Journal of Applied Business, Taxation and Economics Research (JABTER)
Vol. 5, No. 4, April 2026 (Page: 734-745) P-ISSN 2828-4976
https://doi.org/10.54408/jabter.v5i4.607 E-ISSN 2808-263X

Analysis of Price Fluctuation Factors and Production Costs on The Farmers' Terms of Trade in South Sumatra Province, 2010–2024

Moh. Saiful Anam[1]*, Joko Hadi Susilo[1], Hartiningsih Astuti[1], Endang[1], Putri Autika Arifin[1]

[1 *]Development Economics Study Program, Economics, Bojonegoro University, Indonesia

Corresponding author: anamsaiful9119@gmail.com[1*]

Keywords **:** *Farmer Exchange Rates, Price Fluctuations, Production Costs, Farmer Welfare, South Sumatra.*

Abstract: This research aims to analyze the influence of price fluctuations and production costs on Farmer Exchange Rates (NTP) in South Sumatra Province during the 2010–2024 period. NTP is used as an indicator of farmer welfare which reflects the comparison between the price index received by farmers and the price index paid by farmers. This research uses a quantitative approach with multiple linear regression methods and utilizes secondary time series data sourced from the Central Statistics Agency. The price fluctuation variable is proxied through the Price Index Received by Farmers, while production costs are proxied through the Price Index Paid by Farmers. The research results show that price fluctuations have a positive and significant effect on NTP, while production costs have a negative but not significant effect. Simultaneously, both variables have a significant effect on NTP. These findings indicate that agricultural commodity price stability has an important role in improving farmer welfare. Therefore, price stabilization policies and controlling production costs need to be strengthened in order to maintain the sustainability of farmer welfare in South Sumatra Province.

Introduction

The agricultural sector plays a strategic role in Indonesia's economy, particularly in supporting food security and rural employment. However, farmer welfare remains a persistent issue, as reflected in the fluctuating Farmer Exchange Rate (NTP) in several regions, including South Sumatra Province. In some periods, NTP values fall below 100, indicating that farmers' income is lower than their expenditure.

This phenomenon is closely related to two main factors: fluctuations in agricultural

https://equatorscience.com/index.php/jabter

Journal of Applied Business, Taxation and Economics Research (JABTER) is licensed under an Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

commodity prices and increasing production costs. Price volatility is influenced by seasonal patterns, climate change, and market inefficiencies, while rising production costs are driven by increasing input prices such as fertilizers, seeds, and labor.

Previous studies (Oktaviani et al., 2021; Hidayatullah, 2023) show that price fluctuations significantly affect NTP, while other studies (Prasetyo, 2017; Riyadh, 2015) emphasize the negative impact of production costs. However, most studies are limited to short observation periods and specific regions.

Therefore, this study aims to analyze the effect of price fluctuations and production costs on the Farmer Exchange Rate in South Sumatra Province using long-term time series data (2010–2024). This research contributes by providing more comprehensive empirical evidence and supporting policy formulation related to farmer welfare.

One of the indicators used to measure the level of farmers' welfare is the Farmer Exchange Rate (NTP), which is a comparison between the price index received by farmers and the price index paid by farmers Keumala & Zainuddin (2018) . The NTP reflects farmers' purchasing power as well as their ability to cover production costs and household consumption needs. The NTP value below 100 indicates that farmers' income is relatively smaller than their expenses, thus indicating a decline in welfare.

South Sumatra Province is one of the regions with considerable agricultural potential, both in terms of land area and commodity diversity. However, the dynamics of the agricultural sector in this region are still faced with various problems, especially fluctuations in the price of agricultural products and increasing production costs. Fluctuations in agricultural commodity prices are generally influenced by seasonal factors, changes in market demand, climatic conditions, and the length of the distribution chain which causes a weak bargaining position of farmers Irawan et al., (2020). The price instability has a direct impact on farmers' income and has the potential to reduce the NTP.

On the other hand, the cost of agricultural production shows a tendency to increase over time. The increase in the price of production inputs such as fertilizers, seeds, pesticides, and labor is not always balanced with the increase in the selling price of agricultural products, so that farmers' profit margins are increasingly depressed Prasetyo (2017). This condition places farmers in a vulnerable position, particularly when price fluctuations occur simultaneously with rising production costs

Theoretically, fluctuations in output prices affect farmers' income through market mechanisms, while production costs affect the level of profit and efficiency of farming businesses Sukirno (2008). If these two factors are not controlled, it will be difficult for farmers to improve and potentially reduce investment interest in the agricultural sector in the long term Hidayat (2022). This is reflected in the development of the Farmer Exchange Rate in South Sumatra Province during the period 2010–2024 which shows a fluctuating pattern, with several years recording an NTP value below 100.

A number of previous studies have shown that fluctuations in prices and production costs are the main factors that affect NTP in various regions in Indonesia Oktaviani et al.,(2021). However, empirical studies that specifically examine the influence of these two variables on NTP in South Sumatra Province with long-term data coverage are still relatively limited. In fact, the characteristics of agricultural structures and market conditions in each region can result in different NTP responses.

This study arises from the instability of the Farmer Exchange Rate (NTP) in South Sumatra during the period 2010–2024, where in several years the NTP value fell below 100. This condition indicates that farmers' income was lower than their expenditure, reflecting declining welfare. This fluctuation is closely related to two major issues: unstable agricultural

P-ISSN 2828-4976
E-ISSN 2808-263X

commodity prices and increasing production costs. Price volatility is often influenced by seasonal factors, climate change, market inefficiencies, and long distribution chains, while rising production costs are driven by increasing prices of inputs such as fertilizers, seeds, pesticides, and labor.

This issue is important to study because price instability and production cost pressure directly affect farmers' purchasing power and income sustainability. If these problems are not properly addressed, they may reduce farmers' incentives to produce and weaken the agricultural sector in the long term. Therefore, understanding the determinants of NTP is crucial for designing effective agricultural policies.

Several previous studies have examined the determinants of Farmer Exchange Rate (NTP). For instance, Oktaviani et al. (2021) found that price fluctuations significantly influence NTP in Indonesia. Similarly, Hidayatullah (2023) emphasized the role of commodity prices in determining farmers' welfare. Meanwhile, Prasetyo (2017) and Riyadh (2015) highlighted that production costs negatively affect farmer income and competitiveness. However, most prior studies are limited to short observation periods or specific regions**,** and there is still limited empirical evidence that simultaneously analyzes price fluctuations and production costs using long-term time series data in South Sumatra Province.

This research fills the gap by analyzing the effect of price fluctuations and production costs on the Farmer Exchange Rate in South Sumatra Province over a longer observation period (2010–2024). This study provides a more comprehensive understanding of how these two factors interact in influencing farmer welfare.

Based on the background described above, the research questions in this study are:

1. Does price fluctuation affect the Farmer Exchange Rate in South Sumatra Province?
2. Do production costs affect the Farmer Exchange Rate in South Sumatra Province?
3. Do price fluctuations and production costs simultaneously affect the Farmer Exchange Rate?

Based on price theory, an increase in output prices will increase farmers' income and purchasing power. Therefore :

H1: Price fluctuations have a positive effect on NTP.

H2: Production costs have a negative effect on NTP.

H3: Price fluctuations and production costs simultaneously affect NTP.

The contribution of this study lies in:

1. Providing empirical evidence using long-term time series data (2010–2024).
2. Enriching literature on agricultural economics, especially related to NTP determinants.
3. Offering policy recommendations for price stabilization and production cost control to improve farmer welfare.

Farmer's Exchange Rate

The Farmer Exchange Rate (NTP) is an economic indicator used to measure the level of farmers' welfare through a comparison between the price index received by farmers and the price index paid by farmers. The Central Statistics Agency defines NTP as the ratio between the Price Index Received by Farmers (IT) and the Price Index Paid by Farmers (Ib) expressed in the form of percentages. The price index received reflects the income of farmers from agricultural production, while the price index paid reflects the farmers' expenditure on household consumption and production costs.

Conceptually, NTP functions as a proxy for farmers' purchasing power. An NTP value above 100 indicates that farmers' income is greater than their expenditure, thus reflecting surplus

conditions and improved welfare. On the other hand, an NTP below 100 indicates a deficit that has implications for a decline in farmers' welfare Wijaya (2018). Therefore, NTP fluctuations are highly sensitive to changes in agricultural output prices and production input costs.

In the context of the horticulture subsector, NTP has characteristics that are more volatile than other agricultural subsectors. This is due to the perishable nature of horticultural commodities, depending on the season, and vulnerable to market price volatility Irawan et al., (2020). This condition makes horticulture NTP an important indicator in evaluating the sustainability of the welfare of horticultural farmers in agrarian areas such as South Sumatra Province.

Price Theory and Price Fluctuations

Price theory in microeconomics explains that the price of a commodity is formed through the interaction between demand and supply in the market. According to Sukirno (2008), price changes occur when there is an imbalance between the number of goods demanded and the number of goods offered. In the agricultural sector, especially horticulture, the price mechanism often does not work perfectly due to the limitations of market information, the length of the distribution chain, and the dominance of intermediary traders.

Price fluctuations are defined as price changes that occur unsteadily in a given period. Karim & Firmansyah (2025) stated that price fluctuations are a phenomenon that commonly occurs in agricultural commodities due to the influence of seasonal factors, weather conditions, distribution disruptions, and changes in consumer demand. In horticultural commodities, price fluctuations tend to be sharper because production is seasonal and cannot be stored in the long term.

Fluctuations in the price of agricultural output have direct implications for farmers' incomes. A decrease in the selling price of horticultural products will reduce the price index received by farmers, which in turn suppresses the exchange rate of farmers. On the other hand, price increases do not necessarily improve farmers' welfare if they are not followed by production cost efficiency Hidayatullah (2023). Thus, price stability is a key factor in maintaining the sustainability of horticultural farmers' income.

Production Cost Theory

The theory of production economics describes the relationship between inputs and outputs in the production process. Production costs are all expenses incurred by producers to obtain production factors used in producing goods or services Sukirno (2008). In horticultural farming, production costs include the cost of seeds, fertilizers, pesticides, labor, as well as the cost of land cultivation and shrinkage of agricultural equipment.

Puspita (2025) Classify production costs into three main components, namely direct raw material costs, direct labor costs, and overhead costs. In the agricultural sector, most production costs are variable and are greatly influenced by changes in production input prices. Rising prices of fertilizers, pesticides, and labor wages will increase the price index paid by farmers.

The increase in production costs that is not offset by the increase in the selling price of agricultural products will reduce farmers' profit margins. Prasetyo (2017) emphasized that high production costs are one of the main causes of low competitiveness and welfare of farmers in rural areas. Therefore, production costs have a negative relationship with farmers' exchange rates, especially in the input-intensive horticulture subsector.

P-ISSN 2828-4976
E-ISSN 2808-263X

Research Method

1. The Effect of Price Fluctuations on NTP

The results show that price fluctuations have a positive and significant effect on the Farmer Exchange Rate (NTP), as indicated by a coefficient of 0.647 and a significance value below 0.05. This finding suggests that an increase in output prices directly improves farmers' income and purchasing power. According to price theory (Sukirno, 2008), higher output prices increase producer surplus, which ultimately enhances farmer welfare.

This result is consistent with previous studies such as Oktaviani et al. (2021) and Hidayatullah (2023), which found that commodity price dynamics significantly influence NTP. The increase in agricultural commodity prices leads to a higher price index received by farmers (It), which strengthens their exchange rate. Therefore, price stability policies are essential to maintain sustainable farmer welfare.

This study uses a quantitative approach with multiple linear regression to analyze the effect of price fluctuations and production costs on the Farmer Exchange Rate (NTP) in South Sumatra Province. This approach was chosen because it is able to explain the causal relationship between variables objectively based on time series data.

The data used is in the form of annual time series secondary data for the 2010-2024 period sourced from the Central Statistics Agency. NTP is determined as a dependent variable, while price fluctuations and production costs are independent variables proxied by the Farmer Received Price Index (It) and the Farmer Price Index (Ib), respectively, according to the NTP concept as an indicator of farmer welfare.

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + e$$

Data analysis was carried out through descriptive statistics, classical assumption tests, and hypothesis testing. Classical assumption tests include normality, multicollinearity, heteroscedasticity, and autocorrelation to ensure the fulfillment of the BLUE criteria. Hypothesis testing was carried out using t-test and F-test, with all data processing carried out using EViews software.

2. The Influence of Production Costs on NTP

The results indicate that production costs have a negative but not significant effect on the Farmer Exchange Rate (NTP), with a coefficient of -0.440. This implies that increases in production costs tend to reduce farmers' income, although the effect is statistically insignificant in this study. According to production theory (Sukirno, 2008), rising input costs reduce profit margins and weaken producer welfare. This finding partially supports previous research by Prasetyo (2017) and Riyadh (2015), which stated that production costs negatively affect farmer welfare. However, the insignificant result in this study may be due to relatively stable variations in production costs during the observation period. This indicates that price fluctuations play a more dominant role compared to production costs in influencing NTP.

3. The Simultaneous Effect of Price Fluctuations and Production Costs

The F-test results show that price fluctuations and production costs simultaneously have a significant effect on the Farmer Exchange Rate (NTP), with a probability value below 0.05. This indicates that both variables jointly determine farmer welfare in South Sumatra Province. The coefficient of determination (R^2 = 0.64) further confirms that 64% of NTP variation is explained by these variables. This finding aligns with Irawan et al. (2020) and Keumala & Zainuddin (2018), who emphasized that farmer welfare is influenced by both output prices

and input costs. The interaction between price volatility and production cost pressure creates income uncertainty for farmers. Therefore, integrated policies focusing on price stabilization and cost efficiency are necessary to improve farmer welfare.

Result and Discussion

Descriptive Statistical Test

Descriptive statistical analysis is used to describe the characteristics of research variables based on mean, maximum, minimum, and standard deviation values.

Table 1. Decryptive Statistical Analysis Test

	N	Minimum	Maximum	Red	Std. Deviation
Price Fluctuations (x1)	15	96.03	151.59	125.31	17.572
Production Cost (X2)	15	105.28	137.88	121.87	9.551
Farmer's Exchange Rate (Y)	15	88.90	116.48	102.84	9.552

Source: Data Processing Results, 2025

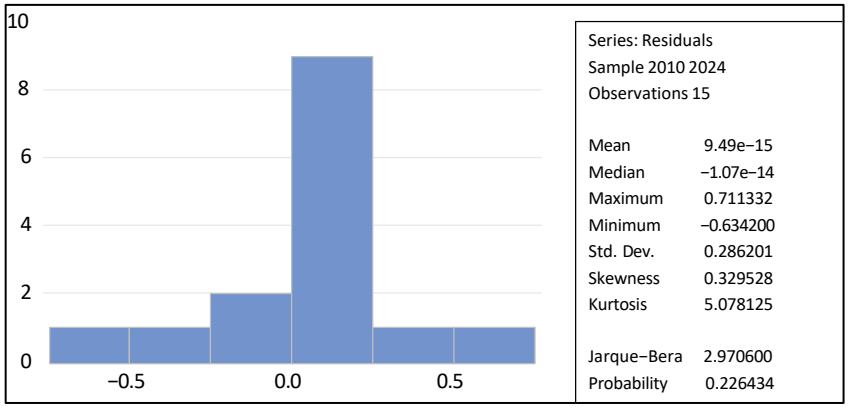
Descriptive statistical analysis was used to describe the characteristics of price fluctuations (X1), production costs (X2), and Farmers' Exchange Rate (Y) in South Sumatra Province for the period 2010–2024. The variable price fluctuation has an average of 125.31 with relatively high variation, reflecting the instability of agricultural commodity prices that has the potential to affect farmers' incomes. Production costs showed an average of 121.87 with a more stable variation, although the upward trend remained under pressure due to rising agricultural input prices. Meanwhile, the Farmers' Exchange Rate has an average of 102.84 which indicates that the welfare condition of farmers is relatively balanced, but the minimum value below 100 indicates a period of decline in welfare. Overall, these results confirm that price fluctuations have a more dominant role than production costs in influencing the movement of NTP during the study period.

Classic Assumption Test

Normality Test

Normality tests are used to find out whether variables in the regression model are normally distributed. In this study, the one-way Kolmogorov–Smirnov test was used with a significance value criterion > 0.05 indicating normally distributed data, while < 0.05 indicated the opposite, and the test was performed using EViews 12.

Table 2. Normality Test



Source: E-Views Data Processing Results 12 (2025)

P-ISSN 2828-4976
E-ISSN 2808-263X

Based on Figure 4.1, it can be seen that the significance value of Jarque-Bera is 0.226 where this value is greater than 0.05 so that it can be concluded that the data in this study is distributed normally.

Multicollinearity Test

The multicollinearity test aims to identify the presence of high correlations between independent variables in multiple linear regression models that can interfere with parameter estimation. The test was conducted using Variance Inflation Factor (VIF) and tolerance values, with the criteria of VIF < 10 and tolerance > 0.10 indicating that multicollinearity did not occur, and all tests were conducted using EViews 12.

Table 3. Multicollinearity Test

Variable	Coefficient Variance	Centered VIF
X1	0.05	6.64
X2	0.19	6.64

Source: E-Views Data Processing Results 12 (2025)

Based on Table 3, it can be seen that the VIF value of variables X1 and X2 is 6.64 where this value is greater than 0.10 and less than 10, so it can be concluded that the data in this study is free from symptoms of multicollinearity.

Heteroscedasticity Test

The heteroscedasticity test aims to detect residual variance dissimilarity in the regression model Gujarati & Porter (2015). The test was carried out using the White test with the Prob criteria. Chi-Square: a significant value of > 0.05 indicates no heteroscedasticity, while < 0.05 indicates the presence of symptoms of heteroscedasticity, and the entire analysis was performed using EViews 12.

Table 4. Heteroscedasticity Test

F-statistic	1.50	Prob. F	0.28
Obs*R-squared	6.82	Prob. Chi-Square	0.23

Source: E-Views Data Processing Results 12 (2025)

Based on Table 4., the value of Sig Prob can be seen. Chi-Square is 0.23 where this value is greater than 0.05, meaning that the data in this study is free from heteroscedasticity symptoms.

Autocorrelation Test

The autocorrelation test aims to detect the presence of residual correlations between periods in linear regression models. The test was carried out using the Breusch-Godfrey LM Test, where the model is autocorrelated free if the p-value of Obs*R-Squared > 0.05. The entire analysis was carried out with EViews 12.

Table 5. Autocorrelation Test

F-statistic	0.140	Prob. F	0.870
Obs*R-squared	0.411	Prob. Chi-square	0.814

Source: E-Views Data Processing Results 12 (2025)

Based on Table 5, it can be seen that the value of Prob. The Obs*R-Squared is 0.814 where this value is greater than 0.05, meaning that the data in this study is free from autocorrelation symptoms.

Multiple Linear Regression Model Estimation

After the model meets the classical assumptions, estimates are made using multiple linear regression with the following equations:

Table 6. Multiple Linear Regression Test Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	75.38156	28.72146	2.624573	0.0222
X1	0.647471	0.240806	2.688766	0.0197
X2	-0.440390	0.4432028	-0.994044	0.3398

R-squared	0.6458	Mean dependent var	102.8463
Adjusted R-squared	0.5867	S.D. dependent var	9.551902
S.E. of regression	4.1407	Akaike info criterion	6.6445698
Sum squared resid	452.4924	Schwarzcriterion	6.786208
Log likelihood	-46.83448	Hanna-Quinn criter	6.643089
F-statistic Prob(F-statistic)	10.93744 0.001976	Durbin-Watson stat	1.410377

Source: E-Views Data Processing Results 12 (2025)

This study analyzes the effect of price fluctuations (X_1) and production costs (X_2) on the exchange rate of horticultural farmers (Y) in South Sumatra for the period 2010–2024 using multiple linear regression with E-Views 12. With the following equation model:

$$Y = 75.38 + 0.64\ X1 - 0.44\ X2 + e\ ,\ or$$

Farmer's Exchange Rate = 75.38 + 0.64 Price Fluctuation – 0.44 Production Cost

The results of the regression estimation showed a positive constant (C) of 75.38 (significant 0.022), which indicates that if the price and production cost fluctuations are zero, the NTP remains at 75.38. Price fluctuations (X_1) have a significant positive effect on the NTP with a coefficient of 0.647 (significant 0.020), meaning that every increase in one unit of price fluctuation increases the NTP by 0.647 units. In contrast, the cost of production (X_2) has a negative coefficient of -0.440 (insignificant 0.340), so it has no significant effect on NTP.

Model fit is indicated by R-squared 0.646 and Adjusted R-squared 0.587, which means that 64.6% of NTP variations are explained by price fluctuations and production costs. A significant F-test (Prob(F) = 0.002) confirms that the model is feasible to use, with a Durbin-Watson of 1.410. The discussion shows that price fluctuations are the main factor affecting the NTP, in line with the findings Oktaviani et al., (2021) and Hidayatullah (2023), while the cost of production is insignificant, likely due to its relatively small variation Ransun (2016). These findings confirm the need for price stabilization policies and production input subsidies to maintain the welfare of horticultural farmers.

P-ISSN 2828-4976
E-ISSN 2808-263X

Hypothesis Test
T Test

Table 7. T Test Results

Variable	Coefficient	t-Statistic	Prob.
C	75.38	2.62	0.02
Price Fluctuations (x1)	0.64	2.68	0.01
Production Cost (X2)	-0.44	-0.99	0.33

Source: E-Views Data Processing Results 12 (2025)

Based on the t-test with a t-table of 1.75, the Price Fluctuation (X_1) has a t-calculation of 2.68 > t-table and a probability of 0.01 < 0.05, thus having a significant effect on the Farmers' Exchange Rate of the horticultural subsector. In contrast, the Production Cost (X_2) with a t-calculation of 0.98 < t-table and a probability of 0.33 > 0.05 had no significant effect on the NTP.

Test F

Table 8. Test Results F

F- statistic	10.93
Prob.	0.00

Source: E-Views Data Processing Results 12 (2025)

With an F-value of 10.93 and a p-value of 0.00 (<0.05), Price Fluctuations (X_1) and Production Costs (X_2) simultaneously have a significant effect on the Farmer's Exchange Rate of the horticulture subsector, so that the two variables together explain the variation in the NTP in the regression model.

Coefficient of Determination Test (R2)

Table 9. R2 Test Results

R-squared	0.64
Adjusted R-squared	0.58

Source: Data Processing Results, 2025

Based on the table above, the Adjusted RSquare value is 0.58. This value states that the ability of the free variable to be able to describe the bound variable is 58%, while the remaining 42% can be explained by other variables outside of this study variable.

The Effect of Price Fluctuations on the Exchange Rate of Horticultural Farmers Development

Price fluctuations are one of the main determinants of the welfare of horticultural farmers in South Sumatra Province, which is reflected in the Horticultural Farmers Exchange Rate (NTPH) as an indicator of farmers' ability to meet consumption needs and production costs. Changes in horticultural commodity prices influenced by demand-supply dynamics, weather conditions, and distribution inefficiencies have a direct impact on farmers' real income and purchasing
power.

BPS South Sumatra data shows that the NTPH fluctuates and tends to decrease from 115.72 in 2010 to 91.41 in 2024, which indicates increasing economic pressure on horticultural farmers due to price instability and high distribution costs (BPS South Sumatra, 2025). These findings are in line with research Fahlevi (2023) and Rizki (2025) which shows that fluctuations in the price of horticultural commodities have a significant effect on NTPH,

although the direction and magnitude of the influence differ between commodities.

Theoretically, price fluctuations reflect market uncertainty that increases the risk of farming, especially for farmers with limited access to technology and institutions Mamilianti (2020). Therefore, price stabilization through government policies, distribution efficiency, and strengthening marketing institutions are important strategies to maintain the exchange rate and welfare of horticultural farmers in South Sumatra.

The Effect of Production Costs on the Exchange Rate of Horticultural Farmers

Production costs are a fundamental factor that affects the welfare of horticultural farmers, as reflected in the Farmer Exchange Rate (NTP). In the horticulture subsector, production costs include expenses for main inputs such as seeds, fertilizers, pesticides, labor, and crop distribution, so that the increase in costs that is not offset by the increase in selling prices will reduce farmers' real incomes.

The results of the study show that production costs have a negative and significant effect on horticultural NTP in South Sumatra Province for the period 2010–2024. These findings indicate that the increase in input costs cannot be fully transmitted to the output price, thus increasing the price index paid by farmers (Ib) faster than the price index received by farmers (It) and ultimately lowering the NTP.

Theoretically, this condition is in line with the theory of production which asserts that the cost structure and input efficiency greatly determine the manufacturer's profit level Sukirno (2008). These results are also consistent with the findings Prasetyo (2017) and Riyadh (2015) which states that high production costs are the main factors that suppress the welfare and NTP of horticultural farmers.

Dependence on production inputs from outside the region and the weak bargaining position of farmers reinforce the negative impact of the increase in production costs on NTP. Therefore, controlling production costs through input subsidies, increasing the efficiency of farming businesses, and strengthening farmers' access to technology and markets is an important strategy in improving the welfare of horticultural farmers.

The Effect of Price and Production Cost Fluctuations on the Exchange Rate of Horticultural Farmers

Simultaneously, fluctuations in prices and production costs have a significant effect on the Farmer Exchange Rate (NTP) of horticulture in South Sumatra Province, which confirms that the welfare of farmers is simultaneously affected by the dynamics of output prices and input cost pressures. The interaction of these two factors creates income uncertainty, especially when price volatility is unable to keep pace with the increase in production costs, so that the NTP in some periods is below 100 and reflects a decline in farmers' welfare.

These findings are in line with Hidayatullah (2023) and Keumala & Zainuddin (2018) which states that the combination of price fluctuations and high production costs is the main determinant of the decline in NTP, and is reinforced by the Irawan et al., (2020) which highlights the role of marketing inefficiencies and the length of the distribution chain. Thus, improving the welfare of horticultural farmers requires integrated policies that include price stabilization, production cost control, and improvement of the agricultural product marketing system.

P-ISSN 2828-4976
E-ISSN 2808-263X

Conclusion

Based on the results of the analysis, price fluctuations have a positive and significant effect on the Farmer Exchange Rate (NTP) in South Sumatra Province for the period 2010–2024, which shows that output price dynamics are the dominant factor in determining the welfare of farmers through a direct influence on real income and purchasing power. On the other hand, production costs have a negative but insignificant effect on NTP, indicating that input cost pressures are relatively weaker than the effects of price fluctuations.

Simultaneously, fluctuations in prices and production costs have a significant effect on the NTP, which confirms that farmers' welfare is determined by the interaction between changes in output prices and input costs. The value of the determination coefficient showed that both variables were able to explain the NTP variation quite strongly, while the rest were influenced by other factors outside the study model.

Acknowledgement

Based on the findings of the research, local governments need to prioritize policies to stabilize agricultural commodity prices through distribution chain control, strengthening market information systems, and developing marketing institutions to improve farmers' bargaining positions and maintain income sustainability in South Sumatra Province. On the other hand, controlling production costs is still needed through strategic input subsidies, increasing the efficiency of farming businesses, and the use of productive and cost-effective agricultural technology so that the price index paid by farmers can be reduced without reducing productivity.

Further research is suggested to include additional variables, such as land area, productivity, access to credit, and subsidy policies, as well as to use a more dynamic analytical approach to gain a more comprehensive understanding of the determinants of the Farmer's Exchange Rate in the long term.

References

Fahlevi, R. (2023). *Factors Affecting the Exchange Rate of Horticultural Subsector Farmers and Forecasting of the Exchange Rate of Horticultural Subsector Farmers in Jambi Province Using the Arima Box-Jenkins Method*.

Hidayat, K. (2022). Analysis of the exchange rate of organic rice farmers in Brenjonk village, Penanggungan village, Trawas district, Mojokerto regency. In *2UPN Veteran*.

Hidayatullah, T. (2023). Empirical Analysis of Oil Palm Production on the Welfare Level of Farmers. *Journal of Budget: State Financial Issues and Problems*, *8*(1), 156–175.

Irawan, E., Arif, S., Hakim, A. R., Fatmahanik, U., Fadly, W., Hadi, S., Pertiwi, F. N., Fauziah, H. N., Santoso, L., Pahlevi, F. S., Hidayati, N., Noviana, L., Ajhuri, K. F., & Aini, S. (2020). *Higher Education During the Pandemic: Transformation, Adaptation, and Metamorphosis Welcoming the New Normal*. Zahir Publishing.

Karim, H. A., & Firmansyah, F. (2025). Factors Affecting Grain Price Fluctuations in Polewali Mandar Regency. *AGROVITAL: Journal of Agricultural Sciences*, *10*(2), 216–221.

Keumala, C. M., & Zainuddin, Z. (2018). Indicators of farmer welfare through the farmer exchange rate (NTP) and sharia financing as a solution. *Economica: Journal of Islamic Economics*, *9*(1), 129–149.

Mamilianti, W. (2020). Farmers' perception of information technology and its influence on farmers' behavior on potato price risk. *Agrippa*, *14*(2), 125–139.

Oktaviani, S., Rofatin, B., & Nuryaman, H. (2021). Factors Affecting the Exchange Rate of Horticulture Subsector Farmers in Indonesia in 2014-2018. *Agristan Journal*, *3*(1), 44–53.

Prasetyo, W. (2017). The Double Paradox of Tobacco Farmers' Production Costs (Phenomenological Study on Tobacco Farmers in Jember Regency). *Journal of Economics and Business*, *20*(1), 67–82.

Puspita, D. I. (2025). Analysis of the calculation of HPP (cost of production) using the full costing method at Cv. Eka Jaya Tabalong. *JAPB*, *8*(2), 2182–2193.

Ransun, K. M. (2016). The Effect of Quality Costs and Production Costs on Product Quality Improvement at Manado Printing Trinity. *Journal of Scientific Efficiency Periodicals*, *16*(4).

Riyadh, M. I. (2015). Analysis of the Exchange Rate of Food Crop Commodity Farmers in North Sumatra. *Journal of Economics and Public Policy*, *6*(1), 17–32.

Rizki. (2025). The Influence of Food Crop Farmers and Horticultural Farmers on the Exchange Rate of Farmers in South Sulawesi Province. *Nusa Putra Journal of Technological Engineering*. Https://Api.Semanticscholar.Org/Corpusid:281694700

Sukirno, S. (2008). *Microeconomics* (Third). Rajagrafindo Persanda.

Wijaya, R. A. (2018). *Determinants of the Exchange Rate of Farmers in Provinces on the Island of Sumatra for the Period 2010-2015 Thesis*. Uin Sunan Kalijaga Yogyakarta.