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EFFECT OF PRICE VOLATILITY ON AGRICULTURAL PRODUCE MARKETING IN AKWA IBOM STATE, NIGERIA

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ABSTRACT

The study sought to examine the Effect of Price Volatility on Agricultural Produce marketing in Akwa Ibom State. To guide the study, two specific objectives, two research questions and two research hypotheses were formulated. Descriptive survey design was adopted for the study. The population of the study comprises (29582) registered farmers in Akwa Ibom State. A sample size of 400 registered farmers was used and was determined using Taro Yamane formula. A multi- stage sampling procedure was employed to select the sample for this study. A researcher made structured questionnaire titled: "Price Volatility Questionnaire (PVQ) and Agricultural Produce marketing (MAPQ)" was used for data collection. The instrument was face validated by three experts. Internal consistency of the instrument was established using a test retest method. The reliability of the instruments was established which yielded a reliability coefficient index of .92 using Cronbach Alpha statistic. The instrument was administered with the help of two (2) research assistants. Regression coefficient R was used to answer the research questions while F- statistics was used to test the null hypotheses at .05 level of significance. The findings of the study showed that Price volatility has significant effect on consumers' demand and level of output. It was concluded that price volatility has contributed positively to consumers' demand for agricultural produce, output of agricultural produce in Akwa Ibom State. Based on the findings, it was recommended that Government and non-governmental organizations should provide support systems, such as subsidies to farmers to encourage them to continue to undertake agricultural production in the period of price shocks.

Keywords: Price Volatility, Agricultural Produce marketing, Consumers' Demand, Level of Output

INTRODUCTION

Globally, agricultural price volatility has affected global food security, farmer income stability, and economic development. The cause of these are multifaceted, including climate change, market speculation, and geopolitical factors, which have profound implications for both producers and consumers. According to Food and Agriculture Organization, FAO, (2021), climate change which has resulted in droughts, floods, hurricanes and other extreme weather conditions constitute one of the drivers or causes of price volatility in agriculture. Furthermore, Isaiah (2024) also attributed agricultural price volatility to 'market fundamentals', (when demand outstrips supply and thus leading to increased prices), climate change, depleted soils low soil water aquifers and the loss of biodiversity. In the same vein, global trade dynamics such as export restriction, tariffs and subsidies can contribute to price volatility by distorting international trade and creating unpredictable price pattern.

The impact of price volatility on the marketing of agricultural produce has been documented and it shows that the price swings can have negative implications for the marketing of agricultural produce by both producers and retailers (Zhao, *et al* 2022), especially the inability to establish consistent pricing strategies, develop marking infrastructures such as storage and transportation. Kim, *et al* (2023) pointed out that agricultural price volatility can also undermine the trust between producers and customers. Thus, marketers face difficulties negotiating contract with buyers who are unwilling to

commit to volatile prices. This situation is often loud in developing economies where there are weak market linkages. The United Nations Development Programmes UNDP, (2021) averred that the implications of agricultural price volatility are far-reaching, especially for smallholders' farmers in developing countries where income instability can hinder investment and perpetuates poverty cycles. It also affects consumers, particularly in low-income households, who face food insecurity as price surges makes essential commodities unaffordable.

The impact of price volatility on food security, household consumption and agricultural investment cannot be overemphasized in agrarian economy like Nigeria with Akwa Ibom State inclusive. Yet little empirical studies have investigated how price volatility specifically, affect the production, consumption and marketing of agricultural produce in Akwa Ibom State. Therefore, this study attempts to examine the effect of price volatility on agricultural produce marketing in Akwa Ibom State, Nigeria.

STATEMENT OF THE PROBLEM

The agricultural sector in Nigeria has experienced pervasive disruption and instability of prices of produce despite policy reforms by government to address the remote causes for agricultural product stability. The persistent price volatility of agricultural produce has had negative implications for farmers, marketers and consumers especially the most vulnerable. Increased price volatility of agricultural produce at a macro level, may have contributed to economic crises experience in Nigeria over time, and may have contributed to the growing food insecurity and poverty that the country is battling with. This problem also may have contributed to farmers' inability to predict income level and future investment, resulting in uncertainty in meeting household needs, procurement of farming inputs, inability to service loans and adopt improved technologies. This situation has put farmers in a continuous cycle of poverty and vulnerability.

Observations have shown that price volatility has made it impossible for low income families to afford nutritious meals, maintain satisfactory food choices and alters their preferences. This situation may have contributed to the increased prevalence of poor dietary quality and health issues such as obesity, diabetes, and other micronutrient diseases. Furthermore, price volatility has further hampers the ability of marketers to establish consistent pricing strategies and develop marketing infrastructures such as storage and transportation. This situation has contributed to weakened trust and loyalty among agricultural supply chain stakeholders and ability of marketers to scale their businesses by endangering adoption of e-commerce and improved logistics.

In Akwa Ibom State, these problems are further compounded by prevalence marketing inefficiency such as poor infrastructure, high cost of transportation occasioned by high pump price of fuel, branding, lack of access to market information and credit facilities. The researcher wonders if price volatility has caused the inefficiency in the marketing of agricultural produce. Hence, the study seeks to examines the effect of price volatility on agricultural produce marketing in Akwa Ibom State, Nigeria.

PURPOSE OF THE STUDY

The main purpose of this study is to determine the effect of price volatility on agricultural produce marketing in Akwa Ibom State, Nigeria. Specifically, the study sought to:

i) determine the effect of price volatility on consumers' demand for the marketing of agricultural produce in Akwa Ibom State.
ii) determine the effect of price volatility on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State.

RESEARCH QUESTIONS

The following research questions were formulated to guide the study

i) Does price volatility affect consumers' demand for the marketing of agricultural produce in Akwa Ibom State?
ii) Does price volatility affect the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State?

RESEARCH HYPOTHESES

The following research hypotheses were formulated to guide the study

i) There is no significant effect of price volatility on consumers' demand for the marketing of agricultural produce by farmers in Akwa Ibom State.
ii) There is no significant effect of price volatility on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State.

LITERATURE REVIEW

Concepts of Price Volatility

Price volatility refers to the extent of variation in the prices of commodity over a period of time. It is a term used to assess the frequency and magnitude of price changes and is often expressed in terms of standard deviation from market indices. Kumar and Kumari (2021) argued that price volatility reflects the market's uncertainty and serves as a critical indicator of risk in economic systems. The concept is commonly associated with commodities, foreign exchange markets, and stock prices. Volatility indicates how much and how quickly a value changes over time, for example the price of a commodity. While this concept may seem obvious, a precise definition of volatility is elusive and measurement prone to subjectivity. In economic theory, volatility connotes two principal concepts: variability and uncertainty; the former describing overall movement and the latter referring to movement that is unpredictable (Jonne, 2021).

Agricultural Marketing

According to Udah (2020) marketing is defined as consisting of business activities that seek to anticipate demand, help in developing and making the product/services available to the satisfaction of the consumers/users at a profit to the product or seller (Anyanwu, 2019). When applied to agriculture, it is seen as consisting of agribusiness activities that seek to anticipate demand and help in developing and making agricultural commodities available to the satisfaction of users at a profit to the agribusiness enterprise (Ehiorobo, 2018). Marketing makes it possible for labour specialization to take place. With the exchange system (trade openness), people do not consider it plausible to labour themselves again to produce all they need. They tend to concentrate on that which they have comparative advantage over others. The result of specialization of labour is improvement and increase in production which contributes to economic growth and development.

Consumers' Demand and Price Volatility

The concept of demand in economics express the willingness and ability of consumers to purchase goods and services at a specific price. It's a flow concept, meaning it's expressed in relation to a specific time period and price. Demand is also conceptualized as a function of quantity and a price. "It tells the quantity of a product that will be demanded at various price levels. So demand is not one quantity demanded but a series of quantities demanded based on alternative prices". According to Wasnik and Pandey (2024) demand, simply put, is the driving force behind what consumers willing to purchase at varying prices. It is a dynamic and multifaceted concept that influences not only the choices

of individuals but also the allocation of resources, the pricing of products, and the strategies of businesses and governments. Santeramo, *et al* (2017) argued that the demand and supply interaction plays a significant role in the dynamics of agricultural commodities price and the exceptional surge in price volatility. Although, noneconomic exogenous drivers such as weather conditions, pest infestations, environmental conditions, and technological changes play a role in price volatility, the joint interaction between dynamics of demand and supply may operate as a buffer of price volatility, calling off price fluctuation throughout a progressive adjustment mechanism over time.

Price volatility and Farmers' Level of Output

The concept of agricultural output refers to the volume of agrarian products generated by farmers within a specific period. It's a crucial index of agrarian productivity and effectiveness which further reflect the effectiveness of inputs like land, labor, capital, and technology. According to Ahmed and Bello (2021) farmers' level of output are determined by a combination of natural, profitable, and institutional factors. One of the most significant factors that impact level of output among farmers is the access to agricultural input. These include seeds, fertilizers, improved tools, diseases control, fungicides, and irrigation installations. growers with access to high- quality inputs tend to achieve advanced yields compared to those without.

Price volatility can lead to higher agricultural commodity prices during periods of demand-supply imbalance. Adeola and Adeyemo (2021) argued that when farmers anticipate favorable price trends, they may have the incentive to increase investment in farming inputs such as fertilizers, improved seeds, and machinery to enhance productivity. Farmers tend to expand their scale of operations when price expectations are positive. Fluctuating prices often push farmers to diversify their crop production to mitigate risks associated with the volatility of a single crop market.

Habtamu (2019) examined the effect of consumers' demand on farm productivity as evidenced by small- scale maize producing farmers in North Bench District, Bench Maji Zone. The study collected cross sectional data from 200 maize producing farmers. The data was analysed using descriptive statistics and Cobb-Douglas production function model. The study revealed that higher demand contributes to maize farmers' productivity. High demand of produce enables farmers to adopt new farm technology, enable farmers to adopt better method of farming. The two studies are related because they investigate the effect of consumers' demand. However, while the reviewed study examined the effect of consumers' demand on farm productivity as evidenced by small- scale maize producing farmers in North Bench District, Bench Maji Zone, the present study examined the effect of price volatility on agricultural produce marketing in Akwa Ibom State.

Oduro-ofori, *et al* (2015) investigated how consumers' demand affect agricultural productivity of farmers in the Offinso Municipality of Ghana. Data was obtained from 100 farmers, Municipal Agricultural Development Unit as well as Non- formal Education Section of the Offinso Municipal Educational Directorate selected from eight farming communities in the Municipality. The study revealed that output level increases with increase in the level of demand. The two studies are related because they investigate the effect of consumers' demand for agricultural produce. However, while the reviewed study investigated how consumers' demand affect agricultural productivity of farmers in the Offinso Municipality of Ghana, the present study examined the effect of price volatility on agricultural produce marketing in Akwa Ibom State.

Abugu (2018) assessed the impact of price instability on the production of plantain and banana in Cross River State, Nigeria. Specifically, the objective of the study was to assessed the impact of cost of input, cost of labour, processing and storage facilities and government policies on the production of plantain and Banana in Cross River State. The variable for the study were cost of input, cost of labour, processing and storage facilities and government policies. Multistage sampling techniques was used to select 160 plantain and banana farmers for the study. Structured interview scheduled was used for data collection. Data for the study were analyzed using descriptive statistics and factor analysis. Results

show that cost of input (56.9%), cost of labour (27.2%), processing and storage facilities (16.2%), while government policies (11.2%). The quantity and price of sale of produce varied depending on the season of the year (26.6%) in which the plantain was produced, number of buyers (20.0%) and quality of produce (16.2%). Off-period production of plantain is more profitable for farmers as price is highly volatile. The two studies are related because they examined the effect of price volatility on the output of agricultural produce. However, while the reviewed study assessed the impact of price instability on the production of plantain and banana in Cross River state, Nigeria, the present study examined the effect of price volatility on agricultural produce marking in Akwa Ibom State.

Olabode and Ogunrinola (2022) carried out a study on effect of agricultural price volatility and investment on the economic growth of Nigeria: a case of cocoa production (1981-2013). Specifically, the study examined the effect of price volatility on the investment on cocoa production. Time series survey research design was adopted for the study. The data used for the study were sourced from CBN statistical bulletin, Africa Development Indicator and World Economic Outlook. Ordinary Least Square (OLS) estimation technique was adopted and a multiple regression analysis method was used for data analysis. The OLS result showed that there exists a negative relationship between government capital and recurrent expenditures and price of cocoa on the level of Gross Domestic Product (GDP) in the short-run but showed a positive relationship in the long-run. The two studies are related because they examined the effect of price volatility on the output of agricultural produce. However, while the reviewed study examined the effect of agricultural price volatility and investment on the economic growth of Nigeria: a case of cocoa production (1981-2013), the present study examined the effect of price volatility on agricultural produce marketing in Akwa Ibom State.

Design of the Study

A descriptive survey research design was adopted for the study. A survey research design typically employs questionnaire and interviews in order to determine the opinions, attitude and perception of persons in line with the objectives of the study. It is one in which the entire population or representative sample is studied by collecting and analyzing data from or the use of questionnaire. This design was considered suitable to this study because it allowed information to be generated through questionnaire and responses analyzed as they appear.

Population of the Study

The population of the study comprised 29,582 registered farmers in Akwa Ibom State. According to the Akwa Ibom State Ministry of Agriculture, (AKSMA, 2024) there are 29,582 registered farmers in Akwa Ibom State.

Sample and Sampling Technique

A sample size of 400 registered farmers was selected for the study. The sample size was determined using Taro Yamane formula. The sample size was selected using multi-stage sampling technique. At the first stage, a stratified random sampling technique was adopted to segment Akwa Ibom State into three strata to reflect the three senatorial districts in the state. Thus, farmers in Akwa Ibom North-East, Akwa Ibom North-West and Akwa Ibom South Senatorial Districts was used for the study. At the second stage, a simple random sampling technique was adopted to select Itu, Ibiono Ibom, Nsit Ibom, Ibesikpo Asutan, and Etinan Local Government Areas from Akwa Ibom North-East Senatorial District, Abak, Oruk Anam, Ukanafun, Etim Ekpo and Essien Udim Local Government Areas from Akwa Ibom North-West Senatorial District and Onna, Mkpat Enin, Eastern Obolo, Oron, and Ikot Abasi Local Government Areas from Akwa Ibom South Senatorial District. At the third stage, a proportional sampling technique was adopted to select 25 farmers from the selected Local Government Areas.

Instrumentation

Researcher's made instruments titled: Price Volatility Questionnaire (PVQ) and Marketing of Agricultural Produce Questionnaire (MAPQ) are used as instruments for data collection. The Price

Volatility Questionnaire (PVQ) contains 50 items were developed in line with the research objectives, questions and hypotheses. On the other hand, the Marketing of Agricultural Produce Questionnaire (MPQ) contained 25 items. The response of Price Volatility Questionnaire (PVQ) and Marketing of Agricultural Produce Questionnaire (MAPQ) were rated using a four-point rating scale and weighted SA-4, A-3, D-2 and SD-1. The instruments were subjected to face validation and reliability test. Reliability coefficient index of .86 and .88 were obtained using Cronbach Alpha statistics for Price Volatility Questionnaire (PVQ) and Marketing of Agricultural Produce Questionnaire (MAPQ) respectively. However, an overall reliability coefficient index of .92 was obtained which indicated that the instruments are highly reliable and suitable for this study.

Method of Data Analysis

Regression coefficient R was used to answer the research questions while F- statistics was used to test the null hypotheses at .05 level of significance. When the computed p-value is less than .05 alpha level, the null hypotheses was rejected and when it is greater than or equal to .05 alpha level, the null hypotheses was retained.

Results

Research Question 1:

Does price volatility affect consumers' demand for the marketing of agricultural produce in Akwa Ibom State?

The value and magnitude of regression coefficients were used in answering the research question as shown in Table 1.

Table 1: Simple Regression Analysis of the Extent to Which Price Volatility Predict Consumers' Demand for the Marketing of Agricultural Produce in Akwa Ibom State

Variables	R	R^2	% prediction
Price volatility	.813*	.678	67.8
consumers' demand			

The result in Table 4.1 shows the value of the regression coefficients (R) and its corresponding R^2 of .813* and .659 respectively. The R-value of 0.81 implies a very high correlation between prie volatility and consumers demand. The value of R^2 of .678 indicates that price volatility has contributed 65.9% to the variation in consumers' demand in Akwa Ibom State. This implies that price volatility has positive effect on consumers' demand for the marketing of agricultural produce in Akwa Ibom State.

Research Question 2

Does price volatility affect the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State?

The value and magnitude of regression coefficients were used in answering the research question as shown in Table 2.

Table 2: Simple Regression Analysis of the Effect of Price Volatility on the Level of Output of Farmers in Akwa Ibom State.

Variables	R	R^2	% Prediction
Price volatility	.853*	.821	82.1
The level of output of farmers			

The result in Table 4.2 shows the value of the regression coefficient (R) and its corresponding R^2 of .853* and .821 respectively. The value of R^2 of .821 indicates that price volatility contributed 82.1% of the variation in the level of output of farmers in Akwa Ibom State. With the percentage of 82, it

therefore means price volatility has a high effect on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State.

Research Hypothesis 1

There is no significant effect of price volatility on consumers' demand for the marketing of agricultural produce by farmers in Akwa Ibom State.

Table 3: Summary of Regression Analysis of the Effect of Price Volatility on Consumers' Demand for the Marketing of Agricultural Produce by Farmers in Akwa Ibom State

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8498.874	1	8498.874	586.615*	.000[b]
Residual	4406.494	395	14.488		
Total	12905.368	396			

The result from table 3 shows that the computed F-value of (586.615) has the probability level of 0.00 which is less than the significant level of 0.05. This is interpreted to be significant at the degree of freedom of 395. Therefore, the null hypothesis which states that there is no significant effect of price volatility on consumers' demand for the marketing of agricultural produce by farmers was rejected. There is a significant effect of price volatility on consumers' demand for the marketing of agricultural produce by farmers in Akwa Ibom State.

Research Hypothesis 2

There is no significant effect of price volatility on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State.

Table 4: Summary of Regression Analysis of the Effect of Price Volatility on the Level of Output of Farmers for the Marketing of Agricultural Produce in Akwa Ibom State

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	11230.282	1	11230.282	2011.191*	.000[b]
Residual	1675.086	395	5.584		
Total	12905.368	396			

The computed F-value of (2011.291) has the probability level of 0.00 which is less than the significant level of 0.05. This is interpreted to be significant at the degree of freedom of 395. Therefore, the null hypothesis which states that there is no significant effect of price volatility on the level of output of farmers for the marketing of agricultural produce is rejected. This means that there is a significant effect of price volatility on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State.

Discussion of Findings

The findings of the study revealed that price volatility has positive effect on consumers' demand for the marketing of agricultural produce in Akwa Ibom State. The test of hypotheses revealed that there is a significant effect of price volatility on consumers' demand for the marketing of agricultural produce by farmers in Akwa Ibom State. This finding is possibly due to the fact that changes in demand causes fluctuation in prices. The findings of the study are in agreement with the findings of Wang *et al.*, (2021) whose findings revealed that changes in consumer demand which may be driven by population growth,

dietary shifts, and seasonal preferences have a direct impact on supply-demand equilibrium which cause prices to rise or fall unpredictably. In the same vein, the findings of the study also affirm the findings by Santeramo, *et al* (2021) that the demand and supply interaction plays a significant role in the dynamics of agricultural commodities price and the exceptional surge in price volatility.

The findings of the study revealed that price volatility has positive effect on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State. The test of corresponding hypothesis revealed that there is a significant effect of price volatility on the level of output of farmers for the marketing of agricultural produce in Akwa Ibom State. This finding may be due to the fact that price volatility causes farmers to either increase productivity or reduces their ability to produce enough for marketing. The findings of the study align with the findings of Abugu (2018) who found that the quality and quantity of plantain produced were dependent on the market price of the commodity. The study also revealed that production of plantain is more profitable for farmers when the price is on the increase rather than a lower surge. The findings of the study also support that of Agube, *et al.*, (2021) that price volatility predicted large output of cassava production in Cross River State. The findings of the study agree with the findings of Toriola (2022) who found that the current maize and soya bean prices positively affect farmers output in the preceding year, and that agricultural output increases with increased agricultural commodity prices. The findings of the study also align with the findings of Zhao *et al.* (2022) whose findings showed that the mismatch between supply and demand creates price volatility, particularly in markets where supply chains are not robust enough to accommodate sudden changes.

CONCLUSION

Based on the findings of the study, it was concluded that price volatility greatly influences consumers' demand for agricultural produce, output of agricultural produce and farmers' income, sales volumes and purchasing power parity for the marketing of agricultural produce by farmers in Akwa Ibom State.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that:

i) Government and non-governmental organizations should provide support systems, such as subsidies to farmers to encourage them to continue to undertake agricultural production in the period of price shocks.
ii) Agricultural produce marketers should be sensitized through workshops and seminars on the interaction of market forces, price fluctuations, and agribusiness to understand the practical realities of agricultural production and marketing in Akwa Ibom State.

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