding money is a way to store wealth. How to store it can be in the form of bonds, deposits, and stocks. According to the Classical Theory, the demand for money is determined by the speed of money turnover, this theory is known as the quantity theory of money and the theory of cash residual or known as the cash-balance theory. Meanwhile, the Keynesian Theory, states that the demand for money occurs because of the demand for money from one individual to another for speculation. The demand for money used for this speculation depends on the interest rate, because the higher the interest rate, the lower the demand for cash requested by the public. According to the Classical Theory, the demand for money is determined by the speed of money turnover, this theory is known as the quantity theory of money and the theory of cash residual or known as the cash-balance theory. Meanwhile, the Keynesian Theory, states that the demand for money occurs because of the demand for money from one individual to another for speculation. The demand for money used for this speculation depends on the interest rate, because the higher the interest rate, the lower the demand for cash requested by the public.

According to the conclusions of the results of the research that has been carried out, the researcher then conveyed several suggestions, namely that Bank Indonesia, which already has the authority to maintain the smooth running of the (electronic) payment system in Indonesia, is expected to continue to maintain the policy on the National Non-Transaction Movement (GNNT) which with this policy can advance the development of class-less payments in Indonesia. In addition, banks can continue to maintain facilities and facilities in the form of services and infrastructure that are many, so that the public can easily use or

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access these non-cash payment instruments. As well as continuing to maintain interest rates, so that the money owned by the public does not circulate too high, employing which the funds can be allocated in the form of deposits in the form of savings or deposits. Advice for future researchers who want to improve this research so that they can add other variables and increase the sample time to be used or use other methods, to obtain even better research results.

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