

Cashless Payments and its Impact on Inflation

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ABSTRACT

Payment with a non-cash system can simplify transactions and are increasingly used. The advantages of non-cash payments are not only due to convenience, speed up transaction time, and time savings but also the benefits that can reduce the circulation of money in the community. The less the amount of physical money in circulation, it will indirectly affect the inflation rate. However, there are inconsistency of research results regarding the relationship of non-cash transactions and inflation. These issues constitute a research gap on cashless payments and inflation in Indonesia. This study aims to prove the relationship between cashless payments and inflation in Indonesia. Using data from Central Bureau of Statistics Republic of Indonesia and Bank Indonesia over the period 2019-2020Q2, the results confirm that electronic money decrease inflation. The research approach in this study focuses on quantitative analysis using the Ordinary Least Square (OLS) method. The results of this study indicate that partially the relationship between debit card transactions and inflation has no significant effect. Credit card transactions have no significant effect on inflation, while electronic money transactions have a significant effect on inflation in Indonesia. Non-cash transactions intensified by Bank Indonesia through the cashless society need to be considered more with the public's understanding of the use of non-cash transaction instruments so that the use of non-cash transactions in Indonesia is not only used for cash withdrawals but is used in every transaction.

Keywords: Cashless; Inflation; E-Money; Card

INTRODUCTION

Non-cash payment instruments are now increasingly common and become the preferred choice because of its convenient, effectiveness, and efficiency. In the current digital era, there are various types of non-cash or cashless payment instruments that are becoming increasingly diverse. In addition to instruments that have long been circulating, such as debit cards or credit cards, there are also new cashless payment instruments issued by banks such as electronic money.

E-money or Electronic money is now not a new thing. As referred to in Bank Indonesia Regulation Number: 11/12 / PBI / 2009 concerning Electronic Money which has now been updated to PBI Number: 18/17 / PBI / 2016, E-money is issued on the basis of the value of money deposited in advance by the holder to the issuer and the value of the money is stored electronically in a media such as a server or chip. E-money is not only a substitute for physical cash in the form of coins and

paper money with equivalent electronic money, but also as a system that allows pay for goods or services by smart device.

The cashless phenomenon is certain to be sustainable because it has a positive effect on the economy. Zandi, et al. (2016) stated that digital payments are not only convenient but also play an important role in stimulating economic growth in a country. The presence of non-cash payment instruments is not only caused by innovation in the banking sector but also driven by the public's need for practical payment instruments that can provide convenience in conducting transactions. The ease of these transactions can drive down transaction costs and in turn can stimulate economic growth (Dias, 2001).

The government already has an agenda to realize what is called a digital society or cashless society. Cashless society is a condition where people do transactions without using cash, but with Electronic Money or various cards (APMK - Card-Based Payment Instrument). APMK is a payment instrument in the form of an ATM / Debit Card, ATM Card and Credit Card. Electronic Money is seen from its storage media, which is divided into Chip / card based Electronic Money (Flazz, E-money, Brizzi, Tapcash, etc.) and server based Electronic Money (OVO, GoPay, LinkAja, etc.).

The National Non-Cash Movement (GNNT) launched by Bank Indonesia in 2014 is the first step towards realizing a cashless society in Indonesia. Various strategies are implemented to make GNNT successful. In October 2017, Bank Indonesia imposed non-cash toll payments using electronic money. At the end of 2017, Bank Indonesia launched the National Payment Gate (GPN) for ATM / Debit cards for payment system interoperability and interconnection. Not only that, August 17, 2019 Bank Indonesia launched the QRIS (QR Code Indonesian Standard) as the QR Code standard for digital payments through the server based electronic money application, electronic wallet, or mobile banking. This is further supported in 2020 by the global conditions because of the emergence of the Pandemic Corona Virus Disease 19 or abbreviated Covid-19. The virus that can be transmitted through droplets makes the government increasingly encourage people to use cashless payments in order to minimize the chance of the spread of the virus through cash transaction.

In the last five years, the use of electronic money in Indonesia has experienced rapid progress. In 2014 when GNNT was launched, the number of circulating e-money reached 35.7 million instruments. In 2019 the number grew to 292.2 million instruments, up more than 8 (nine) times. The value of transactions using thee-money in 2014 reached 3.3 trillion rupiah. In 2019, the transaction value will grow to 16.9 trillion rupiah, an increase of more than 5 (five) times. Whereas for Card-Based Payment Instruments (APMK), the number of ATM / Debit Cards circulation in 2014 reached 112.9 million cards. The number of ATM / Debit in 2019 cards grew to 174.4 million, up more than 54%. The number of ATM cards in circulation in 2014 reached 7.1 million. In 2019, the number of ATM cards in circulation reached 8.9 million, up more than 25%. For the number of Credit Cards circulation in 2014 reached 16 million growing by around 8.75% in 2019, the figure rose to 17.4 million cards Source: Bank Indonesia <https://www.bi.go.id/id/statistik/sistem-pembayaran/uang-elektronik/contents/jumlah%20uang%20elektronik.aspx>).

The advantages of non-cash payments are not only due to convenience, speed up transaction time, and time savings but also the benefits that can reduce the circulation of money in the community. The less the amount of physical money in circulation, it will indirectly affect the inflation rate.

Referring to the quantity theory of money by Irving Fisher, inflation is a proxy of price (P), where the change is proportional to the change in the money supply (M), *ceteris paribus*. If the money supply is too much in circulation, it will trigger price increases and price increases that occur continuously will potentially cause inflation. Inflation that continues to increase until it cannot be controlled by the monetary authority will disrupt financial system stability.

The study of the impact of non-cash transactions on the money supply and inflation is still the latest problem that needs to be reviewed along with the emergence of many financial technologies (fintech) that can affect the condition of the Indonesian economy. For the inconsistency of research results regarding the relationship of non-cash transactions and inflation, these issues constitute a research gap on cashless payments and inflation in Indonesia. Therefore, the author is interested in conducting research on this topic to review how the effect of using non-cash payments, such as the use of debit cards, credit cards and e-money against inflation in Indonesia. This research is expected to be a consideration for the amount of money circulating in the community.

LITERATURE REVIEW

The introduction of Cash-less economy policy by the Bank of Indonesia was aimed at reducing cost of cash management, increasing efficiency of the payments system and driving financial inclusion. Some observers (Klee, 2004., Garcia-Swart et al., 2006) opined that the increased use of cashless payment system has led to prediction of a cashless society. In a cashless society, consumers can make payments over the internet, payment at unmanned vending machine, manned point of sale (POS) using mobile device, personal digital assistant (PDA), smart cards and other electronic payment systems, including debit and credit cards.

Governments and commercial entities provide strong encouragement and support for cashless transaction (Khan and Craig-Lees, 2009). According to EFINA (2013), there is a clear correlation between the proportion of electronic transactions in a society and the proportion of people banked. The term 'banked' refers to individuals who have relationship with a formal financial institution, including banks, cooperatives and credit unions (Solo, 2008).

(Hidayat et al., 2006) stated the definition of e-money in several countries is not always the same, but in general, the e-money feature has several characteristics, among others as follows:

1. The value of money has been recorded in the e-money instrument, or it is often called with stored value, which will decrease at the time of the consumer use to make payment transactions.
2. Funds recorded in e-money are fully under the control of the consumer.
3. At the time of the transaction, the transfer of funds is in the form of electronic value from e-money owned by consumers to the merchant terminal can be done off-line. In this case, verification is sufficient at the merchant level (point of sale), without having to go on-line to the publisher's computer.

E-money emerged as an answer to the need for instruments micropayments which are expected to be able to process online payments. Fast at a relatively low cost because it is generally value for money stored this instrument is placed in a certain place that can be accessed quickly off-line, safely and cheaply.

Various studies on e-money correlations and the velocity of money turn out to prove a positive relationship. This is consistent with Priyatama and Apriansah's (2010) statement that the increase the use of e-money in Indonesia has an impact on increasing the velocity of money. Another study conducted by Kamnar (2014) in various European countries also stated that with the use of e-money, transactions are relatively cheaper and allow an increase in the number of transactions and an increase in the speed of money. Arewa and Nwakanma (2013) stated that the addition of money supply resulted in an increase in the velocity of money in Nigeria. The circulation of money can affect inflation when the velocity of money is high. This statement was also stated by Priyatama and Apriansah (2010) that the velocity of money is one of the variables that determine inflation.

Based on various studies and theories prove that the velocity of money circulation is not constant, especially after the emergence of a new payment instrument that is e-money. In developed countries, inflation has decreased drastically. This is not caused by monetary policy but because of the use of non-cash payment instruments (Marimon et al., 1998). Besides providing various facilities, the widespread use of non-cash payment instruments has created controversy regarding the possible implications of implementing monetary policy, particularly in controlling monetary quantities. Non-cash transactions are also thought to reduce the demand for money issued by the central bank and will affect the implementation of the tasks of the central bank in controlling monetary policy (Costa Storti & De Grauwe, 2001). When the central bank loses its ability to control money supply, the increase in the velocity of money will produce an exponential increase in prices, causing the economy to experience inflation (Al-laham and Altarawneh, 2009).

Several other studies such as those conducted by Goodhart (2000), Freedman (2000), and Woodford (2000) have different perspectives on the implications of the development of non-cash payment instruments in monetary policy. They argue that the development of payment technology will not affect the implementation of monetary policy. Furthermore, Lahdenperä (2001) in his study stated that the impact of the development of payment technology on the implementation of monetary policy is dependent on the level of community preferences in choosing payment instruments to conduct transactions. Zunaitin et al. (2017), states that partially the relationship between the money supply and e-money transactions to inflation has no significant effect.

METHOD, DATA, AND METHODOLOGY

Data Set

The variables used in this study were divided into two namely the dependent and independent variables. The dependent variable is the variable that gives a reaction / response if it is associated with the independent variable. In this study, the dependent variable used is the Consumer Price Index (CPI) as an indicator of inflation. The independent variable used is Non-Cash Payment Instrument transactions, namely Card-Based Payment Instruments (APMK), such as debit and credit cards and Electronic Money.

The type of data in this study is a secondary data type. Secondary data is data obtained indirectly and becomes supporting data in a study. This study uses monthly data from January 2019 to May 2020 (before and during the covid-19 pandemic crisis). Inflation data is taken using the CPI data from the official BPS website (<http://www.bps.go.id>) and APMK and E-money data are taken from the official website of Bank Indonesia (<http://www.bi.go.id>).

Methodology

This research uses a quantitative descriptive approach with the area of research being Indonesia. The data is processed using multiple linear regression analysis with the Ordinary Least Square (OLS) method. The econometrics model used is as following:

$$\text{Inf} = \alpha + \beta_1 \text{DebitCard} + \beta_2 \text{CC} + \beta_3 \text{EMoney} + e$$

where α is a constant, β_1 , β_2 , β_3 is the regression coefficient, Inf is inflation, DebitCard is the value of a debit card transaction, CC is the value of a credit card transaction, EMONEY is an e-money transaction, and e is error term.

Testing using the OLS method is carried out using the estimation results by looking at the estimated value of the t test, F test, and R2 test. Regression models with classical assumptions have ideal and optimal properties, based on the Gauss-Markov theorem by considering the nature of BLUE (Best Linear Unlimited Estimator) (Supranto, 1995). The classic assumption tests used are 1) linearity test, 2) multicollinearity test, 3) autocorrelation test, 4) heteroscedasticity test, and 5) normality test.

RESULT AND DISCUSSION

Statistical Features of the Data

The estimation results by the OLS method show that partially there is only one variable out of three independent variables that have a significant effect on the dependent variable. While simultaneously all independent variables significantly influence the dependent variable. This result is reported in Table 1.

Table 1: OLS Results

Variable	Coefficient	t-statistics	Prob.
C	62.91482	1.81	0.093
DebitCard	8.62e-08	0.99	0.338
CC	1.20e-06	1.10	0.289
E-money	-1.53e-06	-1.91	0.079*
R-square	0.5892		
Prob. F-statistics	0.0075*		

Source: Secondary data, 2020

*) significance at $\alpha = 5\%$

Simultaneously or simultaneously all independent variables, namely debit card transactions, credit card transactions, and BI E-money transactions have a significant effect on inflation. These results can be seen based on the value of prob. F-statistic which shows the value of 0.0075 <significance level α (0.05).

Partially it can be seen in the probability value. Debit card transactions have a positive and insignificant effect on inflation in Indonesia with a coefficient of 8.62e-08 and a probability of 0.338. Credit card transactions have a positive but not significant effect because they have a coefficient of 1.20e-06 and a probability of 0.289. While E-money transactions have a negative and significant effect with a coefficient of -1.52e-06 and a probability of 0.079. The R-Square value in this study is

0.5892 or 58%. That is, the variable non-cash transactions (debit cards and credit cards) and E-Money transactions are able to explain the inflation variable.

Testing the data on the variables in the econometrics model used in the study as an estimation step needs to be seen whether the conditions of a model can be said whether or not good in this case through the classical assumption test. This is because a research model is said to be econometrically good if it has gone through tests on econometrics which basically will produce a BLUE estimation amount (Best, Linear, Unbiased, Estimator). The estimation results of several classic assumption tests are explained in Table 2.

Table 2: Classical Assumption Results

Diagnosis Test	Output	Prob	Result
Linearity	3.09	0.0767	free
Multicollinearity	2.53	-	free
Autocorrelation	1.243925	-	free
Heterokedasticity	-	0.3730	free
Normality	-	0.0767	free

Source: Secondary data, 2020

Table 2 shows the estimation results with the classical assumption test. The classic assumption test in research uses the Linearity test, the Multicollinearity test, the Autocorrelation test, the Heterokedasticity test, and the normality test. The linearity test was performed using the Ramsey Reset Test. Determination of linearity is done by comparing the probability value, if the probability value $> \alpha$ (5%), it can be said that the model is linear. Multicollinearity test is done by comparing the results of the probability. If the VIF value is < 10 then the classic assumption test is free from multicollinearity. The autocorrelation test using the Durbin Watson test can be detected with the following criteria: 1) If dW, dL , or $dW > 4-dL$, then H_0 is rejected, meaning there is a positive or negative autocorrelation. 2) If $dU < dW < 4-dU$, then H_0 is accepted, meaning there is no autocorrelation. 3) If $dU < dW < dU$ or $4-dU < 4-dL$, then there is no conclusion.

Heteroscedasticity testing uses White Test, the method is done by comparing the probability value, which can assess the probability value $Obs * Rsquared > \alpha$ (5%), then the comparison does not require heteroscedasticity problems. The normality test in this study uses the Jarque-Bera test. The method of allowing is to compare the JB probability, which excludes the JB probability value $> \alpha$ (5%), so the residuals are normally distributed. Based on Table 2 the classic assumption test results of linear research models, free from multicollinearity, autocorrelation, heteroscedasticity, and the residuals are normally distributed.

Discussion of the Test Results

Estimation results using the OLS method produce data analysis that shows that the Card Based Payment Instruments transaction variable partially has a positive and not significant effect on inflation. Positive effect means the results of tests conducted in accordance with existing theories. This can be caused because the higher the use of non-cash transactions will increase the money supply in the community. It is estimated that the use of non-cash transactions (cards) is only done for cash withdrawals because there are still many people who are unfamiliar with the use of non-cash transaction facilities. Furthermore, the disparity of infrastructure on network in Indonesia is

still high. People in small cities cannot yet access the same electronic facilities as those in large cities. Besides, the use of credit cards also has no significant effect because of the tendency of people who refuse to owe and become too consumptive to use credit cards.

The statement supports research from Fatmawati and Yuliana (2019). Their results prove that the use of non-cash transactions in developed countries is able to subsidize cash payments by utilizing electronic payments in transactions. However, cash payments are still a culture in Indonesia. The existence of non-cash transaction instruments only facilitates the community in obtaining cash and has not become a major payment facility in making transactions. According to them, non-cash transaction facilities in Indonesia, especially in shops, small retailers and other traders, still do not use non-cash payment instruments. Although the use of non-cash transactions has increased from year to year, it has not yet affected the increase in the money supply in the community. Debit and credit card users must make cash withdrawal for cash payments at a place that still makes cash transactions.

However, the e-money transaction variable shows a negative and significant relationship to inflation. This can be caused by the more intense financial technology in conducting promotions for transactions using electronic money and also because of government regulations to pay tolls using e-money. By using e-money, it can be estimated that the money supply does not exceed and can reduce inflation. Moreover the pressure of cashless society by the government, electronic money is also increasingly used in the midst of the covid-19 pandemic in 2020 because it can reduce the risk of transmission of the virus through cash droplets. A research from Ipsos (2020) stated that the evolution of digital wallet has been widely adopted by consumers in Indonesia, especially by millennial generation. As many as 81% of millennial in cities are interested in using electronic money based on digital wallets for online transactions and shopping purposes which are motivated by cash back promos or discounts.

This study has different results from research conducted by Ady (2016), where e-money has a positive and not significant effect on inflation. Priyatama and Apriansah (2010) also stated that the spread of e-money tended to be slow and did not have a large role in the Indonesian economy, even though based on the real money balance approach, both stated that the use of e-money had an impact on the velocity of money. This difference is expected due to differences in research years in which this study was more recent according to the latest circumstances.

According to Dias (2001) the additional income obtained by consumers from the use of digital money will encourage consumption and public demand for goods and services, which in turn has the potential to encourage real sector activity. Nowadays people are reluctant to carry large amounts of money in their wallets for transactions because besides being considered unsafe it is also considered not practical.

In addition, some literature states that the development of non-cash payment instruments will not affect the effectiveness of the central bank in controlling monetary policy with both interest rates and monetary targets as long as the central bank has good credibility accompanied by a healthy balance sheet structure and the availability of sufficient foreign exchange reserves to carry out monetary control operations (Costa and Grauwe (2001), Arnone and Bandiera (2004).

Robustness Check

For the sake of completeness, this study performs a robustness check of findings as discussed above. The robustness is conducted for test predictability evaluations. The result of robustness check is reported in Table 3. Interestingly, the findings remain unchanged. Therefore, it concludes that in-sample predictability results are robust.

Table 3: Robustness Check

Variable	Coefficient	t-statistics	Prob.
C	62.91482	2.44	0.030
DebitCard	8.62e-08	1.07	0.302
CC	1.20e-06	1.25	0.233
E-money	-1.53e-06	-2.27	0.041*
R-square	0.5892		
Prob. F-statistics	0.0075*		

Source: Secondary data, 2020

*) significance at $\alpha = 5\%$

CONCLUDING REMARKS

Simultaneously the independent variable is able to influence the dependent variable namely inflation in Indonesia as seen from the magnitude of the F-statistical probability value is smaller than the significance level (α). Partial estimation results obtained as follows: Debit card and credit card transactions have a positive and not significant effect on inflation in Indonesia. The growth of e-money has a significant negative effect on inflation in Indonesia. Non-cash transactions intensified by Bank Indonesia through the cash-less society need to be considered more with the public's understanding of the use of non-cash transaction instruments. So that the use of non-cash transactions in Indonesia is not only used for cash withdrawals but is used in every transaction. The government's steps to mitigate the transmissions of COVID-19 through cash are right with the non-cash transaction movement that has been intensified by Bank Indonesia (BI) with Payment System Service Providers (PJSP). This non-cash transaction movement supports the acceleration of distribution of social assistance programs (Bansos) to the community, including the Family Hope Program (PKH), Non-Cash Food Assistance (BPNT), Pre-Employment Cards, and Smart Indonesia Cards (KIP).

BI also needs to increase socialization about cashless system for people to use more non-cash payment transactions through digital banking, electronic money, and the use of QRIS (Quick Response Indonesia Standard). Another step taken by BI is to loosen up the credit card policy to promote non-cash transactions by lowering the maximum interest rate limit from 2.25% per month to 2% per month which takes effect from 1 May 2020. In addition, BI lowered the minimum payment value from 10% to 5%, and late payment penalties from 3% of the total bill or a maximum of IDR 150 thousand to 1% or a maximum of IDR 100,000. Both are valid from 1 May to 31 December 2020. BI also supports credit card issuers to extend the payment term for customers from 1 May to 31 December 2020. However, the extension mechanism is at the discretion of each credit card issuer. This policy is expected to increase the use of non-cash and maintain inflation. The limitations of this study in the use of variables are still simple. Suggestions for future researchers to provide other variables that can affect the dependent variable.

References

- Ady, E. M., (2016). Pengaruh Sistem Pembayaran Non Tunai terhadap Inflasi di Indonesia Tahun 2011-2015. Universitas Brawijaya: Malang.
- Al-laham M, Al-tarawneh H, (2009). Development of electronic money and its impact on the central bank role and monetary policy.
- Arewa, A. & Nwakanma, P. C, (2013). Money Supply and Velocity of Money in Nigeria: A Test of Polak Model. Journal of Management and Sustainability, Vol, 3. No, 4.
- Arnone M., and L. Bandiera, (2004). Monetary Policy, Monetary Areas, and Financial Development with Electronic Money. IMF Working Paper, No. 122.
- Bank Indonesia, (2005). Peraturan Bank Indonesia Nomor: 7/52/PBI/2005 Tentang Penyelenggaraan Kegiatan Alat Pembayaran dengan Menggunakan Kartu. Downloaded from www.bi.go.id pada tanggal 15 Juli 2020.
- Bank Indonesia, (2007). Laporan Perkembangan Sistem Pembayaran 2007. Downloaded from www.bi.go.id pada tanggal 15 Juli 2020.
- Bank Indonesia, (2009). Peraturan Bank Indonesia Nomor: 11/12/PBI/2009 Tentang Uang Elektronik (Electronic Money). Downloaded from www.bi.go.id pada tanggal 15 Juli 2020.
- Costa Storti, C., & De Grauwe, P. (2001). Monetary Policy in a Cashless Society (SSRN Scholarly Paper No. Centre for Economic Policy Research).
- Dias, J., (2001). Digital Money: Review of Literature and Simulation of Welfare Improvement of This Technological Advance. (State University of Maringa, BRAZIL).
- Fatmawati, Meilinda Nur Rasyida., & Yuliana, Indah, (2019). Pengaruh Transaksi Non Tunai Terhadap Jumlah Uang Beredar di Indonesia Tahun 2015- 2018 Dengan Inflasi Sebagai Variabel Moderasi., Jurnal Ekonomi, Keuangan, Perbankan dan Akuntansi Vol. 11, No. 2 (November 2019), Hal. 269 – 283.
- Freedman, C, (2000). Monetary Policy Implementation: Past, Present, and Future-Will Electronic Money Lead to the Eventual Demise of Central Banking? International Finance 2:3.
- Goodhart, C.A.E, (2000). Can Central Bank Survive the IT Revolution? International Finance 3:2.
- Ipsos, (2020). Evolusi Industri Dompot Digital: Strategi Menang Tanpa Bakar Uang., https://www.ipsos.com/sites/default/files/ct/news/documents/2020-02/ipsospress_release_-_indonesian.pdf.
- Kamnar, N. P, (2014). The Use of Electronic Money and Its Impact on Monetary Policy. JCBEI, Vol, 1. No, 2.
- Lahdenperä, Harri. Payment and Financial Innovation, Reserve Demand and Implementation of Monetary Policy. Bank of Finland Discussion Papers 26/2001.
- Marimon, R., Nicolini, J. P., dan Teles, P, (1998). Electronic Money: Sustaining Low Inflation?.
- Priyatama, A. & Apriansah, (2010). Correlation Between Electronic Money and the Velocity of Money. Global Management Conference, April-Mei 2010.
- Supranto, J, (1995). Ekonometrika Buku Dua. LPFE-UI: Jakarta
- Woodford, Michael, (2000). Monetary Policy in a World Without Money. Working Paper 7853. National Bureau of Economic Reserach, 105 Massachusetts Avenue, Cambridge, MA 02138. <http://www/nber.org/papers/w7853>
- Zandi Mark, Koropecjy Sophia, Singh Virenda, (2016). "The impact of electronic payments on economic growth", Moody's Analytics, 2016.
- Zunaitin Eliya, W Regina Niken, P Fajar Wahyu, (2017). Pengaruh E-money terhadap Inflasi di Indonesia. Journal Ekuilibrium, 2017, Volume II (1) : 18-23.