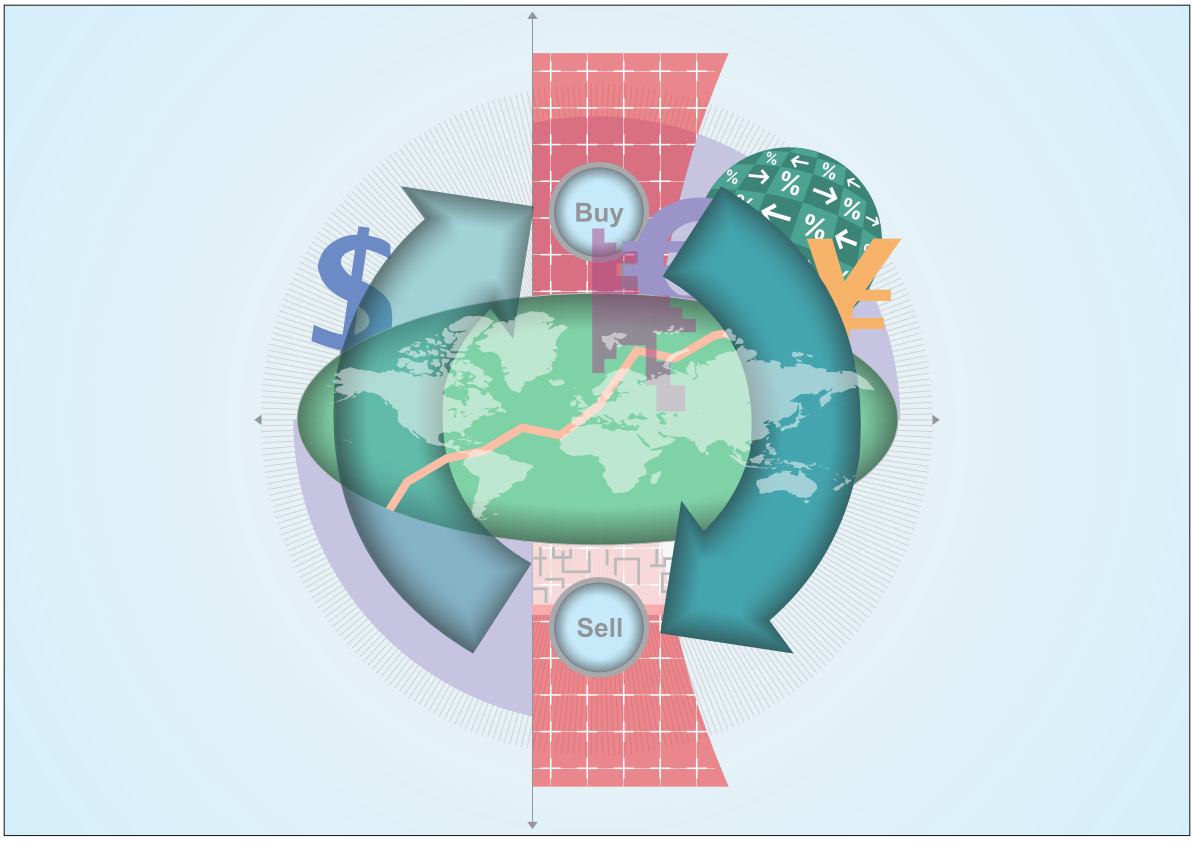

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Research Article
Examining the Political-economy of Cocoa Exports in Nigeria

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Abstract

Even though there was no coherent policy at the time Nigeria attained independence in 1960, agriculture was the economic mainstay with cocoa production taking the lead. However, the discovery of crude oil and the subsequent oil boom of the late 1970s provided a temporary respite for Nigeria's political-economy from collapse of the commodity prices. This study examined the significance of cocoa exports as a veritable alternative revenue source to the Nigeria's dwindling GNP. This study empirically assessed the trends in cocoa export by identifying variables that determine the aggregate cocoa output and export using the methods of functional-analytic framework. The Ordinary Least Square (OLS) analytical technique, using data spanning 1970 to 2010 from various relevant institutions, was utilised. Other analytical techniques employed were subjective descriptive statistics of tables, graph and trend analysis. The study revealed a continued marginal decline in the aggregate output of cocoa attributable to low capacity building and utilisation for controlling the economic and ecological variables affecting cocoa productions. Aggregate output of cocoa in Nigeria showed a strong positive relationship with management of the exchange rates and the utilisation of modern weather control mechanism for annual rainfall and pest control. The period of the liberalisation policy is also discovered to coincide with improvement in total annual income from cocoa, albeit marginally. The study concluded, among others, that the advantages inherent in economic liberalisation could be utilised for the crucial revenue diversification from oil through a sufficient government intervention of boosting cocoa exports in Nigeria.

Key words: Agronomic variables, cocoa exports, liberalisation, Nigeria exchange rate, Nigeria governance crisis, ordinary least square, political-economy, Sub-Sahara Africa

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Nigeria is a country in the Sub-Saharan Africa (SSA), where the festering challenges of economic development and governance crisis have become critical concerns of the contemporary time. In terms of economic growth and poverty incidences, the region has been lagging forlornly behind others in the comity of nations. As, Yu and Nin-Pratt (2011) have pointed out, with an average $612 per capita Gross Domestic Product (GDP) in 2009, which falls short of one-third of what obtains in the emerging economies of East Asia, it is logical that about three-quarter of low-income nations and preponderant worst-hit in malnourished citizens are in the SSA. In addition to this, the instability of the political terrain, corrupt practices, prostate institutional and infrastructural development and poor macroeconomic management have continued to haunt Nigeria, an oil-rich nation seemingly under the perpetual yoke of governance crisis. Successive rulers have been unsuccessful in diversifying the economy away from its monocultural reliance on the capital-intensive oil sector, which provides about 95% of total revenue from foreign sources. Incidentally, the oil sector also provides about 80% of total revenue but nevertheless constitutes less than 4% of total employment. Yet, the significance of agricultural export in the total commodity export in the Nigeria balance of payment accounting is so important that various trade arrangements before independence and immediately after independence were formulated around agricultural commodity export. At independence, there was no well-defined agricultural policy at the national level. However, various regional governments had, in a bid to cause accelerated development of their various individual region, evolved agricultural trade policies built around encouragement of agricultural export (Fabiyi, 1996; Olufokunbi and Titilola, 1993). The sole aim was to generate huge revenue mostly in foreign exchange to finance the importation of capital goods necessary for development.

Notwithstanding, farmers and even produce marketers at various regions bought into this idea as the production of exportable agricultural products generate a lot of cash income to both the farmers and produce merchants. Consequent upon this, export crops are regarded as cash crops while other crops are called food crops. For instance, in South-Western Nigeria where major export crops are cocoa, palm kernels and rubber, the cocoa season always come with a lot of socio-activities like ceremonies, festivals etc., as farmers are always left with cash balances to pursue these social responsibilities. According to Philip (1996), the export crop subsector of the agricultural sector accounted for about 58.4% of the foreign exchange earnings from 1960-1970. However, its contribution declined sharply to 5.3% from 1970-1985 and an average of just 4% between 1980 and 2000 (CBN., 2000). This cannot be divorced from the emergence of petroleum in the nation's economy, which made several regimes shift attention from agriculture to petroleum. The specific consequence of this was that not only the contribution of agriculture to Gross Domestic Product (GDP) declined, Nigeria became a net importer of food items, an indication of national food insecurity.

Agricultural export commodities of Nigeria can be categorised into traditional and non-traditional export crops. The prominent traditional export crops include cocoa, the palm kernel, rubber, coffee, kola nuts, groundnuts, cotton etc. (Oni, 1969), while pineapple, cashew nuts, eggs, processed fruits, alcoholic drinks, spices are the non-traditional export crops. Invariably, the demand for these non-traditional export commodities is on the increase in the international market (Omonona *et al*., 2007; UNIDO., 1992). Cocoa is the most important non-oil export commodity in Nigeria. Available statistics showed that it is the second highest source of foreign exchange after crude petroleum (Adegeye, 1996). According to Ladipo and Adesinmi (1975), cocoa provided employment opportunities and source of livelihood for more than 350,000 people in the South-Western Nigeria. Idowu *et al*. (2007) asserted that the production and marketing of cocoa are labour intensive; hence, it can help to solve the problem of rural employment.

In Nigeria, cocoa production is traditionally for export, with less than 10% utilised for cocoa products like cocoa butter, cocoa biscuit, cocoa liquor, chocolates, etc. However, a sizable quantity is processed to create value addition to the export or for local industries as their main raw materials. Delloitte *et al*. (1990) maintained that the cocoa processing industries in Nigeria utilise on the average about 10% of the total cocoa produced in the country. In addition, a considerable quantity, which cannot be estimated, is smuggled out of the country to neighbouring African countries. Nevertheless, domestic consumption and the quantity smuggled are just a fraction of the aggregate national output, the largest quantity are for export. Nigeria used to be the second largest producer of cocoa in the World after Brazil. As at today, the country occupies the fourth position after Brazil, Cote d' Ivoire and Ghana. Though the aggregate cocoa output, which fell from about 303,000 metric tonnes in 1970 to barely 100,000 t has risen again to about 375,000 t in year 2000. Omonona *et al*. (2007) ascribed this growth after the trade liberalization to improved maintenance of the cocoa plantation in the South-Western region and opening up of new land for cocoa in the eastern region of the country.

A favourable condition of rainfall, humidity and sunshine is necessary for cocoa production. This accounts for its production in only 14 states of the country characterised by rainforest ecological zones. However, the states of Ogun, Oyo, Osun, Ekiti, Ondo, Edo, Delta, Akwalbom and Cross River states are the major producers of cocoa in Nigeria because they are favoured with the right climatic and soil conditions. Furthermore, cocoa is also produced in little quantities in Kogi, Kwara, Abia and some parts of Anambra state. Generally, the four states of Ekiti, Ondo, Osun and Oyo states produced about 80% of the total cocoa produced in Nigeria (Idowu *et al*., 2007; Ajobo, 1989; Adegeye, 1990).

Opinions continue to differ as the size of farm holdings by farmers of cocoa in Nigeria. Nevertheless, cocoa cultivation is largely in the hands of peasant farmers with the average farm size holdings of about 1.6 ha (Ciba, 1993). Nwachukwu *et al*. (2010) reported a slightly higher figure of 3.5 ha probably due to expansion in acreage observed after market liberalisation of the export market. The market liberalization, which led to the dissolution of the marketing board in the mid 80s, removed the indirect tax imposed on agricultural export. As such, farmers gained benefits from world prices directly for their produce. As, Nwachukwu *et al*. (2010) pointed out, farmers responded to this price incentives by cultivating more parcels of land for cocoa plantations in the eastern states of Nigeria, while farmers in the South-Western part responded through an enhanced plantation maintenance of the cocoa trees and pods.

Cocoa has been the most important export crop in Nigeria even before independence and the trend continues until today. However, a review of cocoa aggregate production and export showed that there are periods of decline and growth in both production and export. For instance, prior to Nigeria's adoption of the deregulated policy measures, cocoa production had been on consistent decline. Nigeria's cocoa, which peaked in 1970/71 at 310,000 metric tonnes, declined to a mere 100,000 t in 1985. The export quantity also declined during the period. Several researchers such as, Olayide and Olatubosun (1974), Adegeye (1990), Oni *et al*. (1991), Alimi and Awoyomi (1995), Ajobo (1989) and Olukunle (2013) adduced several reasons for this. Prominent among these reasons was the argument of the indirect tax imposition on cocoa farmers through the Cocoa Marketing Board, which used to fix cocoa prices at a level well below the world prices. In their view, this acted as a price disincentive to farmers and hence farmers started abandoning their farms. This coupled with the petro-dollar dominated economy of the late seventies to early eighties, which created many opportunities in urban centres and cities and facilitated the rural-urban migration led to the continuous decline of aggregate cocoa output and export.

The implementation of quasi-market dependent economy through the adoption of SAP in the mid 80s brought about the dissolution of the marketing board and hence farmers were exposed to international market prices. Interestingly, the aggregate cocoa output rose sharply from the 100,000 metric tonnes in 1985 and 375,000 metric tonnes in 2010. Also in their different views, Oluyole and Sanusi (2009), Villalobos (1989) and Idowu *et al*. (2007) identified some of the factors that contributed to the misfortune of cocoa production and export to include low yield, inconsistent production pattern, incidences of diseases and pest and the employment of the use of cutlass and hoe agriculture, ageing cocoa farms.

From the above, it is obvious the two major areas that researchers have been trying to investigate as to the possible determinants of aggregate cocoa output and hence export are market and agronomic factors. In the analysis of market, investigation has been on the analysis of the effects of open international trade and mainly the effects of pricing as it affects domestic production and exports. Cocoa in Nigeria is primarily for export, though, the considerable amount of the quantity produced in the country is processed locally. The quantity utilised locally either serve as major raw materials for some local industries or processed further into cocoa products to act as value added product in export. Whereas, in agronomic studies, research efforts have been concentrated on the analysis of resource use and their efficiencies as probable determinants of aggregate cocoa output and quantity available for export. This study will examine the socio-political and economic factors and variable with a view to analysing the determinants of cocoa export in Nigeria. The idea is that politics is germane in driving the economy that will eventually produce a suitable production and market conditions for enhanced exportation.

Therefore, this study attempt to offer answers to the following yawning research questions:

- What is the trend of cocoa output in Nigeria?
- Does politics influence the production?
- What are the factors that determine the aggregate cocoa output in Nigeria?

MATERIALS AND METHODS

This study covers a period of about forty years, spanning 1970-2012. Secondary data obtained from relevant international and national bodies like the FAO, IMF, International Cocoa Organisation (ICCO), World Cocoa Foundation (WCF) and Nigeria's Federal Office of Statistics and Central Bank were critically analysed. From the review of

literature on the political economy of primary products, a general preference for any or a combination of the following analytical techniques was discovered. These are but not limited to:

- Descriptive statistics, which is used mainly to compare variables and aggregate export over a period of time. In economic analyses, descriptive statistics are employed to compare variables and economic parameters. Most pre-SAP studies employed this method. The method is generally preferred because of its quickness and ease of application and the fact that it is handy. This technique suffers from its inability to explain causal relationships
- Trend analysis, which usually involve graphical or plotting of trend equations. Trend analysis is also a variant of descriptive statistics method, only that it enables the researcher to demonstrate the trend of economic variables graphically and use the trend equations obtained thereabout to make projections. It is useful in measuring the impact of certain economic policies on a particular commodity. Its general weakness also lies in the fact that it cannot explain the causal relationship and may not be adequate to explain determinants of cocoa export or aggregate output
- Limited general equilibrium analysis, which either employ Ordinary Least Square (OLS) regression technique or a more advanced econometric technique of Error Co-integration Mechanism (ECM). In this method of analysis, the study usually postulate and estimate and/or econometric models to isolate the causal relationship between the dependent variables and the independent variables. The error cointegration mechanism is a newer econometric technique specifically used to address the problem of non-stationary in the economic variables. However, more robust than OLS, its methodologies is still rooted in OLS thereby cannot totally rendered OLS unsuitable

In this study, a hybrid combination of the above methods was adopted in order to give a robust analysis of the descriptive and inferential characteristics of the determinants. Data obtained from reviewed literature on the performance of the Nigeria in cocoa exports were described with table and graphs and prosaically with reference to both pre-SAP and post-SAP periods. In addition, going by a consistency discovered in several published studies, the study adopted the OLS regression technique backed up with the Durbin-Watson (DW) statistic to prevent the encumbrances of autocorrelation.

RESULTS

OLS-DW estimation of the determinants of cocoa exports in Nigeria: To estimate the determinants of cocoa export, this study carried out a regression analysis using the Ordinary Least Squares (OLS) method. The method is popular in post-SAP studies of cocoa production and exports as revealed in Oni *et al*. (1991), Shende and Bhole (1999), Kumar (2004), Kumar *et al*. (2008), Yusulf and Akinlade (2011) and Ojo *et al*. (2014). Critically aligning with these studies, diverse functions, namely, linear, semi-log and log were attempted from the coefficient of multiple determination, level of significance of the variables, signs of the coefficients and Durbin-Watson (DW) estimates. In the end, the lead equation was selected on the basis of best fit.

The basic model is given as:

$$ExQt = f(Qn, Wp, Er, Pp, eF, SAP, Lr, ui)$$

Linearising the model gives:

$$ExQty = b_0+b_1Qn+b_2Wp+b_3Pp+b_4Er+b_5Aef+b_6Aar+b_7Lr+b_8Sap+ui$$

Where:

ExQty = Quantity of cocoa exported from Nigeria
Qn = Aggregate cocoa output
Wp = One year lagged world prices on cocoa product (N)
Pp = One year lagged producer prices on cocoa product (N)
Er = One year lagged exchange rate (N/US$)
Aef = Annual expenditure on fertilizer (N'm)
Aar = Average annual rainfall (mm)
Lr = Lending rate (%)
Sap = Structural adjustment programme introduced (dummy, 0 = before, 1 = after)
b = Defines the coefficient and elasticity of all respective variables (as it may apply)
ui = The random error term

To isolate the factors affecting the export of cocoa from Nigeria, multiple regression analysis was performed. Three functional forms of the regression model namely the linear, semi-log and double log were fitted to the data by the method of the ordinary least squares, as described supra. All the variables conformed to their a priori sign. Table 1 revealed that all the three models demonstrated good fits considering their F-values and coefficients of multiple determination R^2 (78.7, 66.7 and 82.4%, respectively). However, the log function was the best fit and was therefore adopted as the lead equation. To guarantee randomness and unpredictability of errors of the OLS regression models, a DW estimates were

Table 1: Comparing three functional models of cocoa export in Nigeria (1970-2010)

Variables	Linear	Semi-log	Log
Constants	$1.847e^{+05}$	8.808e***	$1.219e^{01*}$
Aggregate cocoa output	$2.675e^{-01**}$	$3.363e^{-01***}$	$1.000e^{02*}$
World cocoa prices	$5.831e^{-01}$	$2.019e^{-01}$	$2.001e^{01*}$
Producer prices	$4.902e^{-01}$	$1.716e^{-01}$	$8.259e^{-01*}$
Exchange rate	$-3.614e^{+02}$	$-4.850e^{-02}$	$-16.315e^{-01*}$
Annual expenditure on fertiliser	$3.534e^{-01**}$	$4.360e^{-02}$	$645.250e^{-04*}$
Average annual rainfall	$1.874e^{+03***}$	$4.944e^{-01**}$	$9.011e^{-03*}$
Lending rate	$-6.044e^{+03}$	$-8.600e^{-01}$	$-3.145e^{-02ns}$
Structural adjustment programme (SAP)	$1.161e^{+04}$	$9.250e^{-02}$	$6.366e^{-02ns}$
R^2 (coefficients of multiple dtermination)	78.7%	66.7%	82.4%
Durbin-Watson (DW) statistic	2.045	2.060	2.096

*Significant at 1%, **Significant at 5%, ***Significant at 10% and ns: Not significant

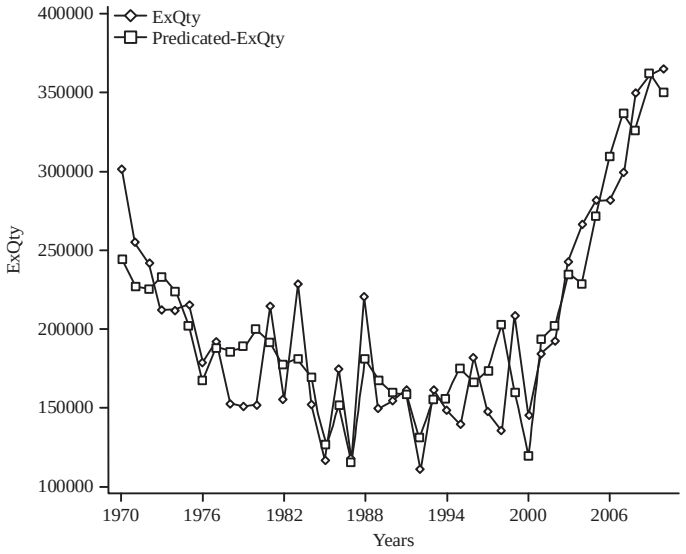

Fig. 1: Predicted and observed values of quantity of cocoa exported using linear function

conducted. Evidences from available published studies state a DW statistic should range between 1.5 and 2.5 to demonstrate nonexistence of autocorrelation. We assumed that the best fit function is free from autocorrelation with a DW value of 2.096. The result showed that the coefficients of Nigeria's aggregate cocoa production (output), world market prices, producer prices paid to Nigerian farmers, exchange rate of the Nigerian currency (naira) against the dollar, annual expenditure on fertilizer and average rainfall are statistically significant at 1%. As confirmed by the coefficient of determination estimate R^2, about 82.4% of the variability in the export of cocoa from Nigeria is explicable by these variables. This implies, among others, that cocoa exports in Nigeria will improve and decline by about 3 and 6% with 1% increase in producer prices and exchange rate, respectively. These results compare favourably with recent works on cocoa exports in Nigeria and Ghana (Nwachukwu *et al*., 2010; Darkwah and Verter, 2014).

Figure 1, 2 and 3 further showed the graphical illustrations of the different trend equation and plots.

DISCUSSION

Marginal revenue from cocoa exports: From Table 2 and Fig. 4, there is an improvement of annual income throughout the period of 2005-2012 with an annual income of about US$ 136.7 and US$ 900, respectively. However, it is also clear that even though the annual income accruing from cocoa exports continue to improve, a trend in the relative increase of the income revealed a galloping tendency. This finding compares with that of Adeyeye (2001), Cadoni (2013) and Idowu *et al*. (2007), who also discovered the same trend in the marginal prices of cocoa in Nigeria.

Trends in cocoa export from Nigeria: Table 3 and Fig. 5 summarise the findings on this. From the table, it can be deduced that from 1970 when Nigeria attained a peak export quantity of 302,000 metric tonnes of cocoa, the volume of cocoa export has been on consistent decline. Exports particularly declined to as low as 150,000 metric tonnes in 1987. Even with the adoption of structural adjustment

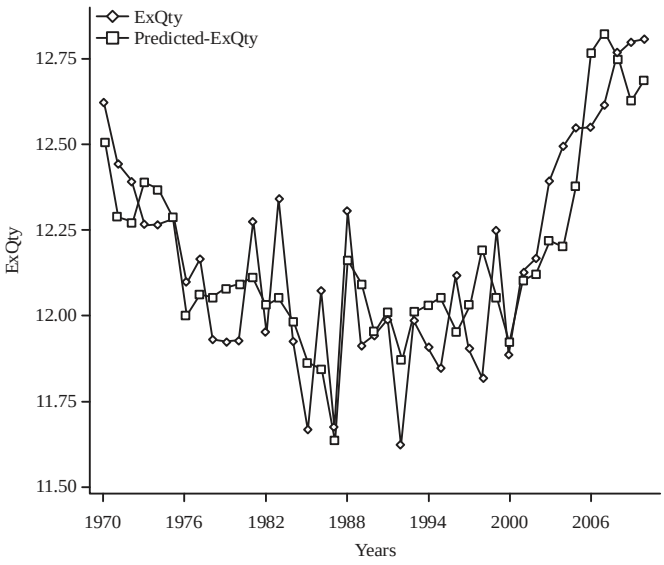

Fig. 2: Predicted and observed values of quantity of cocoa exported using semi log function

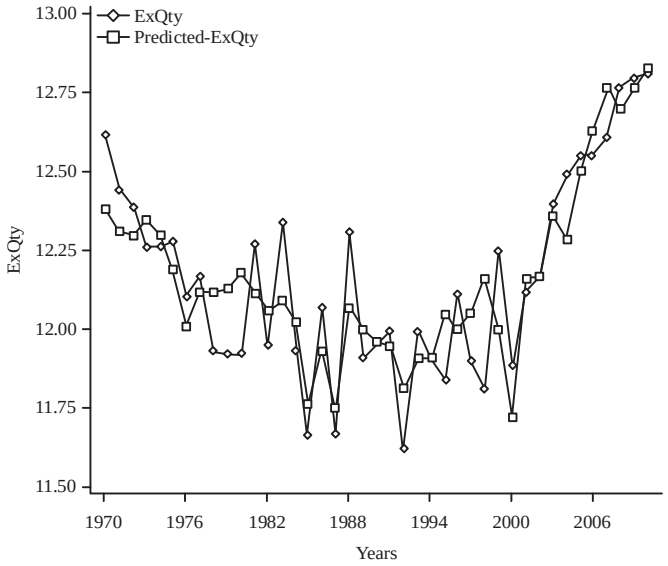

Fig. 3: Predicted and observed values of quantity of cocoa exported using log function

Table 2: Marginal revenue from cocoa exports (2005-2012)

Parameters	2005	2006	2007	2008	2009	2010	2011	2012
Cocoa annual income (US $ million)	136.7	215.0	312.6	487.8	662.2	822.8	833.3	900.0
Marginal revenue (US $ million)	-	78.3	97.6	175.2	174.4	160.6	10.5	66.7

programme in 1986, the volume of exports never reached the value of 302,000 recorded in 1970, though there were improvements in the level of export up till 1990. The volume exported was at its lowest level in 1992 when Nigeria exported barely 110,000 metric tonnes. Cadoni (2013) had suggested that the political situation of the country in that period (1992-1996), resulted in various economic sanctions from United Nation and subsequent expulsion of Nigeria from Common Wealth, could have been responsible for this. This is because during this period, aggregate output of cocoa in Nigeria was on increase and one would expect a corresponding increase in volume of export since cocoa is produced mainly for export.

Furthermore, from the trend graph, the quantity of exports showed both upward and downward trend. However, the result of the fitted trend equation showed a U-shaped

Table 3: Trends in cocoa export from Nigeria (1970-2010)

Years	Export quantity	Change (%)
1970	302,000	NIL
1971	254,000	-15.894
1972	241,000	-5.11811
1973	212,000	-12.0332
1974	212,000	0
1975	215,000	1.415094
1976	179,000	-16.7442
1977	192,000	7.26257
1978	152,000	-20.8333
1979	150,000	-1.31579
1980	150,788	0.525333
1981	213,551	41.62334
1982	154,577	-27.6159
1983	228,220	47.64163
1984	151,183	-33.7556
1985	116,161	-23.1653
1986	174,600	50.30862
1987	117,070	-32.9496
1988	220,322	88.19681
1989	148,982	-32.3799
1990	153,520	3.046006
1991	160,395	4.478244
1992	110,749	-30.9523
1993	160,420	44.85007
1994	147,897	-7.80638
1995	138,981	-6.02852
1996	182,065	30.99992
1997	147,075	-19.2184
1998	135,041	-8.18222
1999	208,617	54.48419
2000	144,821	-30.5804
2001	184,122	27.13764
2002	191,992	4.27434
2003	241,847	25.96723
2004	266,027	9.998057
2005	281,820	5.936615
2006	281,820	0
2007	300,000	6.450926
2008	350,000	16.66667
2009	362,000	3.428571
2010	365,000	0.828729

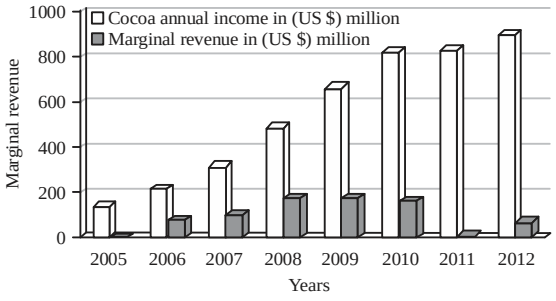

Fig. 4: Marginal revenue from Nigeria's cocoa exports (2005-2012)

which suggested that from 1970 up till 1992, there was a downward trend in the quantity exported. However, the periods of 1999 to date showed that the level of export have been on the increase. This finding suggested that apart from economic variables, political factors and international relationships might have significant effects on international trade. In addition, the result also suggested that the period of democratic rule has positive impacts on the level of quantity export in Nigeria. Since 1999 up to date, the aggregate export has been on the increase and it reached an unprecedented level of 365,000 metric tonnes in 2010.

Table 4: Trends in the aggregate output (1970-2010)

Years	Aggregate cocoa output (metric tonnes)	Change (%)
1970	305,000	NIL
1971	257,000	-15.7377
1972	241,000	-6.22568
1973	215,000	-10.7884
1974	214,000	-0.46512
1975	216,000	0.934579
1976	181,000	-16.2037
1977	193,000	6.629834
1978	157,000	-18.6528
1979	151,000	-3.82166
1980	153,000	1.324503
1981	174,000	13.72549
1982	156,000	-10.3448
1983	140,000	-10.2564
1984	140,000	0
1985	160,000	14.28571
1986	148,000	-7.5
1987	100,000	-32.4324
1988	230,000	130
1989	256,000	11.30435
1990	244,000	-4.6875
1991	268,000	9.836066
1992	292,000	8.955224
1993	306,000	4.794521
1994	203,000	-33.6601
1995	323,000	59.1133
1996	325,000	0.619195
1997	318,000	-2.15385
1998	370,000	16.3522
1999	225,000	-39.1892
2000	338,000	50.22222
2001	340,000	0.591716
2002	362,000	6.470588
2003	385,000	6.353591
2004	412,000	7.012987
2005	441,000	7.038835
2006	485,000	9.977324
2007	500,000	3.092784
2008	502,000	0.4
2009	513,000	2.191235
2010	525,000	2.339181

Trends in aggregate output of cocoa in Nigeria (1970-2010): Table 4 and Fig. 6 showed that Nigeria attained a peak production of 305,000 matric tonnes in 1970. Since that year, the aggregate output has been on consistent decline and it fell to as low as 100,000 metric tonnes in 1987. However, since 1986/1987 cropping season when Nigeria adopted structural adjustment programme, aggregate output shifted to the level of 200,000 metric tonnes and above. In fact, the years of

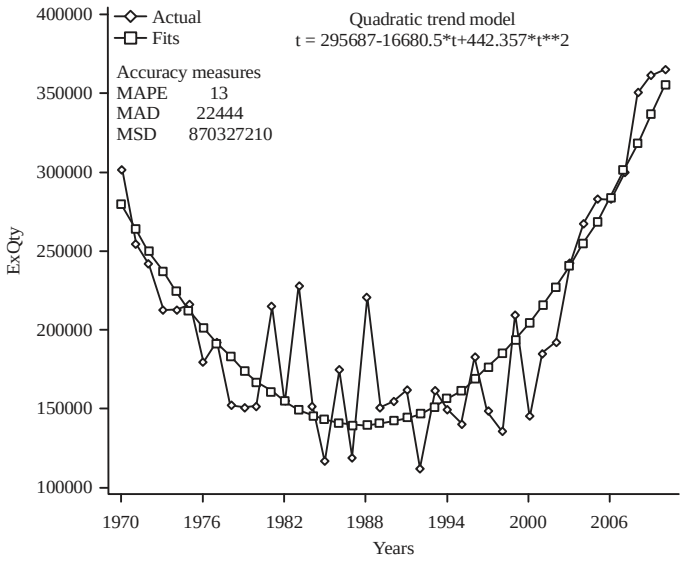

Fig. 5: Trend analysis of quantity of cocoa exported by year

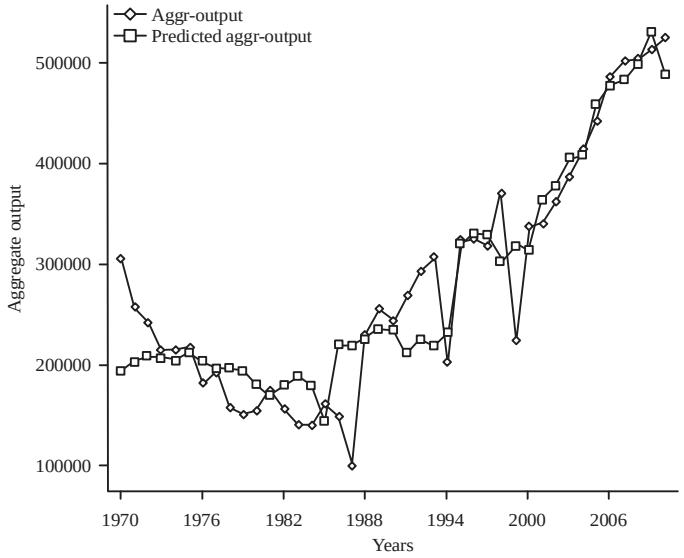

Fig. 6: Trends in aggregate cocoa output in Nigeria

1990's saw Nigeria attained over 300,000 metric tonnes in production. This trend continues to years 2000 when Nigeria attained over 500,000 metric tonnes in production. The visible improvements attained suggested that various programmes put in place by the government to diversify the foreign exchange revenue base of the country, especially those targeted at non-oil export are yielding result. Furthermore, the result of the fitted trend equation also showed graphically that aggregate cocoa output started to increase from the year 2000. The period witnessed an unprecedented growth in output to more than 500,000 metric tonnes. This result is in tandem with those of Cadoni (2013) and Nkang *et al*. (2007), who also observed a visible improvement in overall yield of cocoa attributable to government interventions.

Movement in world prices: Table 5 and Fig. 7 showed at a glance the trends in this variable. In 1970, the world price stabilised at 297 naira, between 1971 and 1973, increased to 660 naira in 1976, 1,030 naira in 1979; 1,300 naira in 1983 and 1,500 naira in 1984. The changes in world prices reflect the relative stability in exchange rate as this used to be determined by administrative fiat. However, this trend changed in the late 1980s due presumably to the

Table 5: Showing the movement in world prices of cocoa (1970-2010)

Years	World prices in Nigeria (naira)	Change (%)
1970	288	Nil
1971	297	3.13
1972	297	0
1973	297	0
1974	541	82.15
1975	660	22.00
1976	660	0
1977	1,030	56.06
1978	1,030	0
1979	1,200	16.50
1980	1,300	8.33
1981	1,300	0
1982	1,300	0
1983	1,400	7.69
1984	1,500	7.14
1985	1,600	6.67
1986	3,500	118.75
1987	7,500	114.29
1988	11,000	46.67
1989	10,100	8.18
1990	8,500	-15.84
1991	10,158	19.51
1992	12,745	25.47
1993	25,278	98.34
1994	61,180	142.03
1995	73,402	19.98
1996	80,222	9.29
1997	89,687	11.80
1998	79,600	-11.25
1999	85,766	7.75
2000	83,818	-2.27
2001	91,300	8.93
2002	129,620	41.97
2003	153,749	18.62
2004	186,870.8	21.54
2005	225,309.3	20.57
2006	243,175.1	7.93
2007	267,435.5	9.98
2008	305,934.4	14.40
2009	410,000	34.02
2010	243,175	-40.69

Table 6: Showing the trends in producer prices (1970-2010)

Years	Producer prices in Nigeria (naira)	Change (%)
1970	95	Nil
1971	222	133.68
1972	200	-9.91
1973	183	-8.50
1974	198	8.20
1975	146	-26.26
1976	165	13.01
1977	515	212.12
1978	494	-4.08
1979	552	11.74
1980	728	31.88
1981	650	10.71
1982	585	-10.00
1983	532	-9.06
1984	600	12.78
1985	640	6.67
1986	3,063	378.59
1987	7,143	133.20
1988	9,706	35.88
1989	8,505	-12.37
1990	8,027	-5.62
1991	8,024	-0.04
1992	10,068	25.47
1993	24,127	139.64
1994	53,838	123.14
1995	69,832	29.71
1996	75,761	8.49
1997	70,852	-6.48
1998	75,174	6.10
1999	78,828	4.86
2000	76,836	-2.53
2001	85,503	11.28
2002	116,658	36.44
2003	121,462	4.12
2004	140,000	15.26
2005	150,000	7.14
2006	175,000	16.67
2007	180,000	2.86
2008	200,000	11.11
2009	340,000	70.00
2010	220,000	-35.29

implementation of SAP when market forces determined exchange rate, tagged the Second-tier Foreign Exchange Market (SFEM). For instance, between 1986 and 1990, the world price of cocoa in naira terms increased tremendously from 1,500-11,000 naira in 1988 and 8,500 naira in 1990. This trend continued as due presumably also to the further devaluation of naira to the dollar and the price reached an astronomical height of 89,000 naira in 1997 and 410,000 naira in 2009.

Though, in dollar terms, there has been an increase in the world prices of cocoa, the increment could not have manifested as such, if the naira value in the international market has been stable. Furthermore, a meticulous look at the actual and fitted trend equations on the graph equally suggested that there has not been a marked difference between the two. The results here tallies with ICCO (2015, 2012), WCF (2014), Nwachukwu *et al.* (2010) and Oluyole (2007) who found that even though Nigeria has comparative advantage in the exportation of cocoa, world export prices and exchange rate were determinants of cocoa export from Nigeria.

Trends in producers prices: Table 6 and Fig. 8 showed that producers' prices that farmers received for their produce were well below the world prices. This further confirmed the assertion of previous researchers like Idowu *et al.* (2007) and Adegeye (1996) that government was using the various commodity boards to indirectly impose taxes on farmers. However, there was a radical departure from this scenario since the adoption of SAP in 1986 when the government dissolved commodity boards that used to fix prices and allowed market forces in determining prices.

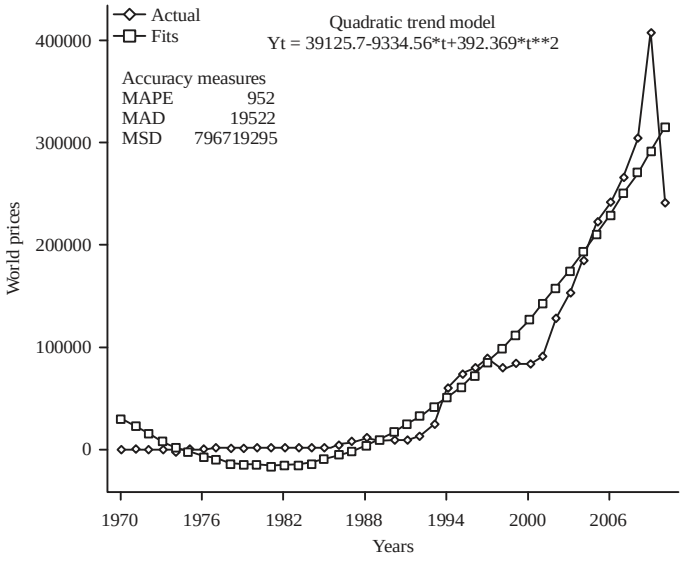

Fig. 7: Trends of world prices

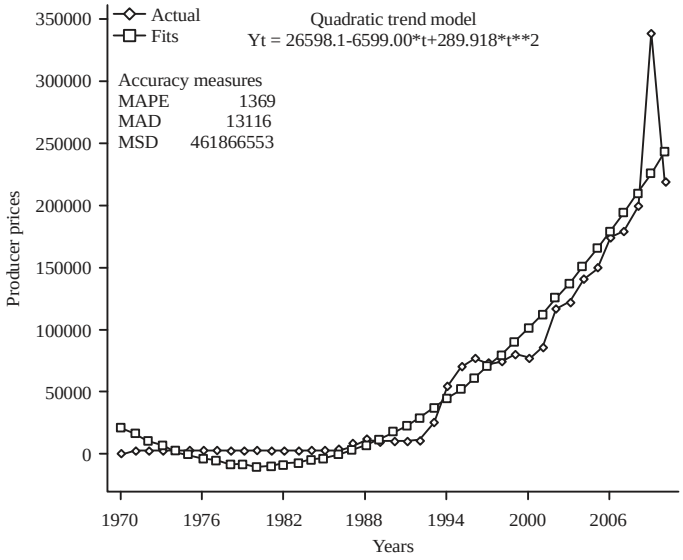

Fig. 8: Trend analysis of producer prices of cocoa output by year

From the table, farmers started receiving better prices, which mirrored world prices for their produce. For instance, producer prices went up from 640 naira per tonne in 1985-3,063 naira in 1986. Between 1986 and 1988, producer prices rose to more than 9,000 naira. However, the producer prices in the period between 1990 and 2000 rose to as high as 78,000 naira. As at 2009, producer prices have risen to 340,000 naira per tonne.

The volatility of producer prices of cocoa has been well documented (Yusoff and Salleh, 1987; Arshad and Zainalabidin, 1994; Akanji and Ukeje, 1995; Assis *et al*., 2010). Assis *et al*. (2010) argued that such instability remained a critical risk to all interested parties in cocoa production and marketing. In this study, two immediate causes of these fluctuations can be discerned. The first is, arguably, occasioned by the persistent devaluation of currency as a direct result of the open market determination of foreign exchange rate. Since, the marketing boards that fixed product prices were dissolved due to the liberalisation policy, the harmonisation of the world prices with the domestic producer prices also became inevitable. While, the result validates the positions of Salami (2001), Folawewo and Olakojo (2010) and Folayan *et al*. (2007), it challenged the findings of Olopoenia (1992) and Ajetomobi (2011). The scholar had argued that

despite the dissolution of marketing boards, the large cocoa exporters who emerged following the defunct boards similarly fixed prices because of their ability to use oligopolistic power of price collusion. However, going by the increase in the final prices paid to the farmers, it can be adduced the liberalisation policy improved the lots of the farmers in comparison to the pre-SAP period.

CONCLUSION

Even though there was no coherent policy at the time Nigeria attained independence in 1960, agriculture was the economic mainstay with cocoa production taking the lead. This article is set against the significance of cocoa exports as a veritable alternative revenue source that already contributes considerably to the Nigeria's gross national product. The result showed that the determinants of Nigeria's aggregate cocoa production (output) are world market prices, producer prices paid to Nigerian farmers, exchange rate of the Nigerian currency (naira) against the dollar, annual expenditure on fertilizer and average rainfall. The study also discovered a continued marginal decline in the aggregate output of cocoa as a direct consequence of dearth of capacity building and utilisation in the control of the economic and ecological variables affecting cocoa productions. Aggregate output of cocoa in Nigeria showed a strong positive relationship with management of the exchange rates and the utilisation of modern weather control mechanism for annual rainfall and pest control. The period of the liberalisation policy is also seen to coincide with improvement in total annual income from cocoa, albeit marginally. Strangely, the results of OLS analysis revealed that SAP variable is not statistically significant as a determinant of cocoa output despite several studies concluding otherwise. In the trend analysis of this study, nevertheless, it was found that the period after SAP witnessed a tremendous growth in output suggesting that farmers are rational and respond positively to price incentives afforded by the market liberalisation. In addition, the study showed evidences of inherent advantages in economic liberalisation that could be utilised for the crucial revenue diversification from oil through a sufficient government intervention of boosting cocoa exports in Nigeria.

In all, the study has shown that cocoa exports are conditioned by a number of factors. The resilience of agricultural products as a sustainable source of revenue in the world's forest regions has not been optimally explored. In Nigeria, the need for positive government intervention, in terms of coherent, coordinated and sustained policy advocacy on agriculture in general and cocoa in particular cannot be overemphasised at this auspicious galloping decline in petrodollar earnings. Most of the determinants of cocoa, as this study showed, are within the area of influence of government in real terms. These factors can be addressed accordingly as they remain critical to export earnings from cocoa as a veritable alternative to the much-needed diversification from oil revenue in Nigeria. Given adequate institutionalised control and improved administrative efficiency therefore, there is room to deduce that the prospect is high for cocoa exports as a meaningful contributory panacea to the dwindling foreign earning of Nigeria and ultimately to the GNP.

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