

# Analysis of the effect of electronic money transactions and macroeconomic variables on economic growth in Indonesia

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**JEL Classification Code:**

F43, E41, F21

**Keywords:**

Economic Growth, Electronic Money, Money Supply, Domestic Investment, FDI (Foreign Direct Investment), Labour, ARDL.

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**DOI:**

10.20885/JKEK.vol3.iss2.art6

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**Abstract**

**Purpose** – This study aims to analyse the effect of the use of electronic money transactions, money supply, domestic investment, FDI, and labour on economic growth in Indonesia.

**Methods** – The research approach in this study uses quantitative analysis with the Autoregressive Distributed Lag (ARDL) method.

**Findings** – The results showed that the variables of electronic money transactions, money supply, FDI, and labour had significant results on economic growth in Indonesia, while domestic investment showed insignificant results on economic growth in Indonesia.

**Implication** – The government needs to strengthen digital infrastructure and expand access to electronic money to all regions, especially underdeveloped areas, to accelerate financial inclusion.

**Originality** – This study contributes to enriching the literature on the relationship between electronic money and economic growth in developing countries such as Indonesia.

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**Abstrak**

**Tujuan** – Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan transaksi uang elektronik, jumlah uang beredar, investasi dalam negeri, FDI, dan tenaga kerja terhadap pertumbuhan ekonomi di Indonesia.

**Metode** – Penelitian ini menggunakan analisis kuantitatif dengan metode *Autoregressive Distributed Lag* (ARDL).

**Temuan** – Hasil Penelitian menunjukkan bahwa variable transaksi uang elektronik, jumlah uang beredar, FDI, dan tenaga kerja menunjukkan hasil yang signifikan terhadap pertumbuhan ekonomi di Indonesia, sedangkan investasi dalam negeri menunjukkan hasil yg tidak signifikan terhadap pertumbuhan ekonomi di Indonesia.

**Implikasi** – Pemerintah perlu memperkuat infrastruktur digital dan memperluas akses uang elektronik ke seluruh wilayah, terutama daerah tertinggal guna mempercepat inklusi keuangan.

**Orisinalitas** – Penelitian ini memberikan kontribusi dalam memperkaya literatur mengenai hubungan antara uang elektronik dan pertumbuhan ekonomi di negara berkembang seperti Indonesia.

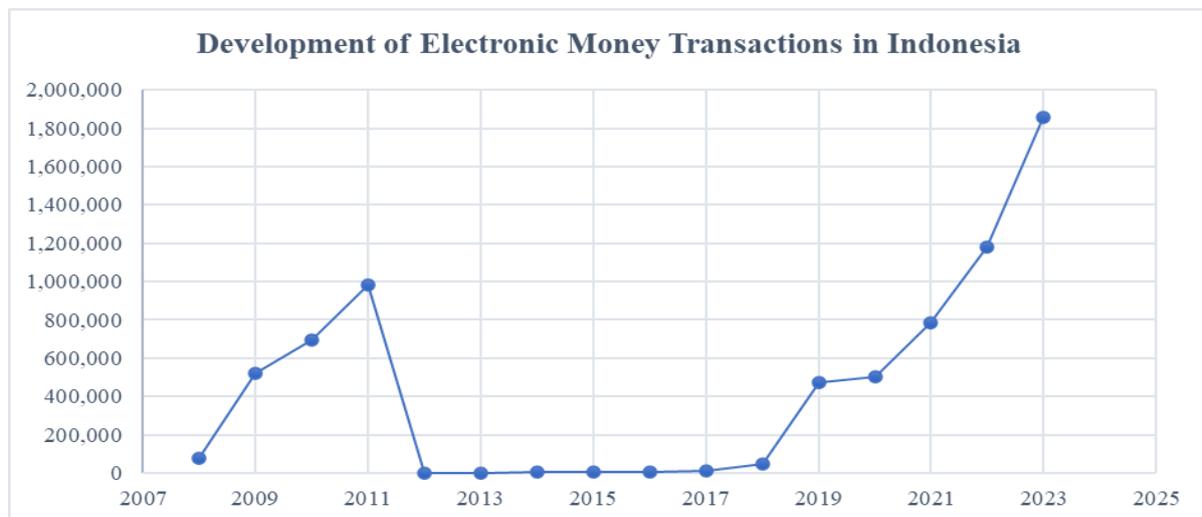
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## Introduction

Technology develops significantly every year. These developments and innovations impact convenience in carrying out various activities. In addition, technological developments have also

impacted economic aspects, especially financial transactions. The emergence of financial transactions has resulted in the development of digital technology, commonly referred to as financial technology, which can be realized by implementing techniques between technology and information (Ardana et al., 2023).

The development of payment systems is driven by the increasing volume and value of transactions, increased risk, transaction complexity, and technological advances. According to (Rosanti et al., 2022), along with the times and technology, payment systems that initially only used physical money have now developed into non-cash payments known as electronic money or e-money. Technological sophistication and advances certainly impact the economy. The emergence of e-money as legal tender in the real sector will have a positive and negative impact. Therefore, electronic money observation is carried out periodically, as required by regulations provided by Bank Indonesia.



Source: Bank Indonesia

**Figure 1.** Development of Electronic Money Transactions in Indonesia 2008-2023

Indonesia is one of the countries that is relatively fast adapting to the rapid digitization of its economy. Indonesia has the potential to become a strong nation with its natural resources, geographical conditions, and additional potential owned by Indonesia. This potential must be utilized wisely to benefit the people of Indonesia. For Indonesia to participate in the global economic wave of Industry 4.0, it must maintain its financial foundation and growth. This era supports a digital manufacturing approach on a surrogate network by integrating information from multiple sources and locations, which is then used to measure and distribute products physically. This era has also brought digitalization in all fields.

Indonesia's economy is experiencing rapid growth; based on the McKinsey Report, Indonesia ranks first as the country that recorded the fastest growth in adopting the digital economy (McKinsey, 2019). This is seen in three pillars: individual, business, and Government applications. The primary assessments are judged by availability and download speed, digital reach of data consumption per user, and digital use value in digital transactions (Aprilia et al., n.d.).

Economic growth is briefly defined as increasing output per capita in the long term. Economic growth is a process, not a picture of the economy at a time (one shot). The dynamic aspect of an economy is to see an economy as something that develops or changes over time (Budiono 1992: 1). According to Simon Kuznets, economic growth is a long-term increase in a country's ability to provide more and more types of economic goods to its people. This ability grows with technological progress and the necessary institutional and ideological adjustments. Economic growth is one of the significant indicators to evaluate financial performance. To encourage economic growth, it is necessary to analyse macro variables that can be the basis for policy considerations to increase economic growth. In addition, the Government also uses

monetary policy, such as paying attention to interest rates that can affect inflation rates, exchange rates, and the amount of money circulating in the community, to encourage economic growth.

Previous research on the influence of electronic money on economic growth shows diverse conditions. Research conducted by Ahmad et al. (2022) aims to analyse how much influence the digital economy, as seen by the Number of Internet Users (JPI), E-Commerce Transaction Value (NT), and the Number of e-commerce business Growth (JU), both partially and simultaneously on economic growth (PE) in Indonesia. The type of research used is Quantitative. The data used in this study is panel data, a combination of time series and cross-section data. The annual time series data is from 2018 to 2020, and the cross-section consists of 34 provinces in Indonesia using E-Views 10 tools. The data sources are the Central Statistics Agency (BPS) and the Indonesian Internet Service Providers Association (APJII). The analysis method used is a fixed-effect panel data regression model. The results showed that the independent variables of Transaction Value and Number of Businesses positively and significantly affected the dependent variable of economic growth or P.E. In contrast, the J.P.I. variable negatively and significantly affected economic growth.

Another study conducted by Nila (2021) is to analyse the digital economy's development in Indonesia and the threats posed by the digital economy from a national defence perspective. The research uses a descriptive qualitative method. Data were obtained from interviews with the Coordinating Ministry for Economic Affairs, the Ministry of Communication and Information, and the Ministry of Defence, supported by secondary data from these ministries. The results of the study explain that the development of Indonesia's digital economy is quite good, which contributes to Indonesia's GDP, increasing productivity, accelerating the flow of production, consumption, and distribution, economic growth in various sectors and being able to survive the economy amid the COVID-19 pandemic. However, the digital economy also poses a threat to national defence where digitalization causes all data to be connected to a server that is prone to data misuse and utilization, unsafe transactions by malware-based cyberattacks, fraudulent transactions and hacking by hackers, and infrastructure constraints that have not reached all regions of Indonesia.

The study by Merin (2021) conducted a study that aims to analyse the effect of ATM and debit cards, electronic money, inflation and tax revenue on economic growth in Indonesia both partially and simultaneously. This type of research uses a quantitative approach with multiple linear regression methods. The data used is secondary data taken from the publications of the Central Bureau of Statistics, Bank Indonesia and the Ministry of Finance of the Republic of Indonesia from 2012 to 2018. The results of hypothesis testing show that ATM and debit cards have a positive effect on economic growth, and electronic money has a positive effect on economic growth. While inflation does not affect economic growth, tax revenue does not affect economic growth. Simultaneously, economic growth is affected by A.T.M.s, debit cards, electronic money, inflation, and tax revenue.

Another Study by Rismawan (2020) said that national economic growth that is relatively high is not necessarily detached from the existence of essential issues such as limited accumulation of national saving capital, domestic needs that are still highly dependent on imported goods, weak exports that rely on primary commodities, insufficient infrastructure development, and low quality of human resources that the Indonesian Government must address. This study aims to analyse the effect of Foreign Direct Investment (FDI) as an alternative source of development funds, the Human Development Index (HDI) as a proxy for the quality of human resources, and Macroeconomic conditions represented by Trade Balance (NX), a dummy of Economic Crisis and Gross Fixed Capital Formation (GFCF) on Economic Growth in Indonesia. The data used is time-series data from 1985-2015 sourced from Statistics Indonesia and the World Bank. The analysis technique used in this research is the Error Correction Model (ECM). The results can be made in the following conclusions: 1) Foreign Direct Investment and Trade Balance have a negative and significant impact on Indonesia's long-term economic growth, but in the short term, they do not have any significant impact. 2) Human Development and Gross Fixed Capital Formation positively and significantly impact Indonesia's long-term and short-term economic growth. 3) Economic Crisis has a negative and significant impact both in the long term and short term.

A study by Sheila et al. (2023) conducted a study to analyse the benefits of implementing QRIS as a payment method for UNNES students, given its potential to contribute to economic growth in the digital era. This research shows that QRIS offers several advantages for UNNES students: convenience, speed, and security in making payment transactions. With QRIS, students can make payments using their smartphones or other digital devices, eliminating the need for physical cash and reducing transaction costs. The researcher used a survey or questionnaire method in this research and used Google Forms to collect data. This research also uses data analysis techniques so that readers can easily understand the information in this article. The results showed that 75% of UNNES students have used QRIS. This is reinforced by almost more than 50% feeling helped by payments with this QRIS method. Users also do not find using QRIS as a payment method difficult. In conclusion, using QRIS can be effective for students in making payment transactions, which shows positive results such as increased transaction security, customer convenience in transactions, and economic growth. Khodijah et al. (2022) researched the impact of the digital economy on economic growth in Indonesia. The research used a quantitative model to measure the role and influence of the digital economy on economic growth using a regression analysis model. The data used was secondary data sourced from BPS, BI, internet search, and other related sources. The results of the research show that the digital economy has business resilience and is significantly able to make a positive contribution to economic growth. The conclusions of this study show that the digital economy is an economic sector that will continue to proliferate in the future. There is a need for a complete digital economy database that can be accessed by researchers so that they can contribute ideas; in turn, the digital economy can play a role in business resilience and positively contribute to sustainable economic growth.

A study by Dian et al. (2023) said innovations in the payment system that lead to noncash payments (digital payment) can potentially impact output, prices, and monetary policy transmission that will drive the economy faster. However, in its work, there is a conspicuous lack of the role of digital payments in encouraging economic activity, especially for an emerging economy like Indonesia. This research aims to evaluate the impact of digital payment on economic growth and look at the influence of Government spending and inflation as control variables on economic growth. In reviewing this empirical concept, a quantitative analysis is applied to assess the research construct using a panel regression approach. The data used are sourced from Bank Indonesia and the Central Bureau of Statistics for the observation period from 2018 to 2021. Findings revealed the significance of each variable representing a positive impact of digital payments and inflation on economic growth, while Government spending harms economic growth. Manopo (2017) conducted a study to analyse macroeconomic factors affecting Indonesia's economic growth. This research is a type of quantitative research that uses the Error Correction Model (ECM) approach. The data used for this study are in the form of quarters from January 2009 - December 2015. Macroeconomic factors analysed for their influence in this study are Inflation, Exchange Rate, Composite Stock Price Index (CSPI) and Prime Lending Rate. The model estimation used is multiple regression analysis with the O.L.S. method. The results showed that in the long term, the variables of Inflation, Exchange Rate, Jakarta Composite Index (J.C.I.), and Prime Lending Rate, both partially and simultaneously, have an insignificant influence on Indonesia's economic growth. In the short term, the variables of Inflation, Exchange Rate, Jakarta Composite Index (J.C.I.), and Prime Lending Rate partially have an insignificant influence on Indonesia's economic growth, and simultaneously, these variables significantly influence Indonesia's economic growth.

## Research Methods

This research uses secondary data obtained from official data publications. The data used in this study is a time series from 2008 to 2023. The data includes economic growth, electronic money transactions, money supply, domestic investment, foreign direct investment (FDI), and labour. The detailed use of the variables in this study is presented in Table 1, which provides definitions for each variable.

**Table 1.** Definition of Variable

Variable Dependent				
Variable	Symbol	Unit	Definition	Sources
Economic Growth	GDP	US Dollars	Economic Growth is the long-term growth of a nation's capacity to produce goods and services for its people. This capacity relies on advances in production technology. Generally, growth is measured by increased national income (GNP, GDP) per capita.	World Bank
Electronic Money Transactions	EMT	Billion Rupiah	Electronic Money transactions exchange or transfer monetary value using electronic media, such as prepaid cards, mobile applications, or digital payment platforms.	Bank Indonesia
Money Supply	MS	Billion Rupiah	The total amount of money available and circulating in society at a given time is used as a means of payment in various transactions.	Central Bureau of Statistics
Domestic Investment	DI	Billion Rupiah	Domestic Investment is the investment or allocation of financial resources by individuals, companies, or governments within a country's borders to increase production capacity, create jobs, and promote economic growth.	Central Bureau of Statistics
Foreign Direct Investment	FDI	US Dollars	Foreign Direct Investment is an investment made by individuals, companies, or governments from one country to another, where the investor gains significant ownership and control over assets or companies in the recipient country.	Central Bureau of Statistics
Labour	LABOUR	Per cent	People who can do work to produce goods or services, whether they are already working, looking for work, or doing other activities such as attending school or taking care of the household.	Central Bureau of Statistics

The regression model used in this study is shown in equation (1).

$$GDP_t = \beta_0 + \beta_1 EMT_t + \beta_2 MS_t + \beta_3 DI_t + \beta_4 FDI_t + \beta_5 LABOR_t + \varepsilon_t \quad (1)$$

This study applies the autoregressive distributed lag (ARDL) method, which was used to find long-run and short-run equilibrium regression equations and evaluate the consistency of the model. In addition, the ARDL model does not depend on whether the variables are stationary at level (I(0)) or at first difference (I(1)) and is flexible in handling variables with different levels of integration. The general ARDL model is as follows:

$$\begin{aligned} \Delta GDP_t = & \delta_0 + \delta_1 GDP_{t-1} + \delta_2 EMT_{t-1} + \delta_3 MS_{t-1} + \delta_4 DI_{t-1} + \delta_5 FDI_{t-1} + \\ & \delta_6 LABOR_{t-1} + \sum_{i=1}^n \theta_1 GDP_{t-1} + \sum_{i=1}^n \theta_2 EMT_{t-1} + \sum_{i=1}^n \theta_3 MS_{t-1} + \\ & \sum_{i=1}^n \theta_4 DI_{t-1} + \sum_{i=1}^n \theta_5 FDI_{t-1} + \sum_{i=1}^n \theta_6 LABOR_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

The analysis steps using the ARDL method start with the data Stationarity Test using a unit root test like the Augmented Dickey-Fuller (ADF). In testing data stationarity issues, the most widely used is the unit root test. The unit root test was first developed by Dickey-Fuller and is known as the Dickey-Fuller (DF) unit root test. The basic idea of the data stationarity test with the unit root test can be explained through the following model (Widarjono, 2018):

$$Y_t = \rho Y_{t-1} + \varepsilon_t, \quad -1 \leq \rho \leq 1$$

Where  $\varepsilon_t$  is a random or stochastic disturbance variable with zero mean and constant variance and is not interconnected (non-autocorrelated) by the OLS method's assumptions, disturbance variables with these properties are called white noise. If the value of  $\rho = 1$ , then the random (stochastic) variable Y has a unit root. If the time series data has a unit root, then the data moves randomly (random walk) and is considered non-stationary. Therefore, the data is considered non-stationary when doing a regression analysis  $Y_t$  against lag  $Y_{t-1}$  and getting a value of  $\rho = 1$ ; the data is non-stationary. This is the basic idea of the unit root test to determine whether the data is

stationary. If the data contains unit roots or not, Dickey-Fuller suggests using the regression model equation:

$$\Delta Y_t = \theta Y_{t-1} + \varepsilon_t$$

$$\Delta Y_t = \beta_1 + \theta Y_{t-1} + \varepsilon_t$$

$$\Delta Y_t = \beta_1 + \beta_2 + \theta Y_{t-1} + \varepsilon_t$$

In every model, if the time series data contains a unit root, then the data is not stationary, and the null hypothesis is  $\theta = 0$ . As for the alternative hypothesis  $\theta \neq 0$ , which means the data is stationary.

The cointegration test was used to test whether there is a long-term relationship between the independent and dependent variables. If the variables are cointegrated, then there is a stable relationship in the long run. Conversely, the variables do not have a long-term relationship if they are not cointegrated. The following is the hypothesis  $H_0$  and the alternative hypothesis  $H_a$  used to test for cointegration inbound testing:

$$H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 (\text{No cointegration})$$

$$H_a = \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 (\text{There is cointegration})$$

If the F-count value is between the lower and upper critical bound, then the decision on the presence or absence of cointegration becomes inconclusive.

## Results and Discussion

The first stage in this ARDL analysis is stationary testing using Augmented Dickey-Fuller (ADF) to determine whether the time series data used is stationary. Table 2 displays the results of the stationary test at the level and first difference of all the variables studied.

**Table 2.** Stationarity Test Results at Level and First Difference

Variable	Level			First Difference		
	ADF	Prob	Interpretation	ADF	Prob	Interpretation
GDP	-3.046093	0.0532	Not Stationary	-3.359066	0.0352	Stationary
EMT	3.314583	1.0000	Not Stationary	1.382202	0.9968	Not Stationary
MS	2.739872	0.9999	Not Stationary	-3.811957	0.0153	Stationary
FDI	0.264.75	0.9673	Not Stationary	-3.206277	0.0415	Stationary
DI	-3.498704	0.0235	Stationary	-5.454976	0.0008	Stationary
Labour	-2.531488	0.1281	Not Stationary	-3.120476	0.0482	Stationary

Based on Table 2, the estimation results of the unit root test using the Augmented Dickey-Fuller (ADF) test at the level stage indicate that only one variable is stationary. The GDP variable has a probability value of 0.0532, greater than  $\alpha = 5\%$  (0.05), meaning that the GDP variable can be considered non-stationary. The Electronic Money Transactions variable has a probability value of 1.0000, greater than  $\alpha = 5\%$  (0.05), meaning that the Electronic Money Transactions variable can be considered non-stationary. The Money Supply variable has a probability value of 0.9999, which is greater than  $\alpha = 5\%$  (0.05), meaning that the Money Supply variable can be considered non-stationary. The Labour variable has a probability value of 0.1281, greater than  $\alpha = 5\%$  (0.05), meaning that the Labour variable can be considered non-stationary. On the other hand, the Domestic Investment variable has a probability value of 0.0235, which is smaller than  $\alpha = 5\%$  (0.05), meaning that the Domestic Investment variable can be considered stationary. The results of the stationarity test at the first difference level using the ADF test, which reports the absolute ADF values and probability values at a significance level of alpha ( $\alpha$ ). Based on the stationarity test results using the ADF unit root test at the first difference level (1st Diff) for the variables GDP, Money Supply, FDI (*Foreign Direct Investment*), Domestic Investment, and Labour, the probability values are all below 0.05 at a significance level of  $\alpha = 5\%$ . Therefore, these variables are considered stationary.

**Table 3.** Cointegration Test Bund Test Approach

Test-Statistics	Value	K
F-Statistics	499.0990	5
Critical Value Bonds		
Significance	Lower Bound (0)	Upper Bound (1)
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Based on Table 3, the comparison of the F-statistic with the lower bound and upper bound values at the  $\alpha = 5\%$  significance level shows that the F-statistic value of 499.0990 is greater than the lower bound value of 2.39 and the upper bound of 3.38. Therefore, the null hypothesis ( $H_0$ ) is rejected, which means that the variables in this study have long-run cointegration. This indicates that changes in the GDP variable are influenced by the independent variables of Electronic Money Transactions, Money Supply, FDI (Foreign Direct Investment), Domestic Investment, and Labour.

**Table 4.** Autoregressive Distributed Lag (ARDL) Estimation Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	0.057846	0.043582	1.327294	0.2418
D(LABOUR)	1.414873	0.456504	3.099369	0.0269
D(MS)	-5.32E-06	7.57E-07	-7.030091	0.0009
D(EMT)	-1.377312	0.054949	-25.06543	0.0000
D(EMT(-1))	2.499766	0.110572	22.60768	0.0000
D(DI)	-3.90E-09	3.38E-07	-0.011538	0.9912
D(FDI)	-9.47E-05	3.96E-05	-2.392587	0.0622
D(FDI(-1))	-0.000137	1.99E-05	-6.892769	0.0010
C	2.268369	0.383172	5.919978	0.0020
<b>R-Squared</b>	<b>0.997413</b>	<b>F-statistic</b>	<b>240.9791</b>	
<b>Adj. R-squared</b>	<b>0.993247</b>	<b>Prob. (F-Statistic)</b>	<b>0.000005</b>	

Table 4 shows the R-squared value of 0.997413. This means that the R-squared is close to one, so the independent variables, namely Electronic Money Transactions, Money Supply, FDI (*Foreign Direct Investment*), Domestic Investment, and Labour, can explain the economic growth variable by 97%. In comparison, other variables outside the model influence the remaining 3%. Based on the table above, it can be seen that the calculated F value is 240.9791, and the Prob value is  $0.000005 < 0.05$ , then  $H_0$  is rejected, and  $H_a$  is accepted, meaning that Electronic Money Transactions, Money Supply, Domestic Investment, FDI (*Foreign Direct Investment*), and Labour affect Economic Growth.

**Table 5.** Classical Assumption Test

Normality Test			
Jarque-Bera			0.324712
Probability			0.850139
Autocorrelation Test			
F-Statistic	0.195281	Prob. F (2,3)	0.8323
Obs*R-squared	1.612675	Prob. Chi-square (2)	0.4465
Heteroscedasticity Test			
F-Statistic	2.954867	Prob. F (8,5)	0.1240
Obs*R-squared	11.55578	Prob. Chi-Square (8)	0.1722
Scaled explained SS	1.117770	Prob. Chi-Square (8)	0.9974

Based on the results in Table 5, the Probability value of normality test is  $0.850139 > 0.05$ , so it can be concluded that the data is normally distributed. Based on Table 8 above, the probability value is 0.8323, greater than 0.05, and there is no autocorrelation. Based on Table 9 above, the

probability value of 0.1722 is greater than  $\alpha = 5\%$  and fulfills the assumption of homoscedasticity or non-heteroscedasticity.

**Table 6. ARDL Estimation Result**

Short Run Result				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.268369	0.383172	5.919978	0.0020
D(GDP(-1)*)	-0.942154	0.043582	-2161820	0.0000
D(LABOUR)**	1.414873	0.456504	3.099369	0.0269
D(MS)**	-5.32E-06	7.57E-07	-7.030091	0.0009
D(EMT(-1))	1.122454	0.456504	3.099369	0.0000
D(DI)**	-3.90E-09	3.38E-07	-0.011538	0.9912
D(FDI(-1))	-0.000232	4.99E-05	-4.647155	0.0056
D(EMT,2)	-1.377312	0.054949	-25.06543	0.0000
D(FDI,2)	-9.47E-05	3.96E-05	-2.392587	0.0622
Long Run Result				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LABOUR)	1.501742	0.491773	3.053728	0.0283
D(MS)	-5.65E-06	7.97E-07	-7.084337	0.0009
D(EMT)	1.191369	0.0989928	12.04277	0.0001
D(DI)	-4.14E-09	3.59E-07	-0.011539	0.9912
D(FDI)	-0.000246	5.93E-05	-4.156061	0.0089
C	2.407640	0.417944	5.760675	0.0022

The results on the electronic money transaction variable amounted to 1.122454 with a probability of 0.0000, which means it is smaller than 0.05, which means that changes in the positive significant effect on economic growth in the short term allow fully for any changes to occur. In the long term, the statistical test results obtained amounted to 1.191369 with a probability of 0.0001, which means that electronic money transactions have a positive and significant effect on economic growth in the long term. The results in this study indicate conformity with the hypothesis which states that there is an alleged positive effect of electronic money transactions on economic growth in Indonesia. The results of the analysis show that electronic money transactions have a positive and significant effect on economic growth. The higher the electronic money transactions increase, the higher the economic growth. This is supported by research conducted by Nando (2015) in Febriaty's journal that increasing cash payments encourages economic growth and increases the money supply. This shows that with the increasing use of non-cash payment systems that continue to grow today, the role of cash in society is starting to shift. Moreover, in the digital era as it is now, innovations in non-cash payment systems are growing, to encourage economic growth through substitution effects and increased efficiency in the economy.

The statistical test results obtained on the variable money supply amounted to -5.3200006 with a probability of 0.0009 or smaller than 0.05, which means that changes in money supply on economic growth in the short term have a negative and significant effect. In the long term, the statistical test results obtained amounted to -5.65000006 with a probability of 0.0009 or smaller than 0.05, which means that the money supply has a negative and significant effect in the long term. An increase in the amount of money in circulation can encourage economic growth. As the amount of money in circulation increases, people tend to allocate some of their funds for consumption. As a result, producers will increase the production of goods, which in turn increases the demand for factors of production. This, in turn, leads to an increase in per capita income, contributing to economic growth. This finding also follows the results of previous research conducted by Tiwa (2016), which shows that the money supply influences economic growth. An increase in the money supply can encourage an increase in investment, which in turn will have a positive impact on economic growth. There is similar research conducted by Ambarwati (2021), where an increase in the amount of money in circulation can encourage economic growth. This happens because, with increased money in circulation, people tend to use some of their funds for consumption. As a result, producers will increase the production of goods, which triggers increased

demand for production factors. This condition will impact increasing consumption, business productivity, and per capita income, contributing to economic growth.

The statistical test results on the domestic investment variable amounted to -3.9000009 with a probability value of 0.9912, which means greater than 0.05, which means that changes in the domestic investment variable have a negative and insignificant effect in the short term. In the long term, the statistical test results obtained amounted to -4.14000009 with a probability of 0.9912 or greater than 0.05, which means that the domestic investment variable has a negative and insignificant effect on economic growth in the long term. This is because an increase in domestic investment does not directly stimulate all sectors of the economy. As explained earlier, economic growth is the cumulative result of overall economic activity. Domestic investment from a small group of domestic elites causes inequality, which leads to decreased purchasing power and ultimately hampers economic growth. In addition, the pandemic factor has also noticeably weakened domestic support. In times of crisis, economic actors tend to hold back and reduce spending, resulting in a significant decline in purchasing power. The results of this study contradict the findings of previous research (Asiyan, 2020), which states that domestic investment does not affect economic growth. This is due to fluctuations in domestic investment caused by a lack of investor confidence and poor infrastructure governance. On the other hand, the results of this study differ from the findings of Arifah (2022) which show that domestic investment has a positive effect on economic growth. The concept of increasing a country's economic growth is determined by savings and investment. Domestic investment, which is an investment with a domestic source of funds, plays a role in encouraging economic activity in the country and helping to advance the economy.

The statistical test results on the FDI variable amounted to -0.000232 with a probability of 0.0056 or smaller than 0.05, which means that changes in FDI on economic growth in the short term have a negative and significant effect. In the long term, the statistical test results obtained amounted to -0.000246 with a probability of 0.0089 or smaller than 0.05, which means that FDI has a negative and significant effect in the long term. In line with research conducted by Agha (2015), where the presence of foreign direct investment can encourage infrastructure improvement. This is done to facilitate the distribution process for companies that receive investment from abroad. The goal is to reduce price disparities that occur in various regions in Indonesia. If these problems can be overcome, the level of public consumption will increase, which in turn will support economic growth. In addition, the influx of foreign direct investment also has an impact on increasing a country's exports. This is related to the transfer of technology that can improve the quality and quantity of products produced. Once domestic needs are met, these products can be exported to various countries. Thus, foreign direct investment contributes to economic growth by increasing skilled human resources through higher education, developing infrastructure to support the distribution of production, and increasing exports.

The statistical test results obtained on the labour variable are 1.414873 with a probability of 0.0269 or smaller than 0.05, which means that 51 changes in labour on economic growth in the short term have a negative and significant effect. While in the long term, the statistical test results obtained amounted to 1.501741 with a probability of 0.0283 or smaller than 0.05, which means that labour has a positive and significant effect in the long term. To encourage economic growth by paying attention to the labour aspect, labour can develop through the increasing population, work experience, and education. Therefore, a group of individuals ready to work and actively seeking work is required, known as the labour force. A person is considered engaged in work if they perform certain activities, such as being a worker or employee. The labour force, which consists of individuals active in the process of producing goods or services, plays an important role in driving the economy. This is in line with research conducted by Purwanggono (2015), where the use of labour in the production process has a relationship with production costs and wage levels. In terms of production cost and wage level, labour demand is influenced by labour productivity and the return obtained from production factors. The addition of labour will increase productivity, which is the impact of changes in the quantity and quality of labour itself. This in turn can encourage economic growth.

## Conclusion and Implications

Based on the results of the estimation and discussion of the analysis of the effect of electronic money transactions and macroeconomic variables on economic growth in Indonesia that has been carried out, it can be concluded that electronic Money Transactions have a significant short-term and long-term effect on economic growth in Indonesia, the Money Supply, in the short term and the long term, has a significant effect on economic growth in Indonesia, domestic investment, both in the short term and in the long term, has no significant effect on economic growth in Indonesia, FDI (*foreign direct investment*) in the short and long term significantly affects economic growth in Indonesia, and labour in the short and long term significantly affects economic growth in Indonesia.

Economic growth can be enhanced through various means, including the Government's need to develop infrastructure and regulations that support the wider adoption and sustainable use of electronic money by improving digital literacy, transaction security, and more equitable access in various regions so that the positive impact of using electronic money is expected to last longer and be sustainable. As the monetary authority, Bank Indonesia is expected to maintain the amount of money in circulation at an optimal level to support economic growth without triggering excessive inflation. Adaptive monetary policy is needed for global and domestic economic conditions to ensure economic stability. To support stable and sustainable economic growth, the government should prioritize domestic investment with greater incentives while still selectively attracting FDI. FDI needs to be directed to high-value-added sectors to bring in capital and increase local economic capacity, technology transfer, and employment. This combination of policies will create an optimal balance for Indonesia's economic growth. The government is to improve the quality of human resources so that more qualified labour can be absorbed by the labour market and encourage economic growth.

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