



ANALYSIS OF THE EFFECT OF NON-CASH PAYMENT TRANSACTIONS ON THE MONEY SUPPLY M1 IN INDONESIA

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Abstract

The rapid development of science and technology encourages various innovations in the financial sector. The payment system has evolved from a cash payment system to a non-cash payment system. The convenience offered by the non-cash payment system will impact the effectiveness of monetary policy and financial stability through the money supply in the community. This study aims to determine the impact of non-cash payments on the narrow money supply in Indonesia. This study was conducted using secondary time series semester data sourced from Bank Indonesia (BI) and the Central Bureau of Statistics (BPS) with a period between 2016 (I) and 2022 (II). The data is processed using multiple linear regression analysis methods. The results of this study will show that transactions using debit cards have no significant effect on the narrow money supply, while transactions using credit cards have no significant effect on the little money supply, and e-money has a positive significant impact on the limited money supply in Indonesia.

Keywords: Money Supply (M1), Debit Card, Credit Card, e-money

INTRODUCTION

Technological developments have much influence on all aspects of life. This development encourages many activities to follow the existing technological developments, including economic activities that always move dynamically following the global market flows. In line with technological advances, the payment system has also developed. This technological advancement indirectly changes the pattern of people's lives and encourages the implementation of non-cash transactions. The emergence of non-cash transactions is supported by Bank Indonesia, which promotes the National Non-Cash Movement (GNNT), which began on August 14, 2014. This movement is intended to make people, government institutions, and economic actors realize that transactions using non-cash payment facilities provide a lot of convenience efficiency, and feel safer.

The growth in the number of non-cash payment transactions tends to experience a significant increase every year. The increase is due to the dynamic development of technology that follows the story of the world market. It is characterized by the emergence of payment systems that offer various advantages and facilitate the calculation of economic activities. However, an increase in excess money also increases the general price of goods, which can lead to inflation, which in the long run will disrupt economic stability. Therefore, it is essential to maintain the strength of the money supply through monetary policy.

LITERATURE REVIEW

Money in circulation

According to Dennis Home Robertson in his book *Money*, "money is everything that is accepted as payment for goods," meaning that money is anything that can be accepted as a form of payment to obtain a good or service. Thus, money can be interpreted as an object the community takes as a medium of exchange/trade.

Some classical economists argue that money supply can also be called *currency* because the public will use this money as direct purchasing power (spent), which can affect the price of goods. *Currency* is the currency itself; not all notes and coins are in the hands of the masses. However, many people move but keep their money in bank accounts and pay with bank cards for transactions, so the balance of the current version has almost the same status or function as cash, and traffic can show significance.

Money can be divided into two categories: in the narrow sense (M1) and in the broad sense (M2).

1. Money in a narrow sense M_1 , commonly referred to as little money, can be understood as money in society, namely money in cash and on demand.

$$M_1 = C + D$$

Where:

M_1 = money supply in the narrow sense

C = Currency

D = Demand

Cash is the notes and coins people use daily as legal tender. Meanwhile, mandatory reserves are the domestic private deposits of Bank Indonesia and commercial banks, which are then converted into foreign currency at face value. Demand deposits include demand deposits in resident funds, excess endowment deposits, remittances, and savings accounts. (Aderibigbe, 2018).

2. Money in the broad sense (M_2) is M_1 plus quasi-money.

$$M_2 = M_1 + TD$$

Where:

M_2 = money supply in the broad sense

TD = time deposit

Quasi money cannot be withdrawn at any time, like demand deposits; new money can be removed after maturity, depending on the bank's agreement or the period's type. An example is time deposits. The same applies to government bonds. Bonds can become money if sold to the public or banks.

The amount of money circulation can be seen from the interaction between the demand and supply of money, so these are the thoughts of some economists, including:

Irving Fisher's Theory (Classical Quantity of Money)

According to Fisher, there must always be a seller and a buyer in any trading activity, so the amount paid must be the same between the seller and the buyer. Where money can affect the price level. This opinion can be seen from the following equation:

$$MV = PT$$

Where :

M = money supply

V = money circulation in society

P = price

T = volume of transactions

Cambridge Theory (Marshall - Pigou)

According to the Cambridge theory, those with wealth in the form of money derive utility from the fact that cash is liquid so that it can be easily converted into other assets. It will influence the behavior of firms with cash to make cost-effective decisions that drive the demand for money through trading volume. According to this theory, the need for money will be influenced by several factors, including the importance of trade and institutional factors, interest rates, the amount of public funds, and people's future expectations. Such a theory assumes a proportional relationship between wealth, trade volume, and national income. The Cambridge theory argues that the demand for money is proportional to national income.

Keynes' theory

In his book "General Theory" Keynes presents a different view of classical monetary theory, where Keynes argues that there are three motives for people to hold money, namely:

1. Transaction Motive: is almost the same as the motive for the demand for money in classical theory; that is, people hold cash to facilitate transactions to meet their needs.
2. The precautionary reason is that sometimes people have money to prepare for unwanted things or unexpected conditions.
3. The speculation motive makes money a medium for profit.

RESEARCH METHODS

A quantitative approach was chosen to be used in the research process. The quantitative approach is defined as a systematic study of a phenomenon. The quantitative research approach relates certain variables related to the research results. Because the research is quantitative, the data to be used is secondary data sourced from the Central Statistics Agency (BPS) and Bank Indonesia (BI) publications.

This study covers the population from all over Indonesia related to the independent variable, namely the volume of use of non-cash transactions in the form of the number of transactions from debit cards, credit cards, and e-money in the form of semester data. As well as the amount of M1 money in circulation as the dependent variable in the form of semesters. The data in this study were taken in the form of time series secondary data starting in the 2016 period until 2021.

In this study, the method used is multiple linear regression analysis by first conducting a classical assumption test to ensure that the regression coefficient is unbiased, consistent, and accurate in its estimation. Furthermore, multiple linear regression tests are carried out to measure how much the independent variable can affect the dependent variable. Then, statistical tests are carried out to test the hypothesis and the basis for decision-making based on the evidence obtained from the data results. SPSS (Statistical Package for the Social Sciences) 27 software-assisted data processing in this study.

RESULTS AND DISCUSSION

Classical Assumption Test

1. Normality Test

Based on the normality test results, the sig result is 0.346, a sig greater than 0.05. It means that the significance level of the study's data is usually distributed.

2. Multicollinearity Test

Based on the results of the multicollinearity test, the tolerance value between variables is more than 0.01, and the VIF value of variables is less than 10; it can be said that this study does not have a strong enough attachment to each other, which means that multicollinearity symptoms do not indicate the model.

3. Autocorrelation Test

Based on the autocorrelation test results, the DW value is 0.757. While the value of $dL = 0.6577$ and $dU = 1.864$. because the value of d counts. Smaller than the value of dL and dU , the DW value is in the positive autocorrelation area. Therefore, the Run. A test is needed so that the model is free from autocorrelation problems.

The run test results obtained a sig value of 0.34, which means the value ($\text{sig} > 0.05$). Therefore, the model is free from autocorrelation problems and has no strong relationship between the independent variables.

4. Heteroscedasticity test

Based on the results of the heteroscedasticity test, the sig value for each variable shows more than 0.05. It can be concluded from all models that there is no correlation or relationship between the residual value and the variable, so there are no symptoms of heteroscedasticity in the model.

Multiple Linear Regression Analysis Test

Based on the results of the multiple linear regression analysis test, it shows that :

1. The constant value of 147011887332.303 indicates that transactions using debit cards, credit cards, and e-money are considered stable, so the money supply M1 will increase by Rp 1,470,118,8732,303,000.
2. With a β_1 value of 1.2, it shows that if credit card transactions (X_2) and e-money transactions (X_3) are considered constant, every debit card transaction (X_1) increases by one million rupiah, the money supply in a narrow sense (M1) will rise by Rp 1,200,000,000.
3. The β_2 value of (-35.822) indicates that if ATM/debit card transactions (X_1) and e-money transactions (X_3) are considered constant, then every credit card transaction (X_2) increases by one million rupiahs, the money supply in the narrow sense (M1) decreases by Rp 35,822,000,000.
4. The β_3 value of 1.215 indicates that debit card transactions (X_1) and credit card transactions (X_2) are considered constant, so that every e-money transaction (X_3) increases by one million rupiahs, the money supply in the narrow sense (M1) will increase by Rp 1,215,000,000.

Test Coefficient of Determination (R^2)

Table 1 Determination Test

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927 ^a	.859	.807	13812212390.44303

a. Predictors: (Constant), Emoney, Kartu Kredit, Kartu Debit

b. Dependent Variable: JUB

Based on the analysis results in Table 5, it can be seen that R has a value of 0.927 and R^2 of 0.859. means the influence between the independent and dependent variables is 92.7%. All independent variables' ability to explain the dependent variable's variance is 85.9%, and other factors explain the remaining 14.1%.

Simultaneous Regression Coefficient Test (F Test)

Table 2 F test

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.333E+21	3	3.111E+21	16.306	.001 ^b
	Residual	1.526E+21	8	1.908E+20		
	Total	1.086E+22	11			

a. Dependent Variable: JUB

b. Predictors: (Constant), Emoney, Kartu Kredit, Kartu Debit

Based on the results of the analysis of table 6, it can be seen that the f count is 16.306 with a sig level of 0.001^b while the value of f table ($\alpha = 0.005$) with a *degree of freedom* (df1) is 3 (number of independent variables / k) and (df2) is 8 (n-k-1) then obtained f table 4.07. These results show that the calculated F value is $16.306 > F$ Table 3. It means that simultaneously, the variables of debit card transactions, credit cards, and *e-money* show a positive and significant influence on the money supply in the narrow sense (M1).

Partial Regression Coefficient Test (t-test)

Table 3 Results of the t-test

VARIABLES	T COUNT	T TABLE	SIG.	DESCRIPTION
DEBIT CARD	1,273	2,306	0,239	No Effect
CREDIT CARD	-2,462	2,306	0,039	No Effect
E-MONEY	3,592	2,306	0,007	Influential

Based on the analysis results in Table 7, debit card transactions do not affect the money supply (M1). The value of t count < t table, then transactions using credit cards do not affect the money supply (M1) because the value of t count < t table, then transactions using e-money affect the money supply (M1) because the value of t count > t table.

DISCUSSION

The Effect of Debit Card Transactions, Credit Cards, and E-money, Simultaneously on the Money Supply (M1)

Based on the analysis results, transactions using debit cards, credit cards, and e-money simultaneously significantly influence the money supply M1. It is known that transactions using debit cards, credit cards, and e-money are considered constant, so the money supply M1 has increased by Rp 1,470,118,8732,303,000.

The Effect of Debit Card Transactions on the Money Supply (M1)

Based on the analysis results in Table 7, partial debit cards do not significantly affect the money supply M1. From the calculation, it is known that the value of t count (1.273) < t table (2.306) and sig.

Value of $0.239 > 0.05$. It is assumed that for every increase in transactions using debit cards of Rp 1,000,000, the money supply will increase by Rp 1,200,000,000, assuming other variables are constant.

The amount of transaction flow using debit cards does not affect the money supply (M1). Regarding categorizing debit cards functions as savings so that when more money Which is stored in savings then will reduce the amount of money circulation Narrow sense (M1) in the long run, it It is supported by research conducted by (WICAKSONO & HUDA, 2022), which explains the transaction amount carried out by the community using a card Debit has no effect On the amount of money Circulating in the narrow sense (M1) in the long term.

Another factor that does not affect the debit card on the money supply is the transfer of funds from one account to another, so there is no creation of new money by the government or the central bank as the authorized institution in printing new money. The money supply has a fixed volume that only moves from one account to another, which assumes that debit cards indirectly do not affect the increase in transaction volume value.

The Effect of Credit Card Transactions on Money Supply (M1)

Based on the analysis results in Table 7, it is known Partially, credit cards do not have a significant influence Against the amount of money supply M1 From the results of these calculations known that the value of t count ($-2.462 < t$ table (2.306)). It is assumed that with every increase in credit card transactions by Rp 1,000,000, the money supply will decrease by Rp 35,822,000,000, assuming other variables are constant.

Although the number of transactions using credit cards continues to increase every year, transactions using cash are still the choice made by the public. Because in the transaction process, credit cards have a process that can be considered quite strict and selective. In addition, the public considers the use of credit cards to only lead to consumptive behavior especially with the offer of low-interest rates which reach 0%, to increase use of credit cards in the community. However, the low interest rate offered makes the public think it will cause a payment burden in the future. So many people avoid using credit cards and choose payments using cash or other non-cash transactions.

The results of this study align with research conducted (Sari, 2020), where the results show that credit card transactions have no effect Significantly on the money supply (M1)

The Effect of E-money Transactions on the Money Supply (M1)

Based on the analysis results in Table 7, it is known that partially e-money significantly influences M1. From the results of these calculations known that the value of t count ($-3.592 < t$ table (2.306)). It is

assumed that with every increase in credit card transactions by one million rupiah, the money supply will increase by Rp 1,215,000, assuming other variables are considered constant.

In its rapid development, driven by digitalization that is easily accessible anywhere, transactions using *e-money* are increasing every year. So, any increase in e-money transactions will increase the money supply (M1). In addition, the float properties of *e-money* also contribute to the rise in the value of the money supply (M1), where the liquid float properties of e-money can be equated with the value of cash or demand deposits so that with these float properties, *e-money* can be considered as part of the currency.

This study's results align with research conducted (Puspitasari et al., 2021), which shows that transactions using *e-money* positively and significantly affect the money supply (M1).

Contribution of Debit Card Transactions to Money Supply M1

Table 4 Debit Card Transaction Contribution Measurement Results

Year	Average Number of Debit Card Transactions (Million)	Debit Card Contribution (percent)
2016	448144155,75	38,86%
2017	516703136,4	39,35%
2018	579594513,6	40,80%
2019	582882312,3	38,40%
2020	555101605,5	32,07%
2021	620700628,8	31,06%

The output of Table 8 shows that from 2016 to 2018, there has been an increase in the contribution of debit card transactions to the narrow money supply (M1). It is influenced by the number of transactions that continue to increase yearly. Almost every community has more than one debit card; even some companies use debit cards to pay their employees' salaries. The entire community almost does the use of debit cards in transactions.

Contribution of Credit Card Transactions to Money Supply M1

Table 5 Credit Card Transaction Contribution Measurement Results

Year	Average Number of Credit Card Transactions (Million)	Credit Card Contribution (percent)
2016	26167413,5	2,27%
2017	24813435,75	1,89%
2018	26191172,34	1,84%
2019	29153843,75	1,92%
2020	23000011,5	1,33%
2021	24632122,25	1,23%

From the output of Table 9 above, the contribution of transactions using credit cards to the money supply in the narrow sense (M1) tends to decrease yearly. In general, transactions using credit cards are

becoming a trend. However, transactions in the payment system are still dominated by payments using cash because not everyone can have a credit card due to several conditions that credit card holders must meet and the process of making it quite strict; when credit card holders cannot pay their bills, then what happens is that the customer experiences default.

Contribution of E-money Transactions to Money Supply M1

Table 6 E-money Transaction Contribution Measurement Results

Year	Average Number of <i>E-money</i> Transactions (Million)	Contribution <i>E-money</i> (percent)
2016	60641855,5	5,26%
2017	86452539,5	6,58%
2018	233438796,3	16,43%
2019	455713348,3	30,03%
2020	386434264,5	22,33%
2021	484511603,5	24,25%

From the output of Table 10 above, it can be seen that the contribution of the *e-money* variable to the money supply in a narrow sense (M1) continues to increase significantly each year. The most significant increase occurred in 2019 by 30.03%. It is due to the growing digitalization in Indonesia, especially in the retail sector. Given that, almost all *merchants* use digital payments in their payments. Almost everyone in Indonesia, in particular, has *e-money* on their cellphones, which is considered more efficient in transferring funds and practical to carry anywhere without carrying money in cash.

CONCLUSION

1. Transactions using debit cards partially do not significantly affect the money supply in a narrow sense (M1). However, the increasing trend of debit cards remains the same volume of money supply because there is no creation of new money by the government or central bank. It is assumed that debit cards indirectly do not affect the increase in the value of the volume of money supply.
2. Transactions using credit cards partially do not significantly affect the money supply in a narrow sense (M1). However, it continues to increase every year, and transactions using cash are still an option made by the community. In addition, the public considers the use of credit cards to only lead to consumptive nature.
3. *E-money* transactions partially have a positive and significant effect on the money supply in a narrow sense (M1). With its rapid development and driven by digitalization that makes it easy to reach anywhere, transactions using *e-money* are increasing every year. The floating nature of *e-money* so that

e-money is considered part of card money. It means that in transactions using *e-money*, the money supply in the narrow sense (M1) will increase because *e-money* is included in cash.

4. The contribution of debit card transactions to the narrow money supply (M1) in terms of the number of transactions increases yearly. It happens because almost every community has more than one debit card; even some companies use debit cards to pay employee salaries. The entire community almost carries out debit card users in transactions.
5. The contribution of transactions using credit cards to the money supply in the narrow sense (M1) tends to decrease yearly. Although credit card transactions have become a trend, transactions in the payment system are still dominated by cash because only some have a credit card.
6. The contribution of *e-money* transactions to the narrow money supply (M1) continues to increase significantly. The growing digitalization in Indonesia, especially in the retail sector. Given that, almost all *merchants* use digital payments in their payments.

REFERENCE

Boediono. (2018). *Monetary Economics Series Synopsis of Introduction to Economics No.5*. BPFE

Djalal Nachrowi, U. H. (2002). Meeting 9 Autocorrelation Test. *Imsspada.Kemdikbud. Go.Id*, pp. 1–12.

Drs. Ismail, MBA, A. (2018). *Banking Management (From Theory)*. Prenadamedia Group.

Scientific Journal and Thesis

Fatmawati, M. N. R., & Indah Yuliana. (2020). How the Impact of Non-Cash Transactions and Inflation on the Amount of Money in Circulation. *JRMSI - Indonesian Journal of Science Management Research*, 11(1), 130-148. <https://doi.org/10.21009/jrmsi.011.1.07>

Fauzie, S. (2014). Analysis of the impact of non-cash payments on. *Journal of Economics and Finance*, Vol.2 No.1, 610–621. <https://www.neliti.com/publications/14817/analisis-dampak-pembayaran-non-tunai-terhadap-jumlah-uang-beredar-di-indonesia>

Fitri Rahayu, Irmawati, S. H. (2011). Credit Card Development in Indonesia. *Journal of Management*, 1(1), 5-13.

Ghozali, I. (2018). *Application of Multivariate Analysis with the IBM SPSS 25 Program (9th Edition)* (Print To). Diponegoro University Publishing Agency.

Jamilah, L. (2015). Analysis of the Application of the 5C Principles Toward the Disbursement of Working Capital Loans of PT Bank Rakyat Indonesia (Case Study at PT Anugerah Surya Cemerlang Sejati Malang) Analysis of the Application of the 5C Principles Toward the Disbursement of Working Capital Loans of PT Bank Rakyat Indonesia (Stud. *Analysis of the Application of the 5C Principles to Working Capital Lending of PT Bank Rakyat Indonesia (Case Study at PT Anugerah Surya Cemerlang Sejati Malang)*, 3(2), 1–9.

Lintangsari, N. N., Hidayati, N., Purnamasari, Y., Carolina, H., & Ramadhan, W. F. (2018). Analysis of the Effect of Non-Cash Payment Instruments on Financial System Stability in Indonesia. *Journal of Development Economics Dynamics*, 1(1), 47. <https://doi.org/10.14710/jdep.1.1.47-62>

Naranjo, J., Fuad, H., Hakim, Z., Panchadria, P. A., Robbi, M. S., Yulianti, Y., Susanti, E., Sholeh, M., Teuku Fadjar Shadek, R. S., Kamil Arif, I., Gunadhi, E., Partono, P., Sampieri, R. H., & Pariyatin, Y. (2016). Analysis of Money Supply in Indonesia in 2005 - 2014. *Algorithm Journal*, 12(1), 579-587. <http://jurtek.akprind.ac.id/bib/rancang-bangun-website-penyedia-layanan-weblog>

- Nofiatin, I. (2013). Relationship between Inflation, Interest Rate, Gross Domestic Product, Exchange Rate, Money Supply, and Composite Stock Price Index (JCI) for 2005-2011. *Journal of Management Applications, II* (66), pp. 215–222.
- Nugraha, C. S., Surgawati, I., & Kurniawan, D. (2022). Non-Cash Transactions during the Covid-19 Pandemic: Has it Decreased Significantly? *WELFARE Journal of Economics*, 3(1), 51–63. <https://doi.org/10.37058/wlfr.v3i1.4862>
- Nursari, A., Suparta, i wayan, & Yoke, M. (2019). The Effect of Non-Cash Payments on the Amount of Money Requested by the Public (M1) and the Economy. *Jep*, 8(10), 285-306.
- Puspitasari, A. N. F., Rotinsulu, T. O., & Niode, A. O. (2021). Analysis of the Effect of Non-Cash Payment Transactions on the M1 Money Supply in Indonesia in 2009-2019. *Emba Journal: Department of Development Economics, Faculty of Economics and Business, Sam Ratulangi University*, 9(2), 523-532.
- Sari, D. K. (2020). Analysis of the Effect of Non-Cash Payment Transactions on the Money Supply in Indonesia. *Journal of Economics Development Issues*, 3(2), 361–376. <https://doi.org/10.33005/jedi.v3i2.68>
- WICAKSONO, F. A., & HUDA, S. (2022). Analysis of the Effect of Payment Instruments Using Cards (Apmk), Electronic Money Instruments, Bank Indonesia-Real Time Gross Settlement (Bi-Rtgs) on the Money Supply. *Jambura Economic Education Journal*, 5(1), 11-21. <https://doi.org/10.37479/jeej.v5i1.14197>
- Yuli Wijaya, A., Mukhlis, I., & Seprillina, L. (2021). Analysis of the effect of E-money, electronic transaction volume, and interest rates on money supply in Indonesia before and after the COVID-19 pandemic. *Journal of Economics, Business and Education*, 1(2), 135-14.

Internet Source

- bi.go.id. (2020). *Payment System & Rupiah Money Management*. Bi.Go.Id. <https://www.bi.go.id/id/fungsi-utama/sistem-pembayaran/default.aspx>.
- Indonesia, B. (2018). *Bank Indonesia Regulation on Electronic Money*.