E-ISSN : 2721-303X
P-ISSN : 2721-3021
DINASTI INTERNATIONAL JOURNAL OF ECONOMICS, FINANCE AND ACCOUNTING (DIJEFA)
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455
DOI: https://doi.org/10.38035/dijefa.v5i4
Received: 16 September 2024, **Revised:** 22 September 2024, **Publish:** 28 September 2024

The Effect Of Per Capita Income, Bi Rates And Consumer Price Index On The Demand For Electronic Money In Indonesia 2009-2022

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Abstract: This study aims to analyze the effect of per capita income, Bank Indonesia (BI) interest rates, and the consumer price index on the demand for electronic money in Indonesia during the period 2009-2022. In an increasingly developing digital economy era, financial technology (FinTech) innovations play a crucial role in facilitating financial transactions and fostering a cashless society. This study highlights macroeconomic variables that are considered to have a significant impact on the adoption of electronic money in Indonesia.The data used in this study consists of annual data obtained from official sources such as Bank Indonesia and the Central Bureau of Statistics. The analysis method used is multiple linear regression to measure the effect of each independent variable on the dependent variable. Before performing the regression analysis, classical assumption tests were conducted to ensure that the data met the classical linear regression requirements, including tests for normality, multicollinearity, autocorrelation, and heteroscedasticity.The results of the study indicate that per capita income has a positive and significant effect on the demand for electronic money. This finding suggests that an increase in per capita income encourages greater use of electronic money as a means of payment. BI interest rates were also found to have a significant but negative effect on the demand for electronic money, indicating that higher interest rates tend to reduce the use of electronic money. Conversely, the consumer price index was found to have a positive but not significant effect on the demand for electronic money, meaning that fluctuations in consumer prices do not have a substantial impact on the use of electronic money.

Keywords: per capita income, bi-rate, consumer price index, electronic money

INTRODUCTION

The digital economy era is growing rapidly in Indonesia with the emergence of digital-based technological innovations that facilitate every activity of society in fulfilling every need, the development of significant technological advances through technology arising from

artificial intelligence is changing the view of financial services, creating opportunities and obstacles facing service providers, regulators, and customers.

Efficiency benefits in the financial industry, including payments, lending, investing, asset management, and insurance, can be facilitated by financial technology. But they may also be a threat to the stability and integrity of the financial system, especially if they operate outside the purview of financial oversight and legislation, which is something that governments and developers must constantly monitor and handle in order to protect user safety. wFinancial technology Financial Technology broadly reflects the digitisation of financial services industries, or financial solutions enabled by information technology (Puschmann, 2017). Financial Technology's embedded business model reduces the cost of financial services, improves access to and quality of financial services, and creates a more diverse view of finance (Lee & Shin, 2018).

New technologies and business models are changing the way people pay for their purchases. In many cases, these developments are accelerating the shift from conventional payment instruments such as cheques and cash to electronic payment instruments, invading the financial sector with innovations in the ease of payment transactions towards the era of less cash society, a trend where payments no longer use physical money as a payment instrument but have shifted towards the use of non-cash payment instruments that are increasingly fast, effective, efficient and secure.

Started in 2006 by Bank Indonesia through a press release continued in 2014 the governor of Bank Indonesia Agus D.W. Martowardoyo officially launched the National Non-Cash Movement (GNNT) aims to make people adapt to using non-cash payment instruments in the future Bank Indonesia will increase the electronification of payment transactions and improve non-cash payment infrastructure as well as develop a centralised framework for utility bills payments and encourage the use of electronic transactions more actively and coordinated to support this, the integration of Electronic Bill Presentment System and Payment Service Integration between payment networks will also be developed.

According to (Institute, 2016) Financial technology or digital finance is an innovation in financial services used through digital means including mobile telecommunications devices and gadgets connected to the internet by minimising the use of cash and conventional bank offices. Mobile telecommunications devices and gadgets that function through point-of-sale (POS) devices connect individuals and businesses to digital national payment facilities so that there is a great opportunity for unlimited transactions for various parties.

A study has made a survey and sampled respondents in 20 countries totalling more than 22,000 resulting in the average %tase of consumers using financial technology services (adoption index) reaching 33% in 2017. That means the percentage increased from the previous 16% in 2015 with the same research, it was found that 50% of Financial Technology users used it for transactions while 65% of respondents were likely to use the service until an undetermined time. (Ernst & Young, 2017).

This is in line with the journalistic view that has recorded the development of Financial Technology in the 20th century towards a projection in the 21st century where a less cash society will be realised in accordance with the vision can be reflected from the FinTechnews Singapore review (2018), Indonesia to be the most appealing economy, followed by Singapore (32%) and Vietnam (13%) in the Southeast Asia region, the FinTech sector has also been growing rapidly in Indonesia, the annual growth of the FinTech market in Indonesia in 2017 reached 16.3%, Investment into FinTech companies continues to be strong, amounting to US $ 176.75 million in 2017 this is in line with the prediction of investment in 2019 experiencing a rapid increase in the number of Financial Technology companies. The Bank for International Settlement (1996), defines e-money as a stored-value or prepaid card product in which a record of the value of funds or (monetary value) available to the user is stored on the user's electronic device, electronic value owned by the user by diverting cash by debiting through a bank account

or retail store service provider owned so that it moves stored on the user's electronic device that will decrease every time the user uses the device to make a purchase and will increase if receiving payment. (BIS, 1996).

In contrast to many existing single-purpose prepaid card schemes such as those offered by telephone companies, e-money products are intended to be used as a general and multipurpose means of payment. The definition includes prepaid cards called electronic purse and prepaid software products that utilise computer networks such as the Internet referred to as digital cash (Nizar & Hanifah, 2021) . Electronic money (e-money) is broadly defined as the electronic storage of monetary value on a technical device that can be widely used to make payments to entities other than the e-money issuer (Hendarsyah, 2019).

The device acts as a prepaid bearer instrument that does not necessarily involve a bank account in the transaction (Bank Sentral Eropa, 1998 in (Pahlawan, 2016). Globally the adoption of e-money products has been slower than expected and there are mixed experiences with success and failure. Most successful innovations tend to be concentrated in cash-intensive economies and fill a specific gap or gap. In Canada, few e-money products are currently available or widely used. So far, most of the competition for cash has come from traditional electronic payment tools such as debit and credit cards (Fung et al., 2014).

Although some central banks are taking steps to encourage standardization, best practices, and oversight, their role as e-money facilitators or catalysts has thus far mostly consisted of research and monitoring. The role that central banks play in overseeing or regulating retail payments has grown dramatically in the last several years. These days, certain central banks are in charge of both retail payment systems with system-wide importance and systemically critical payment systems

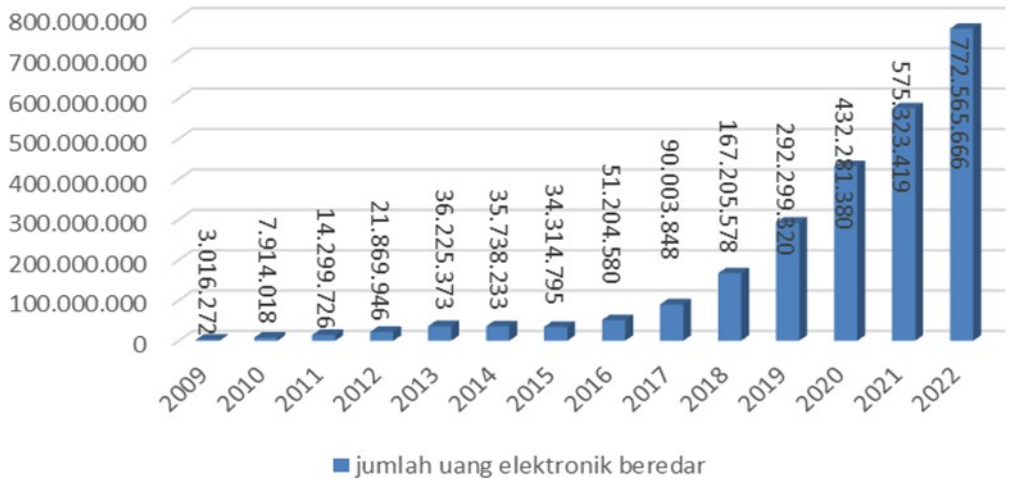

Figure 1. Number of Electronic Money Circulating in Indonesia
Source : (Kusnandar, 2023)

From the graph above, it can be seen that the use of electronic money is increasing from year to year. In Figure 1 it can be seen that there was a decline in 2014 and 2015, but the increase occurred again in the following year. In 2009 the amount of electronic money circulating in the community was 3,016,272 electronic money, until the latest data from Bank Indonesia in December 2022, the electronic money in circulation greatly increased, namely 772,565,666 pieces. The increasing circulation of electronic money in Indonesia shows that the Indonesian people are starting to accept and use electronic money as a means of payment in their daily economic activities.

Currently, its development in the financial sector Financial Technology which is a combination of technological innovation and derivative financial services commonly referred to as e-money or electronic money as a means of payment, e-money itself is divided into 2,

namely chip based (Bank BRI with Brizzi, Bank BCA with Flazz, Bank BNI with Tap Cash, Bank BTN with Blink) and server based (OVO, GoPay, LinkAja, Dana, Doku, Sakuku) (Kusuma & Asmoro, 2021)

This situation will indirectly have the effect of decreasing the demand for M1 currency and chiral money along with Bank Indonesia's records, which have significantly increased electronic money transactions, which means that the demand for electronic money has increased, thus changing the function of money demand on the velocity of money or the speed of money circulation. This opinion is supported by the statement of Irving Fisher (2008), which states that if people use electronic money instruments, namely debit, credit and e-money cards, then less cash is used for purchases and payments, the fewer transactions generated by nominal income. This results in the speed of money circulation will be high, vice versa if people use cash and demand deposits as a means of payment, more transactions will also generate nominal income which will reduce the speed of money circulation. There is also another factor as a benchmark, namely real per capita income per year which has been calculated with other variable elements in 2018 Indonesia's real per capita income of USD 4,349.58 per year which comes from the market beneficial of a nation's generated products and services. (Pambudi, 2020)

Indonesia's per capita income data from year to year shows an increase every year, which means that Indonesia's welfare is improving as well as an indicator of Indonesia's economic growth is increasing. In line with the level of economic growth, it will also increase the consumer price index which is the overall cost incurred by consumers to buy goods and services to meet their needs within a certain period of time to observe the amount of living costs as well as the consumer price index as an indicator of the inflation rate that occurs because the consumer price index is a component of measuring the inflation rate that occurs.

According to Keynes, the interest rate determines the demand for money for speculation. The public's desires for cash for speculative reasons decreases as interest rates rise. The rationale is that there will be less of a need for cash if interest rates rise. On the other hand, there is a negative correlation between the BI rate and the demand for money since people prefer to store cash more when interest rates are lower.(Nopirin, 2014).

Electronic money demand theory is a theory that explains the factors that influence the demand for electronic money. This theory is based on several assumptions, including: Electronic money is a cashless payment instrument. Electronic money can be used for various transactions, both offline and online transactions. Electronic money has lower transaction costs than cash. The income level of the community will affect the demand for electronic money. People with high income levels tend to have a higher demand for electronic money because they have more money to spend (Ismagilova et al., 2020)

The increase in money supply is correlated with a rise in per capita income in a unidirectional manner, meaning that as per capita income rises, so does the money supply. According to the classical perspective, rising money supply corresponds with rising economic growth. This may be seen as a rise in cash as a medium of exchange (M1), which rises in conjunction with economic expansion.

The demand for money for speculation purposes according to Keynes is determined by the interest rate. The higher the interest rate, the lower the public's desire for cash for speculation purposes. The reason is that if the interest rate rises, then the public's desire for cash will be smaller. Conversely, the lower the interest rate, the greater the public's desire to hold cash, so the relationship between the BI rate and the demand for money has a negative effect (Prawoto, 2010).

However, the money supply data shows that the growth of the money supply continues to increase while the interest rate data shows a fluctuating trend, there is a mismatch between theory and reality that occurs in the variable money supply on interest rates in Indonesia. So it

becomes important and interesting to examine how the influence of money supply on BI interest rates (Prawoto, 2010).

There is an interaction between the pricing of products and services, the law of demand for money, and the law of demand for goods and services. The law of demand explains that a good sees an increase in demand when its price drops or is low. The law of demand states that, on the other hand, as an item's price increases, its demand decreases. Buyers or consumers are constantly concerned with the cost of the products or services they receive. Of course, a number of things impact customers' decisions to make purchases, and one of those considerations is the actual cost of the items.

In the theory of money demand Milton Friedman states that the price of goods is one of the factors that affect the demand for money. Milton Friedman's theory is in line with the research conducted. In the short term, the consumer price index from year to year shows that the consumer price index is erratic. Sometimes up and sometimes down. While the demand for money based on the money supply (M1) in Indonesia from year to year has increased so that when compared with the demand for money it is seen that both form different patterns. It differs, although, with the data acquired, which indicates that a number of years of declining prices should have an impact on the decrease in money demand, based on the consumer price index table. In the meanwhile, if we discuss the hypothesis positing that economic increases correspond with a demand for money.

Table 1. Development of Electronic Money Demand in Indonesia by Type of Use 2009-2022

Year	Electronic Money Demand (JUTA IDR)	GDPC (JUTA IDR)	BI Rate (Percent)	CPI (Percent)
2009	3.016.272	9.247.000	6,50	113,82
2010	7.914.018	9.347.000	6,50	118,66
2011	14.299.726	9.647.000	6.00	126,21
2012	21.869.946	9.815.000	5.77	131,80
2013	36.225.373	9.858.000	6,48	140,61
2014	35.738.233	9.903.000	7,54	113,41
2015	34.314.795	10.150.000	7,52	120,16
2016	51.204.580	10.420.000	6	124,08
2017	90.003.848	11.664.000	4,56	130,85
2018	167.205.578	11.059.000	5,1	136,29
2019	292.299.320	11.299.000	5,12	138,80
2020	432.281.380	11.013.000	4,25	103,62
2021	575.323.419	11.156.000	3,52	105,62
2022	772.565.666	11.479.000	4	111,22

Source : (Bank, 2024)*;* (BI, 2014)*;* (BPS, 2022)

The demand for electronic money in Indonesia appears to be rising annually, as indicated by the demand for electronic money development table above. According to data from the Bank Indonesia Reference Interest Rate, per capita income increased year between 2009 and 2022. There was a tendency for per capita income to decline from 2009 and 2022. The demand for electronic money increased in tandem with this development. Naturally, this goes against the idea that says that if inflation declines, investment credit will as well, and vice versa.

The quantity theory of money states that the amount of money in circulation in an economy directly affects the rate of inflation and economic growth. The effect of per capita income on the demand for electronic money is positive. Growth in per capita income will increase demand for electronic money. This is because growth indicates that the economy of an area is growing. Positive economic growth will increase people's income, so the demand for electronic money will also increase. The objectives of this research include examining and analyzing the influence of per capita income on the demand for electronic money in Indonesia during the period from 2009 to 2022. Additionally, the study aims to assess the impact of interest rates on the demand for electronic money within the same timeframe. Furthermore, the research seeks to evaluate the effect of the Consumer Price Index on the demand for electronic money in Indonesia, providing a comprehensive analysis of the factors influencing the adoption and usage of electronic money over the specified period.

METHOD

This research was conducted in Indonesia, utilizing secondary data from the official websites of the Central Statistics Agency (BPS) and Bank Indonesia (BI). The study focuses on time series data spanning from 2009 to 2022. Secondary data, such as documents or other indirect sources, play a significant role in this research, including information from books, journals, articles, and theses related to the demand for electronic money. The data collection involved the documentation method, which includes gathering archival records relevant to the research. The research employed a quantitative data analysis model using multiple linear regression equations to analyze the relationship between variables such as per capita income, interest rates, and the Consumer Price Index (CPI) on the demand for electronic money. The analysis adhered to the Ordinary Least Squares (OLS) method, ensuring the model met the Best Linear Unbiased Estimator (BLUE) criteria. The data was processed using SPSS 25, involving steps like data tabulation, linearity tests, classical assumption tests, and statistical tests to evaluate the impact of independent variables on the dependent variable. Statistical tests, including the T-Test, F-Test, and Coefficient of Determination (Adjusted R^2), were conducted to determine the significance and explanatory power of the model.

RESULTS AND DISCUSSION

Descriptive Analysis of Research Variables

This chapter will contain the results of research on the Analysis of the Influence of Per Capita Income, Interest Rates, and Consumer Price Index on Electronic Money Demand for the 2009-2022 Period. This study uses regression with time series data, which is data that has a certain time period. The following is a table of descriptive statistical results obtained from SPSS processed data:

Table 2. Results of Descriptive Statistical Data Processing

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Electronic Money Demand (IDR)	14	30162772	772565666	235986539,14	285624309,897
GDPC (IDR)	14	9247	11664	10432,64	826,854
BI Rate (Percent)	14	3,52	7,54	5,6329	1,25420
CPI (Percent)	14	103,62	140,61	122,3250	12,26184
Valid N (listwise)	14				

Source: Data Prcessed by Researchers (2024)

In table 2, it can be described that the distribution of data obtained by the researcher is: The variable of electronic money (Y) from the data can be described as the minimum value of Rp.3,016,272 in 2009 and the maximum value of Rp.77,256,566 in 2022 in the demand for electronic money shows a wide range, which reflects the increase in the use of electronic money over time. This wide range reflects a significant increase in the use of electronic money in Indonesia during the research period (Bank Indonesia, 2022) with an average of 23598653.1 and a standard deviation of 28,562,430.9.

The per capita income variable (X1) from the data can be described as having a minimum value of Rp. 9247 million in 2009 and a maximum of Rp. 11664 million in 2017, indicating relatively stable economic growth during the research period. This variation indicates stable economic growth but with reasonable fluctuations. Government policies, foreign investment, and global market conditions can affect per capita income (Central Statistics Agency, 2022) Meanwhile, the average per capita income in the 2009-2022 period was 10,432.64. standard deviation of 826.854. The BI interest rate showed a minimum value of 3.52 per cent in 2009 and a maximum of 7.54 per cent in 2014, Changes in interest rates reflect monetary policy that is adaptive to domestic and global economic conditions. An increase in interest rates is usually used to control inflation, while a decrease in interest rates is used to encourage economic growth (Bank Indonesia, 2022) While the average in the 2009-2022 period was 5.6329 and a standard deviation of 1.25420. The Consumer Price Index (CPI) had a minimum value of 103.62 percent in 2009 and a maximum of 140.61 in 2013. CPI fluctuations indicate changes in the price level of goods and services in the economy. This can be due to changes in production costs, exchange rates, and consumer demand (Badan Pusat Statistik, 2022) with an average of 122.3250 and a standard deviation of 12.26184.

Normality Test

Several approaches can be used in this study to assess the presence of normality symptoms through normality tests. This study uses statistical analysis (Kolmogorov-Smirnov test).

Table 3. Results of Processing Normality Test Using Kolmogorov-Smirnov

Source:Data Prcessed by Researchers (2024)

Processing Normality Test Using Kolmogorov-Smirnov

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		14
Normal Parameters[a,b]	Mean	-,0000001
	Std. Deviation	95377357,34748572
Most Extreme Differences	Absolute	,145
	Positive	,086
	Negative	-,145
Test Statistic		,145
Asymp. Sig. (2-tailed)		,200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Based on the data processing in table 3, the significant value of the data assessed using the Kolmogorov Smirnov One-Sample is 0.200. In order for the data to pass the normality test, a significance value that has been determined is used, which is greater than 0.05. So it can be concluded that the variables in this study are normally distributed.

Multicollinearity Test

The multicollinearity test was carried out to identify the presence of multicollinearity in the model by looking at the Variance Inflation Factor (VIF) value. If the VIF value is more than 10, it indicates that the regression model shows the presence of symptoms of multicollinearity, and vice versa. The results of the multicollinearity test conducted using SPSS are as follows:

Table 4. Multicollinearity Test Processing Results

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	GDPC (IDR)	,390	2,562
	BI Rate (Percent)	,386	2,593
	CPI (Percent)	,931	1,074

a. Dependent Variable: Electronic Money Demand (IDR)

Source:Data Prcessed by Researchers (2024)

The analysis of the multicollinearity test was carried out by looking at the Variance Inflation Factor (VIF) value in the regression model. Based on Table 5.3 it can be seen that the centered VIF value in the three variables studied, both GDPC, BI-Rate and Consumer Price Index are below the tolerance value of >0.1 and the indigo VIF is small from 10, which means that there is no multicollinearity problem in the data.

Autocorrelation Test

An autocorrelation test was carried out to find out whether in the linear regression model there was a relationship between the perturbrillator error in the t-period and the perturbrillator error in the previous t-1 period (Ghozali, 2021). The Durbin-Watson test method can be used to find out whether a data shows an indication of autocorrelation (Ghozali, 2021) provides criteria for interpreting Durbin-Watson values. The Durbin-Watson value is obtained according to the following conditions:

Table 5. Results of autocorrelation test processing using Durbin-Watson

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,943[a]	,888	,855	108746918,959	2,022

a. Predictors: (Constant), CPI (Percent), RGDP (IDR), BI Rate (Percent)

b. Dependent Variable: Electronic Money Demand (IDR)

Source: Data Prcessed by Researchers (2024)

Based on the output table of the "model summary" above, it is known that the Durbin-Watson value (d) is 2.022. This "d" value will be compared to the DurbinWatson table value using a significance of 5% with the sum of "n" being 14 samples, and the sum of "k" or independent variables being 3. So in the Durbin Watson table, the following values are obtained:

du= 17788 d= 2.022

4-du= 4- 17788 = 2.212

So, dU < d < 4-dU or 1. 77882 < 2.022 < 2.212, then it can be concluded that the decision is not rejected or there is no positive or negative autocorrelation or it can be said that there is no autocorrelation in the regression model of this study. So it can be concluded that this study can be said to be BLUE (Best Linear Unbiased Estimator

Heteroscedaticity Test

This study uses the Glesjer Test to ascertain whether the data obtained contains symptoms of heteroscedasticity using the following conditions:

Table 6. Data Processing Results for Heteroscedasticity Test Using the Glacier Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-448631041,850	357913887,222		-1,253	,239
	GDPC (IDR)	49607,753	24233,512	,802	2,047	,068
	BI Rate (Percent)	10339526,911	14622520,438	,272	,707	,496
	CPI (Percent)	-448765,607	978954,264	-,115	-,458	,656

a. Dependent Variable: ABS_RES2

Source: Data Prcessed by Researchers (2024)

Based on the previous table 6, it can be seen that the p-values for all variables exceed the threshold of 0.05, which indicates that these variables are statistically significant and free from heteroscedasticity. The significant values of each variable are as follows: Per Capita Income with a value of 0.068, BI Rate with a value of 0.496, and Consumer Price Index with a value of 0.656.

Hypothesis Test Results and Significance

This study uses multiple linear regression analysis with the Ordinary Least Square (OLS) method to see the effect of Perkapita Income BI- Rate and the consumer price index on the demand for electronic money in Indonesia from 2009 to 2022. The following are the results of multiple linear regression analysis conducted using SPSS:

Table 7. Results of Multiple Linear Regression Data Processing Using the OLS Method

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-47,584	10,290		-4,410	,001
	LogGDPC (IDR)	14,280	2,597	,732	5,498	,000
	BI Rate (Percent)	-1,113	,072	-,211	-1,573	,147
	CPI (Percent)	-,010	,005	-,175	-2,008	,072

a. Dependent Variable: LogY

Source: Data Prcessed by Researchers (2024)

LogE-Money = 14,280 LogGDP – 0.113 BI Rate – 0.010 CPI – 47,584 The regression equation can be explained as follows:

a) The constant has a value of -47.584, When all the variables studied are constant, the demand for electronic money in Indonesia is -47.584 per cent.
b) The regression coefficient in per capita income production is positive at 14.280, meaning that there is a positive relationship between per capita income and electronic money. So if per capita income increases by one percent while the demand for electronic money is considered fixed, exports increase by 14.280 percent. The

regression coefficient in the production of BI-Rate is negative at -1.113, meaning that there is a negative relationship between the BI-Rate and electronic money. So if the BI-Rate decreases by one percent while the demand for money is considered to change, electronic money decreases by -1.113 percent.

c) The regression coefficient in the production of the Consumer Price Index has a negative value of -0.010, meaning that there is a negative relationship between consumer price indicators and electronic money. So if the Consumer Price Index decreases by one percent while the demand for money is considered to change, then electronic money decreases by -0.010 percent.

Partial Result (t-Test)

Based on table 3, above, the calculation of each independent variable, namely Income Per Capita, BI Rate and Consumer Price Index Against Demand for Electronic Money in Indonesia in 2009-2022, is obtained:

1. The Constant value in this study has a coefficient of -47,584 and a probability value of 0.001 which is less than the degree of error of 5% (0.05). Then H1 is accepted and H0 is rejected because it is 0.001 < 0.05. This means that when all the variables in this study are constant, the demand for electronic money in Indonesia will fall by 47,584
2. The independent variable of Per Capita Income has a coefficient value of 14,280 and a probability value of 0.000 which is less than the degree of error of 5% (0.05). Then H1 is accepted and H0 is rejected because 0.000 < 0.05. This means that the per capita income variable has a significant effect on the demand for electronic money in Indonesia.
3. The BI-Rate independent variable has a t-statistical probability value of 0.147 which is greater than the degree of error of 5% (0.05). Then H1 is accepted and H0 is rejected because it is 0.147 > 0.05. This means that the BI-Rate variable has an insignificant effect on the demand for electronic money in Indonesia.
4. The independent variable of the consumer price index has a t-statistical probability value of 0.4744 which is greater than the degree of error of 5% (0.05). So H1 is rejected and H0 is accepted because it is -0.010 > 0.05. This means that the Consumer Price Index variable has an insignificant effect on the demand for electronic money in Indonesia.

Simultaneous Results (Test F)

Table 8. Result Of Data Processing For The F test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,455	3	1,818	43,684	,000[b]
	Residual	,416	10	,042		
	Total	5,871	13			

a. Dependent Variable: lnEMON

b. Predictors: (Constant), CPI (Percent), lnRGDP(IDR), BI Rate (Percent)

Source: Data diolah,2024

Based on the table above 8, the value of 0.000 is smaller than the α significance level of 5% (0.05), so it can be concluded that the variables of Per Capita Income, Interest Rate, and Consumer Price jointly significant effect on the Demand for Electronic Money in Indonesia from 2009 to 2022.

Coefficient of Determination (R^2)

The determination coefficient (R2) shows the contribution of the dependent variable to the independent variable. In this study, the determination coefficient used was adjusted R2. Based on the test results in figure 6, it is known that the Adjusted R2 value is 0.855, or 85.5%.

Fluctuations in this study are determined by other variables outside this study in Indonesia for the period 2009-2022, it can be concluded that 85.5% is associated with variations in per capita income, BI-Rate and Consumer Price Index. Meanwhile, the remaining 14.5% Hence there is a positive relationship between income and the demand for money for transactions (Keynes, 1936).

Table 9. Data processing results of coefficient determination (R2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,943[a]	,888	,855	108746918,959	2,022

a. Predictors: (Constant), CPI (Percent), GDP (IDR), BI Rate (Percent)

b. Dependent Variable: Electronic Money Demand (IDR)

Source:Data Processed by researchers (2024)

The Effect of Per Capita Income on Indonesia Electronic Money Demand in 2009-2022

Based on the regression results, it is known that the Per Capita Income variable has a positive and significant influence on the demand for electronic money in Indonesia, meaning that the higher the per capita income, the higher the demand for electronic money in Indonesia. This positive relationship can be explained through Keynes' theory of the motive for holding money, namely the motive for transactions and precautions determined by the level of income. At times of high income, a lot of money is requested for transaction motives, so that when income rises, it will cause an increase in demand for money (Anwar & Andria, 2016).

The motive for the transaction is the need to hold money to meet the needs of daily transactions, such as the purchase of goods and services. Keynes argued that the amount of money requested for transaction motives was greatly influenced by the level of income. The higher a person's income, the greater the amount of money held for transactions. This is because higher incomes allow individuals and households to make more purchases. Therefore, there is a positive relationship between revenue and demand for money for transactions (Keynes, 1936).

The motive of being on guard refers to the desire to hold money as a reserve in case of unexpected situations. In this context, money serves as a protection tool against economic uncertainty, such as job loss or sudden need. Keynes emphasized that individuals and businesses keep a certain amount of money as collateral to deal with emergencies or other unforeseen events. Increased income allows individuals and households to save more money as a form of protection. Thus, there is a positive relationship between income and the demand for money for a precautionary motive (Keynes, 1936). In addition, the direct relationship between per capita income and demand for electronic money reflects the improvement of economic well-being and the adoption of digital payment technology. In other words, the higher the per capita income of a country, the greater the tendency of its people to use electronic money in daily transactions (Hidayat, 2018). Furthermore, these results also indicate that people who have higher incomes tend to look for more efficient and secure transaction methods, which in this case is electronic money. The increase in the use of electronic money is in line with technological advancements and increased internet accessibility, which allows more people to take advantage of digital financial services.

In recent years, electronic money has become an increasingly popular option for everyday transactions in Indonesia. Various electronic money platforms, such as GoPay, OVO, and Dana, have made it easier for people to make payments at various merchants, both online and offline. With higher per capita income, people are more likely to use electronic money because of the convenience and efficiency it offers (Arango & Taylor, 2018). In addition, the promotions and incentives offered by e-money service providers, such as cashback and

discounts, also play an important role in encouraging the use of e-money. This promotion increases the attractiveness of electronic money as a means of payment that is not only practical but also economical. Increased use of electronic money for daily transactions will strengthen the digital economy ecosystem in Indonesia and reduce dependence on cash (Polasik et al., 2012).

E-money applications often include features that support proactive motivation, such as digital savings, transaction notifications, and personal financial management. These features make it easier for users to manage their money and ensure they have enough funds to deal with emergencies. The security that electronic money offers, such as PIN protection and data encryption, also makes it more attractive as a storage tool than cash (Wijaya & Mulyandi, 2021). The increase in per capita income allows individuals to invest more in other digital financial products related to electronic money, such as mutual funds or insurance. This shows that there is a close relationship between income, the use of electronic money, and investment diversification. Thus, electronic money not only serves as a means of payment, but also as an integral part of an individual's financial strategy to manage risk and prepare for the future (Safitri et al., 2018).

The research is in line with the results of Setiadi's (2013) research, which states that the variable of Real Per Capita Income has a positive effect in accordance with the theory and is significant to the variable of the amount of money in circulation. The classical theoretical approach by classical economists also assumes that the demand for money is purely based on the need to make transactions. From this theory, it is concluded that the demand for money for transaction needs is highly dependent on the level of income. However, this study is not in line with the research of Aini et al. (2016) which concluded that per capita income has no effect on the demand for electronic money in Indonesia. The research results in a very small probability. So that when the value of people's income rises does not occur or is not significant to the demand for electronic money in Indonesia, this is not in line with the basic concept explained by Keynes where Keynes argued that when people in a country experience an increase in income, there is also a demand for electronic money made by the community (Keynes, 1936).

The Effect of Interest Rates on Electronic Money Demand in Indonesia in 2009-2022

Based on the regression results, it is known that the BI-Rate variable has a negative and insignificant influence on the demand for electronic money in Indonesia, meaning that the higher the interest rate, the lower the demand for electronic money in Indonesia. Relationship this can be explained by the Keynes interest rate (liquidity preference). which emphasizes between the interest rate to be paid and the demand for money for speculative purposes. The demand for money will be large when the interest rate is low and vice versa when the interest rate on demand for money falls. In the context of Keynesian theory, there are three main motives that cause a person to hold money: transaction motives, vigilance motives, and speculative motives. The motive of transactions and vigils tends to be influenced by the level of income, while the motive of speculation is greatly influenced by the interest rate. The higher the interest rate, the less people want to hold cash for speculation because the opportunity cost of holding cash increases. Conversely, if interest rates are low, people are more likely to hold cash for speculation because of low opportunity costs (Nopirin, 2014).

The demand for money has a negative relationship with interest rates, a phenomenon that can be explained through Keynes's theory of liquidity preferences. According to Keynes, there are three main motives for a person to hold money: transaction motives, vigilance motives, and speculative motives. Liquidity preference theory emphasizes that the demand for money for speculative purposes is influenced by interest rates. When interest rates are low, people tend to hold more cash for speculation because the opportunity cost of holding cash is low. Conversely, when interest rates are high, the opportunity cost of holding cash increases, so people prefer to keep their money in the form of investments that provide interest returns (Nopirin, 2014).

Keynesian theory states that the demand for money for speculative purposes is determined by the interest rate. This is because people will consider the costs and benefits of holding cash versus storing it in the form of interest-bearing assets. When interest rates rise, the opportunity cost of holding cash increases. This means that by holding cash, one loses the opportunity to earn interest on other investment assets. Therefore, people tend to reduce their demand for cash when interest rates rise (Ismagilova et al., 2020).

Conversely, when interest rates are low, the opportunity cost of holding cash is reduced. People do not feel that they lose much by holding cash because the return on investment assets is also low. As such, they tend to increase the demand for cash for speculative purposes. This creates a negative relationship between interest rates and money demand (Nopirin, 2014). In the context of electronic money in Indonesia increasing interest rates, the general public is gradually reducing the use of electronic money and prefers to invest their money in ways that can provide profits. The reason behind this is the less favorable electronic money transfer fees compared to currency exchanges that offer interest. With more sensitive buttons to press on investment instruments such as deposits or higher liabilities, the demand for electronic money is declining (Ismagilova et al., 2020).

Research on the impact of interest rates on the demand for electronic money in Indonesia has yielded a variety of interesting findings. One of the studies that shows that interest rates have an insignificant influence on the demand for electronic money was conducted by Prawoto (2010). The study revealed that while interest rates fluctuate, other factors such as income levels, technological advancements, and consumer preferences for more modern payment methods play a more dominant role in determining the demand for electronic money. This shows that people are more likely to be affected by the ease and efficiency of using electronic money than by changes in interest rates (Ismagilova et al., 2020).

Another study supporting this finding was conducted by Aini et al. (2016). They concluded that interest rates do not have a significant influence on the demand for electronic money in Indonesia. The study shows that when interest rates change, people do not significantly change their use of electronic money. This is due to the fact that electronic money has become an integral part of the daily lives of Indonesia people, who prioritize ease and speed of transactions over interest rate fluctuations (Ismagilova et al., 2020).

Rising interest rates also impact investment decisions, both at the individual and business level. For companies in the financial technology (fintech) sector, higher interest rates mean higher capital costs for funding new projects. Fintech companies looking to expand services or develop new technologies may face greater financing challenges as high interest rates make borrowing more expensive (Bernanke, 2020). As a result, the pace of innovation in the fintech industry may slow down, which in turn may reduce the attractiveness and usage of electronic money.

The insignificant findings of this study indicate that there are other factors that are more dominant in determining the demand for electronic money, such as income levels, technological developments, and consumer preferences (Prawoto, 2010). In addition, government policies that encourage financial inclusion and the use of digital payments also play an important role in increasing the demand for e-money (Safitri et al., 2018). On the other hand, when interest rates rise, the cost of borrowing electronic money increases. In this situation, the general public is more likely to use electronic money to transact due to the high rate of return on alternative investments (Safitri et al., 2018). Electronic money offers convenience and efficiency in transactions, so its users increase when interest rates reach a high threshold (Aini et al., 2016). Furthermore, another study by Anwar and Andria (2016) showed different results, where interest rates have a positive and significant influence on money demand.

This suggests that in some contexts, people may still hold cash despite high interest rates, perhaps due to other factors such as economic uncertainty or a preference for liquidity (Anwar

& Andria, 2016). They explained that higher interest rates reduce the demand for money because people prefer to keep their funds in the form of interest-earning investments. From the above analysis, it can be concluded that the influence of interest rates on the demand for electronic money in Indonesia cannot be generalized simply. Factors such as income levels, technological developments, consumer preferences, and government policies are more dominant in determining the demand for electronic money (Prawoto, 2010). While there are studies that show a significant influence of interest rates, both negative and positive, other, more dominant factors show that changes in interest rates do not always have a significant impact on the demand for electronic money in Indonesia.

The Effect of the Consumer Price Index on the Demand for Electronic Money in Indonesia in 2009-2022

Based on the regression results, it is known that the Consumer Price Index variable has a negative and insignificant influence on the demand for electronic money in Indonesia, meaning that the higher the Consumer Price Index, the lower the demand for electronic money in Indonesia. Which means that the value of the Consumer Price Index is not significant to the demand for electronic money. This research is in line with the research conducted by Aimon (2010). The conclusion of this study is that the demand for money explains that the Consumer Price Index variable has no effect on the demand for money in Indonesia. The modified price index method of Laspeyres, or Modified Laspeyres Index (MLI), the increase in CPI decreases purchasing power because the price of goods and services increases. In the context of MLI, which updates weights based on actual consumption, price increases Essential goods will better reflect changes in the index. In a situation where the CPI is increasing, consumers are likely to change their spending priorities.

They may reduce spending on non-essential goods and services and increase spending on basic necessities such as food, transportation, and housing. Because electronic money is often used for more modern and perhaps non-essential cashless transactions, the demand for electronic money could decline as consumers prioritize spending on basic necessities (Case & Fair, 2012). Keynes's theory of the demand for money, known as the theory of liquidity preference, is an integral part of his work in his famous book, The General Theory of Employment, Interest, and Money (2007). In this theory, Keynes posited that the demand for money by individuals and companies is mainly driven by three main motives: transaction motives, vigilance motives, and speculation motives (Keynes, 1936).

The Consumer Price Index (CPI) measures changes in the prices of goods and services that are frequently consumed by households. When the CPI increases, the prices of goods and services also increase, which means that individuals and firms need more money to conduct daily transactions. In the context of Keynes' theory, an increase in the CPI will increase the demand for money for transaction motives as consumers need more cash to cover the rising cost of living (Keynes, 1936). When the CPI is high, there is greater economic uncertainty, such as uncertainty about the future prices of goods and services. This may encourage individuals and companies to save more money as a form of precaution. In other words, inflation reflected in rising CPI makes consumers more likely to hold cash to deal with the possibility of further price increases or other unexpected events (Keynes, 1936).

The speculation motive relates to the decision of individuals and firms to save or invest money based on their expectations of future interest rate changes. A high CPI is usually followed by tight monetary policy from the central bank, such as interest rate hikes to control inflation. This expectation of rising interest rates may influence speculative decisions, where individuals and firms may choose to hold cash temporarily rather than invest it in assets whose value may be eroded by inflation (Keynes, 1936). The Consumer Price Index (CPI) variable in this study is in line with the research conducted by (Keynes, 1936) with the title "Macroeconomic Factors Affecting Money Demand in Indonesia", which in the results of the

study show that in the long term the demand for money (M1) in Indonesia is positively and significantly influenced by the variables of Gross Domestic Product (GDP) and price levels.The research entitled "Money demand: A Study On Indonesia Influential Factors", obtained the result that the consumer price index has a negative effect on the demand for money (Prawoto, 2010). These findings suggest that as the consumer price index increases, people's purchasing power decreases, which in turn reduces the amount of needed, for daily transactions. In the context of Indonesia, the increase in consumer prices is often associated with inflation, which can erode the real value of money held by the public.

In addition, the consumer price index and e-money Milton Friedman's theory of demand for money, it is stated that the price of goods is one of the factors that affect the demand for money. Milton Friedman's theory is in line with the research conducted. Henceforth, whether in the short term or in the long term, price increases will always affect the demand for money. The increase in CPI is often followed by a decrease in consumer purchasing power. When the price of goods and services increases, consumers tend to reduce their spending, including in the use of electronic money. The reduction in the use of electronic money can be caused by spending priorities shifting to basic necessities whose prices are increasing (Prawoto, 2010). CPI can trigger a monetary policy response from Bank Indonesia in the form of an increase in interest rates to control inflation. This increase in interest rates, in turn, could lower the use of electronic money due to higher borrowing costs and reduced liquidity in the market (Keynes, 2007). However, the results of this study show that the consumer price index is not significant to the demand for money, based on the data shown in the previous chapter, it can be seen that the price index from year to year shows that the rate of change tends to be different or erratic (fluctuating).

CONCLUSION

Based on the results of the research and discussion discussed in the previous chapter regarding per capita income, interest rates and the consumer price index on the demand for electronic money in Indonesia, the following conclusions are obtained: The demand for electronic money in Indonesia is positively and significantly influenced by income per capita. Meanwhile, interest rates and the consumer price index have a negative and significant effect on the demand for electronic money in Indonesia.

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