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Determinants of Fluctuations in the Prices of Borno State Smoked Fishes in Mile 12 Market of Lagos, Nigeria.

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Abstract:
The marketing of processed fish products contribute positively to the socio-economy of Lagos State and Nigeria at large. The effect of a change in the prices of fish products requires analysis that explains the nature and pattern of price fluctuation in the market. The study evaluates determinants of price fluctuation of smoked fishes from Borno State distributed in mile 12 market of Lagos, Nigeria. Results indicate consumers are insecure not only because of fish price increases but also due to other non-price determinants. The adjusted R^2 indicates that variables are significant at 5% level, while t- values are in parenthesis. Since the series has order of integration equal to one, we used the first difference in the estimation. Thus, the results indicate determinant of change in price. Based on these findings, policy intervention measures are suggested.

Keywords: Determinants, Fluctuation, Price, Smoked Borno Fishes, Lagos.

1. Introduction

Fishing communities, have since ancient times, relied on water resources for a considerable proportion of their living requirements as a result nearness to sea, lagoons, the lakes, big and small rivers. Fishery is an important sub-sector of agriculture in Nigeria, yet, contributing only 4.0% to GDP (FDF 2007). Borno State Nigeria is prominent in artisanal fish production particularly in the Baga peninsular of the Nigerian shore of Lake Chad where fisheries are smoked and moved to other parts of the country (Nigeria). In addition to the supply of river from the highlands to the south, it remains one of the most important freshwater lakes in Africa, which extends over the territories of Cameroon, Chad, Niger, and Nigeria.

Lagos State is an important market for Borno State Smoked Fishes and Mile 12 market is the centre for distribution to other parts of the state, which has become a form of income generation and a prime mover in Nigeria's economic growth. The fish market received tonnes of smoked fishes every Sunday throughout the year for onward distribution within Lagos State (Alhaji 2008). The market is one of the main source of sales and purchases of large volume of Borno State fisheries products for the growing population. However, Lawal and Idega (2004), observed that generally, educational level attained by the marketers to a large extent determine the strategies used to solve marketing problems and to adopt new innovation without difficulties to increase their profit margin.

Fisheries prices variability always have an impact on the real income and welfare of the populace. Increases in the prices of smoked fishes reduce real income and welfare due to poor demand. According to Olukosi and Isitor (1990), most farm products' prices do not remain constant throughout the year; they follow a regular seasonal pattern. Generally, there have been upward trends in the prices of most staple foods in Nigeria. The increase in retail prices of fish was more pronounced in Nigeria during 2005-2006 pathogenic avian influenza (Bird-flu period). However, price increases have been attributed to other factors such as rising transportation costs, occasioned by upward adjustment of prices of petroleum products due to its increasing demand for both domestic and industrial uses. Others are deplorable condition of inter-state roads, poor storage facilities, inadequate supply of locally generated fisheries products, speculation due to the political nature of the country and more recently, insurgent's activities

(Boko Haram). Equally, labour market in the fishing industry is mainly of natural creation, the market is more localised (location specific) as Ogunbadejo (2007) opined that supply of labour to the industry is concentrated around the coastal and inland communities where fishing forms the primary basis for livelihood.

The movement of price level has several substantial economic implications. The price level directly or indirectly determines the profitability level of enterprises producing and distributing those consumer goods, as well as profitability of the production of consumer and non-consumer goods. Inversely, price fluctuation or changes in the price level in the market determine both the demand and supply of the commodities (fishes) within Lagos state in a given period. All things being equal, the forces of supply and demand determines price. It is apparent therefore, that except over long period, the directional change in prices of fisheries products will give rise to major fluctuation in the general level of prices of the products, which may also reflect similar directional changes in the demand for fisheries products in the market.

Lipsey, (1963), asserted that supply side fluctuation are caused by many factors, the agricultural production is subject to large variation due to factors beyond human control; weather reduces output below fishermen expectations, while exceptionally good weather pushes high yield above fishermen expectations. The effect would be variation in output because price changes will largely be less elastic; the demand curve will then be inelastic. Also changes in prices would have an effect on the revenue received by fish merchant because if the product has an elastic demand, fish merchant's revenue is raised through high supply but lowered by less supply. If the product has an inelastic demand, high supply lowers fish merchant's revenue, while less supply raises it. If the demand elasticity happens to be unity, then revenue will not vary as output and prices vary, because every change in output will be met by an exactly offsetting change in price.

Lagos State is the commercial nerve centre of Nigeria with a growth rate of more than 3.2% per annum (NPC 2006). About 73% of the population live in towns and cities, which constitute about 30% of its land mass. An estimated 60,000 farm families occupy about 70% of the total land mass (1992 Village Listing Survey (VLS) by LASDP). The population of fishermen in the state fluctuates as indigenous and foreigners migrate to different fishing settlements in and outside Nigeria, thereby causing fluctuations and inadequacies in the supply of fish and fishes products sourced from within the state

Basically, this research helps to predict fluctuation or variation in the prices of smoked fishes supplied weekly from Borno State to Lagos State. This study is useful for various government's policies on transformation agenda. The study would assist consumers to allocate resources properly by making appropriate choices among fishery products. The research also provides an insight into the effects of insurgents (Boko Haram) in Borno State smoked fishes on the market in Lagos State. The knowledge will enable decision makers understand the state of economic destruction caused and plan effective policies that would alleviate poverty and stimulate national economic growth.

2. Methods

2.1. The Study Area
Lagos state lies entirely within the Southern rain forest zone of the humid tropics. It lies between Latitude 6° and 7° north of the Equator and Longitudes 3° and 4° east of the Greenwich Meridian. Lagos state has a total area of about 4000 km^2 out of which 3277 km^2 (78%) is land. The state has a Marine shoreline of about 180 km and extends inland about 32 km (at its farthest point) from the shoreline. The state is bounded in the north and east by Ogun state, on the west by the Republic of Benin and on the south by the Atlantic Ocean.

The topography that is undulating plain in its northern area is interspersed with swamps in the flood plains of the rivers that flow through the state. The coastal belt of sandy ridges is interspersed by lagoons and creeks; this makes the state rich in water resources for fishing and other agricultural activities. The state experiences two rainfall peaks in the year: first around June/July and the second in Octobers. Average annual precipitation varies from 1312mm to 1726mm. the temperature is fairly high with the minimum ranging from 19° c to 25° c and the maximum between 27° c and 37° c. the relative humidity is, on the average, over 60% though-out the year..

The data were analysed using descriptive statistics-mean, standard deviation and co-efficient of variation and matrix laboratory (mat lab).

2.2. Theoretical Framework
The framework consisting of equations explained convergence and determinants of prices. The pattern of price movements is analyzed using time series, while the empirical framework identified methods for collecting data, trend analysis and regression analysis.

The price (p) of commodity "n" in Mile 12 market at time "t" is;

$$P_{njt} = f(\Delta njt, S_{njt}, P_{njt}) \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Equation (1) shows that S_{njt} is seasonal if n is smoked fish product. However, if demand is seasonal, Δnjt may change seasonally. The market is competitive among smoked fishmongers mostly of the Northern Nigeria.

2.3. Seasonal Adjustments
Dummy variables were used to identify conventional and long-standing problem of seasonality, given quarterly or monthly time series. Secondly, to estimating economic relationship between variables that is available in both unadjusted and depersonalized form. In analyzing the determinant of price fluctuation, coding of the questionnaires is used. Akpan (1955) adopted the approach of the serial correlation analysis via the use of simple regression tests. The change in commodity market prices was regressed on its own lagged value once and there is the expectation of the simple (OLS) regression getting close to zero. "The Nigerian market like it's counterparts in developing countries is relatively volatile in pricing and in conduct and performance".

The estimation result is presented in equation 1-3 below. The result of the adjusted R^2 indicates variables that are significant at 5% level. The t- values are in parenthesis while the series has order of integration equal to one, the first difference in the estimation indicates determinant of change in prices.

Smoked Fish (SF):
- $Sf_1 = 38.2 + 0.62\ Sf_1\ (-1) + 0.19\ Sf_2 + 1.32\ SE$
  - (2.19) (3.45)* (2.06)* (2.36)*
    - $R^2 = 0.61$
- $Sf_2 = 2.53 + 0.56\ Sf_2\ (-1) + 0.24\ Sf_1 + 0.25\ SE$
  - (0.17) 7.10)* (5.23)* (2.32)*
    - $R^2 = 0.76$
- (3) $Sf_3 = 7.30 + 0.22\ Sf_3\ (-1) + 0.81\ Sf_2 + 0.79\ SE$
  - (-0.94) (4.15)* (4.61)* (2.84)*
    - $R^2 = 0.81$

2.4. Trend Analysis

The trend analysis is based on:
- Observation of the graph of the series.
- Measure of the stochastic properties of the series (mean, standard deviation and co-efficient of variation) and
- Comparison of the behaviour of price in different years.

The analysis of the fluctuation in the prices of fishes is consistent with trend analysis that described the pattern of price movement using graphical representation; the one-way classification of the analysis of variance (ANOVA) analyses the mean, standard deviation, the standard error and the confidence interval, of prices in the market. The co-efficient of variation helps to analyze the volatility in the prices of fishes. Other determinants of fluctuation in prices could be due to factors such as the demand and supply forces, storage, transportation system, intermediaries, retailers, insurgency and government policies like levies and taxes.

2.5. Determinants of Price Fluctuation in the Market

To determine the price movement in the market the conventional theory of the market and economic variable are examined in the analysis.

$P_1T = \propto + \beta_1 \Delta w + \beta_2 \Delta gp + \beta_3 Pc + \beta_4 Stg + \beta_5 Trp + \beta_6 CrS + \beta_7 Slry\ (\Delta_0 \Delta_1) + Ut \dots (2)$

Where salary can be broken down using dummy variable

Δ_1 = Month end dummy when salaries are paid

Δ_0 = other period dummy when salaries are not paid

Δw = Change in weather

Δgp = Change in Government policy

Pc = Presence of consumers (buyers)

Slry = Salary payment

Stg = Availability of storage

Trp = Transport

CrS = Credit selling

Ut = Disturbance term.

In equation (2) priori expectation is that are positively related to price. Therefore, an increase in any of the variable will mean an increase in the price of fishes.

Salary, presence of consumers and weather constitute the most important factors that determine the price of fish in the market. Since salary and presence of consumers affect price, then steady salaries will increase demand, which invariably will push the price of fish products upward. In the same vein, price ratios move in the same direction with salary. However, other determinants were captured via the use of questionnaires and interpersonal discussions with respondents. The new equation for the salary effect will be:

$P = \propto + \beta_1\ Slry\ (\Delta_0 + \Delta_1) + Ut \dots \dots (3)$

Where;

P = the price.

$\propto$ = Intercept.

β_1 = Co-efficient of the salary.

Δ_0 = Dummy when salary is not paid.

Δ_1 = Dummy when salary is paid.

Ut = Disturbance term.

2.6.Sources of Data

Figure 1: Chair Mile 12 Smoked Fish Market Association and Researcher, 2011.

The market was surveyed once every month, Sundays is usually distribution day. Data were collected from primary sources through the use of Questionnaires and Semi Structured Interviews (SSI) and was subjected to David Houcque (2005), Matrix Laboratory (Mat Lab).

3. Results and Discussion

Figure 2:Mile 12 Smoked Fish Market 2011.

Figure 2:Mile 12 Smoked Fish Market 2013.

The socio-economic characteristics of the marketers, which include their gender, category of business, source of products, and access to sellers on credit, payment arrangements and market structures are presented in table 1 below.

Market	Gender	Frequency	Percentage
Male 12	Male	135	**100**
	Female	0	**0**
	Total	135	100

Table 1
Sources; field data.

Table 1 indicates gender classification, frequency and percentage of male to female, it shows dominance of males to females involved in transacting smoked fish business of Borno origin, the disparity is attributed to the traditional ethics and religious beliefs of the fish origin.

Year	Qty Supply/Kg (in Carton)	Average price per Carton	Quantity supplied per week (carton)	Total value per week (million)
2004	22	8,000	44,000	3,52
2005	20	8,000	40,000	3,20
2006	20	8,500	40,000	3,40
2007	19	9,000	38,000	3,42
2008	19	9,000	38,000	3,42
2009	17	9,000	34,000	3,06
2010	17	11,000	34,000	3,74
2011	15	12,000	30,000	3,60
2012	13	13,000	26,000	3,38
2013	9	14,000	18,000	2,52

Table 2: Smoked fish weekly supply and average prices (2004-2013).
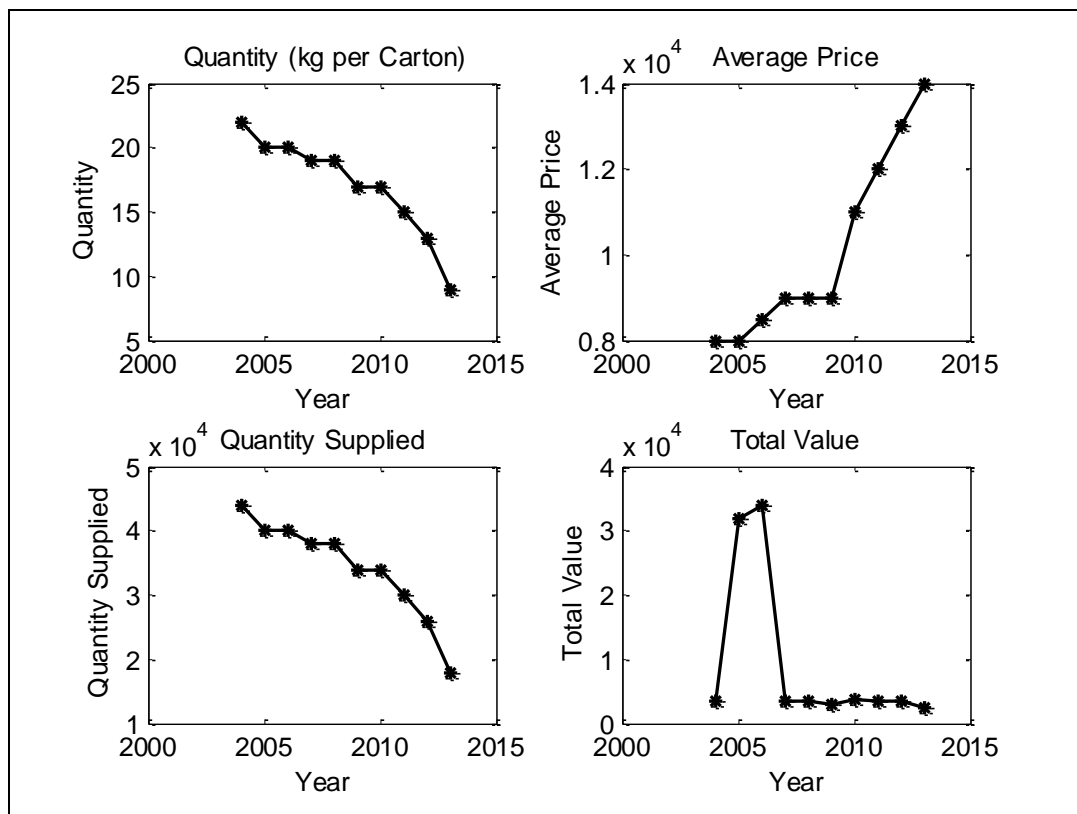*Sources: Field data survey.*

Fiqure: 2
Sources: Field data 2013

Table 2 shows quantity supplied per week, average prices and total value. Fiqure 2 indicates a steady increasing price while the quantity supplied dropped, subjecting to this Matrix Laboratory depicts that R = 0.4105, Rsq =0.1686 and P-val =0.2386. The correlation coefficient between the quantity supplied per week in carton and the total value per week in millions shows a positive linear correlation of 0.4105 with only about 17% of the data utilized in the correlation. However, the probability value for the correlation indicates that we can reject the null hypothesis, suffice to say the linear relationship between the two variables does not interact.

4. Major Constraints
The study has highlighted several factors constraining selling of Borno smoked fishes in Lagos. The factors are inadequate transport means, bad roads, poor processing and marketing facilities, lack of credit facilities, market union, double taxation and insurgents activities (Boko Haram) in the North East of Nigeria. These have made the quantity of Borno smoked fishes supplied to Lagos and their prices to fluctuate even though packaging remained the same.

5. Conclusion
The study established major determinants of price fluctuation for Borno smoked fishes as marketed at the Mile 12 market of Lagos State using primary data. The study established that fluctuations in the prices of fish can be attributed to seasonality observed in agricultural produce. To enhance the economic potential of the business, the authors proposed the following recommendations:

- Government should encourage good information system on price trends.
- Government should give attention to policies targeted towards improving foodstuffs price.
- Government should maintain fuel price regime, because fish marketing has direct relationship with prices of petroleum products and consequently cost of transporting agricultural goods.
- Good roads will link fish production areas to the market thereby, reducing the pressure from transportation cost.
- The problem of insurgency in the North East, which is presently the source of smoke fishes, should be, completely eliminated.

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