

Price Volatility of Milkfish Commodities in Aouth Sulawesi

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ARTICLE INFO

A B S T R A C T

Article history:

Received
November
Accepted
December

Keywords

*Fluctuations,
price,
milkfish,
trend*

Milkfish is an important fisheries commodity in South Sulawesi, both for domestic consumption and as an export product. However, the high price volatility of milkfish often poses challenges for producers, traders, and consumers. This study aims to analyze the price volatility of milkfish in South Sulawesi from 2018 to 2023, using secondary data on producer prices and total milkfish production. The analysis methods include calculating the coefficient of variation and linear trend analysis to measure price fluctuations and trends over the period. The results indicate significant price fluctuations, especially in 2020 and 2021, which were influenced by supply chain disruptions due to the COVID-19 pandemic. Overall, milkfish prices have shown a steady increase from 2018 to 2023, despite sharp price spikes in certain periods. Factors affecting price volatility include production levels, distribution policies, and external factors such as extreme weather and the pandemic. This study provides insights into the price patterns of milkfish and the factors influencing price fluctuations, which can serve as a basis for formulating more effective policies to stabilize the milkfish market in South Sulawesi.

1. Introduction

The price volatility of fishery commodities, particularly milkfish, is a significant issue in the economic sector of South Sulawesi. The unstable price of milkfish can affect the welfare of fish farmers, traders, and consumers, which in turn can disrupt the economic stability of the region. Milkfish is one of the key commodities in South Sulawesi, which, in addition to being important for domestic consumption, is also one of the flagship products exported to international markets. Its presence as a strategic commodity not only supports regional food security but also creates significant economic opportunities for the local fishing sector. However, large price fluctuations often occur, which can lead to market uncertainty and difficulties for both producers and consumers. Price fluctuations, also known as price volatility, are one of the main challenges faced by the fishing sector in South Sulawesi. This price volatility can be caused by various factors, such as changes in market demand, disruptions in the supply chain, and uncertainties arising from external factors like natural disasters or pandemics. Sharp price fluctuations not only affect producers and traders, but can also increase consumer prices in the market, which in turn may impact consumption patterns.

One of the consequences of unstable milkfish price volatility is the reduced market confidence. When milkfish prices are unstable, fish farmers tend to face difficulties in planning their production and expenditures. Fish traders also face challenges in setting appropriate selling prices, leading them into

unprofitable situations. Consumers are also confronted with a situation where it is difficult to predict milkfish prices, which can cause uncertainty in consumption and market demand.

1.1. Background

Milkfish has become one of the key fishery commodities that plays a significant role in the economy of South Sulawesi. According to Wibowo et al. (2020), the price of fishery commodities can be influenced by many external and internal factors, which can lead to considerable price volatility. In South Sulawesi, the price of milkfish is not only influenced by production factors but also by market conditions, distribution policies, and other external factors such as changes in global market demand or the impact of natural disasters. Rizki and Sari (2021) add that, in addition to production factors, price fluctuations are often triggered by supply uncertainties and changes in global demand, which frequently create gaps between supply and demand in the domestic market. These price fluctuations can disrupt the economic stability of the fisheries sector. Wibowo et al. (2020) state that seasonal factors and inefficiencies in distribution also significantly contribute to the volatility of fish prices in Indonesia. Therefore, it is important to understand the specific factors causing milkfish price volatility in South Sulawesi in order to identify the appropriate policies to mitigate the negative impacts of price fluctuations.

1.2. Problem Statement

Although several studies have addressed price volatility in other fishery commodities, research specifically discussing the price volatility of milkfish in South Sulawesi is still very limited. Rizki and Sari (2021) revealed that price volatility in the Indonesian fisheries sector is often caused by a combination of supply changes influenced by natural factors and fluctuations in both domestic and global demand. However, there is limited research on how these factors specifically operate in South Sulawesi, particularly regarding milkfish. Therefore, this study aims to fill this research gap by identifying and analyzing the factors influencing milkfish price volatility during the period of 2018–2023.

1.3. Objectives and Scope

The main objectives of this research are to:

1. Measure the price volatility of milkfish in South Sulawesi during the 2018–2023 period.
2. Analyze milkfish price trends during this period to observe significant upward or downward price movements.
3. Identify the factors affecting the price volatility of milkfish, including production levels, distribution policies, and other external factors.

The scope of this research is limited to the analysis of secondary data on producer prices and total milkfish production from 2018 to 2023. This study does not include primary data related to consumer behavior or direct interviews with milkfish producers.

2. Literature Review

Based on previous research, price volatility in fishery commodities can be caused by various factors, including supply fluctuations, seasonal changes, market uncertainties, and government policies that affect the distribution and pricing of these commodities. Rizki and Sari (2021) showed that external factors, such as changes in global market prices and inefficiencies in distribution, play a major role

in price fluctuations. Meanwhile, Wibowo et al. (2020) noted that harvest seasons, which are highly dependent on weather conditions and other natural factors, can significantly affect fish supply and cause high price volatility.

2.1. Related Research

Several studies have analyzed price volatility in fishery commodities in Indonesia. Rizki and Sari (2021) observed that price volatility in fish in Indonesia is influenced by a combination of external factors such as changes in global demand and natural shocks. They also noted that the imbalance between demand and supply is the primary cause of price fluctuations. Their study emphasized the importance of efficient distribution management to maintain price stability.

On the other hand, Wibowo et al. (2020), in their study on fish price volatility in Central Java, found that seasonal changes—leading to differences between harvest seasons and lean seasons—are a major factor contributing to price instability. These findings align with this study's objective of analyzing the influence of seasonal factors on milkfish price volatility in South Sulawesi.

2.2. Research Gap

While many studies have been conducted on price volatility in fishery commodities in general, there has been no specific study focusing on milkfish price volatility in South Sulawesi. This research aims to fill this gap by focusing on the analysis of milkfish prices in South Sulawesi and the factors influencing them during the period 2018–2023.

3. Methodology

This study uses a quantitative approach to analyze milkfish price volatility in South Sulawesi by using secondary data from the Central Statistics Agency (BPS) and the Fisheries Department of South Sulawesi. The data collected includes information on total production and producer prices of milkfish from 2018 to 2023.

3.1. Data Collection

The data used in this study was obtained from BPS and the Fisheries Department of South Sulawesi. The collected data includes producer prices of milkfish per kilogram and total annual production in tons. This data will be used to measure price volatility by calculating the coefficient of variation (CV) and standard deviation.

3.2. Data Analysis Techniques

The analysis techniques used in this study include:

1. Descriptive Statistics to describe the production and price patterns of milkfish during the research period.
2. Coefficient of Variation (CV) and Standard Deviation to measure the fluctuations in milkfish prices.
3. Regression Analysis to test the relationship between milkfish production and price volatility.

3.3. Validation

The data used will be validated with other sources, including industry reports and relevant publications. The validation process will also involve checking the consistency of the data within the specified time period.

4. Results and Discussion

4.1. Milkfish Price Volatility in South Sulawesi during the 2018–2023 Period

To measure milkfish price volatility in South Sulawesi, the coefficient of variation (CV) and standard deviation methods were used. These tools allow us to observe the extent to which milkfish prices fluctuated during the 2018–2023 period. From the price data, it is evident that there was a continuous price increase from 2018 to 2023. Although the price of milkfish increased gradually, sharp fluctuations in price occurred in 2020 and 2021. Table 1 shows that in 2020, the producer price of milkfish saw a significant spike to IDR 23,529 per kilogram, higher than the previous year's price of IDR 22,025 per kilogram. This price surge continued in 2021, with the price rising again to IDR 25,857 per kilogram.

Price volatility measured using the coefficient of variation (CV) revealed that the years 2020–2021 had higher volatility values compared to other years, indicating greater price instability during this period. The standard deviation and CV calculations confirmed that 2020–2021 was a period of significant price volatility, largely due to disruptions caused by the COVID-19 pandemic. The supply crisis due to lockdowns and distribution disruptions at the time affected market price stability. This aligns with the findings of Rizki and Sari (2021), who stated that external disturbances, such as natural disasters or pandemics, can increase price volatility in fishery commodities.

4.2. Milkfish Price Trends during the 2018–2023 Period

To analyze the price trend of milkfish during this period, a linear trend analysis was conducted using the available producer price data. The analysis found that the price of milkfish consistently increased from 2018 to 2023. In 2018, the price of milkfish was IDR 21,621 per kilogram, and it gradually increased each year. By 2023, the price of milkfish had reached IDR 26,984 per kilogram, representing a 24% increase from the initial price in 2018.

This price increase followed a linear trend, although there were more significant price spikes in 2020 and 2021, as previously discussed. Overall, the price trend indicates a steady upward movement, despite sharp fluctuations in certain years. This suggests that milkfish has become an increasingly valuable commodity in the South Sulawesi market, reflecting growing demand driven by both domestic consumption and export growth.

4.3. Identifying Factors Affecting Milkfish Price Volatility

1) Production Factors

One of the key factors influencing milkfish price volatility is production levels. Data show a decline in production in 2019 and 2020, with the lowest production recorded in 2019 (183,354 tons). This drop in production was directly linked to supply shortages, which then triggered price surges. This finding is consistent with the observations of Wibowo et al. (2020), who noted that

production declines due to natural factors or operational disruptions, such as a pandemic, can significantly affect prices.

2) Distribution Policies

Distribution policies play a crucial role in maintaining price stability for milkfish. The COVID-19 pandemic caused major disruptions in the distribution of fishery commodities, hindering the supply of milkfish to the market. During the pandemic, travel restrictions, market closures, and supply chain disturbances were major obstacles that exacerbated price volatility. As a result, milkfish prices experienced sharp increases in 2020 and 2021. However, more efficient distribution policies began to be implemented in 2022 and 2023, leading to a stabilization of milkfish prices. This highlights the importance of effective distribution management in mitigating sharp price fluctuations and maintaining market stability.

3) External Factors

In addition to production and distribution policies, external factors such as changes in global demand and extreme weather events also contributed to milkfish price volatility. For example, global demand for milkfish can affect domestic supply and, consequently, the price. Likewise, extreme weather events that disrupt fishing seasons can affect the available supply. The decline in production in 2020, which was also caused by natural disasters such as floods and tropical storms in some major production areas in South Sulawesi, worsened the supply situation and led to price spikes.

Overall, this study identified that the price volatility of milkfish in South Sulawesi is influenced by a combination of internal factors (such as production levels and distribution policies) and external factors (such as natural disturbances and changes in global demand).

5. Discussion

5.1. Comparison with Previous Studies

This study aligns with the findings of Rizki and Sari (2021), who stated that price volatility in fish in Indonesia is greatly influenced by the imbalance between supply and demand, often triggered by external factors such as natural disasters or global market disruptions. Additionally, the research by Wibowo et al. (2020), which highlighted the influence of seasonal changes on fish price fluctuations, is also relevant to milkfish in South Sulawesi, where seasonal factors contribute to price volatility.

However, this study adds a new dimension by emphasizing the role of local distribution policies and government subsidies in mitigating sharp price volatility. Previous studies have mostly focused on natural factors and global markets, while this research also identifies the importance of local policy interventions in stabilizing prices.

5.2. Limitations

One limitation of this study is the use of secondary data, which may contain errors or inconsistencies in reporting, particularly regarding price and production data that may not always reflect on-the-ground conditions accurately. Additionally, this study did not include an analysis of consumer behavior or direct interviews with fish farmers, which could provide further insights into how prices are influenced by other factors in the market.

5.3. Future Research

Future research could consider primary data analysis through interviews with fish farmers and traders to gain deeper insights into their perceptions of price volatility and the factors influencing it. Additionally, predictive models that combine external factors and distribution policies could be developed to forecast future milkfish prices and assist policymakers in designing price stabilization strategies.

6. Conclusion

This study successfully identified and analyzed the price volatility of milkfish in South Sulawesi between 2018 and 2023. The results show that milkfish prices are influenced by several key factors, including production levels, distribution policies, and seasonal changes. Significant price fluctuations occurred, particularly in 2020 and 2021, triggered by supply crises caused by the COVID-19 pandemic. After 2022, more efficient distribution policies began to take effect, leading to price stabilization. This study also emphasizes that government subsidies and better distribution management are critical to reducing milkfish price volatility and ensuring market stability in South Sulawesi.

7. Recommendations

Based on the findings of this study, several recommendations can be made to improve the stability of milkfish prices in South Sulawesi:

- Improve Distribution Policies:** The government should enhance the distribution system to reduce price instability caused by supply and demand imbalances.
- Provide Subsidies to Fish Farmers:** Subsidies can help reduce production costs and improve the competitiveness of fish farmers, especially during lean seasons or crisis periods.
- Increase Production Capacity:** The government and relevant stakeholders should encourage the development of technology and increase milkfish production capacity to address supply instability.

Attachment

Table 1: Producer Prices, Price Percentage, and Total Production of Milkfish in South Sulawesi (2018-2023)

Year	Producer Price (IDR/kg)	Price Change Percentage (%)	Total Production (Ton)
2018	21.621	1.21%	193.511
2019	22.025	1.87%	183.354
2020	23.529	6.82%	193.766
2021	25.857	9.87%	211.194
2022	26.681	3.18%	206.082
2023	26.984	1.13%	228.729

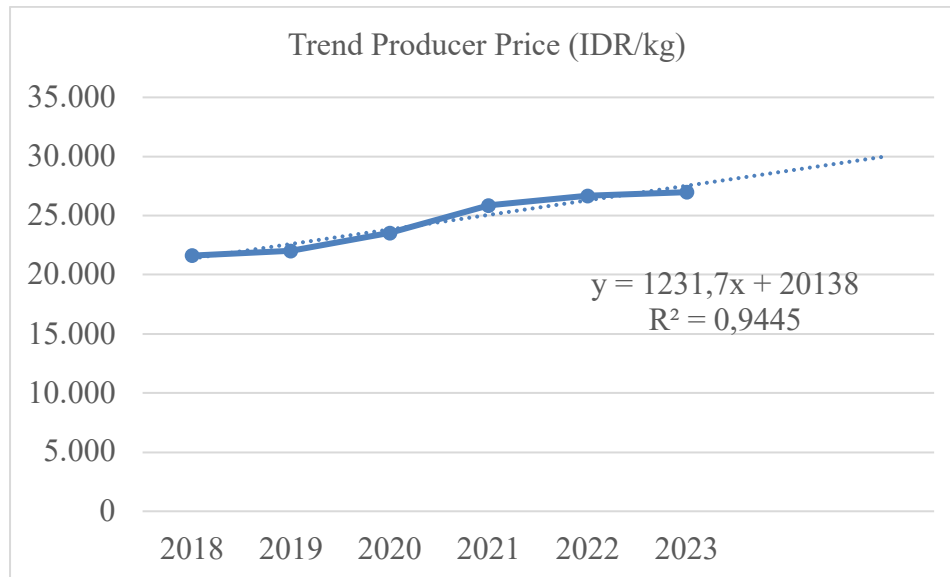


Figure 1. Producer Price Trend of Milkfish from 2018 to 2023

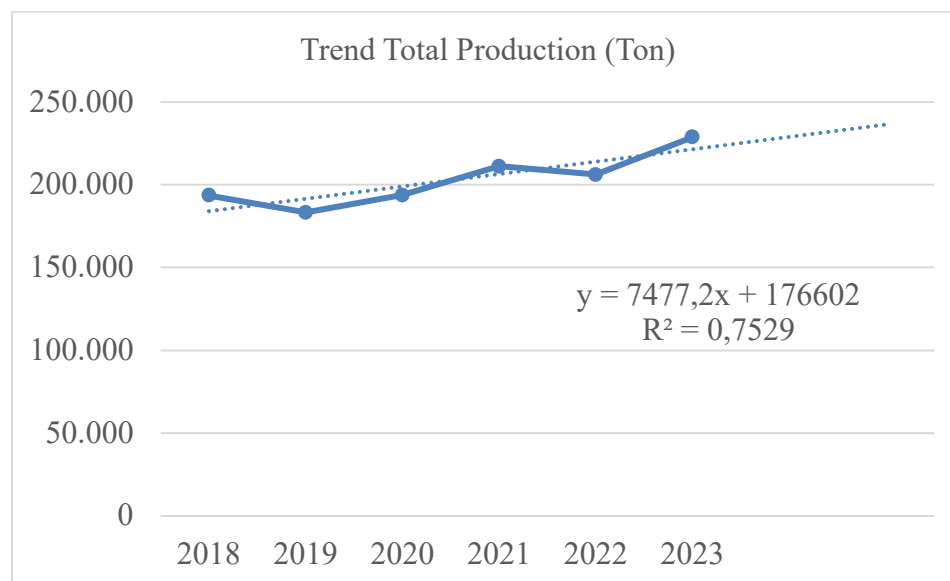


Figure 2. Total Production Trend of Milkfish from 2018 to 2023

Acknowledgements

The author would like to express sincere gratitude to the Central Statistics Agency (BPS) and the Fisheries Office of South Sulawesi for providing the data used in this research. Special thanks are also extended to all the faculty members of the Doctoral Program in Agribusiness at the University of Muhammadiyah Makassar for their valuable input and suggestions on this paper.

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