Political Economy of Electronic Money in Indonesia, Perspective and Comparison to Singapore.

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Abstract

This study aims to find a harmonious understanding of the massive use of electronic money in Indonesia. This research reveals the idea that rapid adoption has shaped the change in traditional payment mechanisms and money creation in central banks and banks. This study uses panel data analysis techniques by analyzing the inflation rate, interest rate, and circulation of electronic money on the level of the money supply compared between the two countries, Indonesia and Singapore. The sampling technique used is saturated sample, saturated sampling technique is a sampling technique in which all members of the population are used as samples. The research sample was taken as many as 80 observations consisting of 2 country objects, namely Indonesia and Singapore from 2011-2020 and using quarterly data. The results of the study show the results in the regional 1 model, namely: (1) Electronic Money Volume has a significant effect on economic growth (2) inflation has a positive and insignificant effect on economic growth (3) interest rates have a significant effect on economic growth (4) the state has a significant influence on economic growth and for the results of regression model 2 testing, namely: (1) Electronic Money Volume has a significant influence on the money supply (2) ATM/debit transaction volume has a significant effect on the money supply (3) the volume of credit card transactions has a significant effect on the amount of money in circulation (4) countries have a significant influence on economic growth.

Keywords: inflation, interest rates, electronic money circulation, the level of money supply.

Introduction.

In terms of the theory of money, according to Keynes, money is a form of wealth owned by a person, for example, wealth in the form of savings, shares or other securities. The people's decision to form their wealth into cash, the benefits obtained if the wealth is realized in the form of cash is the ease of conducting transactions, because cash is the most liquid payment instrument. Liquidity is measured by the speed of exchanging wealth in the form of means of payment (for transactions) without any loss of value [1]. Judging from the basic theory of money, this theory can also influence the theory of money demand which will explain the pattern of demand for money which is divided, one of which is the demand for money with the purpose

of transactions. According to Keynes' theory, it is explained that individuals or societies will need money to finance a transaction because of an expenditure, Keynes also stated that the demand for money in this transaction depends on income where the greater the income, the greater the desire to transact [2, 3].

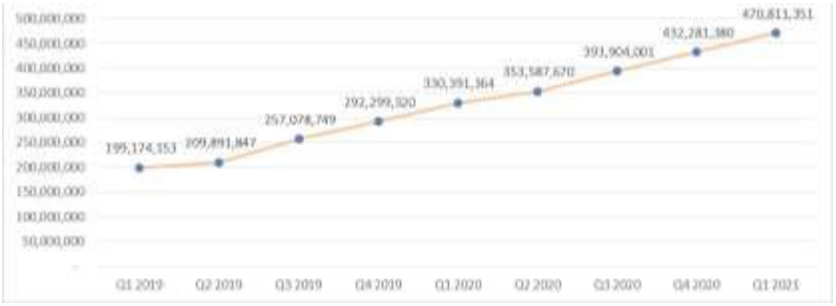
With the existence of non-cash payment instruments such as e-money, which is part of the new policy in the payment system by Bank Indonesia, it will be able to optimize people's purchasing power which at the same time has an impact on improving the country's economy. Because e-money itself provides convenience and security for the community, in this case as e-money users, one of the conveniences and security provided is that people do not need to carry large amounts of cash directly to transact, making people feel safe. and convenient and become one of the advantages of e-money compared to other payment instruments [4].

Source: Indonesian Central Statistics Agency 2011-2020 and The Ministry of Trade and Industry 2011-2020

Graph 1. Economic Growth of Indonesia and Singapore in 2011-2020

Based on the data stated that the level of economic growth that occurred in Indonesia and Singapore from the beginning of 2011 to 2018 is still in contrast, it can be seen that the fluctuations in economic growth that occurred in Indonesia grew with an average of 5.6 percent, and the average economic growth that occurred in Singapore it is at 3.4 percent. The lowest growth occurred in Indonesia in 2020 at 2.07 percent and in Singapore, there was a contraction to minus 5.8 percent due to the global Covid-19 pandemic. Electronic money (E-Money) can make transaction activities more practical, fast, flexible and convenient when compared to using cash. When the transaction is of small value, because the customer does not need to provide the exact amount of money for a transaction or has to save change, then the existence of E-Money will become a source of income for non-cash payment service providers. And with the use of electronic money, it will describe a form of role and contribution made by citizens in supporting government programs to realize a cashless society (Hendarsyah, 2016). The background of the emergence of e-money is supported by Bank Indonesia No.11/12/PBI/2009 and No.16/8/PBI/2014 which are one of the supporters of Bank Indonesia's agenda in creating a society that can reduce the use of cash in Indonesia. According to Bank Indonesia, e-money is a means of payment that meets the following elements: first, it is issued on the basis of the value of money that was deposited in advance to the issuer. Second, the value of money is stored electronically in a medium such as a server or chip. Third, the value of electronic money managed by the issuer is not a deposit as referred to in the law governing banking.

The existence of E-money indicates that additional income obtained by consumers from the use of E-money will encourage consumption and public demand for goods and services which in turn has the potential to encourage real sector activity. In today's era, people are reluctant to carry large amounts of money in their pockets because apart from being seen as unsafe, they are also considered impractical. The amount of money brought by the community in making payment transactions can be considered as an obstacle to efficiency in payments[5, 6].



Sumber: Central Bank, 2020.

Graph 2 Number of Electronic Money Instruments Circulating in Indonesia

Above is a graph that can show the development of the number of electronic money instruments or e-money in Indonesia when viewed quarterly. The graph shows that there is always a significant increase in the number of e-money instruments. E-money itself was first published in Indonesia in 2007 [7]. Where Bank BCA became the first financial institution to provide e-money through its Flazz BCA [8, 9]. However, Bank Indonesia itself first issued an e-money license in 2009 through Bank Indonesia Regulation Number 11/12/PBI/2009 concerning electronic money (e-money). Since the electronification of toll roads, which became one of the e-money breakthroughs that began at the end of October 2017, has encouraged an increase in the number of e- money circulating in the community, especially in big cities such as Jakarta, Bandung, Surabaya, Medan and Makassar. It was recorded that in September 2017 more than 71.8 million units of e-money were circulating in the community according to the data listed in Bank Indonesia, where in 2010 the data only showed a number of 8 million units. There has been a significant increase in the number of e- money over the 7 years since its issuance in 2009. This is in contrast to credit card growth, which is estimated to be quite stagnant. It can be seen in May 2017 that the growth in the number of credit cards tends to decline until September 2017. This is possible because of the ease with which e-money is used compared to credit cards and since the electronification of toll roads has been carried out by the Government, people prefer e-money because e-money can be used for purchases goods in retail [10, 11]

Table 1

Indonesia's Money Supply Per December (Billion Rupiah)

Year	M1	M2
2011	722991.17	2877219.57
2012	841721.50	3304644.62
2013	887081.01	3730197.02
2014	942221.34	4173326.50
2015	1055439.82	4548800.27
2016	1237642.57	5004976.79
2017	1390806.95	5419165.05
2018	1457149.68	5760046.20
2019	1565358.00	6136552.00
2020	1855624.80	6900049.49

Source: Central Bureau of Statistics, 2020.

The table above is the data on the money supply (JUB) in Indonesia which was taken over the last 10 years. The data above shows that the JUB seen from both the M1 (in the narrow sense) and M2 (in the broad sense) categories has increased every year. JUB with M2 category itself is an illustration of economic liquidity. Where M2 is the sum of M1 and quasi money. The definition of quasi money is money that is not circulated which consists of time deposits, savings and foreign exchange accounts belonging to the domestic private sector [12]. According to a study conducted by , the increase in JUB in Indonesia is driven by three main actors, namely the government, companies, and the community. Where the government acts as an economic actor who needs money to be used in carrying out state development programs. As for the company, money is needed to finance the process of production and distribution of goods and services that will be produced by the company. Then for the community, the use of money itself is used as a tool in carrying out economic transactions every day [13].

Table 2

Money Supply (DBU and ACU) S$ MILLION

Tahun	M1	M2	M3
2011	191661.6	582407.2	590715.4
2012	212586.2	622169.5	632692.4
2013	241001.2	671298.1	682290.3
2014	261640.8	722354.5	734090.1
2015	279119.6	751387.6	764092.4
2016	294476.7	814485.2	826303.8
2017	315314.6	848325.2	860414.0
2018	310950.4	891627.9	904191.5
2019	326460.9	931003.1	945174.0
2020	436534.8	1031043.2	1044341.2

Sumber: Monetary Authority of Singapore, 2020.

Above is a table showing the money supply (JUB) in Singapore. The difference in the presentation of the data here is the presence of M3 in the table above. M3 is a combination of M2 plus savings, then added time deposits at non-bank institutions. As seen from the table above, every year for M1, M2, and M3 tends to increase. Only in 2018, the money supply for the M1 group decrease, but on the contrary for the M2 and M3 groups both showed an increase. When it comes to e-money, the existence of e-money can increase the money supply. This is because e-money is a tool that can also be used in a transaction. According to research submitted by [14]. There are conclusions, one of which is “e-money transactions have a positive and statistically significant effect at the 0.05 level (95% confidence level) on M1. Every 1 million increase in e-money transactions will increase the money supply (M1) by 0.185457 million”. E- money in this study itself is included in the M1 group due to the characteristics of APMK (Card-Based Payment Instruments) and e-money which can be used at any time as a means of payment. So that these two types of funds are categorized as highly liquid funds so that APMK and e-money can be equated with currency and demand deposits.

The interest rate does not affect the role in determining the amount of money supplied at a certain time. While the demand for money is aggregate demand, namely the overall demand for money in the economy which is the demand for money for transactions, precautionary and speculation, Soekirno 2001. The money supply is often associated with interest rates, Gross Domestic Product growth, inflation rates. Too much money supply can push up the price of goods in general, which will cause inflation. If the money supply is too little, economic activity will be slower. Based on this, the money supply needs to be regulated to suit economic capacity [15].

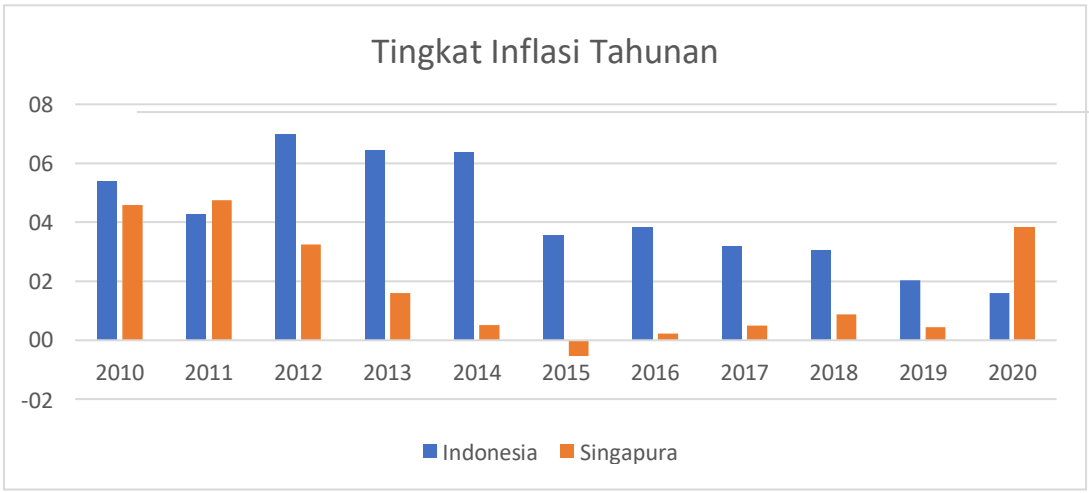
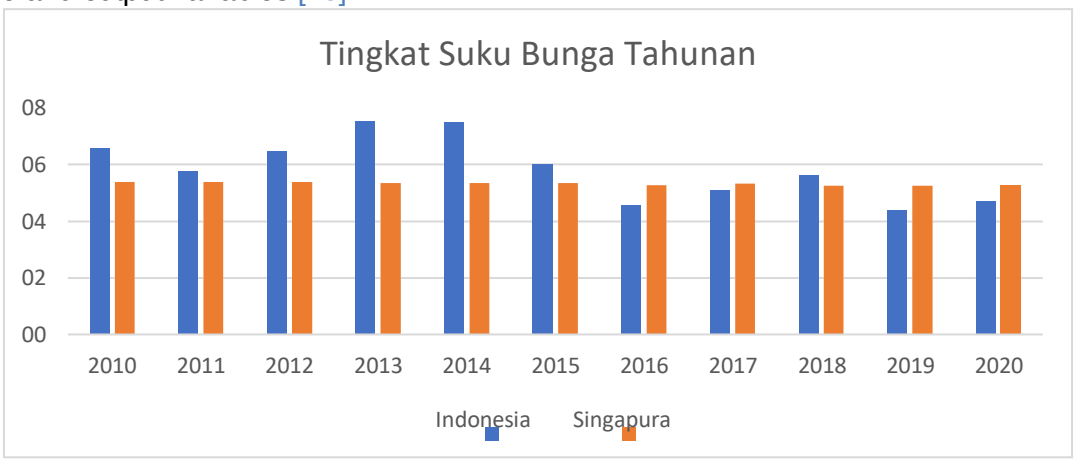


Chart 3 Inflation Rates for Indonesia and Singapore in 2010-2020

The value of money is determined by the supply and demand for money. The money supply is determined by the Central Bank, while the money demand is determined by several factors, including the average price level in the economy. The amount of money demanded by the public to make transactions depends on the level of prices of goods and services available. The higher the price level, the greater the quantity of money demanded. Eventually, the economy will reach a new equilibrium, when the quantity of money demanded returns to balance with the amount of money in circulation. An explanation that describes how the price level is determined and changes with changes in the money supply is called the quantity theory of money. According to this theory, the money supply in an economy determines the value of money, while growth in the money supply is the main cause of inflation. In general, the quantity theory of money describes the effect of the money supply on the economy, associated with price and output variables [16].



Source: Indonesian Central Statistics Agency 2010-2020 and Monetary Authority of Singapore 2010-2020

Graph 4 Interest Rates in Indonesia and Singapore in 2010-2020

[16] The Bank Indonesia interest rate is the policy interest rate that reflects the monetary policy stance or stance set by Bank Indonesia and announced to the public. [17]stated that Bank Indonesia in general will increase the BI rate if future inflation exceeds the set target, on the contrary Bank Indonesia will lower the BI rate if future inflation is below the set target. Thus the amount of money circulating in the community can be controlled properly. In other words, the relationship between Bank Indonesia interest rates is negative to the money supply [18]. [19]stated that the interest rate is used by the government through its monetary authority to control the price level. When the price level is high where the price of goods in general increases, then people need more money on hand to meet the needs of life, so this

will result in an increase in the amount of money circulating in the community [20]

The problem formulations for this research are:

1. How does the volume of *e-money* affect economic growth?
2. How does inflation affect economic growth?
3. How do interest rates affect economic growth?
4. How does the value of ATM/debit transactions affect M2?
5. How does the credit card transaction value affect M2?
6. How does the value oftransactions *e-money* affect M2?

Theoritical review

Money

according to Keynes is one form of wealth owned by a person for example wealth in the form of savings, shares or other securities. People's decisions to form their wealth into cash, savings or securities will determine the high interest rate. To simplify his model Keynes only divides the composition of the components of wealth in two forms, namely cash and securities (bonds). The advantage gained when wealth is realized in the form of cash is the ease of conducting transactions, because cash is the most liquid payment instrument. Liquidity is measured by the speed of exchanging wealth in the form of means of payment (for transactions) without any loss of value. But wealth in the form of cash cannot generate income, for example in the form of interest. Keynes, in his theory of the demand for cash, distinguished between transactional, precautionary and speculative motives. Keynes ignored the classical view that acceleration was constant. Then Keynes developed the theory into the theory of liquidity preference (liquidity preference theory), which asks why individuals hold money.

Electronic Money Electronic

money (e-money) has been present in Indonesia since 2009, as an alternative to electronic transactions to replace the cash system issued by banks and non-bank institutions with permission from Bank Indonesia based on Bank Indonesia Regulation Number 11/12/PBI/2009 about electronic money. The development of e-money issuing companies that have obtained permits from Bank Indonesia as of 24 May 2019 there are 38 companies, including: in 2009 there were 9 companies, in 2010-2015 there were 11 companies added, in 2016 – 24 May 2019 18 companies added, with facilities the name of server-based and chip-based products, this proves that the development of the electronic money system in Indonesia is able to change the pattern of financial business models, where the weakening of the barrier to entry gives fintech a role in bringing up unregulated behavior that runs a business model like a regulated company or institution. The e-money system proves that in Indonesia, payment transactions using e-money have been implemented. (Manik, Analysis of the Effect of Electronic Money Digitization Transactions on Cashless Society and Electronic Money Infrastructure as [21].

Theory of Economic Growth

In Keynesian theory also states that in economic growth a long tradition in macroeconomics (including both Keynesian and monetarist perspectives) emphasizes that monetary policy affects employment and production in the short run because prices respond slowly to changes in the money supply. According to this view, if the money supply falls, people spend less money, and the demand for goods falls. Because prices and wages are inflexible and do not fall immediately, spending declines. A long tradition in macroeconomics (including both Keynesian and monetarist perspectives) emphasizes that monetary policy affects employment and production in the short run because prices respond slowly to changes in the money supply. According to this view, if the money supply falls, people spend less money, and the demand for goods falls. Because prices and wages are inflexible and do not fall immediately, declining spending causes production to fall. Nominal income is determined by the money supply. The stimulus from higher incomes, in turn, increases the demand for the products of all firms. The macroeconomic impact of one firm's price adjustment on the demand for the products of all the other firms is called the *aggregate demand externality*.

The Money Supply The

relationship between the money supply and inflation is illustrated by the quantity theory. This theory explains that inflation occurs through two things, namely the money supply and people's expectations about rising prices in the future [22]. In the liquidity preference framework developed by Keynes, he explains the balance of interest rates in terms of money supply and demand. When the money supply increases (other variables are held constant), it will cause the interest rate to fall. The quantity theory of money has explained that money growth is the main determinant of the rate of inflation. Therefore, controlling the money supply is an important thing for Bank Indonesia to do considering its wide impact on other macro variables. Inscription & Slamet, The Effect of the Money Supply on Inflation and Interest Rates, as well as on Investment and Economic Growth in Indonesia,[23].

Interest Rate

Interest rate is the price that must be paid in the event of an exchange between one rupiah now and one rupiah later. An unreasonable increase in interest rates can makes it difficult for the business world to pay interest and liabilities due to high interest rates will add to the burden company, so that it will directly reduce company profits[24]. Interest rates are a benchmark for a country's economic activity that can affect the circulation of banking financial flows, inflation, investment and currency movements in a country. In raising and lowering interest rates, one must take sides and prioritize the welfare of the domestic people. [25]

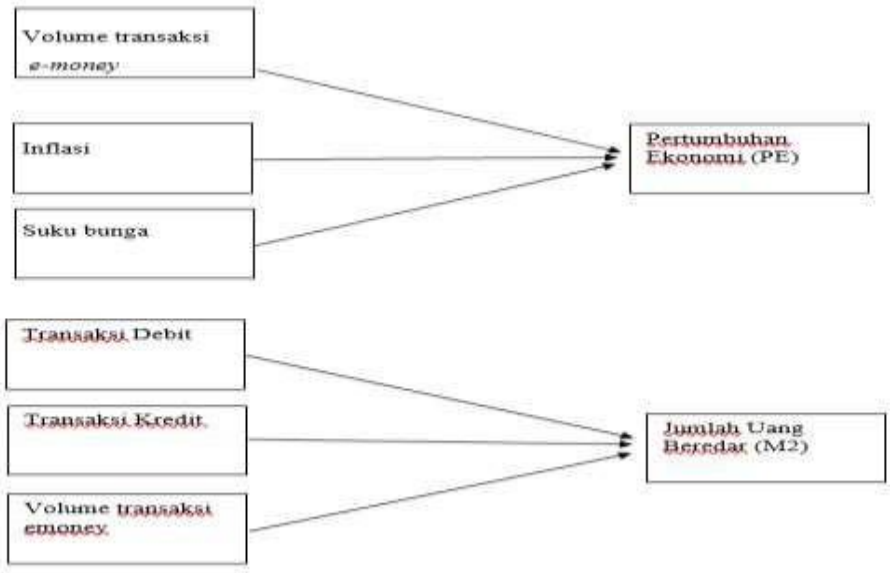


Figure 1. Thinking Framework Research method

For the population, this study analyzes the average inflation rate, interest rate, and circulation of electronic money to the level of the money supply which is compared between the two countries, Indonesia and Singapore. For the sample The sampling technique used is saturated sample, saturated sampling technique is a sampling technique in which all members of the population are used as samples. According to [26] the sample is part of the population taken as a data source and can represent the entire population. The research sample was taken as many as 80 observations consisting of 2 country objects, namely Indonesia and Singapore from 2011-2020 and using quarterly data. The secondary data used in this study is panel data, which is a combination of cross-sectional data and time series data from 2011-2020. The data in this study is quantitative and uses data in the form of calculated numbers that are processed with certain statistical criteria. Sources of data used in this study include data on inflation rates, interest rates, circulation of electronic money obtained through publications

conducted by the Central Statistics Agency of the Republic of Indonesia and Bank Indonesia, as well as public statistical data from the Central Bank in Singapore [27]

The data analysis technique used in this research is using panel data regression analysis technique and the data is processed using the Eviews 10 program. The panel data in this study is a combination of time series data with cross section data.

Model 1

$$PE = \alpha 0 + \alpha_1 VEM_{it} + \alpha_2 Inflasi + \alpha_3 Sukubunga_{it} + \alpha_4 Country_{it} + e_{it}$$

Model 2

$$M2 = \beta 0 + \beta 1\ NTATM_{it} + \beta 2\ NTKK_{it} + \beta 3\ NTE_{it} + \beta_4 Country_{it} + e_{it}$$

Description:
PE = Growth
VEM = Volume of Electronic Money
Ir = Interest Rate
Inf = Inflation
M2 = *board money*
VTATM = volume of transactions ATM / debit
VTKK = volume of credit card transactions
VTE = volume of *e-money*
$\alpha_0, \beta_0, \gamma_0$ = constant
Country = 1 if Singapore and) if Indonesia
EC = *Error Correction Term* which is a measure of imbalance *(disequilibrium error)*

Three tests can be performed in determining the use of the best estimation method, namely: Chow test, Hausmant test and Langrang test. For the data test technique using normality test, significance test consisting of t-statistics test, R-Squared test

Results and Discussion

Analysis of Panel Data Modeling Results

Table 3

Hausman Results

Test Summary	Chi Square Statistics	Chi Square df	Probability
	12.46373		
Cross- Section random	5	4	0.0052

Based on the Hausman test above, the chi-square distribution value is 12.463735 with a chi-square probability of 0.0052, which is smaller than alpha 0.05 (0.0052 < 0.05), so rejecting H0. That is, the best estimation method used in this study is the fixed effect model. After testing to determine which regression model is better to use, until the Hausman test, the results show that the most appropriate model to use is the Fixed Effect Model.

Analysis of Regression Results of Random Effect Model

Table 4

Results of Data Regression of

	Variabel Terikat			
	PE		JUM (M2)	
	Koefisien	Prob	koefisien	prob
C	0.878891	0.0032	0.662728	0.0000
VEM	.888891	0.0000	.709288	0.0033
Inflasi	0.766777	0.0875		
Sukubunga	.770000	0.0000		
VTATM			0.739900	0.0289
VTKK			0.44099	0.0309
Country	.772819	0.03092	.65562	.00441
R Square	0.80982		0.83002	
Adjusted R Square	0.8809		.87999	
Prob F (Statistics)	0.0000		.0000	

Source: Research processed data, 2021

First Model

$$PE = 0.878891 + 0.888891\ VEM_{it} + 0.766777\ Inflasi + 0.770000\ Ir + \alpha_4\ Ir_{it} + 0.772819\ Country_{it} + e_{it}$$

The results of the first equation show:

a. The regression results produce a constant value at 0.878891 which indicates that if the variable vem, inflation, interest rates, country are considered unchanged or constant value, the value of the economic growth variable has a value of 0.878891.

b. The effect of Electronic Money Volume on economic growth is 0.888891 and is significant. This means that every increase in the average Electronic Money Volume of 1 unit will cause an increase in economic growth of 0.888891 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between Electronic Money Volume and economic growth. The probability value is less than = 5% (0.0000<0.05) so that the Electronic Money Volume (VEM) is significant and has an effect on economic growth.

c. The effect of inflation on poverty is 0.766777 and is not significant. This means that every 1 unit increase in inflation will cause an increase in economic growth of 0.766777 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between inflation and economic growth. The probability value is more than = 5% (0.0875>0.05) so that the inflation variable (Inf) is not significant and has no effect, which means that inflation does not affect economic growth too much so that increasing/decreasing inflation does not directly affect economic growth

d. The effect of interest rates on economic growth is 0.770000 and is significant. This means that each increase in the average interest rate of 1 unit will cause an increase in economic growth of 0.770000 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between interest rates and economic growth. The

probability value is less than = 5% (0.0000<0.05) so that the interest rate variable is significant and has an effect on economic growth.

e.The effect of country on economic growth is 0.772819 and is significant. This means that every increase in the country's average of 1 unit will cause an increase in economic growth of 0.772819 units with the assumptionvariables *independent* that the otherhave a fixed value. This means that there is a positive relationship between the country and economic growth. The probability value is less than = 5% (0.03092<0.05) so that the country (country) variable is significant and has an effect on economic growth.

Second Model

M2 = 0.662728 + 0.709288 VEMit + 0.739900 $NTATM_{it}$ + 0.44099 $NTKK_{it}$ + β3 NTE_{it} + 0.65562 $Country_{it}$ + e_{it}

The results of the second equation show:

a.The regression results produce a constant value at 0.662728 which indicates that if the variables vem, VTATM, VTKK, country are considered unchanged or have a constant value, the value of the money supply variable has a value of 0.662728.

b. The effect of Electronic Money Volume on the money supply is 0.709288 and is significant. This means that each increase in the average Electronic Money Volume by 1 unit will cause an increase in the money supply by 0.709288 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between Electronic Money Volume and the money supply. The probability value is less than = 5% (0.0033<0.05) so that the Electronic Money Volume (VEM) is significant and has an effect on the money supply.

c.The effect of the volume of ATM/debit transactions on the money supply is 0.739900 and is significant. This means that each increase in the average volume of ATM/debit transactions by 1 unit will cause an increase in the money supply by 0.739900 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between the volume of ATM/debit transactions and the money supply. The probability value is less than = 5% (0.0189<0.05) so that the variable volume of ATM/debit transactions (VTATM) is significant and affects the money supply.

d. The effect of credit card transaction volume on the money supply is 0.44099 and is significant. This means that each increase in the average volume of credit card transactions by 1 unit will cause an increase in the money supply by 0.44099 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between the volume of credit card transactions and the money supply. The probability value is less than = 5% (0.0309<0.05) so that the variable volume of credit card transactions (VTTK) is significant and affects the money supply.

e. The effect of the country on the money supply is 0.65562 and is significant. This means that each increase in the country's average of 1 unit will cause an increase in the money supply by 0.65562 units assuming thevariables *independent* otherhave a fixed value. This means that there is a positive relationship between the country and the money supply. The probability value is less than = 5% (0.00441<0.05) so that the country (country) variable is significant and has an effect on the money supply.

Normality Test

If the Jarque-Bera probability value is greater than 0.05, it can be concluded that the *error term* is normally distributed and vice versa. As can be seen from the results of the regression model normality test 1, the calculated value of the Jarque-Bera probability value is 0.416688> 0.05, so it can be concluded that the *residuals* are normally distributed, which means that the classical assumptions about normality have been met or there are no normality problems.

As can be seen from the results of the normality test of regression model 2, the calculated value of the Jarque-Bera probability value is 0.416688> 0.05, so it can be concluded that the *residuals* are normally distributed, which means that the classical assumptions about normality have been met or there are no normality problems.

Multicollinearity Test

Based on the results of the correlation matrix output test of model 1, it can be seen that there is no value above 0.08, so it is free from the problem of multicollinearity.

Based on the results of the correlation matrix output test in model 2, it can be seen that there is no value above 0.08, so it is free from the problem of multicollinearity.

Heteroscedasticity Test

Based on the results of heteroscedasticity testing in regression model 1, it can be concluded that this data does not have heteroscedasticity problems because thevalues *probability* for all variables are greater than 0.05.

Based on the results of heteroscedasticity testing in regression model 2, it can be concluded that this data does not have a heteroscedasticity problem because thevalues *probability* for all variables are greater than 0.05.

Table 5

Test Results T

Regression Model 1		Regression Model 2	
Variables	T-statistic	variables	T-statistics
c	4.55667	c	6.999837
VEM	5.99894	VEM	4.000938
Inflation	1.00998	VTATM	3.665277
rate	4.99829	VTKK	3 ,887744
Country	5,32112	Country	3,998744

Source: Research processed data, 2021

It is known that the t table is 1.99167261.

First Model

a. Testing on Electronic Money Volume Variables.

Based on the regression results above, Electronic Money Volume has t_{count} (5.99894) > t_{table} (1.99). The probability value of the Volume Electronic Money variable of 0.0000 is smaller than = 5% (0.0000 < 0.05), so statistically the Volume Electronic Money (VEM) variable has a significant effect on the economic growth variable, so it can be concluded that Ho is rejected, which means var Volume Electronic Money has an effect on (bound var), therefore Hypothesis 1 is declared accepted.

b. Testing Against Inflation.

Based on the regression results above, inflation has a t_{count} (1.00998) < t_{table} (1.99). The probability value of the inflation variable is 0.0875 which is greater than = 5% (0.0875

> 0.05), so that statistically the inflation variable has no effect and is not significant on the economic growth variable, it can be concluded that Ho is accepted, which means that the inflation var has no effect on (bound var), therefore Hypothesis 2 is rejected.

c. Testing on Interest Rate Variables.

Based on the regression results above, the interest rate t_{count} (4.99829) > t_{table} (1.99). The probability value of the interest rate variable of 0.0000 is smaller than = 5% (0.0000 < 0.05), so statistically the interest rate variable has a significant effect on the economic growth variable, so it can be concluded that Ho is rejected, which means that the interest rate var has an influence on (var bound), therefore Hypothesis 3 is accepted.

d. Testing on Country Variables.

Based on the regression results above, the country has t_{count} (5.32112) > t_{table} (1.99). The probability value of the country variable is 0.03092 which is smaller than =5% (0.03092 < 0.05), so statistically the country variable has a significant effect on the economic growth variable, so it can be concluded that Ho is rejected, which means that the country var has an influence on (bound var). , therefore Hypothesis 4 is accepted.

Second Model

a. Testing on Electronic Money Volume Variables.

Based on the regression results above, Electronic Money Volume has t_{count} (4,000938) > t_{table} (1.99). The probability value of the Volume Electronic Money variable is 0.0033 which is smaller than = 5% (0.0033 < 0.05), so statistically the Volume Electronic Money (VEM) variable has a significant effect on the money supply variable, so it can be concluded that Ho is rejected, which means var Electronic Money volume has an effect on (bound var), therefore Hypothesis 1 is declared accepted.

b. Testing on the Volume of ATM/debit Transactions.

Based on the regression results above, the ATM/debit transaction volume has t_{count} (3.665277) < t_{table} (1.99). The probability value of the ATM/debit Transaction Volume variable is 0.0189 which is smaller than =5% (0.0189 < 0.05), so statistically the ATM/debit Transaction Volume variable has a significant effect on the money supply variable, so it can be concluded that Ho is rejected, which means var ATM/debit transaction volume has an effect on (bound var), therefore Hypothesis 2 is declared accepted.

c. Testing on Credit Card Transaction Volume Variables. Based on the regression results above, Credit Card Transaction Volume t_{count} (3.887744) > ttable (1.99). The probability value of the Credit Card Transaction Volume variable is 0.0309 smaller than =5% (0.0309 < 0.05), so statistically the Credit Card Transaction Volume variable has a significant effect on the money supply variable, so it can be concluded that Ho is rejected, which means var Volume Credit Card transactions have an effect on (bound var), therefore Hypothesis 3 is declared accepted.

d. Testing on Country Variables.

Based on the regression results above, the country has t_{count} (3.998744) > t_{table} (1.99). The probability value of the country variable is 0.00441 which is smaller than = 5% (0.00441 < 0.05), so that statistically the country variable has a significant effect on the money supply variable, it can be concluded that Ho is rejected, which means that the country var has an influence on (bound var).), therefore Hypothesis 4 is accepted.

Table 6

Results of R-Squared

Model 1		Model 2	
Description of	Results	Description	Results of
r-squared	0.80982	r-squared	0.83002

Source: Research processed data, 2021

The R-*Squared value* for model 1 is 0.80982 which means that the variable of economic growth can be explained by variables of vem, inflation, interest rates, country by 80.98% and the remaining 19.2% can be explained by variables outside this research model. And the Rvalue-*Squared* for model 2 is 0.83002, which means that the dependent variable is the money supply is influenced by the independent variables VEm, VTATM, VTKK, country by 83% and the remaining 17% is influenced by other variables not used in this study.

Political Economy Analysis of Electronic Money Explain here:
Advantages of Singapore and Indonesia implementing the electronic money policy.

The e-e-policy *money* has many benefits for both Indonesia and Singapore. For Indonesia, with the consumption and economic growth that occurs from the use of *e-money* , in turn, it has the potential to encourage people's increase in non-cash money in order to simplify and speed up the transaction process. From the perspective of a bank or non-cash payment issuing institution, this again has the potential to increase revenue and profits. This is referred to as the *dual effect* or the multiple impact of the use of non-cash payment instruments. The multiple impact of using non-cash payments to consumers and entrepreneurs in turn can encourage economic growth. In addition, a payment system is issued to regulate the amount of money in circulation so that it can be controlled properly and prevent the circulation of counterfeit money which is increasingly widespread and with the presence of *emoney* -which has the advantage of security, the circulation of counterfeit money can be suppressed [28]

Singapore is one of the countries that has already implemented a payment system using electronic money. Some of the benefits obtained include, first, providing convenience in fast and safe payment transactions for the wider community. Second, the problem of cash handling can be solved which has often been experienced when using cash as payment for the industry. Third, increasing the efficiency of money printing and money duplicating [29].

What makes their economy grow with electronic money.

Singapore is a "magical" island country that is currently one of the world's trade centers, and it has even received various admirable honors, such as being the country with the most competitive economic development in the world, having strong economic indicators, far outperforming countries in Asia, even including the highest in the world. The State of Singapore has strengthened the success of its cooperation with a number of multinational companies, this strategy is better known as the "New Singapore" which invites all Singaporean businesses to reach new markets in countries that can be reached by 7 (seven) hours of flight from Singapore and are then expected able to connect with all countries in the world, in building domestic capabilities, and sharpening its strategic network with regional countries. In line with that, the success of a number of local companies must be developed into world-class companies (word-class), besides that the workforce must be cost-competitive, have high motivation and productivity, with world-class capabilities in business management. , technology, innovation, products and services and the development of its international trade. In addition, with the ease of transactions due to e-money, the economy is increasing [30].

1. **What laws and regulations do they have in Singapore (such as a bitcoin policy may exist)**

Many arrangements have been written to cope with today's technological developments for which there is already protection. Like giving a password where only registered people can enter the site to prevent theft in electronic transactions, but there are conditions where there are still parties who abuse it so that this act allows someone to use a fake identity, namely stealing or other things. The Singapore government has consistently updated the law to respond to cyber crimes, especially in electronic transactions and also to harmonize them with the international community or globally. And the Singapore government has also expanded its territorial jurisdiction in law to help tackle cybercrimes both globally and internationally.

2. In Indonesia there is no such policy, and in the end, Indonesia is far behind Singapore

Bank Indonesia (BI) assesses that the undeveloped e-money payment model in Indonesia is partly due to the absence of a business model that unites regulators and business actors in integrating the payment system, so it is still not interoperable. The electronic money business model in Indonesia is still not interoperable (not yet integrated), so there are still very few transactions using e-money. Thedevelopment of e-money in Indonesia is lack ofdue to the fact that people still view that payment instruments using e-money are quite complicated and do not reach all levels. Existing e-money cannot be used for all existing merchants. There are limitations. So for the community it is not yet flexible. The undeveloped e-money can also be seen from the government's policies, namely the absence of synergy between government agencies in making electronic money development strategies for the national interest on a broad scale. It can be said that Bank Indonesia has not comprehensively regulated security standards like other payment instruments. Therefore, it is necessary for the principal to manage all existing transactions using this e-money. With this, it takes only one card to make transactions for all existing merchants. This is the reason why it lags behind other countries, such as Singapore [31].

Economic Analysis and Discussion Regression Model 1

Analysis of the Effect of Electronic Money Volume Variables on Economic Growth.

The results of testing thismodel *random effect* prove that the probability value in the study is 0.0000 < 0.05, then $H_{0\ is}$ rejected and $H_{1\ is}$ accepted, which means that the results are in line with the hypothesis that the Volume of Electronic Money has a significant effect on economic growth. This study shows that the coefficient value of the Volume Electronic Money variable is 0.888891, which means that each increase in Electronic Money Volume by 1 unit can increase economic growth by 0.888891 units.

The results in this study indicate a match between the hypotheses which state that there is an alleged positive influence of e-money on economic growth. The higher the increase in the volume of e-money, the economic growth will increase. The results of this study are in line with research conducted by [32] which analyzed the effect of non-cash payments on the amount of money demanded by the community (M1) and the economy. The analysis used is the Error Correction Model (ECM). The results showed that in the long term money has a positive effect on GDP in the Indonesian economy. The same study was also conducted by [33] who analyzed electronic money transactions on the speed of money in five ASEAN countries, namely Indonesia, Malaysia, Thailand, Singapore, and the Philippines using panel data analysis. The results of his research show that e-money transactions in the five ASEAN countries have increased from 2010 to 2014 where there is a positive trend in the use of e-money. The increase was due to public and government awareness in the five ASEAN countries that encouraged the use of e-money.

Analysis of the Influence of Inflation Variables on Economic Growth.

The results in this study indicate that there is a positive and insignificant effect of inflation on economic growth. This is because inflation has an indirect effect on economic growth. The results in this study are not in accordance with the research hypothesis which says that there is an alleged negative influence of INF on economic growth. Based on the quantity theory of money put forward by Irving Fisher, it is said that the more money circulating in the economy for the level of economic output, the condition will cause inflation and this will cause economic growth to decline. The results of this study are in line with research conducted by [34]with the title of the relationship between the money supply, inflation, and exchange rates on national income in Indonesia using a dynamic model, where the inflation variable has a positive and insignificant effect on national income. However, this study is not in line with research conducted by [35] with the title of the effect of inflation on economic growth, namely that inflation has a negative and significant effect on economic growth in Indonesia. This is related because an increase in inflation will lead to a reduction in foreign investment and investment

which will then have an impact on economic growth

Analysis of the Effect of Interest Rate Variables on Economic Growth.

The results of testing this random effect model prove that the probability value in the study is 0.0000 < 0.05, then H0 is rejected and H3 is accepted, which means that the results are in line with the hypothesis that interest rates have a significant effect on economic growth. In this study, it shows that the coefficient value of the interest rate variable is 0.770000, which means that each increase in interest rates by 1 unit can increase economic growth by 0.770000 units.

The higher the interest rate, the higher the economic growth. The results of this study are in accordance with previous research conducted by [36], namely the value of interest rates has a significant influence on economic growth with a coefficient of 0.4666420. Interest rates are indeed used by all people in the world as a means of payment in conducting international trade transactions and in relation to economic growth interest rates affect the open economy [36]

Analysis of the Effect of Country Variables on Economic Growth.

The results of testing themodel *random effect* prove that the probability value in the study is 0.03092 < 0.05, then $H_{0\ is}$ rejected and $H_{4\ is}$ accepted, which means that the results are in line with the hypothesis that the country has a significant influence on economic growth. This study shows that the coefficient value of the country variable is 0.772819, which means that for every 1 unit increase in the country, it can increase economic growth by 0.772819 units.

Economic Analysis and Discussion of Regression Model 2

Analysis of the Effect of Electronic Money Volume Variables on the Money Supply.

The results of testing thismodel *random effect* prove that the probability value in the study is 0.0033 < 0.05, then $H_{0\ is}$ rejected and $H_{1\ is}$ accepted, which means that the results are in line with the hypothesis that Electronic Money Volume has a significant effect on the money supply. In this study, it shows that the coefficient value of the interest rate variable is 0.709288, which means that each increase in Electronic Money Volume by 1 unit can increase the money supply by 0.709288 units.

According to [37], Indonesia's involvement in world economic forums has also slightly influenced economic policies in Indonesia, one of which is the policy on the payment system. In Indonesia, the payment system in general still uses cash as a legal tender, even though the amount of money circulating in the community can trigger an increase in inflation. So look at the development of payment systems in several other countries such as Japan, Singapore, England and the United States which have already implemented a payment system using a tool called E-money. The purpose of making payment system regulations, one of which is to provide security and convenience for the public to make buying and selling transactions so that no one feels disadvantaged. The rules regarding the payment system have been established by Bank Indonesia as the Central Bank which has the authority in this matter. In this case, the purpose of implementing a non-cash payment system, especially with e-money as a micro payment innovation, one of which is to optimize purchasing power and increase public consumption. The high number of payment transactions in the community makes Bank Indonesia see this as an opportunity for developments in economic innovation in Indonesia. From this e-money policy itself, Bank Indonesia can regulate the amount of money in circulation and see the development of the existing inflation rate. The results of this study are the same as that of [38], which states that e-money has a positive and significant effect on the money supply (M1) and is also supported by research [39] that in e-money has the term float which means the amount of funds owned by the issuer and recorded in the e-money card that has not been or has been used for payment but has not been billed by the merchant. Considering the characteristics of e-money which has a float of funds that can be used at any time as a means of payment, this type of fund can be categorized as highly liquid funds or can be equivalent to cash or demand deposits so that it can be categorized as part of M1.

Analysis of the Effect of Variable Volume of ATM/Debit Transactions on the Money Supply.

The results ofmodel testing *random effect* proves that the probability value on research that is equal to 0.0189 <0.05, then $H_{0\ is}$ rejected and H_2 is received, which means the results are consistent with the hypothesis that shows the transaction volume ATM / debit have a significant effect on the money supply. In this study, it shows that the coefficient value of the variable volume of ATM/debit transactions is 0.739900, which means that each increase in the volume of ATM/debit transactions by 1 unit can increase the money supply by 0.739900 units. This is in accordance with the hypothesis that has been stated previously. Where M1 is currency plus demand deposits. If currency is considered constant, then the nominal increase in ATM/debit card transactions included in the demand deposit category also causes an increase in M1 [40]

Analysis of the Effect of Credit Card Transaction Volume Variables on the Money Supply.

The results ofmodel testing *random effect* proves that the probability value on research that is equal to 0.0309 <0.05, then $H_{0\ is}$ rejected and H_3 is received, which means the results are consistent with the hypothesis that shows the volume of credit card transactions have a significant effect on the money supply. This study shows that the coefficient value of credit card transaction volume is 0.44099, which means that each increase in credit card transaction volume by 1 unit can increase the money supply by 0.44099 units. The majority of people think that the use of credit cards will lead to consumptive nature, especially with the offer of low credit interest reaching 0% with the aim that credit card use can increase, so that credit cards have a negative direction towards M1 because in its use it can show awareness of the level of public interest in the convenience and ease of use of credit cards. security so that they make substitutions in making payments [32]

Analysis of the Effect of Country Variables on Economic Growth.

The results of testing thismodel *random effect* prove that the probability value in the study is 0.00441 < 0.05, then $H_{0\ is}$ rejected and $H_{4\ is}$ accepted, which means that the results are in line with the hypothesis that the country has a significant influence on economic growth. In this study, it shows that the coefficient value of the country variable is 0.65562, which means that for every 1 unit increase in the country, it can increase economic growth by 0.65562 units.

References

1. Flannery, M.J., *Financial crises, payment system problems, and discount window lending.* Journal of money, credit and banking, 1996. **28**(4): p. 804-824.DOI: https://doi.org/10.2307/2077922.
2. Parguez, A. and M. Seccareccia, *The credit theory of money: the monetary circuit approach*. 2002: Routledge.
3. Jermsittiparsert, K., *EXAMINING THE SUSTAINABLE ENERGY AND CARBON EMISSION ON THE ECONOMY: PANEL EVIDENCE FROM ASEAN.* International Journal of Economics and Finance Studies, 2021. **13**(1): p. 405-426.
4. Azhar, Z., H.S. Putra, and M. Huljannah. *Implications of Using E-money and APMK on the Money Supply: The Case of Indonesia*. Atlantis Press.DOI: https://doi.org/10.2991/aebmr.k.201126.025.
5. Abidin, M.S., *Impact of E-Money Policy in Indonesia as a New Payment System Tool.* Accountancy Journal, 2015. **3**(2).
6. Jermsittiparsert, K., *LINKAGE BETWEEN ENERGY CONSUMPTION, NATURAL ENVIRONMENT POLLUTION, AND PUBLIC HEALTH DYNAMICS IN ASEAN.* International Journal of Economics and Finance Studies, 2021. **13**(2): p. 1-21.
7. Saraswati, N. and I. Mukhlis, *The influence of debit card, credit card, and e-money transactions toward currency demand in Indonesia.* Quantitative Economics Research, 2018. **1**(2): p. 87-94.
8. Indriastuti, M. and R.H. Wicaksono, *Influencers E-Money in Banking Sector.* South East Asia Journal of Contemporary Business, Economics and Law, 2014. **4**(2): p. 10-17.
9. Jordaan, H. and J. Coetzee, *ACCESS TO FINANCE PERCEIVED AS AN OBSTACLE AND THE CHARACTERISTICS OF THE SMME AND ITS OWNER: EVIDENCE FROM THE FREE STATE GOLDFIELDS–SOUTH AFRICA.* International Journal of Economics and Finance Studies, 2021. **13**(1): p. 373-404.
10. Salsabila, S.S. and A. Sulistiyono, *Urgency for the issuance of Bank Indonesia Regulation Number*

20/6/Pbi/2018 concerning Electronic Money (E-Money) as a Payment Instrument. Jurnal Privat Law, 2019. **7**(2): p. 289-294.DOI: https://doi.org/10.20961/privat.v7i2.39338.

11. Kraipornsak, P. and P. Poramapojn, *DETERMINANTS OF THE MARKET VALUE OF LISTED FIRMS IN THE SERVICES SECTOR: A CASE OF THAILAND.* International Journal of Economics and Finance Studies, 2021. **13**(1): p. 155-172.

12. Badrudin, R., *Nexus of Money Function and Its Effect on Inflation Rate in Thailand and Indonesia.* International Journal of Engineering & Technology, 2018. **7**(3.21): p. 67-72.DOI: https://doi.org/10.14419/ijet.v7i3.21.17098.

13. Gerber, E.M. and J. Hui, *Crowdfunding: Motivations and deterrents for participation.* ACM Transactions on Computer-Human Interaction (TOCHI), 2013. **20**(6): p. 1-32.DOI: https://doi.org/10.1145/2530540.

14. Lintangsari, N.N., et al., *Analysis of the effect of non-cash payment instruments on financial system stability in Indonesia.* Journal of Development Economic Dynamics, 2018. **1**(1): p. 47-62.DOI: https://doi.org/10.14710/jdep.1.1.47-62.

15. Gurley, J.G. and E.S. Shaw, *Financial aspects of economic development.* The American Economic Review, 1955. **45**(4): p. 515-538.

16. Amassoma, D., K. Sunday, and E.-E. Onyedikachi, *The influence of money supply on inflation in Nigeria.* Journal of Economics & Management, 2018. **31**: p. 5-23.DOI: https://doi.org/10.22367/jem.2018.31.01.

17. Chowdhury, A., *Does inflation affect economic growth? The relevance of the debate for Indonesia.* Journal of the Asia Pacific Economy, 2002. **7**(1): p. 20-34.DOI: https://doi.org/10.1080/13547860120110452.

18. Mahatir, M.R., H. Aimon, and S.U. Sentosa. *Stability of Money Supply, E-money, Interest Rate, and Inflation in Indonesia.* Atlantis Press.DOI: https://doi.org/10.2991/aebmr.k.201126.012.

19. Khan, W.A. and A. Sattar, *Impact of interest rate changes on the profitability of four major commercial banks in Pakistan.* International journal of accounting and financial reporting, 2014. **4**(1): p. 142.DOI: https://doi.org/10.5296/ijafr.v4i1.5630.

20. Pigou, A.C., *The value of money.* The Quarterly Journal of Economics, 1917. **32**(1): p. 38-65.DOI: https://doi.org/10.2307/1885078.

21. Tomić, N. and V. Todorović, *Challenges of transition to cashless society.* Contemporary issues in economics, business and management, 2018: p. 313-320.

22. Bozkurt, C., *Money, inflation and growth relationship: The Turkish case.* International Journal of Economics and Financial Issues, 2014. **4**(2): p. 309-322.

23. Darwanti, D., *Contribution of Domestic Direct Investment and Direct Foreign Investment to Economic Growth in Indonesia Era Joko Widodo.* International Journal of Business, Economics and Management, 2020. **8**(1): p. 39-49.DOI: https://doi.org/10.18488/journal.62.2021.81.39.49.

24. Feldstein, M., *Inflation and the stock market*, in *Inflation, tax rules, and capital formation*. 1983, University of Chicago Press. p. 186-198.DOI: https://doi.org/10.7208/chicago/9780226241791.001.0001.

25. Hull, J. and A. White, *Pricing interest-rate-derivative securities.* The review of financial studies, 1990. **3**(4): p. 573-592.DOI: https://doi.org/10.1093/rfs/3.4.573.

26. Gervasi, V., et al., *A multiple data source approach to improve abundance estimates of small populations: The brown bear in the Apennines, Italy.* Biological Conservation, 2012. **152**: p. 10-20.DOI: https://doi.org/10.1016/j.biocon.2012.04.005.

27. McCallum, B.T., *Monetary policy in east asia: The case of singapore.* Monetary and Economic Studies, 2007. **25**(S1): p. 13-28.

28. Omelchuk, O., et al., *Management and regulation of electronic money circulation: Information and juridical aspects.* International Journal of Management (IJM), 2020. **11**(4).

29. Utami, S.S. and B. Kusumawati, *Factors influencing interest in using e-money (Study on STIE Ahmad Dahlan Jakarta students).* BALANCE: Economic, Business, Management and Accounting Journal, 2017. **14**(02).

30. Putri, C.A. and P.E. Prasetyo, *Money Supply, Counterfeit Money, and Economic Growth Effect to E-Money Transaction.* Efficient: Indonesian Journal of Development Economics, 2020. **3**(1): p. 634-649.DOI: https://doi.org/10.15294/efficient.v3i1.35951.

31. Hefner, R.W., *1. Introduction Multiculturalism and Citizenship in Malaysia, Singapore, and Indonesia*, in *The politics of multiculturalism*. 2001, University of Hawaii Press. p. 1-58.DOI: https://doi.org/10.1515/9780824864965.

32. Nursari, A., I.W. Suparta, and Y. Moelgini, *The Effect of Non-Cash Payments on the Amount of Money Demanded by the Community.* Journal of development economics, 2019. **8**(3): p. 169-182.DOI: https://doi.org/10.23960/jep.v8i3.46.

33. Cholifihani, M., *A cointegration analysis of public debt service and GDP in Indonesia.* IBT Journal of Business Studies (JBS), 2008. **2**(2).

34. Sidrauski, M., *Inflation and economic growth.* Journal of political economy, 1967. **75**(6): p. 796-810.DOI: https://doi.org/10.1086/259360.

35. Kasidi, F. and K. Mwakanemela, *Impact of inflation on economic growth: A case study of Tanzania.* Asian Journal of empirical research, 2013. **3**(4): p. 363-380.DOI: https://doi.org/10.6007/IJAREMS/v3-i5/1198.

36. Ismanto, B., M.A. Kristini, and L. Rina, *The Effect of Exchange Rates and Imports on Indonesia's*

Economic Growth for the Period of 2007-2017. Ecodunamika, 2019. **2**(1).

37. Sharifuddin, J., et al. *Green Revolution's Role and Impact: Organic Farming Potential for Indonesian Sustainable Agriculture*.DOI: https://doi.org/10.21082/fae.v37n2.2019.115-125.

38. Fitri, N. and H. Suriono, *ANALYSIS OF THE EFFECT OF PAYMENT SYSTEMS USING ATM CARD, CREDIT CARD AND E-MONEY ON THE AMOUNT OF MONEY CIRCULATION (M1) IN INDONESIA 2013-2017 PERIOD.* Journal of Management, Science Economics, 2020. **1**(2): p. 70-83.

39. Wijaya, A.Y., I. Mukhlis, and L. Seprillina, *Analysis of the influence of E-money, the volume of electronic transactions and interest rates on the money supply in Indonesia before and after the COVID-19 pandemic.* Jurnal Ekonomi, Bisnis dan Pendidikan, 2021. **1**(2): p. 135-145.DOI: https://doi.org/10.17977/um066v1i22021p135-145.

40. Ulina, E. and R. Maryatmo. *The Effect of Non-cash Transactions on The Money Supply Indonesia (2009: Q1–2019: Q2)*.