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Analysis Of Agricultural Sector Growth And Inflation On Farmer Exchange Rate In Indonesia

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ABSTRACT

This study analyzes the effect of agricultural sector growth and inflation on farmer exchange rates in Indonesia. The data used in this research is secondary data and sourced from the Central Bureau of Statistics obtained from 34 provinces in Indonesia. This study uses multiple linear regression Analysis of panel data using the Fixed Effect Model (FEM). The results of this study indicate that: (1) the growth of the agricultural sector has a positive and significant effect on farmer exchange rates, meaning that every one percent increase in agricultural sector growth can increase farmer exchange rates in Indonesia; (2) Agricultural sector inflation has a positive and significant effect on farmer exchange rates, meaning that every one percent increase in agricultural sector inflation can increase farmer exchange rates in Indonesia.

INTRODUCTION

Agriculture is an activity to extract and utilize the results of biological natural resources and is used to produce food, raw materials, industry, and energy source needs, and can manage the environment. Agriculture is an economic sector based on local resources that has a considerable role in the development of a country (Ninh, 2021; Rohne Till, 2022). National economic development is not spared from the agricultural sector, which contributes greatly to the Indonesian economy. Indonesia, as an agricultural country, certainly has abundant natural resources.

The implementation of agricultural development aims to improve the welfare of farmers, but based on the obstacles that occur, it has not been able to increase the income and welfare of farmers (Arham et al., 2020). When viewed by the majority of the Indonesian population who work in the agricultural sector, amounting to 88.43 percent, welfare and society should be guaranteed (Badan Pusat Statistik, 2021).

Based on the regulation of the Minister of Home Affairs Number 137 of 2017 concerning Government Administration Area Codes and Data, it is stated that there are 34 Provinces in

Indonesia. The province is divided into two regions called: the Western Region of Indonesia (KBI) and the Eastern Region of Indonesia (KTI). Over time, the province, divided into two regions, continues to show rapid development (Permana, 2021). Economic growth is the increase in output prices in the long run, emphasizing three aspects: the process, per capita output, and long-term (Canon et al., 2018; J. Jumilah et al., 2021; Sukirno, 2012). The agricultural sector's growth reflects the added value of agricultural sector output as a whole (Bafada, 2020). When the agricultural sector's output increases, it affects the sector's income, which is expected to improve farmers' welfare.

Inflation is closely related to the Farmer Exchange Rate, an economic phenomenon where the price of goods and services rises continuously within a certain period. Inflation can directly affect farmers' exchange rates because inflation is directly related to market prices. When inflation is high, goods and services are even higher. That is, the selling price of agricultural products will increase, but farmers' expenses will be greater and increase. To find out the inflation rate during a certain period can be seen with macroeconomic indicators (Langi et al., 2014; Rahardja, 2008) . These indicators include the Consumer Price Index, Large Trade Price Index, and Implicit Price Index (GDP Deflator). This study uses the calculation of the Implicit Price Index or GDP Deflator of the Agricultural sector by calculating the ratio of nominal GDP and Grill GDP.

Amid the downturn in the Indonesian economy caused by the Covid-19 pandemic, the Farmer Exchange Rate was also affected by this pandemic; the decline in NTP was caused by the decline in the price index received by farmers (It) which is greater than the decline in the price index paid by farmers (Ib). Inflation during the Covid-19 pandemic also increased. Income inequality between 34 provinces in Indonesia is also difficult to contain, caused by differences in natural resources from each region. In addition, the growth of the agricultural sector tends to fluctuate every year; this will impact the Farmer Exchange Rate based on the calculation of contributions from the agricultural sector.

LITERATURE REVIEW

Farmer Exchange Rate

Farmers, in this case, as the driving force of the agricultural sector to increase economic growth, of course, hope to prosper farmers in terms of purchasing power. The instrument used in seeing the purchasing power of farmers is the Farmer Exchange Rate (NTP) (Mulyawan & Fakhruddin, 2022); the Farmer Exchange Rate is a measure of welfare that has been updated since the 1980s.

In conception, NTP measures the exchange power of agricultural commodities produced by farmers against products purchased by farmers for consumption purposes and purposes in agricultural production. NTP measurements are expressed in index form as follows:

$$\mathbf{NTP} = \frac{\boldsymbol{It}}{\boldsymbol{Ib}} \times \mathbf{100}$$

Where :
NTP: Farmer Exchange Rate
It: Price index received by farmers
Ib: Index of prices paid by farmers

Agricultural Sector Growth

According to Sukirno, economic growth is a quantitative measure in describing the development of an economy in a certain year and comparing it with the previous year (A.

Rahman & Sangeran, 2022). This statement is always delivered as a percentage change in national income in the previous year.

According to Boediono, economic growth is a process of long-term increase as a percentage of output growth must be greater than the population, and economic growth will continue (A. G. Rahman et al., 2022). The first factor affecting the Farmer Exchange Rate is economic growth as measured by GDP and the development success rate. Increasing economic growth through GDP indicators will increase the welfare and prosperity of the people (A. Rahman & Sangeran, 2022).

Inflation

Inflation is the continuous rise and fall of the price of goods (Mulyawan & Fakhruddin, 2022). However, when the price of one or two goods increases, it only includes inflation if the increase becomes widespread and increases the majority of the prices of other goods (Boediono, 2010).

METHODS

Analysis Methods

In this study, using multiple linear regression method panel data, panel data combines cross-section data and time series data obtained from data from 34 provinces in Indonesia. Meanwhile, time series data is taken from 2017-2021. Then, the equation is formed from independent and dependent variables as follows:

$$NTPit = a + \beta 1\ PSP + \beta 2\ INF + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots (1)$$

NTP = Farmer Exchange Rate
α_0 = Constant/Intercept
$\beta_{1,2}$ = Partial Regression Coefficient
PSP = Agricultural Sector Growth
INF = inflation
ε = Error
i = Cross Section
t = Time Series

RESULTS

Table 1. Model Selection

Testing	Test	Prob.	Decision
Test Chow	Cross Section F	0.0000***	**FEM (ρ<α)**
Uji Hausman	Cross Section Random	0.0001***	**FEM (ρ<α)**

Source: Processed Products, 2023

Based on the results of previous estimates in Table 1, it can be compared that the model used in this study is a fixed effect model; this is because in the Chow-Test testing stage, it looks that ρ-cross section F is significant at an alpha level of 1% and then in the Hausmant-Test it can be seen that ρ-cross section Random is less than 1% confidence level so in this determination a fixed effect model is used.

Table 2. Multiple Linear Regression Analysis Results

Variable	Coefficient	Prob.
C	2.649.059	0.2316
PSP	0.379087	0.0298
INV	0.548555	0.0000
R-Squared	0.793029	
Adjusted R-Squared	0.737006	
F-Statistics	1.415.559	
Prob(F-Statistic	0.000000	

Information : ***) 1%, **) 5%, *) Significant 10% and NS) Insignificant
Source: Processed Products, 2023

The inference model above can be interpreted in the following sentence:

1. The Farmer Exchange Rate, without being influenced by any independent variable in this research model, is worth 26.49059 percent.
2. The growth of the agricultural sector has a positive effect on the exchange rate of farmers. This means that every increase in Agricultural Sector Growth by 1 percent will increase the Farmer Exchange Rate by 0.379087 percent.
3. Agricultural Sector Inflation Positively Affects Farmer Exchange Rate. This means that every increase in the Implicit Price Index by 1 percent will increase the Farmer Exchange Rate by 0.0548555 percent.

Statistical Hypothesis Testing

Hypothesis testing can use statistical techniques to present test results in a statistically significant way. However, what is related to statistical hypothesis testing is the coefficient of determination of classification R, Statistical Significance Test F, and Partial Test (t-statistical).

a) Coefficient of Determination

This test is intended to show the percentage change in the independent variable in explaining the dependent variable. The R-squared value was used to identify the Coefficient of Determination for this study. This is because the number of independent variables more than two independent variables is more susceptible than two variables, so it is prone to errors in interpreting them. It is known that the R-squared value in Table 2 is 0.793029 or 79.30 percent, so the decision taken is that 79.30 percent of the variables of Agricultural Sector Growth and Agricultural Sector Inflation can explain the variable of Farmer Exchange Rate. At the same time, the remaining 20.70 percent was explained by other variables outside the study.

b) Concurrent Test (F TEST)

The next statistic, intended to analyze the suitability of the model, the f-test statistic, is designed to be a reference for making decisions about whether external variables are included in the model and can describe a linear relationship with internal variables. In table 2, it can be seen that the F-Statistics coefficient value is 14.15559 and ρ-FStatistics (0.0000) > α 0.05. Therefore, it was decided that the independent variables jointly influence the dependent variable.

c) Partial Test

The last test in this study was designed to determine the influence exerted by the independent variable on the dependent variable and how much influence was expressed by the variable.

1. The Effect of Agricultural Sector Growth on Farmer Exchange Rate
   From the results of the analysis that has been carried out, it is known that the Value of the Growth Coefficient of the Agricultural Sector is 0.379087, and the value ρ (Prob) for the variable is equal to 0.0298. If the p-value is compared with the significance level, then the p-value obtained is still smaller than the significant level (10%, 5%, and 1%), so H0 is rejected. Thus, the decision is that the Growth of the Agricultural Sector has a positive and statistically significant effect on the Farmer Exchange Rate during the 2017-2021 period.
2. The Effect of Inflation on the Exchange Rate of Farmers
   From the results of the analysis that has been carried out, it is known that the value of the Inflation Coefficient is 0.548555, and the value of ρ (Prob) for the variable is equal to 0.0000. If the p-value is compared with the significance level, then the p-value. The value obtained is still smaller than the significant level (10%, 5%, and 1%), so H0 is rejected. Thus, the decision is that inflation has a positive and statistically significant effect on the Farmer Exchange Rate during the 2017-2021 period.

Classical Assumption Test

Classical Assumption testing is performed to test whether the regression model used meets the BLUE requirements and the data is not biased.

a) Residual Normality Test

This test aims to identify whether the data used in this study are normally distributed from confounding variables or residual values. This can be known by comparing the alpha level by (1%, 5%, 10%) with the value Jarque-bera obtained from regression results.

Figure 1. Residual Normality Test Results

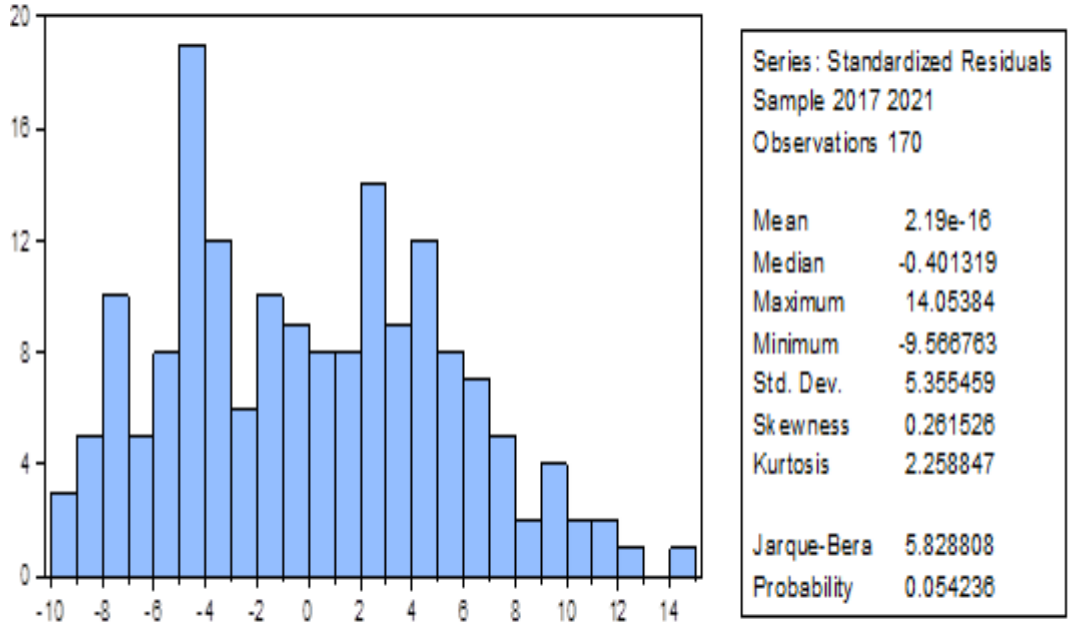

Figure 1 shows that the Jarque-Bera value obtained is 38.21441 with a ρ (Prob) value of 0.054236, which is greater than the alpha level (1%, 5%, 10%). So, it can be stated that the data in this study is not distributed normally.

b) Multicolliniality Test

Some linear relationships (Multicollinearity Detection) can be manifested statistically (VIF) or mathematically (Matrices). This test uses only one of them, namely in the form of statistics (VIF), while in the mathematical form, it is less suitable for panel data. The Vector Inflation Factor (VIF) is done by progressing each independent variable. Where the R2 value is used as the basis for measuring the correlation, the VIF value is as follows:

Table 3. Multicollinearity Test Results

Variable	VIF
C	NA
PSP	1.541619
INV	1.588544

Source: Results output on eviews-10, 2023

Table 3 Test Results show that the value of the VIF of the Two Independent Variables is less than 10 (VIF<10); thus, there is no multicollinearity between independent variables in this research model.

c) Heteroscedasticity Test

Regression models with heteroscedasticity have serious consequences on OLS method estimators because they are no longer BLUE. Therefore, it is very important for us to know whether a model contains elements of heteroscedasticity or not. The Glacier Test is used in this stage of testing, which only compares the values of the absolute residual estimate (RESABS) with Free variables. However, the independent variable shows a value less than the alpha level of 0.05, so it can be concluded to be heteroscedasticity. So, this test was changed to use Robust Least Square regression to overcome the heteroscedasticity problem as follows:

Table 4. Heteroscedasticity Test Results

Variable	Coefficient	Prob.
C	-3.379.884	0.9279
PSP	0.075549	0.8273
INV	0.054031	0.4329

Source: Results output on eviews-10, 2023

The results of the Heteroscedasticity test in Table 4 show that the independent variable in this study gives a value greater than alpha or the confidence level used in this study of 0.05. This means that the estimation of this research model is free of heteroscedasticity problems.

DISCUSSION

After testing the estimation hypothesis in this research model, we can be further examined the Effect of Agricultural Sector Growth and Agricultural Sector Inflation in KBI and KTI. Below are the test results of each independent variable on the Farmer Exchange Rate in 2017-2021.

The Effect of Agricultural Sector Growth on NTP

Based on the results of the analysis conducted in this study, the growth of the agricultural sector has a positive and significant effect on the Farmer Exchange Rate with a coefficient of 0.379087 with value ρ –value as big as 0.0298 < α = (1%, 5%, 10%) in Western and Eastern Indonesia in 2017-2021, This means that any increase in Agricultural Sector Growth can have an influence and can explain in real terms the increase in the Exchange Rate of Farmers in the Western and Eastern Regions of Indonesia during 2012-2021.

This happens because the agricultural sector's growth can positively contribute to farmers' exchange rates. Then, the Growth of the Agricultural Sector shows a large role in the welfare of farmers seen from the added value of goods and services in the agricultural sector. The high growth value of the agricultural sector can cause farmers' income to increase and certainly have an impact on the Farmer Exchange Rate as an instrument to measure the level of farmer welfare. The growth of the agricultural sector is a source of technological improvements that can encourage increased output from the agricultural sector; this can increase the supply of commodities in the agricultural sector.

The results of this study are in line with research conducted by Aulia et al. (2021), which explains the growth of the agricultural sector has a positive and significant effect on the exchange rate of farmers in Indonesia. This means that any increase in contribution from agricultural sector growth can improve the welfare of farmers in Indonesia. The results of the study are contrary to the research conducted by Yilmaz (2018), which illustrates that Economic Growth in Indonesia is no longer in the Agricultural Sector but in the Non-Agricultural sector, which provides a greater role in Economic Growth.

The Effect of Inflation on Farmer Exchange Rates

Based on the results of the research obtained, Agricultural Sector Inflation Has a Positive and Significant Effect on the Farmer Exchange Rate with a Coefficient of 0.548555 percent by value ρ –value as big as 0.0000 < α = (1%, 5%, 10%) in Western and Eastern Indonesia in 2017-2021, meaning that every 1 percent increase in inflation in the agricultural sector can improve farmers' welfare by 0.0548555, this can be explained by the Agricultural Sector Inflation Variable.

The results show that Inflation in the Agricultural Sector can have a positive and significant effect on the Farmer Exchange Rate, in line with research conducted by D. Jumilah (2021). where when there is inflation in the agricultural sector, of course, goods and services in the agricultural sector will increase. This is because production from the agricultural sector is a basic need of the community, so this can increase farmers' income, as seen from the price index ratio received by farmers (it).

This research is contrary to research conducted by Annisa & Chandriyanti (2021), where inflation has a negative and significant effect on the exchange rate of farmers. This is due to high inflation, which can cause people's living costs to increase, and production factors such as fertilizers and workers' wages also increase. The increase in costs can increase the price index that farmers have to pay (ib). In addition, in research conducted by Annisa & Chandriyanti (2021) using the Inflation Indicator, namely the Consumer Price Index, which measures goods and services in the agricultural and non-agricultural sectors, inflation tends to be biased towards non-agricultural goods.

However, this study uses Inflation Indicators, namely the Implicit Price Index of the Agricultural Sector / GDP Deflator of the agricultural sector. According to Theodeores (2014), the

Implicit Price Index is the market's value for goods and services within a certain period of time. Then, the Implicit Price Index is a measurement of the inflation rate, seen from the average price of all goods weighted and actually purchased in the agricultural sector.

CONCLUSION

Based on the results of the Analysis and Discussion on the Growth of the Agricultural Sector and Inflation of the Agricultural Sector on the Exchange Rate of Farmers in Western Indonesia (KBI) and Eastern Indonesia (KTI), it can be concluded as follows: 1) The growth of the Agricultural Sector has a positive and significant effect on the Exchange Rate of Farmers in the Western and Eastern Regions of Indonesia. This means that every increase of 1 percent in agricultural sector growth can increase the exchange rate of farmers. The increase can be explained tangibly; 2) Inflation in the Agricultural Sector Has a Positive and Significant Effect on the Exchange Rate of Farmers in Western and Eastern Regions of Indonesia. This means that every 1 percent increase in inflation in the Agricultural Sector can increase the Farmer Exchange Rate. The increase can be explained in real terms.

Based on the conclusions of the study, several suggestions were put forward that are very helpful in increasing the Exchange Rate of Farmers in Western Indonesia (KBI) and Eastern Indonesia (KTI), namely: 1) The government, in this case, needs to maintain and increase capital assistance in the form of facilities in the Agricultural Sector, so that it can stimulate the public to better utilize technology in increasing productivity in the agricultural sector; 2) The government needs to maintain and increase the selling value of agricultural products. So that farmers can make a profit. Then, the government is expected to encourage a government purchase price policy with the aim of preventing a decrease in the selling price of agricultural products due to decreased production.

LIMITATION

This research has several limitations that cause obstacles and impacts from the results of this study. The limitations contained in this study include the lack of literature from previous studies that examine the relationship between income inequality and farmers' exchange rates, which causes the insignificance of the research results.

In addition, the limited data used in this study makes the results less than optimal, such as difficult to access 30 years of data in each region in Indonesia. Some of the limitations of the study can be recommendations for further studies in the future for better refinement of results.

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