ASSESSMENT OF VARIATIONS IN COTTON SEED AND COTTON LINT EXPORTS IN PRE-SAP, SAP AND POST-SAP REGIMES IN NIGERIA.

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ABSTRACT

This paper examines the instability in cotton seed and cotton lint exports in pre-Structural Adjustment Programme (pre-SAP), Structural Adjustment Programme (SAP), and post- Structural Adjustment Programme (post-SAP) regimes in Nigeria. The paper combines data on cotton seed and lint exports in Nigeria during the three regimes. Coefficient of variability approach was used in analyzing the data to examine the presence of instability among the regimes. The result showed that Cotton seed exports had a coefficient of variability of 176.76%, 100.99% and 46.65% in pre-SAP, SAP and post-SAP regimes respectively. This indicated that the whole study time frame had a high instability and a tendency towards stability. Findings also showed that Cotton lint exports had a coefficient of variability of 153.63%, 109.18% and 51.09% in pre-SAP, SAP and post-SAP regimes respectively. This also indicated a wide instability in the three regimes as well as a tendency towards stability. The study further revealed that the growth of cotton seed and cotton lint exports in Nigeria had the highest level of stability and least variability during the post-SAP regime, whilst Pre-SAP and SAP regimes had a high level of instability. The study recommends that the variables that accounted for this such as exchange rate should be strengthened and well regulated by the government so as to achieve stability in the exports of both produce. Those policies that brought high instability during Pre-SAP and SAP periods should be dropped.

Keywords: Cotton lint and seed, Export, Instability, Structural Adjustment Programme

INTRODUCTION

Nigeria, ranks 98th in the midst of the 107 countries with sufficient necessary data to determine the year 2020 Global Hunger Index scores (GHI, 2020). This is despite the fact that a large proportion of the population (about 75%) are directly or indirectly involved in agriculture mostly at the subsistence level (Iyoha and Itsede 2003, Asikadi 2010 and Akenbor 2012). On his part, Olomola (2007), noted that the agricultural sector is gradually being transformed by commercialization at the small, medium and large-scale enterprise levels. The environmental factors in the country are such that favours the production of most crops including cotton as well as livestock across its length and breadth. If these resources are properly managed and effectively maintained, it could lead to the development of a sound agricultural sector which can provide adequate food for its large population and raw- materials for the industrial sector as well as enough for export to earn a huge foreign exchange (Ekiran, Awe and Ogunjobi, 2014).

As at today, cotton producers and marketers in Nigeria are left to directly face the world market where they make profits when prices are encouraging but absorb shock as well as suffer some degree of losses when the prices are low. As a result of this, the price of producers of cotton lint and lint has not been stable. Mesike *et al* (2008), noted that this situation has created a dis-incentive for production and has brought about sufferings in both the output and exports of agricultural commodities. Cotton lint and seed exports have accounted for 9.8%, 4.9%, 2,4%, 3.8% and 3.8% share of the total value of exports from Nigeria in 2009, 2010, 2011, 2012, and 2013 respectively (CBN, 2013). This has shown a downward trend in the contribution of cotton to the total value of exports from the country. In cotton sector, the export dimensions have actually been subjected to various developments and instruments in external policy environments over the past years. External influences in the form of export subsidies imposed by major players in cotton industry including China, United States of America as well as India has to a large extent brought downward pressure on world prices and consequently prices faced by exporters, traders and producers in Nigeria. States producing cotton at commercial level in Nigeria include Bauchi, Borno, Gombe, Jigawa, Kaduna and Kano. Others include Katsina, Ogun, Ondo, Oyo, Sokoto, Zamfara as shown in figure 1.

Nigeria has witnessed three periods of pre-Structural Adjustment Programme (pre-SAP) (1970-1985), SAP (1986-1994) and post-SAP (1995-2015) since independence. The period of pre-SAP is the period before SAP was introduced in Nigeria. During this period particularly in the early 80s, developing nations including Nigeria that depended greatly on the production and export of agricultural commodities began to have problems of balance of payments, mounting external debts as well as external shocks. To solve these problems, the country decided to promulgate Stabilization and Austerity Acts comprising of Economic Stabilization Act (ESA) of 1982 as well as National Economic Emergency Act (NEEA) of 1985. However, these measures could not address the economic crises. This situation necessitated the adoption of SAP which was initiated by International Monetary Fund IMF in collaboration with the World Bank with the aim of bringing reforms

in poor developing nations (Oyefusi and Mogbolu, 2003). The SAP period began in 1986 and lasted till 1994, though it was originally scheduled to last for only two years. The policy measures of SAP among others include the liberalization of agricultural prices and marketing. Tariff policy, quantitative restrictions and licenses were abolished during this period. Policy reforms such as revaluing of exchange rate, promotion of cash and food crops as well as banning of grains and vegetable oil imports aimed at promoting local production were put in place during this period. At the end, SAP had a mixed impact on Nigerian economy. On the positive side, it was able to bring some improvement in the growth of the nation's GDP rising from as low as 21% in 1980 to 41% in 1988 whilst on the negative side, it increased cost of living relative to income during the period (Oyefusi and Mogbolu, 2003; Akarue, 2015). Post-SAP period in Nigeria began in 1995. Mesike (2011), highlighted that since 1995, Nigeria made foreign exchange accessible at close to market rates as well as lift most restrictions on capital and current transfers. Furthermore, the country became one of the founding members of World Trade Organisation (WTO) in 1995 and a signatory to Lome Convention which was held between the European Union and emerging nations of Africa, the Caribbean and the Pacific area (ACP). These brought significant improvement in trade and investment.

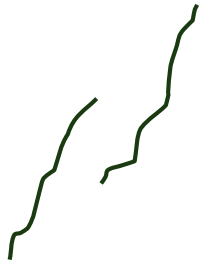
At this juncture, it is necessary to review some studies that have been carried out in the past on variability in agricultural exports in Nigeria and across the world. Ukoha (2007), established a quantitative relationship among the relative price volatility of agricultural commodities in Nigeria with data covering 1970-2003. The study showed that SAP, PSAP and Green revolution policies increased relative price variability between cash crops in the long run but influenced the prices of food only in the short run. Mesike (2010), examined the impact of government agricultural policies on exports of rubber and cocoa in Nigeria from 1970 to 2008. From the result it was observed that Policies such as Structural Adjustment Programme (SAP), Post-Structural Adjustment Programme (PSAP) and Agricultural Credit Guarantee Scheme Fund (ACGSF) made a positive and significant impact on cocoa and rubber exports in the country. This may be as a result of the export promotion incentives put in place during the SAP and PSAP periods which may have encouraged the production of cocoa and rubber. Ethiopia and Ramli (2011), assessed the variability of palm oil export earnings in Malaysia by using generalized autoregressive conditional heteroskedasticity (GARCH). The study revealed that prices of palm oil as well as soya bean constituted the main sources of instability in Malaysian export earnings. Ekirah, Awe and Ogunjobi (2014), analyzed the relationship which is existing between the export of agricultural produce and economic growth in Nigeria using a time series data of between 1980 and 2012. The findings revealed that economic expansion in the country is determined at the long run by agricultural exports and output, net capital flows well as the world price of its main agricultural produce. The study recommended that as a way of enhancing national economic growth, the government should as much as possible makes more efforts aimed at improving agricultural exports in Nigeria. Safdari *et al*. (2011), carried out a study on the causality relationship that exist between economic growth and exports for thirteen Developing Countries in Asia for a period covering 1988 to 2008. Using Panel Vector Error Correction Model which was based on Wald test, they observed that enough evidence were available to accept the null hypothesis that economic growth was not Granger caused by export, but economic growth Granger cause exports. This indicates a unidirectional causality from economic growth to exports which is in supports of the hypothesis regarding growth-driven exports (GDE). Adama, and Ohwofasa (2015), examined the factors determining the earnings from agricultural exports in Nigeria between 1980 and 2011. The study revealed that exchange rate and world income are the key variables which explain the changes observed in agricultural export earnings as revealed from the findings of impulse respond function and variance decomposition.

The variability of some agricultural produce exports in most countries as well as the effect on their economies have been widely studied as seen from the reviewed empirical studies. However, little or nothing is known about the variability of cotton lint and cotton seed exports in Nigeria, hence this study. Therefore, the objective of this study is to determine the variations in cotton lint and cotton seed exports in pre-SAP, SAP and post-SAP periods in Nigeria.

RESEARCH METHODOLOGY

The Study Area

This study was conducted in Nigeria, situated in West Africa. Nigeria has boundaries with Republic of Benin to the West, Cameroon to the East, Republic of Niger and Chad to the North and Atlantic Ocean to the South. The country has a North – South length of about 1450 km and a West - East breath of about 800km. The nation is blessed with abundant fertile agricultural land, rivers, streams, lakes, grasslands and different types of forests. If these resources are properly managed and effectively maintained, it could lead to the development of a sound agricultural sector which can provide adequate food for its large population and raw- materials for the industrial sector as well as enough for export to earn a huge foreign exchange (Ekiran, Awe and Ogunjobi, 2014).



States Producing Cotton in Commercial Quantities

Figure 1: Map of Nigeria Showing States Producing Cotton

Method of Data Collection

Time series data collected from secondary sources were used for this study. These secondary sources include various issues of Central Bank of Nigeria (CBN), United Nations Food and Agricultural Organization (UNFAO) and United Nations Development Programme (UNDP). The data collected covered pre-SAP, SAP and post-SAP periods.

Method of Data Analysis

In order to achieve the objective of this study, different analytical tools were used including Frequency Distribution Tables and Co-efficient of Variation.

Analytical Framework

In order to determine the variations in cotton seed and cotton lint export in the period under review, the coefficient of variation was used to measure the variability in this study. The co-efficient of variability (CV) measures instability and it is a normalized measure of dispersion and it is given as the ratio of standard deviation (σ) to the mean (μ) (Sadiq, 2014). The higher the value of CV is from zero, is an indication of higher instability (Antia-Obong et al, 2013). As noted by Manyong et al (2003) and Antia-Obong et al (2013), Market and policy failures are factors that do contribute to these instabilities. This view was authenticated by Ghosh (2010), who opined that the CV allows for comparison of means that differ widely from each period; as such it serves as a better measurement of relative variability.

$$\mathrm{CV}(\%) = \frac{S\tan dardDeviation}{mean(\chi)} * 100 \ldots\ldots\ldots(1)$$

Test for Differences in the Variation of Cotton seed and lint export

It is generally believed that crop export tends to vary overtime, and also across the periods (regimes). The Kruskal-Wallis test is believed to be helpful in carrying this test. The hypothesis is stated as follows:

H_0: Sub-period CVs with respect to Cotton seed and lint export are identical.

H_1: Sub-period CVs with respect to Cotton seed and lint export are not identical.

From the hypothesis, the null hypothesis reflects stability while the alternative hypothesis is a reflection of Instability across the periods. The Kruskal-Wallis test uses the sum of ranks for CVs of the three sub-periods for cotton lint and seed export and is as follows:

Kruskal-Wallis test:

$$H = \left[\frac{12}{n(n+1)} \left(\frac{R_1^2}{n_1} + \frac{R_2^2}{n_2} + \frac{R_3^3}{n_3} \right) \right] - 3(n+1)$$

…….(2)

Where: k= the number of population (here sub-periods), n_i = The number of observation in the sample i and Ri = Dummy of ranks for sample i

RESULTS AND DISCUSSION:

The variability analysis enables us to compare the coefficient of variation of means that differ widely among periods. It is worthy of note that a higher instability is obtained when there is a higher rate from zero.

Variability Analysis for Nigerian Cotton Seed Export

As mentioned earlier the variability analysis provided us a leeway of comparing the coefficient of variation of means among the different periods of Pre-SAP, SAP and Post-SAP. It is worthy of note that a higher instability is obtained when there is a higher rate from zero in the result.

Table 1: Instability Analysis of Cotton Seed Export in Nigeria

Period	Export
PRE –SAP	
Arithmetic mean ('000 tonnes)	19127.86
Standard deviation	33810.80
Coefficient of variability (%)	176.76
SAP	
Arithmetic mean ('000 tonnes)	2304.67
Standard deviation	2327.40
Coefficient of variability (%)	100.99
POST-SAP	
Arithmetic mean ('000 tonnes)	9363
Standard deviation	4367.85
Coefficient of variability (%)	46.65

Source: Authors computation from time-series data, 1970-2015

Table 1 presents the variation in cotton seed export within the three periods. It shows that the whole study time frame had a high variability (instability). The pre-SAP had a coefficient of variability of 176.76; this is followed by the SAP period of 100.99%, while the post-SAP has a value of 46.65%, showing tendency towards stability. The result in the post-SAP showed the least in terms of variability which confirms a widening instability across the variables during the period under study although it tended towards stability. However, Antia - Obong et al (2013), reported that in the case of oil palm with respect to variation in harvested area, yield and output, the highest variability (instability) captures study period of 1961-2007. Sadiq (2014), reported that there were variations in the production, area as well as productivity of rice production in the country during the periods of pre-SAP, SAP and post-SAP. He also observed that the production and area during the periods of pre-SAP and SAP were relatively higher compared to period of post-SAP. This gave an indication that there was a higher variability during the era before post-SAP for rice production.

Test for Differences in the Variation of Cotton Seed Export: Kruskal-Wallis Test

The result of the Kruskal-Wallis test is shown on Table 2. It reveals the results vary significantly as shown by $\chi 2\ (2) = 12.631$, $p = 0.002$, at k-1 degrees of freedom, where k =3 sub-periods. In this case, the alternative hypothesis was rejected at the 5 % level of significance, thus showing a general variation in cotton seed export for the periods under study.

Table 2: Estimated Kruskal-Wallis tests for variations between periods of Cotton Seed Export

Period		Pre-SAP R_1	SAP R_2	Post-SAP R_3
N		3	3	3
Rank N		16	9	21
Rank Mean		***21.44***	***11.61***	***30.17***
H=Chi-Square	***12.631***			
Chi-Square(df.2)	***0.002***			

Source: *Author's Calculation based on Faostat data and R_1 = Sum of ranks in the period 1970-1985; R_2 = Sum of ranks in the period 1986-1993; R_3 = sum of the ranks in period 1995- 2015.*

*. ** = significance at 5% level Chi-square at 0.05 with 2 degrees of freedom.*

Variability Analysis of Nigeria Cotton Lint Exports

The variability analysis was also carried on cotton lint exports in for Pre-SAP, SAP and Post-SAP periods. The results are shown in Table 3.

Table 3: Variability Analysis of Nigeria Cotton Lint Exports

Period	Export
PRE –SAP	
Arithmetic mean ('000 tonnes)	6214.44
Standard deviation	9547.49
Coefficient of variability (%)	153.63
SAP	
Arithmetic mean ('000 tonnes)	1275.89
Standard deviation	1393.04
Coefficient of variability (%)	109.18
POST-SAP	
Arithmetic mean ('000 tonnes)	17330.10
Standard deviation	8854.66
Coefficient of variability (%)	51.09

Source: Authors computation from Time-series Data, 1970-2015

The result in Table 3 presents the variation in export lint of cotton. It shows that there was high variability (instability) in the whole study time frame for each variable, during the various periods. The implication of this result is that it confirms a widening instability across the variables during the period under study.

Test for Differences in the Variation of Cotton lint export: Kruskal-Wallis Test

The result of the Kruskal-Wallis test is shown on Table 4. It is observed to vary significantly as indicated by $\chi 2$ (4) = 18.055, p = 0.000, at k-1 degrees of freedom, where k =3 sub-periods. The alternative hypothesis was rejected at the 5% level of significance, thereby signifying a general instability in cotton lint exports for the periods under study.

Table 4: Estimated Kruskal-Wallis tests for variations between periods of cotton lint export.

Period		Pre-SAP R1	SAP R2	Post-SAP R3
N				
Rank Sum		16	9	21
Rank Mean		16.69	14.44	32.57
H=Chi-Square	18.055			
Chi-Square(df.2)	0.000			

Source: Authors Calculation based on Faostat data. R1 = Sum of ranks in the period 1970-1985; R2 = Sum of ranks in the period 1986-1994; R3 = sum of the ranks in period 1995- 2015.
. ** = Significance at 5% level Chi-square at 0.05 with 2 degrees of freedom.

CONCLUSION

The study established that the growth of cotton seed and cotton lint exports in Nigeria had the highest level of stability and least variability during the post-SAP period, whilst Pre-SAP and SAP periods had a high level of variability. The variables that accounted for this such as exchange rate should be strengthened and well regulated by the government in order to achieve stability in the exports of both produce. Those policies that brought high instability during Pre-SAP and SAP periods should be dropped.

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