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Analysis of Vertical Integration in the Rice Market in West Nusa Tenggara Province

Tri Yuliana Lopes[1], Suparmin [2,] Dwi Praptomo Sudjatmiko[2], Muhamad Siddik[2], Taslim Sjah[2].

[1] Agribusiness Master's Program, Agriculture Faculty, University of Matara, Mataram, Indonesia.

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Abstract: **The objectives of this research are (1) To analyze vertical market integration in West Nusa Tenggara Province; (2) To analyze the price transmission of unhusked rice (GKP) at the producer level to rice prices at the consumer level in West Nusa Tenggara Province; (3) To analyze the price disparity between rice and unhusked rice in West Nusa Tenggara Province; (4) To analyze market efficiency at the provincial level in West Nusa Tenggara Province. The method used in this research is the quantitative descriptive method. The unit of analysis in this study is rice marketing in the Province of West Nusa Tenggara. The data sources used in this research are secondary time series data. Data was collected by obtaining it from related agencies, in the form of time series or secondary data which includes monthly data on rice prices at the producer and consumer levels in the Province of West Nusa Tenggara from 2016-2023. The results of the study show that the vertical market integration of rice in the Province of West Nusa Tenggara can be said to be weak in the short term because the IMC value is 8.3 > 1. In the long term, there is also weak market integration because the d2 value (the coefficient of the current and previous rice price variable) is 0.00 < 0.05. With weak market integration occurring in the short and long term, perfect market efficiency has not yet been achieved. The price transmission elasticity from producers (unhusked rice) to consumers (rice) is 0.549% < 1, meaning the elasticity is inelastic. The price transmission elasticity from consumers (rice) to producers (unhusked rice) is 1.175% > 1, meaning the transmission elasticity is elastic. In general, the disparity between rice prices and the prices of dry harvested unhusked rice (HGKP) in the Province of West Nusa Tenggara during the 2016-2023 period was relatively constant, but for the January-April period (the first planting season), the price disparity was relatively high compared to other months.**

Keywords: **Market Integration, Price, Transmission Elasticity, Price Disparity, Market Efficiency, IMC (Index of Market Connection).**

I. INTRODUCTION

West Nusa Tenggara is one of the provinces known as a rice producer. Rice plays a very strategic role as a commodity. Due to this role, the government takes the necessary integrated steps by formulating rice-related policies through Presidential Regulation (PERPRES) Number 125 of 2022 on the Implementation of Government Food Reserves. This regulation states that rice is one of the commodities included in the Government Food Reserves (CPP). The state-owned enterprise BULOG is assigned to manage the CPP, which includes rice, corn, and soybeans. One of its objectives is to safeguard rice prices at both the producer and consumer levels, considering the Government Purchase Price (HPP).

The price of rice in West Nusa Tenggara Province continues to fluctuate, with significant price differences between traditional markets and follower markets. This price disparity necessitates the need for information on price changes occurring in the main market to be communicated to follower markets. If this price information is not accurately conveyed, retail traders can easily increase prices at the consumer level.

If the market mechanism is in control of determining prices, price instability occurs. The issue with agricultural products, particularly rice, is the presence of lean seasons (undersupply) and harvest seasons (oversupply). Rice prices increase sharply during lean seasons, which burdens consumers. Meanwhile, during harvest seasons, the price of unhusked rice drops drastically, which burdens producers/farmers. The constant fluctuation in rice prices creates a problem, thus necessitating a study on price integration analysis between producer and end-consumer markets for organic rice (Nurmalina, 2017).

Market integration is a term used to identify the phenomenon of goods and services markets experiencing rises or falls in the prices of traded products. Market integration is also defined as a measure that indicates the degree of price movements occurring in a reference market, which will later cause changes in follower markets. Market integration is achieved if there is the same, adequate market information, is quickly transmitted to other markets, and a positive relationship exists between prices in different markets. Market integration can occur intentionally, usually as efforts made by the government to implement certain strategies as a way to control the direction of the economy (Shodhganga, 2019). Market integration can also refer to geographical conditions that will affect the prices of traded goods and services. Market integration can also be caused by shifts in demand and supply factors, which will later impact several markets. Market integration can occur in two or more markets, leading to changes or shifts in other markets with a focus on a particular product.

Meanwhile, market integration can be distinguished into two types based on market relationships: spatial market integration and vertical market integration. Spatial market integration is defined as the extent of a change in prices in one market that causes proportional price changes in other markets. A market can be said to be spatially integrated with another market if there is trade between the two markets, and the price in the consumer area is equal to the price in the producer area plus the transportation costs needed to move goods from the producer area to the consumer area. On the other hand, vertical market integration refers to the degree of interrelation between one marketing institution and another within a marketing chain (Reni, 2018).

A market can be said to be well integrated if the price at one marketing institution can be transmitted to other marketing institutions within a marketing chain. Vertical price linkage is often associated with the structure, behavior, and performance of a market. The extent of price changes that can be transmitted at each marketing chain can serve as an important indicator to measure the strength of a market (Carolina, 2016).

The implementation of price stabilization policies will be more effective in integrated markets compared to non-integrated markets. In integrated markets, the impact of government intervention is transmitted to other markets, allowing the implementation of price policies to be carried out at a low cost. Market integration can be defined as the extent to which the price formation of a commodity at a certain marketing institution level is influenced by prices at other institution levels. A well-integrated market is an efficient market because information can be transmitted effectively. This market integration can be observed based on the price transmission elasticity value; if the price transmission elasticity value is equal to one, it means that the price difference between the producer and consumer levels is only differentiated by a fixed marketing margin, thus being transmitted perfectly and said to be well integrated (Lestari Adi Putra, 2016).

Price transmission analysis is the change in the price of a good at one market level in response to the change in the price of that good at another place/market level (Hasyim and Priyadi, 2023). Price transmission is the comparison of the percentage change in price at the retailer/marketer/consumer level (Y) with the price change at the farmer/producer level (X). It aims to determine the extent of the price change at the retailer/marketer/consumer market (Y) due to a one-unit price change at the farmer/producer market (X). This change/relationship can indirectly estimate the effectiveness of market information, the market structure, and the effectiveness of the marketing system.

The price transmission values resulting from several previous studies show values less than 1. This indicates that price changes at the consumer level are higher than the price changes at the producer level. The elasticity values of agricultural commodity transmission being less than one mean that, with constant input volume and price, the relative price changes at the retailer level will not exceed the relative price changes at the farmer level (Carolina, 2016).

Price transmission is needed to maintain market dynamism, thereby also building market integration. The absence of market integration will certainly hinder price transmission. If market integration is well established, meaning there is a price change from one market to another, it ultimately leads to economic welfare. Both market integration and price transmission benefit market and economic actors, thus contributing to their welfare.

In rice marketing, a market is needed to accommodate and distribute the farming outputs from the reference market to the retail market or end consumers. Therefore, farmers will strive to market their farming outputs to markets that can accommodate their products at profitable prices. However, the prices formed in the reference market often cannot keep up with the price changes in the retail market due to a lack of information. This will cause relatively large price differences. In each marketing institution, prices are interrelated, which will affect price changes at both the reference market level and the retail market level. In other words, there is a relationship between prices at the reference market level and prices at the retail market level.

The fluctuating rice prices can be caused by changes in domestic supply and demand. These price changes or fluctuations in rice prices have implications for changes in consumer-level rice prices. However, whether these price changes are transmitted to rice producers still needs further investigation. Prices at the producer or farmer level should be well transmitted to the consumer level, and similarly, prices at the consumer level should be well transmitted to the rice farmer (producer) level. This price transmission is an important part of achieving more efficient rice market integration. According to Irawan & Rosmayanti (2016), vertical integration can occur if there are price changes or differences in rice at the wholesale level, followed by changes in rice prices at the community or consumer level. Similarly, the rice market in the Province of West Nusa Tenggara must be integrated and efficient to ensure stable rice prices without high fluctuations. Based on this, it is important to research the market integration of rice commodities in the Province of West Nusa Tenggara.

The objectives of this research are: (1) To analyze Vertical Market Integration in West Nusa Tenggara Province; (2) To analyze the price transmission of unhusked rice (GKP) at the producer level to rice prices at the consumer level in West Nusa Tenggara Province; (3) To analyze the price disparity between rice and unhusked rice in West Nusa Tenggara Province; (4) To analyze market efficiency at the provincial level in West Nusa Tenggara Province.

Based on this explanation, it is necessary to conduct research entitled: "Analysis of Rice Market Integration in West Nusa Tenggara Province."

II. METHODOLOGY

The research method used is a descriptive method with a quantitative approach. Sugiyono (2015) explains that the quantitative research method is based on the philosophy of positivism and is used to investigate specific populations or samples with data collection using instruments and statistical data analysis. The purpose of using the descriptive quantitative method is to analyze market efficiency in the rice market in West Nusa Tenggara. This method is also used to obtain a comprehensive picture of both verbal and numerical data related to rice in West Nusa Tenggara, studied quantitatively. The data used in this study is time series data, which consists of monthly rice prices at the producer and consumer levels from the NTB Provincial Trade Office, NTB Provincial Agriculture and Plantation Office, and the NTB Provincial Food Security Office.

The chosen research location is West Nusa Tenggara Province because, in recent months, rice prices in NTB Province have increased and tended to fluctuate. The method for determining the research area is purposive sampling (sampling with specific intentions and objectives). In purposive sampling, the selection of samples is based on the researcher's judgment that the selected samples are truly representative with wide coverage, considering that each rice-producing district and the area with the highest rice production in NTB is included.

Vertical Integration Analysis

Market integration can also be measured using regression analysis, employing the following equation.

Explanation:

$HGKP_{it}$ = Price of unhusked rice at producer level i at time t

HB_{jt} = Price of rice at consumer level j at time t

a_0 = Constant

a_1 = Parameter (regression coefficient)

e_t = Error term

Vertical market integration will be strong if a1=1 or 0.5 a_1<1, where prices at the producer market level are integrated with prices at the consumer level .

In measuring short-term and long-term market integration, Timmer's Index of Market Connection (IMC) analysis method concludes that the market structure consists of one primary market and several secondary markets. The primary market controls price formation while secondary markets respond to conditions in the primary market (Kustiari et al., 2018).

To calculate the coefficient of Timmer's Index of Market Connection, commonly known as the Index of Market Connection (IMC), the following equation is used:

$$\mathbf{H_{GKPt} - H_{GKPt-1} = d_0 + d_1 (H_{GKPt-1} - H_{Bt-1}) + d_2 (H_{Bt} - H_{Bt-1}) + d_3 H_{Bt-1}} \ldots \mathbf{(1)}$$

After obtaining the regression coefficient from equation (1), the equation above can be rearranged to explain the interpretation of the obtained regression coefficient, as follows:

$$H_{GKPt} = d_0 + (1 + d_1) H_{GKPt-1} + d_2 (H_{Bt} – H_{Bt-1}) + (d_3 – d_1) H_{Bt-1} \quad \text{..... (2)}$$

From the equation (2) above, it can be seen that the coefficients $(1+d_1)$ and $(d_3 - d_1)$ each reflect the contribution of price movements in the local market and the central market to price formation at the farmer level in the local market. This information can be further used to calculate the Index of Market Connection, which depicts the comparison of the coefficient of the local market with the coefficient of the central market, with the following equation:

$$IMC = \frac{1+d_1}{d_3-d_1} \quad \text{..... (3)}$$

Explanation:

IMC = Index of Market Connection

H_{GKPt} = Current price of harvested dry unhusked rice at farmer level (Rp/kg)

$H_{GKP(t-1)}$ = Previous price of harvested dry unhusked rice at farmer level (Rp/kg)

H_{Bt} = Current price of rice at the consumer level (Rp/kg)

$H_{B(t-1)}$ = Previous price of rice at consumer level (Rp/kg)

d_1 = Regression coefficient of $H_{GKP(t-1)}$

d_2 = Price difference of rice at current and previous levels.

d_3 = Regression coefficient of H_{Bt-1}

When markets are integrated in the short or long term, it indicates that market participants have successfully connected one market to another, despite being separated by distance. Integration is useful for understanding how sensitive information obtained by one market is to another market in responding to price changes.

Price Transmission Analysis

Price transmission describes the relative price changes at the consumer level in response to relative price changes at the producer/farmer level (Nuraeni et al., 2016). Mathematically, the price transmission formula can be written as follows:

$$\text{Log } HB_{it} = \text{Log } b_0 + b_1 \text{ Log } HGKP_{it} + e_t \quad \text{..... (4)}$$

Or ;

$$\text{Log } HGKP_{it} = \text{Log } a_0 + a_1 \text{ Log } HB_{it} \quad \text{……..(5)}$$

Explanation:

$HGKP_{it}$ = Price of harvested dry unhusked rice at producer level i at time t

HB_{jt} = Price of rice at consumer level j at time t

a_0 = Constant

a_1 = Parameter (regression coefficient)

b_0 = Constant

b_1 = Regression coefficient

e_t = Error term.

Price Disparity Between Unhusked Rice and Rice

The analysis of the price disparity between unhusked rice and rice is conducted to understand and explain the significant differences between the prices of unhusked rice and rice in NTB. The formula for the disparity is as follows (Suparmin, 2022):

$$DH_{it} = HB_{it} – HGKP_{it} \quad \text{……..(6)}$$

Explanation:

DH_{it} = Price Disparity

HB_{it} = Price of rice at the consumer level at the time it

$HGKP_{it}$ = Price of unhusked rice at the farmer level at the time it

III. RESULTS AND DISCUSSION

Vertical Integration

Vertical market integration is used to observe the degree of relationship between the two markets in the marketing chain. This integration is influenced by the equitable distribution of price information across all marketing institutions (producers and middlemen-consumers). If this information is not perfectly disseminated, the prices formed in the market will not reflect good vertical market integration (Asmarantaka, 2013).

Table 1. Results of Regression Analysis of Market Integration for HGKG (Producers) at the District Level and Rice Prices (Consumers) at the Provincial Level in NTB.

Variabel	Korelasi (r)	Determinasi (R^2)	(Constant)	Koefisien Regresi	Sig
HGKG Loteng (Rp/kg)	0,749	0,560	5,598	0,798	,000
HGKG Lotim (Rp/kg)	0,376	0,141	7,027	0,475	,000
HGKG Kabupaten Sumbawa (Rp/kg)	0,875	0,766	1,759	1,445	,000
HGKG Kabupaten Dompu (Rp/kg)	0,586	0,343	5,413	0,860	,000
HGKG Kabupaten Bima (Rp/kg)	0,824	0,679	1,313	1,616	,000

Source: Secondary Data Processed, 2024.

It can be seen from the table above that the market integration between the district-level market and the provincial-level market can be analyzed using a multiple linear regression model, by examining the significance of each independent variable on the dependent variable. From Table 4.3 above, it can be seen that the significance values of the five variables for the price of harvested dry unhusked rice (HGKG) from the five districts are less than 0.05. In other words, the five district-level HGKG variables have a significant effect on the rice prices at the provincial level in NTB (at a 5% error rate), indicating that there is integration between the district-level market and the provincial-level market.

Table 2. Results of Market Connection Index (IMC) Analysis of HGKP (Producers) and Rice Prices (Consumers) at the Provincial Level in NTB.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	0,927[a]	0,859	0,846	,27551	0,859	63,096	3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14,368	3	4,789	63,096	,000[b]
	Residual	2,353	31	0,076		
	Total	16,721	34			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,516	0,653		-,791	0,435
	Harga Gabah Kering Panen Sebelumnya (Rp/Kg)	0,913	0,148	0,870	6,176	0,000
	Selisih Harga Beras Sekarang dengan Harga Beras Sebelumnya (Rp/Kg)	0,000	0,000	-,126	-1,537	0,135
	Harga Beras Sebelumnya (Rp/Kg)	0,110	0,119	0,134	0,919	0,365

Source: Secondary Data Processed, 2024.

To observe the market integration occurring in West Nusa Tenggara Province, whether in the long term or short term, the method used is the Index of Market Connection (IMC). Based on the regression test results above, the IMC equation between the price of harvested dry unhusked rice at the farmer level and the price of rice at the consumer level is obtained.

Here is the IMC equation derived from the integration of the price of harvested dry unhusked rice at the farmer level and the price of rice at the consumer level:

$HGKP_t = 0{,}913\ HGKP_{t-1} + 0{,}000\ (HB_t - HB_{t-1}) + 0{,}110\ HB_{t-1}$

Then, to determine the level of integration between the price of harvested dry unhusked rice at the farmer level and the price of rice at the consumer level, the Index of Market Connection (IMC) is used:

$IMC = \frac{0{,}913}{0{,}110} = 8{,}300$

The calculation result of IMC = 8.300 indicates that rice prices in the market are linked to prices in the primary market (farmers). An IMC value > 1 suggests that the level of market integration is low, where rice prices at the consumer level are not fully transmitted to the farmer level; hence, the price of harvested dry unhusked rice at the farmer level lacks short-term vertical integration. This aligns with the opinion of Ratya (2013), stating that short-term market integration is unlikely because the conditions in the primary market (farmers) cannot directly influence market prices at the secondary level (consumer rice prices) from one period to another accurately, but rather over a certain period, this is due to a determining effect.

The IMC value obtained (> 1) indicates a relatively low short-term integration between rice prices at the retailer level (consumer) and the price of rice received by rice farmers (producers).

Market integration in the long term can be seen from the coefficient value of the rice price difference variable at time t and the rice price at time t-1. The value (d2) at both rice market levels is 0.00 < 0.5, indicating that both rice market levels are weakly integrated in the long term.

Price Transmission

Price transmission analysis is an analysis that can describe the extent to which changes in the price of goods at one market level affect the changes in the price of those goods at another market level (Lestari, 2016 in Rahmadany, 2019).

The data used in this study is time series data, namely rice prices at the retail level and unhusked rice prices at the farmer level over 96 months or from 2016 to 2023. This data was analyzed using IBM SPSS Statistics Version 25 to determine the regression coefficient values as follows:

Table 3. Price Transmission Elasticity of Rice to Farmer's Unhusked Rice Prices in NTB Province, 2016-2023.

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Variable		B	Std. Error	Beta	t	Sig.
1	(Constant)	1979,303	357,753		12.926	,000
	Harga Beras (Konsumen) Rp/kg	0,549	0,042	0,803	13,077	,000

Explanation: Coefficient of Determination (R2) = 0.645, and Correlation Coefficient (r) = 0.803

Source: Processed Secondary Data, 2024.

Table 4. Price Transmission Elasticity of Unhusked Rice to Rice Prices in NTB Province, 2016-2023.

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Variable		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1032,434	153,130		-2,886	,005
	Harga Gabah Kering Panen (Produsen) Rp/kg	1,175	,090	0,803	13,077	,000

Explanation: Coefficient of Determination (R2) = 0.645, and Correlation Coefficient (r) = 0.803

Source: Processed Secondary Data, 2024.

From the table above, it can be seen that the elasticity of price transmission indicates the response of changes in current harvested dry unhusked rice prices to changes in current rice prices. The analysis results show a price transmission elasticity of 1.175%, meaning that if the price of harvested dry unhusked rice increases by 1%, the price of rice will increase by 1.175%. This indicates a significant response in rice price increases categorized as greater than 1%.

Furthermore, the elasticity of price transmission from rice prices to unhusked rice prices is 0.549%, meaning that if there is a 1% change in rice prices, unhusked rice prices will increase by 0.549%. This suggests that the transmission of rice prices to unhusked rice prices is still low, less than 1%. This condition shows that every rate of change in unhusked rice prices at the producer level will affect the rate of change in rice prices at the consumer (retail) level to a greater extent.

Consistent with the findings of Weldegebriel et al. (2016) and Etienne et al. (2016), varying assumptions about market power behavior can be observed from relatively imperfect price transmission and depend on decreasing or increasing behavior. The marketing of harvested dry unhusked rice and rice at the provincial level in NTB is not yet efficient and falls into an imperfect competitive market (oligopoly). The inefficiency of the formed marketing is indicated by an elasticity value greater than 1. Short-term integration is only possible if changes in unhusked rice prices at the farmer level are proportionally reflected by changes in rice prices at the consumer level, thus the value of coefficient c will approach 1.

Disparity Between Unhusked Rice and Rice Prices

The disparity between unhusked rice and rice prices can be attributed to the marketing costs incurred during the transformation process from unhusked rice to rice and its distribution. From the moment rice is harvested, it undergoes several treatments including threshing, cleaning, drying, and milling. These treatments incur costs, including distribution costs, and subsequently serve as benchmarks for setting retail rice prices at the consumer level. The disparity between unhusked rice prices at the farmer level and retail rice prices at the consumer level represents the price difference resulting from these treatments during the transformation of paddy into rice.

Table 5. Disparity Between Farmer's Unhusked Rice and Consumer Rice Prices in West Nusa Tenggara Province, 2016-2023.

Month	Value of Price Disparity (Rp/kg)							
	Year							
	2016	2017	2018	2019	2020	2021	2022	2023
January	5.038	5.362	4.661	4.923	5.316	4.701	4.597	5.227
February	5.272	6.176	5.666	4.978	5.216	4.847	4.255	5.966
March	5.587	5.514	5.694	5.300	5.144	5.583	4.811	5.403
April	5.113	4.714	5.642	5.560	5.482	5.596	5.049	5.948
May	4.899	4.776	5.759	5.344	5.684	5.478	5.231	5.788
June	4.781	4.782	4.836	5.225	5.579	5.501	5.198	5.568
July	4.927	4.851	4.809	5.159	5.493	5.713	5.124	5.594
August	4.728	4.767	4.654	5.079	4.917	5.683	4.499	5.401
September	4.557	4.556	4.812	5.079	5.216	5.675	3.915	6.590
October	4.326	4.663	5.078	4.937	5.223	5.640	3.893	5.787
November	4.402	4.668	4.879	4.888	5.232	5.560	4.171	7.032
December	4.511	4.791	4.778	4.688	5.228	5.498	4.271	7.051

Source: Provincial Trade Office and Department of Agriculture and Plantation of NTB (2016-2023), processed.

It can be seen in the table above. During the period 2016-2023, the price of unhusked rice (GKP) fluctuated with a nearly identical pattern. It experienced decreases in March, April, and May, while it increased in other months. The same pattern of price changes also occurred in retail rice prices. This pattern of price changes in unhusked rice and retail rice prices also led to a similar pattern of disparity between unhusked rice prices at the farmer level and retail rice prices. There were decreases in disparity in March, April, and May, while increases in disparity were observed in other months.

This indicates that the disparity in prices is caused by the pattern of changes in both prices. When there is an increase in retail rice prices, there is a corresponding increase in unhusked rice prices. The changes in both prices are synchronized with each other. Consistent with the findings of Lastinawati et al. (2018) in Ogan Komering Ulu District, they stated that the rate of change in unhusked rice prices at the farmer level is higher than the rate of change in retail rice prices at the consumer level.

The change in the gap between unhusked rice prices and rice prices can be seen in the graph below:

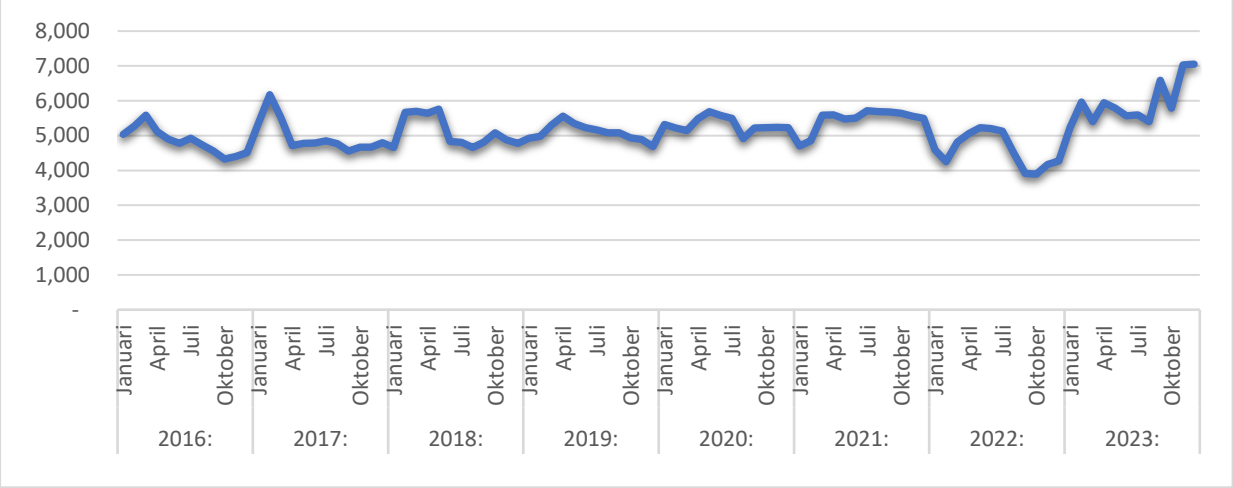

Image. The disparity between the price of unhusked rice (GKP) and rice prices during the period 2016-2023

From the graph above, it can be seen that during this period, the trend of changes in the gap between the price of unhusked rice (GKP) and rice prices follows a nearly identical pattern each year. The price difference between them increases during the first planting season or rainy season (November to January) and the third planting season (July to September), and decreases during the second planting season (April to May) (Figure 4.2). It is also interesting to note that this trend of price disparity continues to increase from 2016 to 2023. This condition is related to the seasonal patterns in Indonesia, where during the rainy season, almost all agricultural land in Indonesia, including NTB, is planted with rice. Subsequently, during the first planting season, the area of rice cultivation begins to increase. The similarity between the seasonal pattern and the rice harvesting pattern also contributes to the same pattern of changes in the price gap. Therefore, the government has taken preemptive measures to mitigate excessively high fluctuations in paddy prices through the annual establishment of government procurement price policies.

Rice Market Efficiency

The efficiency of the rice market in this study is assessed using the Index of Market Connection (IMC) analysis to examine both short-term and long-term market dynamics. The integration of the rice market in West Nusa Tenggara Province exhibits weak market integration at both levels, indicating that perfect market efficiency has not yet been achieved. The short-term IMC value of 8.3 > 1 highlights this. Additionally, the (d2) value at both levels of the rice market is 0.00 < 0.5.

The inefficiency is primarily attributed to limited market information available to farmers and pressures from higher-level marketing institutions, which weaken farmers' bargaining power in price determination. These pressures from higher-level marketing institutions result in local market prices received by farmers not being integrated with export-level rice prices (reference prices) in both the short and long terms (Putri, Fariyanti & Nunung, 2016).

IV. CONCLUSION

Based on the analysis results, the following conclusions can be drawn:

1. Vertical integration of the rice market in West Nusa Tenggara Province can be considered weak in the short term, indicated by an IMC value of 8.3 > 1. Similarly, in the long term, there is also weak market integration as evidenced by a d2 value (coefficient of current and previous rice price variables) of 0.00 < 0.05. With weak market integration observed both in the short and long terms, perfect market efficiency has not yet been achieved.
2. Price transmission elasticity from producers (paddy) to consumers (rice) is 0.549%, which is <1, indicating that the elasticity is inelastic. Price transmission elasticity from consumers (rice) to producers (paddy) is 1.175%, which is >1, indicating that the transmission elasticity is elastic.
3. Generally, the disparity between rice prices and harvested dried unhusked rice (HGKP) prices in West Nusa Tenggara Province during the period 2016-2023 remains relatively constant, but there is a relatively high price disparity during the January-April period (first planting season).

4. It is known that with weak short-term and long-term market integration of the rice market in West Nusa Tenggara Province, perfect market efficiency has not yet been achieved. The inefficiency is primarily due to limited market information available to farmers and pressures from higher-level marketing institutions, which weaken farmers' bargaining power in price determination.

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