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Agricultural Exports and Economic Growth in Nigeria (1980 – 2010)

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Abstract
This paper seeks to determine if a significant long-run relationship exists between agricultural exports and economic growth in the present-day Nigeria. It would also access the long run impact of agricultural exports on growth performance in Nigeria. The study covers the periods between 1980 and 2010. The underlying models are the Export- Led Growth Hypothesis and the Neo-classical Growth Model. In the formulated model, Real Gross Domestic Product was used as the proxy for economic growth. The explanatory variables used were Gross Fixed Capital Formation, Labour force, Foreign Direct Investment and Agricultural exports. The study made use of unit root tests and Johansen Maximum Likelihood Test of Co-Integration. It was discovered that a long run equilibrium relationship exists between agricultural exports and economic growth and the relationship is elastic in nature meaning that a unit increase in agricultural exports would bring a more than proportionate increase in the Real Gross Domestic Product in Nigeria.
Keywords: Agricultural exports, economic growth, Real Gross Domestic Product

1. Introduction

During the first decade after independence, Nigeria could considerably be described as an agricultural economy because agriculture served as the engine of growth to the overall economy (Ogen, 2003). From the standpoint of occupational distribution and contribution to the Gross Domestic Product, agriculture was the leading sector contributing about 70% of the Gross Domestic Product (GDP), employing about the same percentage of the working population, and accounting for about 90% of foreign earnings and Federal Government revenue. During this period, Nigeria was the world's second largest producer of cocoa, largest exporter and producer of palm products. Nigeria was also a major exporter of leading commodities such as cotton, groundnut, rubber, hides and skins (Alkali, 1997). This situation began to change drastically with the discovery of oil.

Between 1970 – 1974 agricultural exports as a percentage of total exports declined from about 43% to slightly over 7%. The major cause of this development was the oil price shocks of 1973 – 1974 which resulted in large receipts of foreign exchange earnings by Nigeria and the neglect of agriculture. From the mid-1970s to the mid-1980s, the average annual growth rate of agricultural exports declined by 17 per cent. By 1996, agriculture accounted for only 2 per cent of exports. As agricultural exports shrank from the traditional 12-15 commodities of the 1960s, Nigeria became a net importer of basic food stuff she formerly exported (Bakare, 2011).

In the early 1980s, it became apparent that the agricultural sector could no longer meet domestic food requirements, supply raw materials for industry and earn enough foreign exchange through exports, owing to various economic, social and other environmental problems. Food production has since become a major problem in Nigeria and huge foreign exchange earnings are being utilized in importing food. The food import bill rose from a mere 14,112.88 million annually during 1970-74 to N1, 964.8 million in 1991 (Talabi, 2004).

Abolagba et al (2010) emphasize that Nigeria has lost its role as one of the world's leading exporters of agricultural commodities. In addition, the country is currently suffering from a declining as well as fluctuating income from its heavy dependence on oil exports and with the present situation in the oil market, it has become necessary for the country to reconsider its agricultural export position.

Olomola (2010) further stated in his study that increased agricultural production is necessary to tackle starvation and malnutrition, and that a rapid growth in agricultural productivity is a pre-condition for economic take off and sustained poverty reduction in Nigeria. In the same vein, this study attempts to find out if a significant long-run relationship exists between agricultural exports and economic growth in Nigeria and to access the long run impact of agricultural exports on growth performance in Nigeria.

2. Data and Methodology

This study involves the use of two quantitative techniques: unit root tests and Johansen Maximum Likelihood Test of Co-integration. The results obtained from data collected will help in achieving the stated objectives for the research. The model is stated in a way that establishes a functional relationship between economic growth and agricultural exports. The variables used are based on the Neo- Classical Growth Model (Capital, Labour)

and the Export Led Growth Hypothesis (Agricultural exports). Capital is decomposed into domestic and foreign capital i.e. capital imported through Foreign Direct Investment (FDI).

$$RGDP = f(GFCF, LAB, AGEX, FDI) \quad (1)$$

$$RGDP = \beta_0 GFCF^{\beta}{}_1 LAB^{\beta}{}_2 AGEX^{\beta}{}_3 FDI^{\beta}{}_4 \mu \quad (2)$$

Taking the natural logarithm of equation 2 and assuming linearity among the variables, the following function is obtained.

$$\text{Log } RGDP = \beta_0 + \beta_1 \log GFCF + \beta_2 \log LAB + \beta_3 \log AGEX + \beta_4 \log FDI + \mu_1 \quad (3)$$

Apriori Expectation: $\beta_1, \beta_2, \beta_3, \beta_4 > 0$

Where:

RGDP: Real Gross Domestic Product
GFCF: Gross Fixed Capital Formation
LAB: Labour Force
AGEX: Agricultural Exports
FDI: Foreign Direct Investments
β_0: constant term
$\beta_1 - \beta_4$: elasticity coefficients
μ: stochastic disturbance term

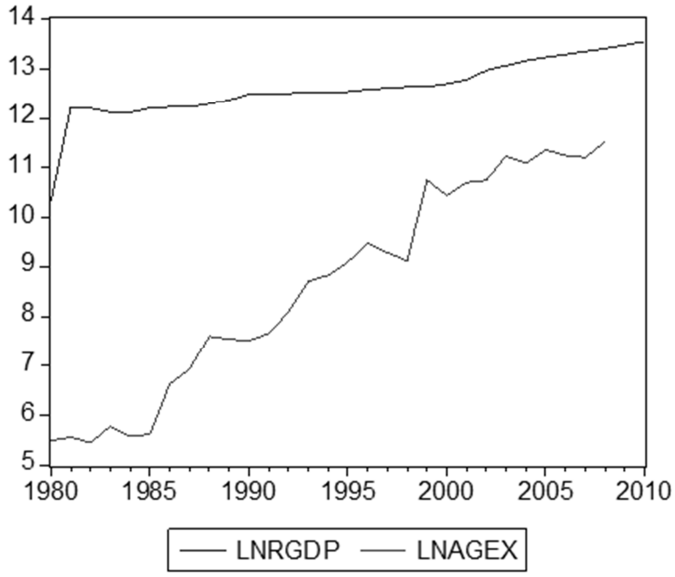
Data used were obtained from various sources. RGDP and FDI were obtained from Central Bank of Nigeria: Statistical Bulletin 2010, GFCF was obtained from United Nations' Statistics Division 2008, LAB data was from World Development Indicators 2008 and lastly, AGEX was from Food and Agriculture Organization Statistics (FAOSTAT) 2010.

3. Empirical Results

3.1 Descriptive Analysis

A graph is used to show the relationship between agricultural exports and economic growth. It (figure 1) shows the trend in the growth rate of Real Gross Domestic Product and Agricultural exports between 1980 and 2010. From the graph, it can be observed that the growth rate of agricultural exports has been fluctuating. It increased steadily between 1986 and 1989. This indicates the periods of Structural Adjustment Programme (SAP). The diagram however shows that RGDP has been growing at a decreasing rate over the years.

Figure 1: Diagram Showing the Graphical Relationship between AGEX and RGDP



3.2 Econometric Analysis

The econometric analyses include the Unit root test and Johansen Maximum Likelihood Test of Co-integration. The significance and long-run impacts of the relationships are assessed by the econometric techniques employed.

3.2.1 *Unit Root Test Results*

The unit root test is a test of stationarity (or non stationarity) of time series data. A time series is said to be stationary if its mean, variance and auto-covariance (at various lags) remain the same no matter the point at which they are measured. The order of integration of the variables is assessed using the Augmented Dickey

Fuller (ADF) and the Phillip Peron (PP) Tests at both level I (0) and first difference I (1). The variables are assessed at 1%, 5% and 10% critical values. The feasibility of co-integration among the variables in the long run depends on whether or not the variables are stationary. From table 1, it can be shown that agricultural exports and Real Gross Domestic Product are stationary at 1%, 5% and 10%. Thus, co-integration can be carried out.

Table 1: ADF Test and Phillips-Perron Test for Unit Root

Variables	Augmented Dickey Fuller Test		Phillips-Perron Test	
	Level	1st Difference	Level	1st Difference
LRGDP	-4.690473*	-36.11679*	-4.177492*	-28.46356*
LGFCF	-1.970288	-3.640005**	-2.029780	-4.186425*
LLAB	0.903791	-2.777014***	1.537268	-3.056445**
LAGEX	-0.728795	-6.785217*	-0.570073	-7.503067*
LFDI	-0.991842	-7.519600*	-0.800466	-7.633618*

Source: Computed by author using E-views 5

Note: * denotes stationarity at 1%, 5% and 10%
** denotes stationarity at 5% and 10%
*** denotes stationarity at 10%

3.2.2 Johansen Maximum Likelihood Test of Co-Integration

A co-integration test is performed to determine the existence of long-run relationship among the variables. This is to ensure that the regression of the variables will be meaningful and non-spurious. It would also show if a long run relationship exists among the variables. If the trace statistic and the Max-Eigen statistic are greater than the 5% critical values, the null hypothesis of no co-integration will be rejected in favour of the alternative hypothesis at that level. The trace statistic and the Max-Eigen statistic show that there is co-integration among the variables implying a long run equilibrium relationship. Thus, this shows that there is a long run equilibrium relationship between agricultural exports and economic growth in Nigeria (see table 2)

Table 2: Unrestricted Co-integration Rank Test (Trace and Maximum Eigen value)

	TRACE		MAXIMUM EIGENVALUE	
Hypothesized No. of CE(s)	Statistic	0.5 Critical Value	Statistic	0.5 Critical Value
None *	90.70664	79.34145	38.90848	37.16359
At most 1	51.79816	55.24578	22.39907	30.81507
At most 2	29.39909	35.01090	19.91659	24.25202
At most 3	9.482504	18.39771	7.805015	17.14769
At most 4	1.677488	3.841466	1.677488	3.841466

Source: Computed by author using E-views 5

Notes: Trace and Max-eigen value test indicate 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Since the model is in double logged form, the co-efficient estimates can be interpreted in terms of long run elasticity and the t-statistic is used to determine the statistical significance of each variable. Based on the rule of thumb, a variable is said to be statistically significant if the absolute value of its t-statistic is approximately 2 or above. The major relationship of interest is that which exists between agricultural exports and economic growth in Nigeria. From table 3 below, the magnitude of LNAGEX which is 5.916013 shows an elastic relationship with LNRGDP and the t-statistic of LNAGEX shows that the co-efficient is statistically significant.

Table 3: Normalized Co-integrating Coefficients

The estimates of the Johansen Maximum Likelihood estimates showing the co-integrating coefficient normalized to LNRGDP are shown in the table below.

1 Cointegrating Equation(s): Log likelihood 166.5832				
Normalized cointegrating coefficients (standard error in parentheses)				
LNRGDP	LNGFCF	LNLAB	LNAGEX	LNFDI
1.000000	-0.702657	-207.6886	5.916013	-2.796794
	(1.57595)	(54.3726)	(1.03357)	(0.67809)
	[-0.44586]	[-3.81972]	[5.72386]	[-4.1245]

Source: Computed by author using E-views

Note: t- values are in brackets.

3.2.3 Economic Interpretation of Findings

The model sought to relate the proxy for economic growth Real Gross Domestic Product (RGDP) to its explanatory variables Gross Fixed Capital Formation (GFCF), Labour (LAB), Agricultural Exports (AGEX) and Foreign Direct Investment (FDI). The coefficient of AGEX, LAB and FDI are greater than one. This implies that a unit increase in agricultural exports, the Labour force and Foreign Direct Investment (FDI) in Nigeria would bring about a more than proportionate increase in the Real Gross Domestic Product by 5.916013, 207.6886 and 2.796794 respectively while a unit increase in Gross Fixed Capital Formation will bring about a more than proportionate decrease in RGDP by 0.702657. Based on the rule of thumb that a variable is said to be statistically significant if the absolute value of its t-statistic is approximately 2 or above, only GFCF among all the variables is not statistically significant.

4. Conclusion and Recommendations

The study shows that there is a long run equilibrium relationship between agricultural exports and economic growth and the relationship is elastic in nature meaning that a unit increase in agricultural exports will bring about a more than proportionate increase in the Real Gross Domestic Product in Nigeria.

It is therefore recommended that in Nigeria's development efforts, effective supply of agricultural innovations is of topmost priority. These include improved seeds, fertilizers and other inputs. The agricultural input supply system needs to be continually strengthened and irrigation capacity also needs to be expanded in the country.

In addition to that, the tradability of Nigerian agricultural products in the world markets must be increased. This can be achieved through crop specialization, linking farmers more directly to markets and creating strong supply-chains. Concentrated focus on specific crops per time can help develop and expand export markets for those crops. Lastly, it is recommended that credit providing institutions (e.g. Commercial Banks, ACGSF, etc.) strictly adhere to their specified guidelines of operation to ensure the efficiency of finance policies in relation to agricultural exports in Nigeria.

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