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Effects of Price Speculation on Consumers' Purchase Behaviour of Agricultural Products in Ehime Mbano Local Government Area of Imo State, Nigeria

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Abstract
Despite studies on price *vis-à-vis* the *purchase* of agricultural products, none seems to have addressed the effects of price speculation on consumers' purchase behaviour of agricultural products in Ehime Mbano Local Government Area of Imo State. To address the problem, the study determined the trend of agricultural commodities prices from 2015-2020; analysed the factors influencing price speculation in relation to purchasing behaviour of agricultural products consumers; analysed the effect of price speculation on the purchase behaviour of agricultural products consumers; and analysed the constraints to increasing the stability of prices of agricultural products. A multistage sampling procedure involving three stages was employed to select respondents for the study. Data were collected with the use of a structured questionnaire. Data were analysed using both inferential and descriptive statistics (frequency, bar chart, line graphs, factor analysis, and multinomial regression analysis. Results showed that there has been a steady increase in the prices of agricultural products since 2015 with their peak prices in 2020 at N24, 523.3, and N 9, 883.0 for milled rice and palm oil respectively. The result further showed that consumer perception, demand and supply, cost of production, government policies, exchange rate, hoarding of the commodity, and taxation were the factors influencing price speculation on the purchase behaviour of agricultural product consumers. With the R^2 of 0.894, F^{-cal} of 22.997, and F^{-tab} of 2.02, the result gave strong proof that price speculation has a significant effect on the purchase behaviour of agricultural product consumers in Ehime Mbano Local Government Area of Imo State. The result identified the activities of the middlemen, demand and supply, producer's goodwill, grading, and standardization, inadequate product sales outlet, and taste and preference as constraints to agricultural product's price stability. Based on the findings, the study recommended for establishment of price regulatory authority for agricultural commodities so as to create a clear price structure for products; increased awareness of the activities of the middlemen.

Keywords: Price, speculation, purchase behaviour, agricultural products, consumers

Introduction

In a market-oriented economy with perfect information, a key variable in the food system is the price of commodities (Kuwornu *et al*., 2019). Prices of agricultural products in Nigeria have been on the increase over the years with 55% in 2020 [Food and Agriculture Organisation (FAO), 2021]. The consequence of price oscillation is always being borne by the consumers, and to effectively cushion the effect of the price swing, consumers try to forecast. Price speculation is an integral part of commodity trading. Its quantitative accuracy with small errors, along with turning point speculation power is important for evaluating future prices (Kofi, 2018). Since food price is an important component to fight hunger, policymakers need reliable prices of expected agricultural product prices. Before the onset of liberalization and globalization, the government was controlling prices, thus rendering price speculation a low-value-added activity. In developing countries like Nigeria, prices are not determined by the government due to poor pricing mechanisms but rather by domestic and international market forces. Forecasts are important for farmers also as they base their production and marketing decisions on the expected prices that may have financial repercussions many months later (Kofi, 2018).

According to Koichi (2020), price speculation of agricultural products plays a major role in the sustainability of agricultural production. Providing price forecasting information would help in decision-making, managing agricultural supplies and helping to improve purchasing behaviours of consumers. In addition to the seasonality in production caused by year-

round cycle climate change, the prices are affected by the users' preferences for products and suppliers' trading strategies and behaviour. These human factors do not always have seasonality but they could be represented as relations between events in the past and the current status (Koichi, 2020). Furthermore, speculation is used to determine how to allocate resources and to plan for anticipated expenses for the upcoming period of time. The forecast is based on the projected demand for the goods and services and the supply of the goods and services offered in the markets. Buying behaviour refers to the attitude that the consumer shows during the search, purchase and consumption of a certain product (Vilcekova and Sabo, 2013). It is the procedure by which consumers make a decision concerning the product of his choice on whether to purchase and acquire an existing product or not (Laoviwat, Suppapanya and Yousapronpaiboon, 2014). However, while development in the food sector increases, consumers' attitudes and perceptions towards food products are also evolving. However, the consumer approach towards purchasing agricultural products is affected by several factors such as cultural, lifestyle, psychological and economic factors, which prejudice the consumer's preferences and their decision whether to accept or reject produced goods (Nowicki and Sikora, 2012).

Speculation acts as an early warning signal and helps the policy makers to get insights of future prices and to manage the resources needed. Price speculation helps in avoiding prolonged inflation and deflation and contributes to achieving high levels of economic activity and employment. Price speculation allows for making well informed consumption decisions thus making purchasing decisions more efficient. Various factors responsible for changing prices include demand and supply situations, cyclical and structural factors and domestic and international market dynamics. In general, consumers will use less of any good if its price increases relative to other goods (referred to as the pure "substitution effect" by economists). However, a consumer's price responsiveness is a matter of degree and is subject to the potential effect of disposable income as well as other non-price factors. Under most circumstances, the availability of many close substitutes is likely to make consumers more sensitive or responsive to price changes, because they have the opportunity to switch to similar alternatives. In contrast, a lack of substitutes may give the consumer little choice but to continue to purchase the available good, even as its price rises, especially if it is deemed a necessity (Randy, 2013).

However, some scholars have carried out some research on price speculation. For instance, Koichi (2020) worked on time series forecasting of agricultural product prices based on recurrent neural networks and its evaluation method; in his findings, he argued that the prices of agricultural products show seasonality in their time series, and conventional methods such as the Auto-Regressive Integrated Moving Average (ARIMA or the Box Jenkins method) have tried to exploit this feature for forecasting; Muhammad (2017) researched on Price Forecasting Model for Perishable Commodities: A Case of Tomatoes in Punjab, Pakistan, his results indicate that the farmers' production decisions are affected by the expected profitability which is based on the expected output prices. Niranjan (2015) researched on Impact of Seasonality on Agricultural Commodity Price Behaviour, finding that price forecasting can aid both growers and end users in making optimal production decisions and in managing overall price risk. However, despite all these studies, none seems to have researched on the effect of price speculation on the purchase behaviour of agricultural products consumers in Ehime Mbano Local Government Area of Imo State. To address the problem, the study determined the trend of prices of agricultural commodities from 2015-2020;

i. analysed the factors influencing price speculation in relation to purchasing behaviour of agricultural products consumers in the study area;
ii. analysed the effect of price speculation on the purchasing behaviour of agricultural products consumers in the area; and
iii. analysed the constraints to increasing the stability of prices of agricultural products in the study area.

Methodology

Study Area

This study was carried out in Ehime Mbano Local Government Area of Imo State with geo-coordinate of latitude 5º 66′¹ N and 5º 4′ 9^{0}N and longitude 7º 3^{0}E and 7º 58′E. The area occupies a landmass of about 65 square kilometers and lies within the humid tropical climate with annual rainfall and temperature of over 2000mm and 20 respectively. Ehime Mbano Local Government Area is one of the 27 Local Governments that make up Imo State. It shares common boundaries with Isiala Mbano Local Government Area on the North, Umuahia South Local Government Area on the South, and on the West and East are Ahiazu Mbaise and Isikwato Local Government Areas respectively. Ehime Mbano is made up of 25 autonomous communities which includes; Ehime, Umueze I, Umueze II, Agbaja, Umukabia, Akanu, Umuezela, Umunakanu, Umualumaku, Umuihim, Nneato Ugwumezi, Umunumo, Nzerem, Ikpem, Ikpe-Nsu, Ihile-Nsu,Umuakagu-Nsu, Umuezeala-Nsu, Ibeafor, Umudimokoro, Umunumo Ibe-Nkwo, Umueleke, Umuezeala-Ama, Umuoma Nzerem and Dioka Nzerem. The people of Ehime Mbano are predominantly subsistence farmers.

Sampling Technique

The study used palm oil and processed rice as a proxy for determining the forecasting propensity of consumers. To sample the respondents, a multistage sampling technique was adopted. The first stage involved a purposive selection of four communities – Umuakagu-nsu, Ehime, Umunumo, and Umualumaku from Ehime Mbano Local Government Area. The choice of purposive selection at this stage is due to the high

economic activities in the area. The second stage involved the selection of two (2) villages from each of the four (4) communities to give a total of (8) villages. The third stage involved a convenient sampling of fifteen (15) respondents from each of the 8 villages, to give a total sample size of one hundred and twenty (120) respondents.

Data Collection

Primary data were used for the study. Primary data were collected with the use of a structured questionnaire. The data were sourced from the consumers of the products who were identified conveniently from various points of distribution of the products.

Data Analysis

Both inferential and descriptive statistics were employed to analyse the data collected. Specifically, objective i was achieved using descriptive statistics such as frequency, bar charts and line graphs. Objective ii and iv were realised using factor analysis and objective iii was actualized using multinomial regression analysis.

Multinomial regression analysis on the effect of price speculation on the purchase behaviour of agricultural products consumers

$Y = F(X_1, X_2, X_3, X_4)$ Implicit

$Y = \beta_0 + \beta_1 x_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + et$ Explicit

Where,

Y = Price Speculation (spot price = 1, future price = 2, convenient price = 3)

X_1 = Complex buying behaviour (Yes = 1, No = 0)

X_2 = Dissonance-reducing buying behaviour (Yes = 1, No = 0)

X_3 = Habitual buying behaviour (Yes = 1, No = 0)

X_4 = Variety seeking behaviour (Yes = 1, No = 0)

β_0 = Constant

$\beta_1 - \beta_4$ = Parameters to be estimated

et = Error term

Results and Discussion

Trend of Agricultural Commodities Prices from 2015-2020

In order to determine the movement of price of palm oil in the area between 2015 – 2020, a trend analysis was employed. The unit of measurement of processed rice and palm oil was 25 kg and 25 litres respectively. From the analysis, there has been a steady increase in the prices of processed rice and palm oil since 2015 with their peak prices in 2020 at N24, 523.3 and N 9, 883.0 respectively. This persistent increase can be attributed to the increase in the cost of production inputs, inflation, weather variation, and increasing demand of the products. This agrees with the Food and Agriculture Organization of the United Nations (FAO) and USDA project reports which showed that in the next few years, unexpected weather and inflation-adjusted commodity will continue to push prices to follow at an increasing trend (FAO, 2016; USDA, 2019). Hence, expected agricultural commodity prices will continue to play an important role in the production decisions of farmers, including planted/harvested acreage of crops or inventory and, thus, the supply of agricultural commodities.

Factors Influencing Price Speculation on the purchase behaviour of Agricultural Products Consumers

In order to identify the factors influencing price speculation in relation to purchasing behaviour of agricultural product consumers in the study area, factor analysis was employed. The result as shown in Table 2 showed that factors were categorized into two principal components - consumer and institutional factors. The naming of the factors was based on Kaiser's rule of thumb as applied by Nwibo and Okorie (2013) in which a factor that loads 0.4 and above was accepted to have an effect on entrepreneurship determinants among agribusiness investors in southeast, Nigeria. Results revealed that the identified consumer-related factors were consumer perception (0.553), demand (0.627), supply (0.633), and cost of production (0.664). Hence, consumer perception is an important factor in the purchasing behaviour of agricultural products, especially for products that are frequently purchased (Faith and Agwu, 2014). This therefore justified the finding of Kotler and Keller (2016) who reported that consumer perception explains information about a product and provides a deep meaning for the consumers. Consumers are very rational when it comes to judging what benefits they wish to get from buying products or services they pay for. Speculation in most cases is based on the projected demand for the goods and services and supply of the goods and services offered in the markets. On this note, the result revealed that changes in the quantity demanded and supplied have a positive effect on the consumers' purchase behaviour of agricultural products. This supported the assertion of Koichi *(*2020) who affirmed that consumers purchasing behaviour of agricultural products was influenced by demand and supply. Finally, the identified institutional factors were government policies (0.848), exchange rate (0.746), hoarding of the commodity (0.758) and taxation (0.658). This is justified as it is hypothesised that bad government policy will always have a retributive effect on price and consumption of agricultural products. This is in line with the findings of Baffoe-Bonnie and Ashong (1995) which affirmed that the price of agricultural products is influenced by government policies and exchange rates.

Effect of Price Speculation on the Purchasing Behaviour of Agricultural Products Consumers

Price speculation is an integral part of commodity trading and price analysis. The result on the effect of price speculation on the purchasing behaviour of agricultural product consumers as presented in Table 3 revealed with the coefficient of determination (R^2) of 0.894 which implied that the independent variables explained about 89% of the total variation in price speculations. Again, with an F^{-cal} of 22.997 which was greater than the F^{-tab} of 2.02, the result gave strong prove that price speculation has significant effect on the

purchase behaviour of agricultural product consumers in Ehime Mbano Local Government Area of Imo State. Specifically, the coefficient of complex buying behaviour was significant at 5% level of significance and had a positive relationship with price speculation. With the a marginal effect of 0.125, a unit change in the complex buying behaviour of agricultural product consumers will cause price speculation to increase by 12.5%. This result however agrees with the previous study of Motamed *et al.* (2018) who found significant positive relationship between price speculations and complex buying behaviour of consumers. However, the coefficient of dissonance-reducing buying behaviour (0.734) was positive though statistically insignificant with price speculation. However, the marginal effect connotes that increase in dissonance-reducing buying behaviour will increase price speculation by 73.4%. This finding is congruent with Randy (2013) who affirmed that dissonance-reducing buying behaviour has positive relationship with price speculation. The coefficient of habitual buying behaviour (0.319) was positive and statistically significant at 10% level of probability. This connotes that habitual buying behaviour resulted to about 31.9% effect on purchase behaviour. Lastly, the coefficient of variety seeking behaviour (-0.295) was negative but significantly significant 1%. Therefore, a unit increase in variety seeking behaviour will bring about 29.5% decrease in price speculation. This agreed with Nkang, Omonona, Yusuf, and Oni, (2013) who asserted that negative and significant relationship exists between variety seeking behaviour and speculation in Nigeria. However, other studies on price speculation have shown mixed results. For instance, the work of Koichi (2020) suggested that price speculation affect consumers purchasing behaviour of agricultural product positively. While Niranjan (2015), maintained that price speculation has negative relationship with consumers purchasing behaviour of agricultural product, Ani, Ugwunta, Inyiama, and Eneje (2014) found that price speculation has no impact on consumers purchasing behaviour.

Constraints to increasing the Stability of Prices of Agricultural Products

Keeping the prices of agricultural products steady has been a major challenge to policy makers and economists. Therefore, in order to identify the challenges of achieving price stability, a principal component factor analysis was used (Table 4). The result identified three major component factors – marketing, intrinsic, and financial factors. Specific analysis of the component factors revealed that the identified marketing factors were activities of the middlemen (0.751), demand and supply (0.665), producer's goodwill (0.662), grading and standardization (0.628), and inadequate product sales outlet (0.663). This finding is in consonance with Omolara *et al.* (2017) who highlighted the major marketing constraints influencing price stability of agricultural products in Osun State to include activities of the middlemen, supply and demand, producer's goodwill and grading and standardization. It is also consistent with the result of Muhammad-Lawal *et al.* (2013) and Ehinmowo *et al.* (2015). Similarly, Ashaye *et al.* (2018) reported that organization of market, lack of information on markets, grading and standardization among others were significant constraints to price stability of agricultural products in Kwara State, Nigeria. The result further showed that the identified intrinsic factor was taste and preference (0.776). This finding was justified as improvement on this factor will increase the price stability of agricultural products in the study area. Finally, the result further showed that the financial factors that affect price stability of agricultural products were cost of inputs (0.581), and cost of transportation (0.529). This finding justified the earlier findings of Niranjan (2015), who categorized financial factors influencing price stability of agricultural products as cost of input, transportation cost and high processing cost.

Conclusion

The study analysed the effect of price speculation on the purchase behaviour of agricultural products consumers in Ehime Mbano Local Government Area of Imo State. The result revealed that with the coefficient of determination (R^2) of 0.894, F^{-cal} of 22.997, and F^{-tab} of 2.02, it is therefore concluded that price speculation has significant effect on the purchase behaviour of agricultural products consumers. Based on the findings, the study recommended for establishment of price regulatory authority for agricultural commodities so as to create clear price structure for products; increased awareness on activities of the middlemen.

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Figure 1: Map of Imo State showing the study area

Table 1: Annual Average Prices of Agricultural Commodities from 2015-2020

Year	Processed rice (₦) per 50kg	Palm oil (₦) per 20 litres
2015	8795.0	3136.5
2016	10130.8	4314.1
2017	13638.3	5664.2
2018	16677.5	6807.8
2019	19619.2	8808.3
2020	24523.3	9883.0

Source: Field Survey, 2022

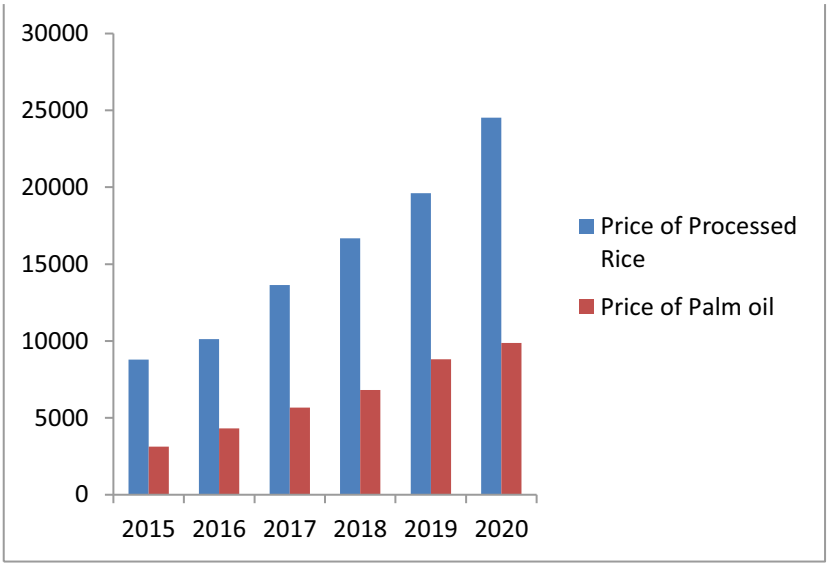

Figure 2: Bar Chart on Trend on Prices of Agricultural Commodities from 2015-2020
Source: Field Survey, 2022

Table 2: Varimax Rotated Component Matrix on Factors Influencing Price Speculation on the purchase behaviour of Agricultural Products Consumers

Factors	Factor 1 Consumer Related	Factor 2 Institutional
Consumer perception	0.553	-0.063
Supply	-0.627	0.023
Demand	0.633	0.138
Competition	0.255	0.344
Government policies	-0.034	0.848
Exchange rate	0.296	0.746
Cost of production	0.664	0.035
Hoarding of the commodity	0.061	0.758
Taxation	-0.078	0.658

Source: Field Survey, 2022

Table 3: Multinomial regression analysis Result on Relationship between Price Speculation and Purchasing Behaviour of Agricultural Products Consumers

Variables	Coefficient	Standard errors	T-value	Level of significance
Constant	1.315	1.626	0.809	0.000 ***
Complex buying behaviour	0.125	0.483	0.259	0.018 **
Dissonance-reducing buying behaviour	0.734	1.724	0.426	0.913NS
Habitual buying behaviour	0.319	0.941	0.339	0.085*
Variety seeking behaviour	-0.295	0.415	-0.711	0.005***
R^2	0.894			
Adjusted R^2	0.863			
DW	1.186			
F-ratio	22.997			

Source: Field Survey, 2022. *= significant at 10%, **= significant at 5%, ***= signifi cant at 1%, NS= Not significant

Table 4: Constraints to increasing the Stability of Prices of Agricultural Products

Constraints	Factor 1 Marketing	Factor 2 Intrinsic	Factor 3 Financial
Activities of the middlemen	**0.751**	0.040	-0.028
Taste and preference	-0.309	**0.776**	-0.063
Supply and demand	**0.665**	-0.485	0.277
Producers goodwill	**0.662**	0.153	0.320
Grading and standardization	**0.628**	0.224	0.310
Cost of inputs	-0.185	-0.253	**0.581**
Cost of transportation	0.200	0.176	**0.529**
High processing cost	0.239	0.369	0.301
Inadequate product sales outlet	**0.663**	-0.172	0.219
Seasonality in agricultural products	-0.025	**0.628**	**0.647**

Source: Field Survey, 2022