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Variable Determinants of Inflation Rate: A Study of BI Data Analysis 2021-2023

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Abstract

This research aims to analyze the influence of e-money transaction value, e-money transaction volume, money supply and exchange rate on the inflation rate in Indonesia. The data used in this research is secondary data obtained from Bank Indonesia (BI) and the Central Statistics Agency (BPS), with a time span from 2021 to 2023. This research uses a quantitative approach and applies classic assumption tests for data analysis. The results of this research show that the value of e-money transactions, the volume of e-money transactions, and the exchange rate are proven to have an influence on inflation, while the amount of money in circulation does not show a significant influence on inflation. It was found that the value of e-money transactions had a positive and significant influence on inflation, while the volume of e-money transactions had a negative and significant influence on inflation. On the other hand, the money supply does not have a significant effect on inflation, while the exchange rate shows a positive and significant effect on inflation. From this research it can be concluded that e-money has a different influence on inflation depending on the variables measured: the value of e-money transactions contributes positively to inflation, while the volume of e-money transactions contributes negatively to inflation.

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INTRODUCTION

Nowadays, the development of technology takes place at a very fast pace compared to previous years, with easy access and can be used by all levels of society. This increasingly sophisticated technology brings significant changes to people's lives and encourages economic development. One indication of economic development is the increase in digital business transactions. This is supported by changes in people's lifestyles, which now less frequently carry large amounts of cash for transactions. Instead, people prefer to use debit cards, credit cards, or e-money for their transaction needs.

According to Hendarsyah (2016), individuals with high mobility really need practicality in financial transactions. The development of digital technology, especially in the form of electronic money (e-money), has brought significant changes to the global financial and economic system. Electronic money (e-money) is one of the facilities provided by financial institutions to facilitate financial transactions without the need to use cash. This shows a change in people's lives which now prioritizes practicality, with e-money as a solution that supports these needs.

In Indonesia, online business growth has increased, which is also accompanied by an increase in the number of e-money transactions. Based on the provisions of Bank Indonesia (2019) Number 20/06/PBI/2018 concerning electronic money, the implementation of e-money as a non-cash payment instrument in Indonesian territory must continue to be carried out in rupiah. Apart from that, the use of e-money must provide benefits to the Indonesian economy and be carried out by prioritizing the principles of prudence, risk management and healthy business competition. BI supervises e-money transactions and issues policies to regulate the money supply, so as to minimize high risks due to the rapid increase in non-cash transactions.

The use of electronic money (e-money) has brought major changes in consumer behavior and influenced inflation. E-money makes transactions easier, makes consumers more likely to make instant purchases and increases consumption due to ease of payment. The use of e-money offers various promotions to the public, which can have an impact on increasing transaction volume and value. With the promotions offered, people are increasingly interested in using e-money, which can encourage consumer behavior (Wijaya, 2021). This increase in consumption levels can ultimately encourage economic growth. The more people use e-money in transactions, the faster the circulation of money in the economy.

However, behind this positive impact, e-money can have negative impacts, such as making it difficult to control expenses because you don't feel the loss of cash directly. Increasing public interest in e-money can attract the attention of cybercriminals to commit fraud. In addition, increasing use of e-money can trigger inflation if demand for goods and services increases faster than availability (Wijaya, 2021). Apart from e-money, other factors such as money supply and exchange rates can also influence inflation. The increase in transaction volume and value cannot be separated from the increase in the money supply. Money in circulation is divided into two, namely money in the narrow sense (M1) and money in the broad sense (M2). M1 includes currency, demand deposits, e-money and savings that can be withdrawn at any time. M2 includes M1 plus controlled money and securities other than shares issued by banks (Bank Indonesia, 2024). The price level of goods and services available affects the amount of money people need to make transactions. When the prices of goods and services rise, the amount of money needed for transactions also increases. The growth in the amount of money circulating in the economy can be one of the causes of inflation (Perlambang, 2017). Research by Naibaho et al. (2023) also noted that e-money, interest rates and inflation have a significant influence on the money supply in Indonesia.

The exchange rate, or exchange rate, is a comparison of the value of one country's

currency to another country's currency. Changes in currency prices can affect demand for goods, which in the end can cause inflation (Anggun Sriwahyuni et al., 2020). Based on several studies, the inflation rate can be influenced by e-money transactions, money supply and exchange rates. Inflation refers to increases in the prices of goods and services that occur consistently over a certain period of time. However, a variety of different variables can influence the rate of inflation. The development of inflation in Indonesia during 2021-2023 can be seen in Figure 1.

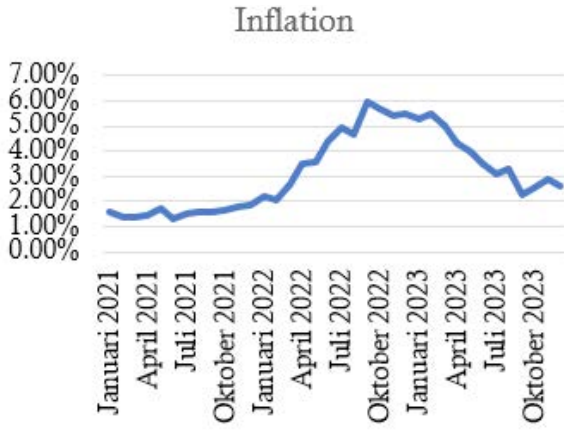

Figure 1. Inflation 2021-2023

Based on Figure 1, inflation in Indonesia increased from January 2021 to September 2022, before declining until December 2023. In January 2021, the inflation rate was 1.55%, which increased to 2.18% in January 2022. Inflation peaked in September 2022 at 5.95%, before declining to 2.61% in December 2023. Inflation in 2021 and 2023 is considered good for the economy as it is below the annual inflation target of 3%, at 1.87% in December 2021 and 2.6% in December 2023. In contrast, inflation in 2022 is considered bad as it reached 5.51% in December, exceeding the annual inflation target of 3%.

An inflation target is the inflation rate expected by Bank Indonesia (BI) in collaboration with the government (Bank Indonesia, 2024). Based on the Ministry of Finance of the Republic of Indonesia (2017) Number 124/PMK.010/2017, the inflation target for the 2019-2021 period is set at 3.5%, 3.0%, and 3.0% respectively with a deviation of around 1%. Meanwhile, the Ministry of Finance of the Republic of Indonesia (2021) Number 101/PMK.010/2021 sets the inflation target for the period 2022-2024 at 3.0%, 3.0%, and 2.5% respectively with a deviation of around 1%.

Low and stable inflation is important for sustainable economic growth, benefiting society as a whole. High and volatile inflation can have a negative impact on the economy. Therefore, controlling inflation is very important. Inflation control efforts by the Government and Bank Indonesia (BI) include: (1) Implementing monetary and fiscal policies that support inflation control and economic growth; (2) Focusing on controlling inflation in the Volatile Food group below 5%; (3) Preventing short-term risks such as changes in harvest seasons and increased demand ahead of the National Religious Holidays (HBKN) by ensuring the availability of food supply and smooth distribution; (4) Increasing productivity and food downstreaming for food security; (5) Strengthening the availability of food supply data for inflation control policies; (6) Through the National Food Inflation Control Movement (GNPIP), strengthening cooperation between the Central and Regional Inflation Control Teams (TPIP-TPID); and (7) Maintain inflation expectations by strengthening communication.

High and unstable inflation can cause a general and sustained increase in the prices of goods and services (Agusmianata et al., 2018). If prices continue to rise, people's purchasing power decreases, and production goods are not sold out, which can reduce investment and national income, affecting the stability of the economy. However, inflation can also have a positive impact. At the right level, inflation can boost the vigor of domestic production. Moderate price increases can speed up the turnover of goods and increase profits, which encourages investment, employment, and ultimately positive economic growth. With the increasing use of e-money, consumption levels are also rising, which can increase the

demand for goods and services. If supply does not increase in line with demand, prices will rise, causing inflation. Research by Rahmayuni (2019), Kalbuadi (2021), and Damayanti (2021) shows that electronic money has a significant effect on the inflation rate.

An increase in money supply can also increase people's purchasing power, which encourages more spending and leads to price increases. Research by Agusmianata et al. (2018), Aprileven (2017), and Jumhur et al. (2018) show that money supply has a significant effect on inflation. A decrease in the rupiah exchange rate causes an increase in the price of imported goods and raw materials, and increases the price of domestic production, which can cause inflation. Increased exports due to depreciation of the rupiah exchange rate also affect domestic prices, which can cause inflation. Research by Rumondor et al. (2021), Mahendra (2016), and Susmiati et al. (2021) show that the exchange rate has a significant effect on inflation. Inflation is an important indicator in economic development, so analyzing the variables that affect inflation is very important. The focus of this study is to determine the effect of electronic money transaction value, electronic money transaction volume, money supply, and exchange rate on the inflation rate in Indonesia for the period 2021-2023.

METHODS

This study analyzes the effect of electronic money (e-money), money supply, and exchange rates on inflation. The data used is secondary data from Bank Indonesia (BI) and the Central Bureau of Statistics (BPS) with a time span from January 2021 to December 2023. Data processing is done using EViews 12 software. This study applies the classical assumption test, which includes normality test, autocorrelation test, and multicollinearity test. The econometric model used is as follows:

$$INF_t = \beta_0 + \beta_1 LogNILAI_t + \beta_2 LogVOLUME_t + \beta_3 LogJUB_t + \beta_4 LogKURS_t + e_t$$

RESULTS AND DISCUSSION

The multicollinearity test used in this study is the VIF test. In the VIF test, multicollinearity occurs if the VIF value for the independent variable is> 10. In the calculation, it can be seen that the VIF value on LogKURS < 10, so it can be concluded that LogKURS does not have a multicollinearity problem. While the VIF value on LogValue, LogVOLUME and LogJUB> 10, it can be concluded that LogValue, LogVOLUME and LogJUB have multicollinearity problems.

The normality test used in this study is the Jarque Bera test. In the Jarque Bera test, the residuals are normally distributed if the probability value> α (0.05). In the calculation, it is known that the probability value is 0.512, so the probability value (0.512) > α (0.05). So it can be concluded that the variables are normally distributed.

The autocorrelation test will be tested with the Breusch Godfrey test. In the Breusch Godfrey test, there is no autocorrelation in the model if Prob. X^2 Breusch Godfrey test > α (0.05). In the calculation it is known that Prob. X^2 is 0.000, so Prob. X^2 (0.000) < α (0.05). So it can be concluded that there is autocorrelation in the model.

The white test is used in the heteroscedasticity test. In the white test, there is no heteroscedasticity problem in the model if Prob. X^2 white test > α (0.05). In the calculation it is known that Prob. X^2 amounted to 0.002, so Prob. X^2 (0.002) < α (0.05). So it can be concluded that there is a heteroscedasticity problem in the model.

Based on Table 1, it can be seen that the coefficient of determination (R2) has a value of 0.578, meaning that 57.8% of inflation variation is caused by variations in the value of e-money transactions, the volume of e-money transactions, the money supply and the exchange rate. While the remaining 42.2% is caused by other variables that are not included in the model.

Judging from Table 1, it can be seen that Prob. F is 0.000, so Prob. F (0.000) < α (0.05).

Then the variable value of e-money transactions, the volume of e-money transactions, the money supply and the exchange rate together - together affect the inflation variable.

The calculation results from Table 1 can be seen that the variable value of e-money transactions, the volume of e-money transactions, and the exchange rate proved to have an effect on inflation. While the money supply is proven to have no effect on inflation. The transaction value of e-money has Prob. t of 0.024, so Prob. t (0.024) < α (0.05). Then the value of e-money transactions is significant. The volume of e - money transactions has a Prob. t of 0.010, so Prob. t (0.010) < α (0.05). Then the volume of e - money transactions is significant. The money supply has a Prob. t of 0.332, so Prob. t (0.332) > α (0.05). Then the money supply is not significant. The exchange rate has a Prob. t of 0.030, so Prob. t (0.030) < α (0.05). Then the exchange rate is significant.

The results of multiple linear regression show that the regression coefficient for the value of e-money transactions is 12.104, which means that an increase in the value of e-money transactions by 1% will result in inflation increasing by 12.104%. In contrast, the regression coefficient for e-money transaction volume is –15,600, indicating that an increase in e-money transaction volume by 1% will reduce inflation by 15,600%. The regression coefficient for the money supply is 9.058, while for the exchange rate it is 20.243, which shows that if the exchange rate rises by 1%, inflation will increase by 20.243%.

The regression test results show that the exchange rate variable has a strong influence on inflation, with the highest coefficient value of 20.243. This research reveals that the volume of e-money transactions has a negative influence on inflation, while the value of e-money transactions, money supply and exchange rates have a positive influence on inflation. In particular, the value of e-money transactions, the volume of e-money transactions, and the exchange rate were proven to have an influence on inflation, while the money supply did not show a significant influence.

E-Money Transaction Value: Is the nominal amount of e-money usage. The regression coefficient of 12.104 shows a positive and significant influence on inflation. An increase in the value of e-money transactions tends to increase inflation. The t probability of 0.024 confirms the significance of its influence on inflation. So, the value of e-money transactions has a significant influence on inflation. With e-money, it's easier for people make transactions, because the nature of e-money is that it is easy to use, so the circulation of money in society will also increase. This really allows people's consumption to increase. In the end, the continuously higher value of e-money transactions can cause inflation. This finding is in line with research conducted by Pebrianti et al. (2018), Daniyanti (2020), and

Table 1. Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-254.3250	103.8053	-2.450019	0.0201
LOGNILAI	12.10374	5.081640	2.381858	0.0235
LOGVOLUME	-15.60085	5.663209	-2.754772	0.0097
LOGJUB	9.057625	9.195305	0.985027	0.3322
LOGKURS	20.24309	8.850916	2.287118	0.0292
R-squared	0.577575			
F-statistic	10.59646			
Prob(F-statistic)	0.000016			

Source: Processed Data, 2024

Rahmayuni (2019) which show that e-money has a positive and significant influence on inflation.

E-Money Transaction Volume: This is the number of transactions using e-money. The regression coefficient of –15,600 shows a negative and significant influence on inflation. The higher the volume of e-money transactions, the lower the inflation rate. The t probability of 0.024 shows the significance of its influence on inflation. So, the volume of e-money transactions has a negative and significant influence on inflation. With e-money, it is easier for people to make transactions. Therefore, the circulation of money in society will increase. This really allows people's consumption to increase. Ultimately, a continuous increase in consumption levels can cause inflation. These findings support Irving Fisher's theory that too much money circulating in society is the cause of inflation. However, with the nominal limit when transacting with e-money, people will be able to control their consumption. This finding is in line with research conducted by Ananda (2021), Yudi (2023), and Soraya et al. (2022) also shows that the volume of e-money transactions has a negative effect on inflation.

Money Supply: Does not show a significant influence on inflation, with a t probability of 0.332 indicating that the money supply does not have a significant influence on inflation growth. This finding is in line with research conducted by Pawer Darasa Panjaitan et al. (2021), Perlambang (2017), and Jumhur et al. (2018), which shows that the money supply has no significant effect on inflation.

Exchange Rate: Has a significant influence on inflation. The regression coefficient is 20.243, which shows a positive and significant influence on inflation. An increase in the exchange rate causes inflation to increase, with a t probability of 0.030 indicating a significant influence on inflation. Depreciation is defined as a decrease in the exchange rate of one currency against another foreign currency. With a depreciation in the exchange rate, the quantity of imported goods can decrease due to an increase in the price of imported goods, while the quantity of export goods can increase due to a decrease in the price of export goods, which ultimately increases inflation. This finding is in line with research conducted by Rumondor et al. (2021), Mahendra (2016), and Susmiati et al. (2021) supports that the exchange rate has a significant effect on inflation.

CONCLUSION

Based on the results and discussions that have been carried out, this research examines the influence of e-money transaction value, e-money transaction volume, money supply, and exchange rate on inflation in Indonesia using monthly data from 2021 to 2023. The research findings show that the transaction value e-money, e-money transaction volume, and exchange rates are proven to have an influence on inflation, while the money supply does not show a significant influence on inflation. Simultaneously, all independent variables—e-money transaction value, e-money transaction volume, money supply, and exchange rate—have an influence on the rate of inflation, so any change in the independent variable can have an impact on the variable dependent. Partially, the value of e-money transactions has a positive and significant influence on inflation; Every increase in the value of e-money transactions will result in an increase in inflation. The e-money transaction value refers to the nominal amount of e-money used.

On the other hand, the volume of e-money transactions shows a negative and significant influence on inflation. Increasing the volume of e-money transactions will reduce the rate of inflation. E-money transaction volume refers to the number of transactions using e-money. Even though e-money makes transactions easier and increases money circulation, increased consumption can affect inflation. The money supply does not show a significant effect on inflation, which is contrary to the initial hypothesis which states that inflation is significantly influenced by the money supply. The exchange rate has a positive and signifi-

cant influence on inflation; every increase in the exchange rate contributes to an increase in inflation. Depreciation of the exchange rate causes the price of imported goods to increase and the price of exported goods to become cheaper, which can simultaneously increase demand from foreign countries and affect inflation. Because the independent variables used in this study do not fully explain the causes of inflation, it is recommended that future research consider additional variables to provide a more comprehensive picture.

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