Transition Effect of Payment Tool to Real Currency in Indonesia

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Abstract

Research aims to analyze the impact of the transition of payment equipment to real currency in Indonesia for the period 2015:07-2019:01. Real currency used in this research is the result of real money outside the commercial bank and BPR per consumer price index. The payment tool in this study represented 4 transaction schemes that are nominal debit card transactions, credit cards, RTGS (Real Time Gross) and nominal electronic money transactions (e-money). Data analysis methods use Error Correction Model (ECM). Before the data is processed, stationarity of the root test unit, co-integration, ECM, the individual test (T-test) and overall simultaneous testing (F-test) will be conducted. Results of the study showed the nominal transaction of debit cards, credit cards, RTGS (Real Time Gross) and nominal electronic money transactions (e-money) jointly significant effect on real currency in Indonesia. On the other hand, partial test results show that the amount of debit card transactions, credit card nominal and e-money is positively and significantly influential on real currency in Indonesia, while the nominal transaction of RTGS (Real Time Gross Settlement) is not significant impact on real currency in Indonesia.

Keywords: *debit card, credit card, RTGS, e-money, ECM*

Introduction

The payment system becomes important for financial and monetary stability. System of payments contribute to facilitate the activities of the economy of the community one of them using the method of payment that is unpopular and people feel comfortable with the method of payment and the country recognizes the system of payment that used. Payment method the more varied the functions and benefits are increasingly felt directly by consumers , including the cost of time , the cost of security, comfort and the difference cost between methods of payment are one with the other is almost not there are differences in prices were felt by consumers (Stavins, 2018). One form of cash payment system that is popular in the community is real currency. The use of real currency has efficiency constraints, because procurement and management costs are relatively expensive, have the risk of being easily lost, easy to find, or easily forged. People are used to using cash transactions. However, this type of cash transaction creates many risks if the value is very large. Used of total money in cash still dominates the transaction is worth the low, especially that much lower than $ 25 and most major countries use the money in cash is still very strong (Chen, Huynh, & Shy, 2017).

The progress of financial digitalization is currently changing the payment system in economic transactions. Transactions economy nowadays has brought comfort because not only facilitated with the money in cash, but also use the instrument of non -cash. Changes in the system of payment is already experiencing a change of instrument paper as money in cash into a payment of non-cash using the card, such as debit card and credit card (Wang & Wolman, 2016). (Chaubey, 2017) digitizing payments can change people's buying behavior and can prevent the black money market from occurring because it can assist the government in monitoring any transaction records that occur. Changes to the payment system have led to views of the pros and cons in various countries. This also happened in Indonesia. One view that is pro non-cash payment system (Chen, 2017) describes the innovation system of payment to facilitate transactions

among other things, credit card can quickly replace the method of payment of the money in cash at the point of sale.

On the other hand the view of the contra innovation of the payment system (Agarwal, Ghosh, Li, & Ruan, 2019) explains that the replacement of the cash payment system into a digital payment will have the effect of the belief that cash will eventually run out and the public will no longer hold cash. The system of payment also includes the advantages, challenges, considerations of security which over the passage of time, the present value is simpler than the system of barter up through the payment of money paper and digital i.e., *e-money* , debit, credit (Masihuddin, Ul, Khan, Ul, & Mattoo, 2017). Bank Indonesia as the Bank of the Central has followed the development of digitalization finance one of them with the establishment of the system of payment which come into force in Indonesia by using the instrument of non-cash tool payment card like credit card, debit card, the system BI-RTGS and *e-money*. Research that is done (Paper, Bundesbank, & Bundesbank, 2017) showed that the three instruments of payment are money in cash, electronically money, and the credit card be choice of payment principal to the transaction with a value of less than 1,000 yen about 8.7 euros, while for income high tends to use electronic money and cash.

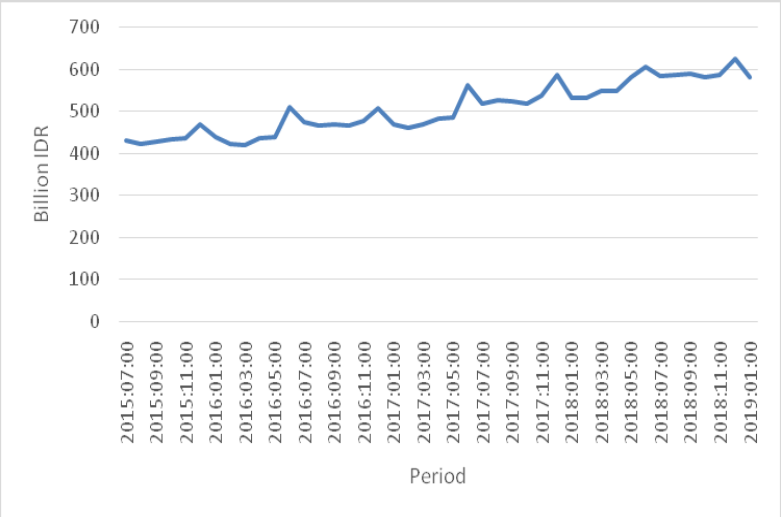

Figure 1. Development of Real Currency Year 2015-2019

Source: (Bank Indonesia, *2019), Processed*

(Wahyuningtyas & Ajija, 2019) with the title "Non-cash payments and demands for real money in Indonesia". In this study the authors analyze non-cash payments to real money demand in Indonesia. In earlier research that is done (Bank of Japan, 2017) shortly found result the level of credit card used is getting a little , while the use of the debit card further increased, (Fereira, 2017) conducts research under the title "Assessing Payment Instrument Alternatives Using Cognitive And The Choquet Integral". Research is generating conclusions that debit card and *e-money* is a method of payment that is most much preferred from the perspective of the user. The purpose of this study is to analyze the impact of payment instrument transitions on real currency in Indonesia.

Method

The type of data used in this study is secondary data in the form of time series data. Data is presented monthly from 2010:07 to 2019:01. In this study the data used real currency data, debit card transactions data, credit card transactions data, E-Money transactions data, and BI-RTGS transactions data. Data obtained from Bank Indonesia. To see the relationship and transition effect of the payment tool to real currency in Indonesia, tests conducted include a station test using Augmented Dickey Fuller (ADF), then co-integration, ECM, testing the meaning of each variable (T-test) and through sense testing or F test will be conducted. Analysis is

done using Error Correction Model (ECM). The equation Model of this research is as follows:

Short-term equation Model

$\Delta Rcur = \alpha_1 \Delta kd_t + \alpha_2 \Delta kk_t + \alpha_3 \Delta E\text{-}Money_t + \alpha 4 \Delta RTGS_t$ (1.1)

$\Delta Rcur = RTGS_t - \alpha(\Delta Rcur_{t-1} - \beta_0 - \beta_1 \Delta kd_{-1} + \beta_3 \Delta kk\text{-}1 + \beta_4 \Delta emoney_{t-1} + \beta_5 \Delta BIRTGS_{t-1} + \mu t$ (1.2)

The short-term equation results can result in a new form of equation, the equation developed from the previous equation to measure long-term parameters by using econometric regression with the ECM model.

$\Delta Rcur = \beta_0 + \beta_1 \Delta kd_t + \beta_2 \Delta kk_t + \beta_3 \Delta Emoney_t + \beta_2 \Delta RTGS_{t-1} + ECT + \mu t$ (1.3)

$ECT = \Delta kd_{t-1} + \Delta kk_{t-1} + \Delta Emoney_{t-1} + \Delta RTGS_{t-1}$ (1.4)

Where:

$\Delta Rcur_t$: *Real currency*
ΔKDT : The amount of debit card transactions
Δkkt : Nominal Credit card transaction
Δemoneyt : Nominal e-Money transaction
Δemoneyt : Nominal e-Money transaction
μt : Residual
t : Time period
ECT : *Error correction term*

Results and Discussion

The first test conducted is the stationarity test. The stationarity test of data is an important trait. The purpose of this test is to find out whether the time series data used is static or not, the unit root test (DF) is used. If the data is not stationary then a false regression will be obtained, an autocorrelation phenomenon arises and also cannot generalize the results of the regression for a different time. According to (Insukindro, 1999), the test is carried out on a unit root test, if it turns out that the data is not stationary in the first degree, the test is carried out in the first differentiation form. Stationary tests were carried out for each variable, namely real currency log, debit card nominal, credit card nominal, e-money and Bi-RTGS log. In concluding, a variable is said to have no unit roots if the value of the ADF test (Augmented Dickey Fuller Test) is greater than its critical value or a critical value of five percent (Mackkinon Critical Value). From the tests conducted all variables are not stationary at the level. However, all stationary variables are at the 1st difference level. Stationary test results are presented in Table 1.

Table 1 Stationarity Test Results

Variable	Unit Root Test	ADF Test Statistic	Critical Value 5%	Note
Logrcur	1st difference.	-4.17946	-2.954021	*Significant*
Kd	1st difference.	-11.2018	-2.935001	*Significant*
Kk	1st difference.	-6.524782	-2.941145	*Significant*
e-money	1st difference.	-8.480050	-2.935001	*Significant*
logrtgs	1st difference.	-11.64567	-2.935001	*Significant*

Source: Author's processed results

Co-Integration Test

After knowing that the data is not stationary, the next step is to identify whether the data is co-integrated. For this reason, co-integration testing is needed. Co-integration test is used to give an early indication that the model used has a long-term relationship. Co-integration test results are obtained by forming a residual obtained by regressing the independent variable on the dependent variable used OLS. The residual must be stationary at the level to be said to have co-integration. After the test is performed, DF testing to test the resulting residuals, it is found that the residuals are not stationary on the data level which is seen from the t-statistic value which is not significant on the data level which is seen from the t-statistic value which is not

significant at the critical value of 5% (Prob. 0.00). Thus, it can be said that the data is not co-integrated. The results of the co-integration test are presented in Table 2.

Table 2 Co-Integration Test Results

Variable	ADF Test Statistic	Prob.
ECT	-5.7858	0.0000

Source: Author's processed results

Error Correction Model ECM

Finally, an ECM model is presented which presents short-term and long-term relationships. After the tests were performed, shows the value of coefficient p is no model of ECT on the model of the significant and marked negative for the estimation of *real currency.* Results estimates that show that in the period of the short nor in the run length variable that is used in the research is influenced significantly to *real currency.* On the value of R^2 of 0.7387 or 73.87%, can be concluded that the type of variable free are entered into in the model is already quite good, because about 70% diversity of variables bound are influenced by variable outside models. The results of the estimation in the above, illustrates that the term short change transaction nominal of credit card, transaction nominal e-money and transaction nominal BI-RTGS have impact negative on the *real currency* in Indonesia. While the value of the coefficient of ECT by 0. 9322 has the meaning that the difference between the *real currency* that will be adjusted in time of 1 year. The ECM model is presented as follows:

D(Log(RealCurrency)) = 0.002+ 0.67*D(debit))- 0.31*D(credit)-0.03*D(E-Money)-4.87*D(logBI- RTGS) 0.93*ECT(-1)

T-test

T-test aims to test how the influence of each independent variable individually to the dependent variable. This t-test uses a 95 percent confidence level with degrees of freedom nk-1 (n = number of observations, k=number of independent variables). Once the tests are done, all the variables log *real currency*, nominal of debit card, nominal of credit card, *e-money* and log Bi-RTGS system in Indonesia. The results showed that the nominal transaction of debit card, nominal transaction of credit card, and nominal card *e-money* is partially influenced significantly and positively to real currency in Indonesia. While the BI-RTGS is partial is negative and not significant to the *real currency* that exist in Indonesia. The results of partial tests or T-test are shown in table 3.

Table 3 T-test

Variable	ADF Test Statistic	Prob.	Note
Kd	7.9410	0.0000	*Significant*
Kk	-2.0283	0.0496	*Significant*
e-money	0.0000	0.0000	*Significant*
log rtgs	-0.1640	0.8706	*No Significant*

Source: Author's processed results

F-test

F-test is to see how the influence of all the independent variables together on the dependent variable. This F-test uses a 95 percent confidence level and degrees of freedom df1 = (k) and df2 = (nk-1) (n = number of observations, k = number of independent variables). Once the tests are done, all the variables which logs *real currency*, nominal of debit card, nominal of credit card, *e-money* and log Bi-RTGS All variables have a significant influence together on real currency in Indonesia. The results are presented in Table 4.

Table 4 F-test

R-squared	0.944987	Mean dependent var	2.701705
Adjusted R-squared	0.939196	S.D. dependent var	0.051607
S.E. of regression	0.012725	Akaike info criterion	-5.781486
Sum squared resid	0.006154	Schwarz criterion	-5.576696
Log likelihood	129.3020	Hannan-Quinn criter.	-5.705966
F-statistic	163.1863	Durbin-Watson stat	1.821103
Prob(F-statistic)	0.000000		

Source: Author's processed results

Conclusion

The use of nominal debit card payment method, credit card, E-money partially influential positive and significant towards real currency in Indonesia year 2015-2019. Meanwhile, BI-RTGS has a negative impact on real currency in Indonesia. However, the use of nominal debit card payment method, credit card, E-money jointly influence positive and significant to real currency in Indonesia. The use of all payment methods that are the nominal cards of debit cards, credit cards, E-money and BI-RTGS have a positive and significant effect on real currency in Indonesia, both in the short term and in the long term.

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