



# THE IMPACT OF SELECTED AGRICULTURAL EXPORTS ON THE GROWTH OF THE DOMESTIC ECONOMY

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# The impact of selected agricultural exports on the growth of the domestic economy

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This study sought to analyze the impact of selected agricultural exports on economic growth in Nigeria from 1980 to 2014. It specifically examined the determinants of total agricultural export supply, cocoa export supply and rubber export supply; their export performance and determining factors. Both export crops were chosen because they remain the most exported agricultural commodities from Nigeria, and published national aggregates on specific trade and macroeconomic variables in *CBN Statistical Bulletin* (various years) and *National Bureau of Statistics* (NBS). For the data analysis, descriptive statistic and ordinary least square (OLS) were used. The results revealed that export supply of cocoa was insignificant, but had a positive impact on real GDP, while the coefficient of export supply of rubber was negative and insignificant at 5% level. Export commodity price index was found to be significant with a positive impact on real GDP, depicting that export commodity prices have been favourable during the period under study. Domestic economic growth (proxied by real GDP) was influenced positively by exchange rate, interest rate, and trade openness, but only exchange rate was significant, while inflation rate had a negative impact on economic growth. The results further showed that the aggregate agricultural exports was positive and had a significant impact on economic growth in Nigeria. The study therefore recommended policy options such as export financing, value addition to cocoa beans being exported, and favourable foreign exchange policies to promote production in the export subsector of agriculture and industrial sector for proper diversification of Nigerian economy in the years ahead.

**Key words:** Agricultural exports, cocoa, rubber, economic growth

**JEL Classification:** C 23, Q11, Q13, Q17, Q18, Q58

## INTRODUCTION

### Background to the study

There is an increasing interest in the relationship between export and economic growth. Theoretically, it has been argued that a change in export rates could change output. Exports are therefore considered as the main factor that accelerates an economy towards a

sustainable growth. Since there is no country in the world which is self-sufficient and in a state of economic independence, one country has to trade with many others so as to enjoy goods and services with a comparative disadvantage in its production (Noulaet *et al.*, 2013). Export trade is a function of international trade whereby goods

manufactured in one country are shipped to another country for sale in order to generate income through export multiplier effect (Investopedia, 2015).

Generally, export trade has waned considerably in Nigeria, particularly agricultural exports, resulting in economic problems begging to be solved. According to Noullet *et al* (2013), there are two main largely opposing schools of thought explaining the decline in agricultural exports.

1. One stresses factors that are exogenous to the individual economy, such as: the slow volume of growth in the world's primary market and the deteriorating terms of trade etc.
2. The second school of thought emphasizes factors that are endogenous to the country, such as: the domestic policies that have affected export supply adversely.

In the 1960's, agriculture was the pride of the Nigerian economy (Aminu and Anono, 2012), contributing over 70 per cent of the gross domestic product (GDP), employing about 70 per cent of the working population and accounting for about 90 per cent of foreign exchange earnings and federal government revenue (Gbaiye, 2011). At that time, Nigeria was the world's second largest producer of cocoa with 15 per cent of the world's market, the largest exporter of palm oil with 60 per cent market share and leading exporter of groundnut with 30 per cent of the world market (Lawal and Atte, 2006). Nigeria also held dominant positions in the market for cotton, rubber, hides and skin. Although, the farmers relied more on rudimentary traditional tools and methods, the sector accounted for about 70 per cent of the country's export, and about 95 per cent of domestic consumption.

Consequently, from domestic self-sufficiency and leading exporter in the 1960's; by 1982 Nigeria imported about 153, 000 metric tonnes of palm oil at a cost of 92 million USD and 55, 000 metric tonnes of cocoa. Between 1973 and 1980, Nigeria imported 7.07 million tonnes of wheat, 1.062 million tonnes of rice and 431, 000 tonnes of maize. In 1990, Nigeria spent 430 million USD on food imports, a figure which increased to 1.25 billion USD in year 2000 and 4.2 billion in 2010 (El-Rufai, 2011). Previously the world's leading producer and exporter of palm-oil, Nigeria became a net importer of vegetable oil in 1976.

The dismal performance of the agricultural sector in terms of its contribution to Nigeria's yearly total revenue and economic growth prompted the government to initiate several agricultural schemes and programs to enhance agricultural productivity in the country. According to Ekpo and Umoh(2015), the medium-term policy documents intended to help the country achieve the millennium development Goals for 2015 and its own 'vision 2020' includes the National Economic Empowerment and Development Strategy (NEEDS) emphasizing economic

development driven by the private sector, and the framework guiding economic reform in the country that was adopted in May, 2007. The aim of these reforms is to make Nigeria one of the top twenty economies in the world by 2020; for agriculture, this means bolstering current domestic production. Other policies by the government include; the Agricultural Credit Guarantee Scheme Funds (ACGSF), National Accelerated Food Production Project (NAFPP), Green Revolution (GR), Operation Feed the Nation (OFN), Root Tuber Expansion Projects (RTEP),etc. (Abolagba, 2010).

A review of the agricultural sector depicts a gloomy picture. Performance is reflected in mounting food deficit and decline in both gross domestic product and export earnings (Iganiga and Unemhilin, 2011). Thus, it will be paramount for Nigeria to target certain cash crops that contributes most to her economic growth. This is in the light of reasoning that, for the exportation of agricultural product to thrive; the prevailing economic conditions (such as, the high rate of inflation, lack of finance, high interest rates etc.) must be favorable.

### **Statement of the problem**

The slow development of the agricultural sector remains one of the major constraints to economic growth in Nigeria. A major problem confronting the sector, however, is its inability to contribute to foreign exchange earnings of the nation (Nwachukwu, 2011). The economy remains weak and easily hurt by external shocks arising from the frequent changes in the world prices of crude oil and commodities, and the rising prices of imports. These results in economic imbalances which can be seen clearly in the adverse balance of payment (BOP) position, unemployment and low capacity utilization in various economic sectors (Lawal and Atte, 2006).

Agriculture in Nigeria has remained largely subsistence - farm sizes are between 0.5-3 hectares, with a national average size of 1:2 hectares (El-Rufai, 2011); militating against large scale production, which in turn hampers exports. Of these problems, provision of finance for production seems inadequate to meet the food production needs of the nation (Adetiloye, 2012; and Obansa and Maduekwe, 2003).Farmers have no title to land and therefore unable to access credit from banks. Loans, when available are at high rates of interest, and most banks do not really understand, or make any effort to appreciate the vagaries of farming and agribusiness (Oloyede, 2014). According to Uger (2013), Public expenditure, which serves as the bed rock of financing for the sector has consistently fallen short of the public expectation.

The issues raised above bring us to the pivot of this study which is to examine the impact of some selected agricultural exports on the growth of the domestic economy. Agricultural exports such as: cocoa and rubber have a historical base and revenue from them has helped

the economy towards path of growth in time past. However, earlier studies such as Noula *et al.* (2013); Gbaiye *et al.* (2013); and Abolagba *et al.* (2010) examined cocoa and rubber exports, and discovered that these agricultural exports have mixed effects on economic growth. In particular, Abolagba *et al.* (2010) and Gbaiye *et al.* (2013) found that a positive and significant relationship existed between agricultural exports (cocoa and rubber exports inclusive) and economic growth in Nigeria. Noula *et al.* (2013), discovered that cocoa export was found to have a negative and insignificant effect on economic growth. Thus, this study will consider effect of cocoa and rubber exports and the aggregate agricultural exports on economic growth in Nigeria. By the time the study is concluded we shall be in a position to ascertain whether they positively or negatively influenced growth of the domestic economy within the period under study.

### Objectives of the study

The main objective of this study is to examine the impact of selected agricultural exports on the growth of the domestic economy. Other objectives of the paper include:

1. To identify the factors affecting agricultural exports in Nigeria
2. To examine the impact of total agricultural exports on economic growth in Nigeria
3. To ascertain the impact of cocoa and rubber exports on the growth of the Nigerian economy
4. To identify the particular cash crop that contributes most to economic growth in Nigeria within the period under study

### Research questions

This research study shall be guided by the following questions:

- i. Given the performance of the agricultural sector in Nigeria, what are the factors affecting agricultural exports?
- ii. What is the impact of total agricultural exports on economic growth in Nigeria?
- iii. What is the impact of cocoa and rubber exports on growth of the domestic economy?
- iv. Which of these cash crops contributed most to economic growth in Nigeria?

### Research hypotheses

**H<sub>01</sub>:** Total agricultural exports has no positive and significant impact on growth of the domestic economy

**H<sub>02</sub>:** Export of cocoa has no positive and significant impact on economic growth

**H<sub>03</sub>:** Export of rubber has no positive and significant impact on economic growth

At this juncture, the study will subsequently review relevant past literatures in section 2; state research

methodology to be used to carry out the study and sources of data in section 3; present and analyze data and discuss results in section 4, and summarize findings of research, and make recommendations for policy and conclude the paper in section 5.

## Review of Related Literature

### Concept of agriculture

Agriculture encompasses a lot of activities such as, the cultivation of land, raising and rearing of animals, for the purpose of production of food for man, feed for animals and raw materials for industries. Essentially, it is composed of crop production, livestock, forestry, and fishing. The role of agriculture in reforming both the social and economic framework of an economy cannot be over-emphasized. It is a source of food and raw materials for the industrial sector. It is also essential for the expansion of employment opportunity, for reduction of poverty and improvement of income contribution, for speeding up industrialization and easing the pressure on balance of payment Folawewo and Olakojo (2010). In effect, it has been the main source of gainful employment, which the nation can feed its teeming population, a regenerative source of foreign exchange earnings, and a means of providing the nation's industries with local raw materials and as a reliable source of government revenue.

Various authors have defined agriculture in different ways but common among these definitions is the fact that it is the production of food, feed, fiber and other goods by the systematic growing and harvesting of plants and animals. However, the aspect of research and training that is so vital in production was conspicuously missing in the definition.

In order to fill this gap, Aminu and Anono (2012), defined agriculture as the science of making use of the land to raise plants and animals; it is the simplification of nature's food webs and the rechanneling of energy for human planting and animal consumption.

Kwanashie *et al.* (1998), defined agriculture as the cultivation of soil for crop production and of looking after animals to produce better meat and other food products and also a process by which farm products are sold. Thus, when farm products are sold across borders, it becomes agricultural exports.

To Tutwiler and Straub (2005), the role of agriculture in transforming both social and economic framework of an economy cannot be over-emphasized. In effect, it has been the main source of gainful employment from which the nation can feed its teeming population, providing the nation's industries with local raw materials, and as a reliable source of government revenue.

### Concept of economic growth

We always hear the term "economic growth" in the news. Economy experts and politicians agree that this panacea creates employment, overcomes poverty in societies,

makes education, health care and other social services possible, and therefore guarantees welfare for everybody. According to Peng and Almas (2010), economic growth is a long term rise in the capacity to supply increasingly diverse economic goods to its population. It entails sustainable rise in national output which is a manifestation of economic growth.

Beyond the economic sector, the level of economic growth has an impact on the development of society and of the nation. A growth in the economy implies that, if laws remain unchanged existing tax revenues also increase, if the employment rate increases due to economic growth, then the impact is much stronger. Additional public revenue, if well invested can further foster growth in an economy (Olajide, 2010).

### Theoretical concept of agriculture

According to the physiocrats, the source and hub of national wealth is essentially agriculture. In their view, the agricultural sector is the only reliable productive sector of the economy and generator of surplus upon which all depends. In line with the physiocrats, Todaro and Smith (2003), while looking at the Lewis theory of development, assumed that underdeveloped economies comprises of two sectors. These sectors includes of traditional agricultural sector and the modern industrial sector. Agricultural development was seen as necessary for successful economic transformation.

Following the export-led growth literature, exports acceleration is a measure of outward orientation and could also serve as a proxy for internationally competitive cost structure. Export expansion can be a catalyst for output growth both directly, as a component of aggregate output, as well as indirectly through efficient resource allocation, greater capacity utilization, exploitation of economies of scale and stimulation of technological improvement due to foreign market competition (Fischer and Witt, 1994). Also, higher level of investment (i.e. gross capital formation) should stimulate growth while agricultural productivity is expected to have a positive effect on aggregate economic growth.

Also, according to Subasat (2002), countries at their infant stages of development will rely almost fully on agricultural growth for employment, foreign exchange, government revenue and food supply to the population. In this sense, agricultural growth is the key impetus to the growth of underdeveloped and developing countries.

### Constraints of agricultural exports

The growth of agriculture in Nigeria's economy has remained critical even the decades since her political independence. Aigbokhan (2001), documented that agricultural sector played an important role in the boosting of the nation's gross national product (GNP) in the 1960s. Hereported that agriculture accounted for over 42 percent of commodity export earnings and about 74 percent of

total government revenue within the period reviewed. In line with the above are Oyinbo *et al.* (2014), who observed that the production of agricultural products from independence to the early 1970s accounted for 96.4 percent of total export earning while non-oil product accounted for 97.3 percent of total exportation.

However, this changed drastically in the early 1970s. Agricultural output began to erode rapidly at a time which not only coincided with the end of the Nigerian civil war, but it also coincided with the period of oil boom of 1970s. Nigeria, once a major exporter of numerous food commodities such as cassava, groundnut, palm oil and palm kernel, etc. now became a major importer of food commodities (Nwibo, 2012).

Utomakili and Abolagba (1996), unraveled the main agricultural environment associated problems relating to population pressure on natural resources and these include:

1. Soil erosion and loss of fertility as small holders seek to intensify production by adding labor to existing agricultural land without corresponding increase in capital (chemical, organic inputs, land conservation and infrastructure).
2. Loss of biodiversity and the damage of natural ecosystems as small holders seek to enhance agriculture production by clearing forests and expanding into fragile ecosystems.

According to Adubi (1999), some major problems confronting the Nigerian agricultural sector are poor infrastructural facilities such as poor feeder roads and road network, storage facilities, rural electrification, etc. poor manpower development, socio cultural factors like the land tenure system, poor government/regulatory policies. Poor state of agricultural development could lead to a situation of deficit food supply and higher demand for food which consequently leads to higher food importation to supplement domestic food production.

### Empirical review of literature

Using the ordinary least square (OLS) regression analyses and secondary data, Essien *et al.* (2011), discovered that relative prices of cocoa are insignificantly related to quantity of export, however, it had a negative sign which was in line with the expectation.

Awe (2013), employed Vector Auto Regressive Model (VAR) to analyze time series data from (1980 – 2009) on domestic finance and agricultural *a priori* production. The OLS regression and (VAR) results revealed that positive relationships existed between the variables and the variance decomposition measured by the proportion of forecast error. The paper therefore recommended that the Federal Government recurrent expenditure on agriculture should be reviewed upward for enhanced agricultural productivity.

On his export demand model, Agbogan *et al.* (2014)

found that the impact of non-oil export on the economic growth was moderate. A unit increase in non-oil export impacted positively by 26% on the productive capacity of goods and services in Nigeria during the period studied. It was also evident in the study that the policies on non-oil sectors during that period in Nigeria did not sufficiently encourage non-oil exports, thus reducing their contributions to growth.

Nwibo (2012), examined the effect of agricultural exports on food security in Ebonyi state, Nigeria and found that agricultural exports contributed 75.5% of the total non-oil export earnings in 2005 and 65.6% in 2009. The major agricultural crops exported included cocoa, cassava, yam, maize, millet, oil palm, soya beans, palm kernel, groundnut, and rubber.

Moreso, Nwachukwu (2011), empirically analyzed the dynamics of rubber and cocoa exports from Nigeria within 1961 – 2010. In the course of his data analysis, descriptive statistics, diversification index and error correction model (ECM) were employed. The results revealed that export supply of cocoa was found to be influenced by export cost and rainfall in the long run, while output; cost of production and export affected it in the short run. Rubber export supply was influenced by cost of export and exchange rate in the long run while world export-output ratio and cost of export affected it in the short run.

Assem *et al.* (2010), used a gravity model to analyze the main factors influencing Egypt's agricultural exports to its major trading partners for the period 1994 to 2008. The findings were that a one percent increase in Egypt's GDP results in roughly a 5.42 percent increase in Egypt's agricultural export flows. In contrast, the increase in Egypt's GDP per capita caused exports to decrease, which was attributed to the fact that an increase in economic growth, besides the increasing population, raised the demand per capita for all normal goods.

The study of Abolagba *et al.* (2010), examined factors that influenced agricultural exports with specific reference to cocoa and rubber. The OLS findings revealed that rubber export was significantly influenced by domestic rubber production, producer price, exchange rate, domestic consumption and interest rate. For cocoa, the OLS showed that cocoa output, domestic consumption and rainfall significantly influenced cocoa exports.

In analyzing the effects of agricultural reforms on the agricultural sector in Nigeria, Ugwu and Kanu (2012), opined that the effects of economic reforms on the agricultural sector could be said to be unsatisfactory in view of its minimal contributions to the sector. In order to stem the aforementioned identified problems and weaknesses of these agricultural policies and/or reforms in the context of their contributions to the agricultural sector, genuine democracy and good governance should be allowed to thrive in Nigeria.

### **Restatement of the research problem**

There are some problems and limitations in past studies that relate to the present study in hand discovered that till

date, there exist numerous previous research studies on agricultural exports and economic growth in Nigeria and elsewhere (Abolagba *et al.*, 2010; Assem *et al.*, 2010; Nwachukwu, 2011; Noula *et al.*, 2013). However, there is no study known to the authors that had captured the volatility in the export commodity price index, aggregate agricultural exports and the level of trade openness in Nigeria. The present study will therefore look into these issues as relevant factors that could inhibit agricultural exports among other things in Nigeria in order to fill the gap in existing literature.

### **Restatement of research hypotheses**

In order to accomplish the main objectives of this study, we would develop a main hypothesis to be followed by other specific hypotheses, as such:

1. There is a positive and significant relationship between agricultural exports and growth of the domestic economy. This is in agreement with the findings of Noula *et al.* (2013) and Gbaiye *et al.* (2013). In a similar manner, specific hypotheses for this study would be stated in an alternative fashion as follows:
2. There is a positive and significant relationship between cocoa exports and economic growth in Nigeria. This particular hypothesis is in line with the findings of Abolagba *et al.* (2010) and Noula, *et al.* (2013).
3. There is a positive and significant relationship between rubber exports and economic growth in Nigeria. This last hypothesis is in consideration of the findings of Abolagba *et al.* (2010) and Nwachukwu (2011), so to speak.

## **RESEARCH METHODOLOGY**

### **Research Design**

This research study employs the analytical research design technique which uses empirical evidence to examine the relationship between variables (both independent and dependent variables).

### **Nature and sources of data**

Secondary data obtained from the *Central Bank of Nigeria (CBN) Statistical Bulletin*, *National Bureau of Statistics (NBS)*, and *Securities and Exchange (SEC) Commission Bulletin* of various years were used in the study due to the nature of the study. The justification for choosing this period is to empirically test the extent to which agricultural exports have contributed to the growth of the domestic economy despite several years of government neglect, and the renewal of efforts towards stabilizing the agricultural sector.

### **Data analysis**

The method of analysis adopted in this study was the use of E-views 8.0 econometric software, ordinary least square (OLS) multiple regression techniques and a time series data from 1980-2013 to carry out our tests and

analyses. Regression Analysis described the nature of the relationship between variables by expressing the relationship in a mathematical form. In other words, regression analysis provided an estimated equation which expressed the functional relationship between these variables.

### Model specification

The impact of selected agricultural exports on growth of domestic economy is determined by a number of factors such as: total agricultural exports, cocoa, rubber, export commodity prices, exchange rate, inflation rates, and interest rates.

The model according to Nwibo (2012), is stated below:

$$RGDP=f(TAEXPT, COEXPT, RUEXPT, EXCHR, OPENSS, EXPTCPI, INTR, INFR)..... (Eqn 1)$$

Where these variables and their classifications are explained as follows below:

COEXPT= Value of cocoa export

RUEXPT= Value of rubber exported

TAEXPT= Total agricultural exports

GDP= Gross domestic product

EXCHR= Exchange rates

OPENSS= Trade openness

EXPTCPI= Export commodity price index

INTR= Proxied by lending interest rates

INFR= Inflation rate

The econometric form of the above model will be given as:

$$RGDP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + U ..... (Eqn 2)$$

Where,

$\beta_0$ = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ = Population parameters

$X_1$  to  $X_7$ = Dependent variables

U= Error term (unexplained variations, for instance, variables that could affect the dependent variable but not included in the model).

Coefficient of Determination ( $R^2$ ): It determines the proportion of variation in the dependent variable as a result of variations in the independent variable.

DW-Statistic: The Durbin Watson Statistic is a test statistics used to detect the presence of autocorrelation (for instance, when the error term in one time period is correlated with the error term in the previous time period).

T-Statistic: This is a ratio of the departure of an estimated parameter from its notional value and its standard error. It is used for hypothesis testing.

F-Statistic: This is applied to test the overall significance of the regression equation.

### Meaning of variables and classifications of relevant variables used in the model

#### Dependent variable

#### Real Gross Domestic Product (RGDP)

Real GDP denotes gross GDP minus domestic inflation rate. It is the dependent variable and is defined as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

#### Independent Variables and their Classifications

1. Selected Cash Crops: The variables comprises of cocoa exports (COEXPT) and rubber exports (RUEXPT) in the natural or unprocessed state in Nigeria. These cash crops have a long historical base and revenue from them has been a strong force towards Nigeria's growth achievement. This study focused the sale of these cash crops produced in Nigeria to foreign countries. The export of these products is measured in naira value.
2. Trade Openness (OPENSS): The share of imports and exports in the overall output provides a ready measure of extent of globalization of the goods market. Openness to trade enhances an economy's growth rate since it provides access to a variety of imported inputs, especially technology, in addition to, expanding the market for domestic exports to innovation and specialization. The direction of impact of openness on growth, therefore, remains an empirical issue. It is measured by  $[\text{exports}(X) + \text{imports}(M)]/\text{GDP}$  (Wikipedia, 2015).
3. Exchange Rate (EXCHR): The strength of a country's currency depends on a number of factors. These include the state of the economy in terms of its competitiveness and volume of its exports, the level of domestic production, and the quantum of foreign reserves (CBN, 1999). Where the importation of essential goods and services becomes costly as a result of increase in prices of domestic goods there is going to be a reduction in the purchasing power of the domestic currency. Therefore, a globalization process that leads to high naira exchange rate can further increase distress in the economy.
4. Export Commodity Price Index (EXPTCPI): This variable measures how the volatility in prices of export commodities affects the value of goods exported. It is believed that export prices affects world demand for Nigerian export commodities.
5. Interest Rates (INTR): Access to finance at reasonable costs could be important for industrial development by simply making it easier and less costly for firms to finance working capital needs and investments. The interest rate is the amount charged and expressed as a

**Table 1:** Descriptive statistics of agricultural exports and real GDP

Variables	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
RGDP	381.8	302.1	987.2	51.7	266.4	0.6	2.2
TAEXPT	1644.5	650.9	7191.6	10.5	2241.6	1.3	3.3
COEXPT	56.2	4.7	312.1	0.14	99.4	1.6	4.2
RUEXPT	18.9	2.7	158.0	0.003	40.03	2.6	8.7
EXCHR	68.5	22.05	158.01	0.61	68.6	0.17	1.2
INTR	19.1	18.2	29.8	13.54	3.6	1.4	4.6
EXPTCPI	92.3	92.0	183.5	34.5	35.8	0.5	2.9
OPENSS	0.44	0.44	2.07	0.05	0.33	3.1	16.8
INFR	27.1	14.0	75.4	6.6	21.1	0.7	2.2

Variables	Jargue-Bera	
	Value	P-Value
RGDP	2.8	0.023**
TAEXPT	10.5	0.005***
COEXPT	18.7	0.000***
RUEXPT	88.1	0.000***
EXCHR	4.6	0.095*
INTR	16.1	0.000***
EXPTCPI	1.51	0.468
OPENSS	339.2	0.000***
INFR	4.03	0.132

**Source:** Authors Computations from Table 4.1 using E-views 8 (2015)

**Key:** \*\*\*, \*\*, and \* denote significance at 1 %, 5% and 10% respectively

percentage of principal, by a lender to a borrower for the use of funds. It is expected that higher interest rates will discourage borrowing, and hence result in lack of funds for agricultural production.

6. Inflation Rate: This is the proxy for consumer price index (CPI). Coefficient of consumer price index is expected to be positive because increase in price will stimulate supply of agricultural products from the producers.

### ESTIMATION, RESULTS AND DISCUSSION

The empirical results are presented in table 1 which shows the estimated parameters and the t-statistic of the equation.

Table 2 contains descriptive statistic for the indicators of selected agricultural exports and real gross domestic product (RGDP). It was observed that on average, the growth of real gross domestic product recorded the highest across the sample variable and the other variables are total agricultural exports (TAEXPT), cocoa exports (COEXPT), export commodity price index (EXPTCPIs), exchange rate (EXCHR) rubber exports (RUEXPT), inflation rate (INFR), interest rate (INTR) and trade openness (OPENSS). From all indication, it was observed that the real gross domestic product (RGDP) is highly volatile as at when compared with other selected variables with an index point of 266.4. It is expected that the performance of the domestic economy should be more volatile because in recent times, macroeconomics fundamental have changed tremendously with variables like exchange rate, interest rates, inflation and

**Table 2:** Regression results, dependent variable RGDP

Variables	Coefficient	t-Statistic	P-value
TAEXPT	0.076	3.545	0.001***
COEXPT	0.223	0.569	0.573
RUEXPT	-0.515	-1.187	0.245
EXPTCPI	0.880	2.880	0.007***
INTR	9.233	3.326	0.002***
EXCHR	1.134	3.099	0.004***
OPNSS	43.623	1.170	0.252
INFR	-0.755	-1.116	0.274
CONSTANT	-80.683	-1.200	0.240

R-squared = 96.64%

Adjusted R-squared = 95.56%

F-statistics = 93.70

Prob (F-statistics) = 0.0000

Durbin-Watson stat = 1.126

**Source:** Authors Computations Using E-views 8 (2015)

**Key:** \*\*\* denote significance at 1% level

agricultural exports which represents the explanatory variables are expected to have more volatility. It can be seen from table 4.1 that all the variables are positively skewed and to the right. Also, all the series were normally distributed as could be seen by their probability values. Thus, this buttresses the use of the least square approach as against all other estimation approach.

The result of the ordinary least square regression (OLS) method is presented in Table 4.2. The linear function best fit the model as it has four independent variables with significant effects on real GDP and a high adjusted R<sup>2</sup> value. The adjusted R<sup>2</sup> was 0.9556; implying that the independent variables explained 95.56% of

the total variation in real GDP, while the error term (U) accounted for the remaining 4.44% of variations in the dependent variable (RGDP) not explained by the independent variables. The F-statistic (93.7) and the Prob (F-statistic) is 0.000, all indicating that F-statistic is significant. As such, we accept the alternative hypothesis, implying that the parameters are generally significant at 5%. The constant (C) with negative and insignificant coefficient showed that if all factors (*for instance*, the independent variables) are kept constant, real GDP will be decreasing by 80.68 (80.68%).

The equation for the model equation (1) is therefore given as:

$$RGDP = -80.683 + 0.076 TAEXPT + 0.223 COEXPT - 0.515 RUEXPT + 1.134 EXCHR + 0.880 EXPTCPs + 43.623 OPENSS + 9.233 INTR - 0.755 INFR + U \dots\dots\dots (Eqn 3)$$

***H<sub>01</sub>: Total agricultural exports has no positive and significant impact on growth of the domestic economy***

The regression result presented above showed that a unit increase in the total agricultural exports (TAEXPT) will lead to 0.076 (7.6%) increase in real gross domestic product (RGDP). The results of the regression also showed that total agricultural exports had a positive and significant impact on the dependent variable (RGDP) at 5 percent level. This does not agree with the first null hypothesis (H<sub>01</sub>). Thus, the alternative hypothesis is accepted that total agricultural exports had a positive and significant impact real GDP in Nigeria.

***H<sub>02</sub>: Export of cocoa has no positive and significant impact on economic growth***

The results revealed that cocoa export supply (COEXPT) had a positive and insignificant effect on economic growth in Nigeria, which is in line with the second null hypothesis (H<sub>02</sub>) of this study. That cocoa export had a positive sign direction towards economic growth implies that a unit change in cocoa export will cause real GDP to increase by 0.223 (22.3%). However, the plausible reason for its insignificant effect on real GDP could be due to it being exported in its raw form without proper processing to make for value addition. This result contradicted findings of Abolagba (2010), who found that cocoa export supply was significant at 1 percent level. The problem of cocoa beans being exported raw with no value added through processing has resulted to its low output production. No doubt, processed cocoa will attract more revenue than raw cocoa.

***H<sub>03</sub>: Export of rubber has no positive and significant impact on economic growth***

The findings of this research revealed that rubber export supply (RUEXPT) had a negative and insignificant impact on economic growth in Nigeria which is in line with

hypothesis three (H<sub>03</sub>) of this study. Rubber export supply was found to be insignificant at 5 percent level with a negative coefficient indicating that a change in rubber export resulted to a decrease in real GDP by 0.515 (51.5%). The inappropriate sign on and none significant influence of rubber production on growth of the domestic economy, from findings of this study, the plausible reason for this poor and negative results could be due to Alabi *et al.* (2004)'s argument that "present estimate of small-holder area of 100, 000 ha consist of old planting seedling rubber and yields are therefore low." These plantings have been considered to be in urgent need of habilitation since the 1970s. This result is in line with a research carried out by Nwachukwu (2011), who found that rubber exports were not significant at 5 percent level in influencing growth. However, it contradicts the findings of Abolagba *et al.* (2010) that revealed that rubber export positively and significantly influenced domestic economic growth at 1 percent level of significance. Therefore, the null hypothesis is accepted in this regard.

***The Control Variables***

Inflation rate, though insignificant had affected real GDP negatively by 0.755 (75.5%). A unit change in inflation rate caused real GDP to decrease by 75.5%. The unexpected sign on domestic inflation rate is inappropriate because coefficient of consumer price index is expected to be positive because an increase in price will stimulate supply of agricultural products from the producers (Lawal and Atte, 2006). The plausible reason why agricultural production and economic performance of Nigeria have deteriorated over time, could be due to the prevailing unfavourable domestic prices, thereby inhibiting domestic production.

On the other hand, interest rate had a positive sign (9.233) and was significant at 1 percent level in influencing real growth in Nigeria. This showed that a change in interest rate causes real GDP to increase by 923.3%. This is in agreement with *a priori* expectations in that favourable interest rates to enable cocoa and rubber farmers have access to funds would invariably boost domestic production of agricultural exports. This result is also supported by Essien *et al.* (2011)'s findings that agricultural credit positively affected cocoa exports in Nigeria.

Results also show that exchange rate had positively and significantly affected economic growth in Nigeria at 1 percent level of significance. It then means that a unit change in exchange rate will lead to a 133.4% increase in real GDP. This is not in line with *a priori* expectations that as exchange rate volatility increases, it will cause a corresponding drop in cocoa and rubber exports in Nigeria, thereby re-allocating resources to other crop sectors. However, a positive exchange rate result could be argued from the point of view of devaluation of the domestic currency. This result is in agreement with the

findings of Garba (1998) who found that exchange rate volatility was significant at 10 percent level and that it had the expected positive sign suggesting that the nominal devaluation of the ₦/\$ exchange rate had a positive impact on agricultural export commodities in Nigeria. However, the positive direction of sign of the result is in disagreement with findings of Oyinbo *et al.* (2014) and Anigbogu *et al.* (2014) who found that exchange rate had negative influence on agricultural share of gross domestic production in Nigeria.

On the other hand, trade openness was not significant but has a positive relationship with real GDP. A change in trade openness (OPENSS) causes real GDP to rise by 43.62%, indicating that the economy of Nigeria is open to trade. The plausible reason for its non-significance could be that Nigeria need to do a lot to improve its trade openness rating globally in the areas of transparency and reduction in corruption level, etc. Also, export commodities price index (EXPTCPI) showed a significant and positive impact on RGDP. It also revealed that as EXPTCPI changes, real GDP rises by 88%. This result showed that inflation of export prices had not adversely affected growth of the Nigerian economy. This is in contrast to *a priori* expectations. Plausible reasons could be due to the fact that the other factors such as low agricultural output and exportation of our agricultural produce in raw form may have resulted to the sluggish growth experienced by the Nigerian economy.

### Summary of Findings

The study examined the impact of agricultural exports on economic growth of Nigeria from 1980 to 2014, using ordinary least square (OLS) method of estimation. From the results of the study, the following findings were discovered:

1. The aggregate agricultural exports of Nigeria had a positive and significant impact on real GDP. Thus, the exportation of varieties of agricultural products is beneficial to the Nigerian economy.
2. Export supply of cocoa had a positive and insignificant impact on economic growth in Nigeria; as export supply of cocoa increases, real GDP increases at the same time.
3. Real GDP showed a negative response to the export supply of rubber i.e. export supply of rubber had a negative and insignificant impact on real GDP.
4. Interest rate was found to have a positive and significant impact on economic growth, implying that favourable interest rates on loans to farmers are vital to determining their access to funds.
5. It was equally discovered that domestic inflation rate (proxy for CPI) had a negative and insignificant effect on real GDP in Nigeria due to high domestic prices against *a priori* expectations that devaluation lead to high export of domestic cash crops.
6. Exchange rate also depicted a positive and significant

impact on real GDP, showing that high exchange rate would result to an increase in real GDP contrary to our *a priori* expectations.

7. On the other hand, export commodity price index showed a significant and positive impact on real GDP. Thus the export price had been favourable, but other factors may have been responsible for the deteriorating agricultural exports in Nigeria.
8. Finally, trade openness showed a positive and insignificant impact on real GDP. This implies that Nigerian economy had failed to import capital goods that could boost domestic production, hence the country has been importing more than their exports of domestic agricultural goods from other nations.

### CONCLUSION

The aim of this study was to empirically analyze the impact of selected agricultural exports on the growth of the domestic economy, covering the period, 1980-2014. In the study, efforts were made to develop linear regression models that helped to explain the level of agricultural exports and real GDP in Nigeria.

With regards to the gap identified in this study, the paper has made some contributions to the literature of agricultural exports to the effect of filling the gaps noted in this study. The econometric model of the study extended previous studies of agricultural exports in Nigeria by extending the time horizon of analysis. The paper also extended the time period to cover thirty-five years and enlarged relevant variables to nine (control variables inclusive). A larger time series data should generate more reliable results. Thus, this study has profoundly established that cocoa and natural rubber are core determinants of agricultural exports that significantly affect economic growth of Nigeria.

### Limitations and scope for further research

Our study has certain limitations and could not exhaust all aspects of agricultural exports, in relation to the national and regional level in Nigeria. For instance, looking at the contribution of other agricultural exports, other than the ones we have used to consider economic growth in Nigeria were not discussed. These could be viable area of empirical study to embark on by new research since it is clear from the present study that agricultural exports contribute to economic growth. Besides, the direct contribution of primary commodity export on economic growth needs to be investigated in terms of scope and degree of impact.

### Recommendations

Considering the performance of agricultural exports as revealed from the results of the study, the following recommendations are made:

- i). It is glaring from the findings of the study aggregate agricultural exports had a positive and significant impact

on real GDP. To further improve this, the government should encourage increase in participation of private companies in the agricultural sector so as to increase total output, and also look beyond the production of cocoa and rubber by exploring other areas of agricultural production, such as fishery, livestock, etc. Also, more research on quality maintenance, tropical diseases affecting crops and livestock should be carried out so as to increase the returns from the exports of agricultural products.

ii). The findings of this research revealed that cocoa exports had a positive and insignificant impact on real GDP growth in Nigeria. This is because production of cocoa is carried out by individuals with small income thereby producing on a small scale. Besides, cocoa is exported in its raw form thereby attracting low revenue. Consequently, the government should encourage farmers to form cooperatives so that they could be open to loan schemes which will go a long way to increase productivity. Also the government should finance research activities on improving on the quality of cocoa produced and shipped abroad as such making up for its value addition to boost exports.

iii). The results revealed that rubber exports had a negative and insignificant impact on real GDP in Nigeria. Therefore, as a policy, rubber production should be carried out on a large scale by companies which will help to maintain quality and thus an increment in its value. Also, the government should put in place policies to stimulate rubber production through financial aid given to farmers, intensive research on improvement of quality of rubber produced, organization of seminars comprising of all participants (the rubber producers, exporters, industries who use rubber as raw material and other stake holders). Besides, there is urgent need of rehabilitating ageing rubber farms in Nigeria. Government should fashion out policies in this regard.

iv). It is also necessary to explore policy options such as monetary policy by influencing interest rate to further promote fair interest on loan to farmers for the production of export crops in order to expand exports generally, and agricultural exports, in particular.

v). Government should also lift tariffs from the importation of production equipment and other goods meant to accelerate agricultural output in Nigeria. By this, domestic prices (i.e. inflation rate) and cost of producing agricultural products will be controlled and brought to the barest minimum.

vii). Government should articulate monetary policies that make naira exchange rates be favourably influenced to encourage cheaper import prices of the necessary agricultural inputs which cannot be produced locally.

viii). Moreso, adding value to our primary export commodities (such as cocoa and rubber) is important because it will not only command higher export prices but will enhance patronage at the international market.

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