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42- ANALYSIS OF PALM OIL PRICES IN INI LOCAL GOVERNMENT AREA OF AKWA IBOM STATE, NIGERIA

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ABSTRACT

The aim of this study was to analyze palm oil prices in Ini Local Government Area of Akwa Ibom State, Nigeria. Palm oil is a major agricultural commodity that is highly commercialized in the Nigeria and has suffered various economic impacts cardinally is the price volatility. In consideration of palm oil price stability, trend analysis, seasonality, cyclical and irregular elements of price volatility were determined. Data were obtained through structured questionnaires administered to 160 randomly selected palm oil marketers. The time series model, measurement of instability factor and index of dynamic price analysis were used. The result revealed that the instability factor was 0.097% and index dynamic price was 58.49%, which shows that palm oil prices were relatively stable during the time of study. The study concluded that there was no incentive to store palm oil as prices are relatively constant over time. Therefore, the study recommended that the marketers should not store palm oil for future sales rather marketers should speculate palm oil trading through prices differential by geographical market locations and not by time difference.

Keywords: Palm oil Price **trend, seasonality, cyclical and irregular Analysis**

INTRODUCTION

Oil Palm is a perennial crop that originated in the tropical rain forest of West Africa. It spread to South America in the 16th century and to Asia in the 19th century. During the 1970's, Asia overtook Africa as the principal oil palm producing region in the world. In recent decades, the domestic consumption of palm oil in West Africa has increased more rapidly than its production. After centuries as the leading producing and exporting region West Africa has now become a net importer of palm oil (Udo, 2012). These are due to the social, economic and environmental impacts and have affected production and commercialization of the product.

Between 1961 and 1965 world oil palm production was 1.5 million tonnes, with Nigeria accounting for 43%. However, since then, oil palm production in Nigeria has virtually been stagnated. But today, world oil palm production amounts to 14.4 million tonnes, with Nigeria which is one of the largest producers in West Africa, accounting for only 7%. Kei, *et al* (1997) compared the characteristics of the oil palm sectors in Malaysia and Nigeria and found out that Malaysia's success is built on plantation management together with processing in large modern bills. The plantation mode of production is characterized by large scale monoculture under unified management. In Nigeria by contrast, 80% of production comes from dispersed small holders who harvest semi – wild plants and use manual processing techniques.

Due to increased demand for palm oil resulting from an increase in population and income growth, relative to the low productivity of the oil palm sector, Nigeria has become a net importer of palm oil. At the same time, rapid devaluation of the Naira combined with high transportation costs from ports to internal markets put imported palm oil in a competitively disadvantaged position. Thus, Nigeria's first goal is to meet the domestic demand and then if possible sell to international markets.

Palm oil processing is a major source of income and employment to a large proportion of the resource poor rural population in Nigeria especially in the South – western part of the country. In recent times its production has drastically nosedived. Evidence in CBN/NISER, cited by

Olagunju (2008) revealed that this situation has been brought about by a number of socio – economic and political factors along with the technological know – how in the industry. Principally among the factors responsible for this decline is the inefficiency that exists in the production system for palm oil processing. Such inefficiencies arise from high cost of labour, lack of linking roads for transportation, electricity, water, inadequate credit facility etc (Ukpabi, 2004). Also, there is inefficiency in the marketing of the product such as price volatility, poor storage and poor market intelligence.

Agricultural commodities have historically exhibited seasonal price movements that are tied to the annual nature of the crop cycle. Crop prices in the cash and futures markets are usually lowest near harvest due to supply pressure (Deaton and Laroque, 1992 in Udo 2012b). Conversely, the price is usually highest near the end of the marketing year when supplies are less abundant (Olukosi, *at al, 2007a*). Seasonal price movements will vary, however, depending on supply and demand fundamentals. In particular, deviations of actual from expected supplies can have a pronounced impact on seasonal price patterns. During a "small" crop year, the new crop supply falls significantly below what the market expected at the time of planting. During a "large" crop year, the new crop exceeds earlier market expectations. Different seasonal indexes are relevant in these different situations (Thomen and Foote, 1952). The seasonal variation in the production of some farm products and the corresponding changes in prices have been studied by Taylor cited in Udo, (2012c). It is on ground we undertake this study to analyse palm oil prices in Ini Local Government Area, of Akwa Ibom State, Nigeria**.**

The study will describe the nature of the changes in prices of palm oil, (trend, seasonal, cyclical and irregular) and determine the price stability index of palm oil in the study area

Materials and Methods

The research was carried out in Ini Local Government Area of Akwa, Ibom State. The Government Area was carved out of the former Ikono Local Government Area of Akwa Ibom State in 1991, it has a land mass of 320, 451 square kilometers. The study area lies between latitude 4° 32' and 5° 33' North; and longitude 7° 25' and 8° 25' East, with a mean annual temperature of between 26°C and 29°C, a mean annual rainfall ranges from 2000mm to 3000mm, an average sunshine cumulates to 1, 450 hours per year and a high annual evaporation ranges from 1500mm to 1800mm (AKWADP, 2004).

The people of Ini are predominantly cash crop farmers. The study area has a total of four (4) clans with a total of Ninety four (94) villages. The clans are: Itu Mbonuso clan, Iwere clan,Nkari clan and Uquok clan. A multi – stage random sampling technique was used, choosing clans, villages and respondents. The first stage was grouping of the clans into cluster areas, then random selection of eight (8) villages from the four (4) clans, this was followed by the random selection of twenty (20) respondents per village to give a total of 160 palm oil marketers. Market price of palm oil obtained was from 2001 to 2010 that used for the analysis. Data were collected through questionnaires, where applicable personal interviews of the respondents were used.

Analytical Tools

Time Series Analysis

Objective (i) was analysed using time series models that made use of Ordinary Least Square (OLS) method of estimation (Omotosho, 1990a). The time series model was specified using the additive approach which is written as:

$$Y = T + S + C + I \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where: Y = observed data; T = Trend values; S = Seasonal variation; C = Cyclical variation; I = Irregular variation.

Measurement of Instability

Objective (ii) was analyzed using measurement of instability. The measurement approach adopted in the study was the quantitative approach (Reddy *at al*,2004a). Typically, the method used involved the coefficient of variation (CV) which was specified as:

$$CV = \frac{SD}{\bar{X}} \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Where:

$\bar{SD}$ = standard deviation; $\bar{X}$ = ***mean of price measurement; CV*** = coefficient of variation

Also, the long – run instability index measurement (Reddy *at al*, 2004b) was used specified as:

$$I = (1 - R^2)100 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where: I = index of dynamic instability in price and R^2 = coefficient of multiple determination

Results and Discussions

Trend Analysis

The trend is the path which time series graph appears to follow over a long period of time. It forms one of the four components of a time series data. The trend values of a time series can be obtained by any of the following methods: (1) The free hand method (2) The semi – average method, (3) The least square method and (4), the moving average method (Omotosho, 1990b). However, in this research the least squares method was used. The regression coefficient b was given as:

$$b = \frac{n \quad xy - \sum(\quad x)(\quad y)}{n \quad x^2 - (\quad x^2)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Where:

b = coefficient of the slope; n = total number of observations; x = time period (month); y = the average prices of palm oil for each quarters of the year and

$\sum$ = summation sign

The regression coefficient obtained was 2.59 after substituting values for x, y and n in the above equation (4). The regression constant (C) was obtained by the use of the expression:

C = 1/n (y – bx) **…….5**

C = constant; while all other parameters remain as defined earlier.

The regression constant was calculated to be 1.75. The trend was obtained using this equation:

T = bx + C…….6

Where: T = trend; b = slope (intercept at y – axis); x = time period (month) and

C = constant. Therefore, the estimated trend equation took the form of

$$T = 2.59\,x + 1.75$$

The trend values were obtained by substituting different values of x into the equation. The above equation was used to determine the corresponding trend values for each of the monthly average prices of palm oil for the period covered (2001-2012). The resultant palm oil price trend is shown in Fig.1 below. From this figure, prices are seen to be higher during the months of July to September, while the period of January to March having lower prices. These periods of July to September and January to March coincidentally represent the scare and peak periods of palm oil output respectively.

This result is in line with the findings by Agbogo *et al* (2007b). They showed a seasonal response of pineapple prices to lean and peak periods. So, palm oil prices as any other agricultural product is responding to seasonal variations.

This price behaviour within the periods is in consonance with a prior economic theory that prices keeps increasing as demand for agricultural products increases. This shows an inverse relationship between palm oil prices and the demand for palm oil in the area under study. However, the trend analysis as revealed in figure 1 shows that it has a constant average price over the study period (2001 – 2010). It is shown graphically that the average prices in terms of unit change per season stood at zero. The implication therefore is that business speculators who buy and store to take advantage of time are most unlikely to make any substantial profit.

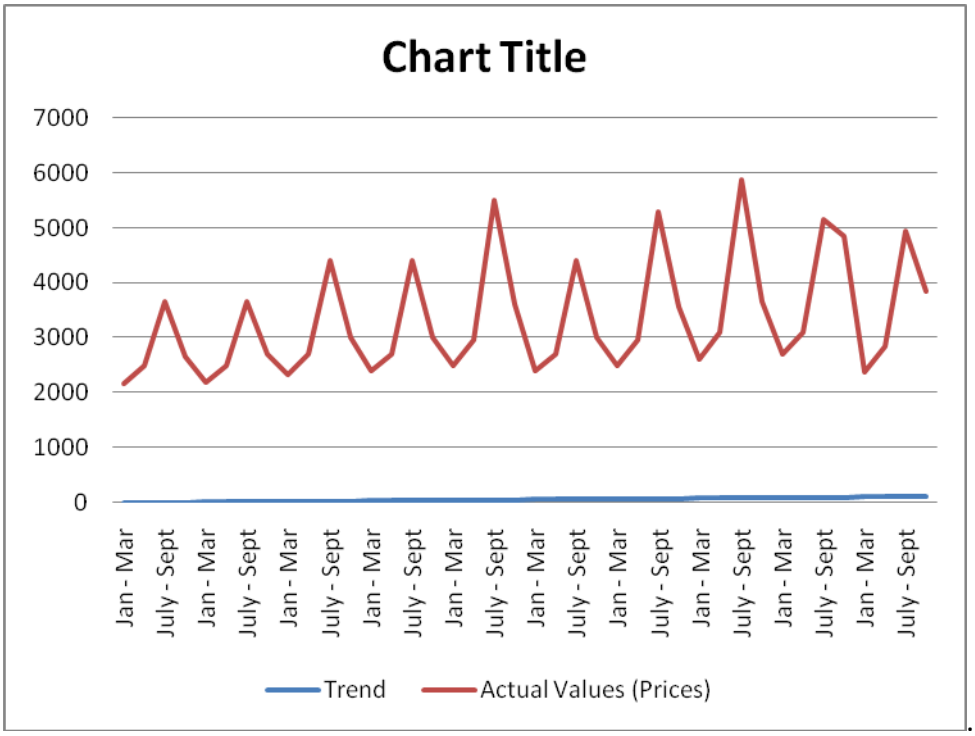

Fig 1. Graph showing palm oil price trend in the study area

Seasonal Analysis

In the seasonal analysis, time series data were used which were recorded monthly. The years were divided into four quarters with first quarter (Jan – Mar), second quarter (Apr – Jun), third quarter (July – Sept), fourth quarter (Oct – Dec). In estimating the seasonal variation of the time series two models are often used namely; (1) Additive model and (2) Multiplicative model. The study adopted the additive model to operationalized the objectives. Therefore, the seasonal variation (S.V.) equation can be written as:

SV = Q.M – G.M…….7

Where: SV = Seasonal variation; Q.M = Quarter mean of palm oil prices; G.M = Grand mean of palm oil prices (see Omotosho, 1990)

The predicted demand for palm oil is highest in first quarter (Jan – Mar) followed by second quarter (Apr – Jun), then the fourth quarter (Oct – Dec) and least period of supply by (Jul – Sept). This implies that palm oil producers should supply palm oil to the markets, keeping in view the demand in different quarters. The difference between the period's calls for proper understanding of the activity within each period as this would enhance marketing efficiency. The significant variations, within these periods may be attributed to seasonal variations in the supply of palm oil (Mbanasor and Nwankwo, 2001).

The seasonal variations in prices of palm oil in the different quarters is in accordance with a prior expectation of an economic theory which states that the higher the quantity supplied the lower the price of palm oil. For the retailers and producers there were significant differences between the third and fourth quarters. The first and second quarters were the period of low prices, which was identified as the main season for palm oil production and consequently many local supplies were prominent within these quarters. It is also evidently clear that producers suffer price variabilities which affect their farm budget, expected income and create uncertainty in future planning. There is need for government intervention to introduce the buffer stock systems to deal with surpluses during gluts.

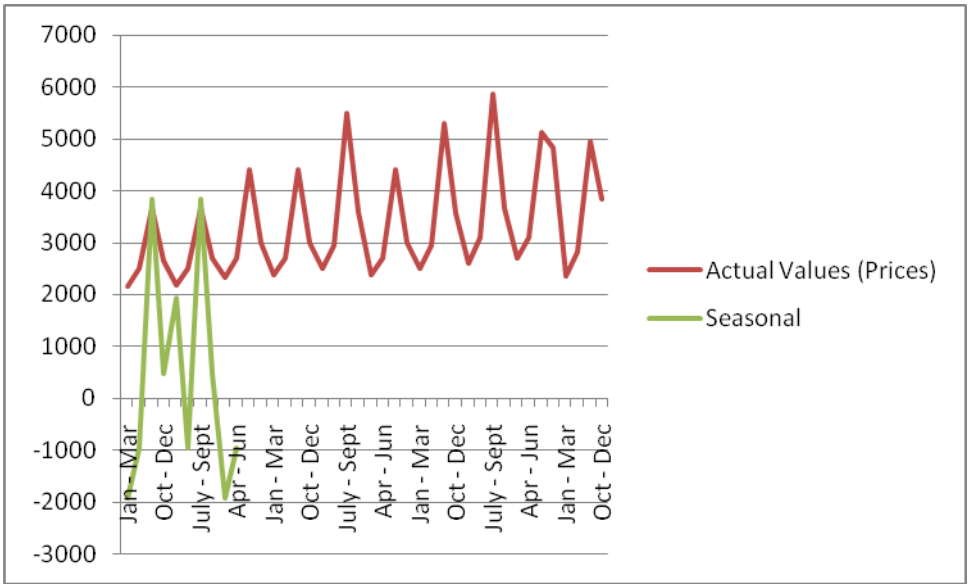

Fig.2 Graph showing the seasonal variation in prices of palm oil in the study area

Cyclical Analysis

Generally, cyclical price variation can be explained by the tendency of the producers to base future production plans on prices and profits of current and recent past operations. Cyclic movement in the prices of certain farm products is an evidence of imperfection in the functioning of the marketing system over a period of time. They cause alternative periods of shortage and glut. They partly result from imperfect forecasting of prices on the part of producers (Olukosi *et al*, 2007c). The knowledge of cyclical variation of a time series is very important in business cycle because it will enable a business organization to make adequate preparations and adjustments for periods of boom, stale – mate, recession and recovery of the business. The study adopted the multiplication model.

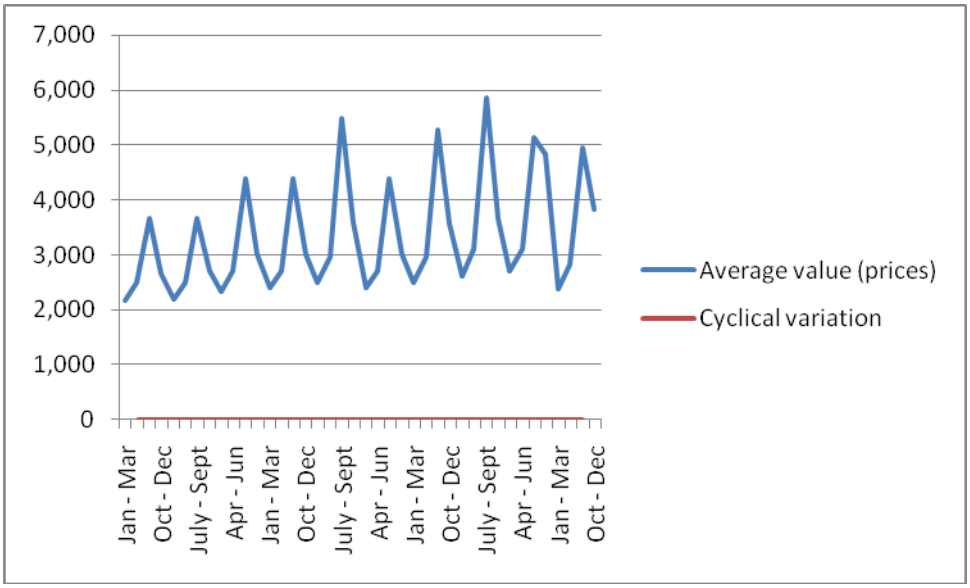

Fig.3 Graph showing the cyclical variation in prices of palm oil in the study area.

Irregular Analysis

Irregular variation is attributable to accidental factors such as war, flood, drought, strikes, fire disaster, and elections. Due to its unpredictable and sporadic nature, irregular variation is not regarded as being very important in business as other variations, though its occurrence may be disastrous. However, its knowledge is very important to make adequate preparation for its occurrence (Omotosho, 1990e).

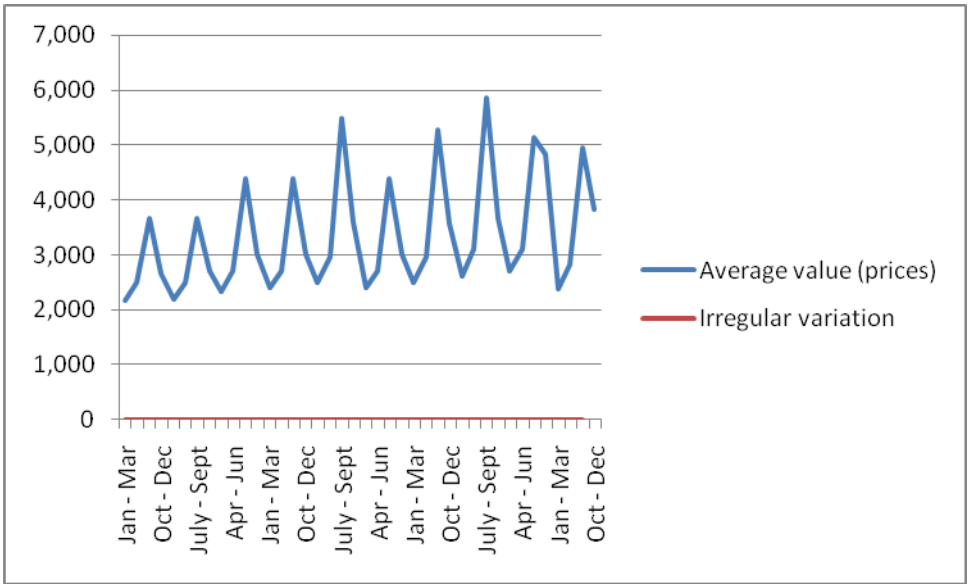

Fig 4 Graph showing the irregular variation of palm oil prices in the study area

Figure 4 depict the irregular variations of palm oil in the study area. It is evidently clear that no major irregular palm oil price movement has occurred during the period under review.

Measurement of Instability of Palm Oil Prices in Ini L. G. A. Akwa Ibom State

Instability is measured through two approaches viz; graphical approach and quantitative approach. The study adopted the quantitative approach. Typically among the approach used is the coefficient of variation (CV). This was specified in equation 2.

The greater the CV, the more the price instability would be. A CV of price instability beyond 5 percent indicates instability and calls for price stabilization measures Reddy, *et al* (2004b). The coefficient of palm oil in the L.G.A is 0.197%. This means that there is no price instability of palm oil in the study area as it reflected in the trend graph. The policy implication is that producers should sell their product immediately after production as there is no much incentive to speculate through time.

Long – run Instability Index of Palm Oil

This index measures the proportion of variation in the price of the commodity not explained by the price trend line over long term period.

The index was given in equation 3

Here R^2 is from the estimated trend equation. The result (58.49%) is called dynamic instability, which implies that the index of dynamic instability in prices in Ini L.G.A of Akwa Ibom State is 58.49%. the implication is that in the short – run period market prices of palm oil is relatively stable but at the long – run period prices of palm oil in the area will change to the magnitude of 58.49%. This is graphically shown in the trend analysis chart figure 1 as the trend line is moving a little above zero.

Conclusion

The trend analysis revealed that it has a constant average price over the study period (2001 – 2010). The instability of palm oil prices was also measured which revealed that the instability factor was 0.097% and index dynamic price instability was 58.49%, this shows that palm oil prices were relatively stable during the time of study. Therefore, there is no incentive to store palm oil, as prices are constant over time in the study area.

Recommendations

Based on the findings of this study, it is recommended that, producers should sell palm oil immediately as they produce since there is no incentive to store palm oil, as prices are constant over time. Producers can form cooperative societies to pool their products together and have stronger bargaining power and obtain increase prices.

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