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Full Length Research Paper

The Performance of Rubber Exports in Nigeria

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The Paper examined the performance of rubber exports in Nigeria using graph, ordinary least square, Pearson correlation and Terms of trade with net exports. The result of the analysis showed that exchange rate, interest rate, import quantity and producer price are significant variables that can influence the performance of rubber export. It is recommended that the policy of input subsidy for rubber production should be put in place by the relevant authority to enable the rubber processors purchase rubber at reduced prices. This policy of input subsidy will help the producers to cut down on their cost of production and this will in turn bring down the farm gate price, lowering farm gate price may lead to higher profit margin of processors and exporters.

Keywords: Performance, rubber, export.

INTRODUCTION

The Nigerian non-oil sector is meant to be among the most robust in the world because of the extent of the abundant natural resources that cut across agriculture, solid minerals; gas and waterways for tourism that are yet to be explored, coupled with talented human capital (Adeloye, 2012). The oil boom of the 1970s led Nigeria to neglect its strong agricultural and light manufacturing bases in favor of an unhealthy dependence on crude oil. In 2002 Oil and gas exports accounted for more than 98 percent of export earnings and about 83 percent of Federal Government revenue. (Adeloye, 2012). The petroleum-based economy of Nigeria with political instability, corruption and poor macro-economic management is undergoing substantial economic reform

following the restoration of democratic rule in 1999. The economy has overdependence on the capital-intensive oil sector, which provides less than 25 percent of GDP, despite providing 95 percent of foreign exchange earnings, and about 65 percent of government revenues.

The largely subsistence agricultural sector has not kept up with rapid population growth, and Nigeria, once a large net exporter of food, now imports some of its food products.

Nigeria overall economic performance since independence in 1960 has been unimpressive. Despite colossal amount of foreign exchange derived mainly from its oil and gas resources, economic growth has been weak and the incidences of poverty has increased. The

objective of every independent nation like Nigeria is to improve the standard of living of its citizenry and promote economic growth and development of the country. Based on comparative advantage, countries depend on each other to foster economic growth and achieve sustainable economic development. Imoughele and Ismaila (2015) noted that expanding non-oil export to get rid of one-product economy has been known as a solution for economic development in oil producing countries which Nigeria is one of them and is the sixth largest oil producing and exporting countries in the world. According to export-led growth hypothesis, increased export can perform the role of "engine of economic growth" because it can increase employment, create profit, trigger greater productivity and lead to rise in accumulation of reserves allowing a country to balance their finances.

Imoughele and Ismaila (2015) also revealed that there are some challenges for countries with natural resource abundance such as oil in comparison with other countries. The main point is that in parallel with windfall of oil revenues, these countries have to pay more attention to the development of the non-oil sector as well as its export performance.

In Nigeria, agricultural exports have played a prominent role in economic development by providing the needed foreign exchange earnings for other capital development projects. From the initial trade in Palm oil, Nigeria's agricultural export has enlarged to include cocoa beans and palm kernel. Available statistics indicate that in 1960, agricultural export commodities contributed well over 75% of total annual merchandise exports (Ekpo and Egwaikhide 1994). Nigeria also ranked very high in the production and exportation of some major crops in the world in the 1940s and 1950s. For instance, Nigeria was the largest exporter of palm oil and palm kernel, ranked second to Ghana in cocoa and occupied a third position in groundnut. Olayide and Essang (1976) observed that Nigeria's export earnings from major agricultural crops contributed significantly to the Gross Domestic Product (GDP). Similarly, Ekpo and Egwaikhide (1994) observed a long-term relationship between agricultural exports and economic growth in Nigeria.

At present 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. With the present situation in the oil market, it has become necessary for the country to reconsider its agricultural commodity export position. This study therefore aims to examine the Performance of rubber exports in Nigeria with the following specific objectives:

- (a) the trend analysis of rubber exports
- (b) to determine the performance of rubber exports using Net exports and Terms of Trade
- (c) to determine factors that influence rubber exports

using Pearson Correlation and Linear regression analysis.

METHODOLOGY

Data used were sourced from the Food and Agricultural Organization Statistics. The main type of data used in this study was secondary. The study employed annual time series data covering the period 1970-2013. The models used in this study were estimated using annual data on some macro-economic indicators, which includes Exchange Rate (EXR); Interest Rate (INR). The correlation and linear regression analysis of the ordinary least square (OLS) is the estimation technique that is being employed in this study to determine the factors that influence rubber export.

The function is stated as:

$$X_t = f(Q_t, P_t, N_t, D_t, R_t, I_t)$$

X_t = natural rubber export quantity (metric tonnes) between 1970 and 2013

Q_t = quantity of natural rubber output (metric tonnes) between 1970 and 2013

P_t = producer price of natural rubber (USD/mt) between 1970 and 2013

I_m = quantity of rubber imports (1000 US) between 1970 and 2013

N_t = exchange rate (Naira to 1 U.S. dollar) between 1970 and 2013

D_t = domestic consumption (metric tonnes) of rubber between 1970 and 2013

I_n = Interest rate (%) between 1970 and 2013

Graph was used to depict the trend of rubber export during the time under review. Simple methods as proposed by Dornbush (1988) were used to evaluate the overall performance of rubber exports in foreign earnings.

These measures include:

(i) Net Export = Total Export - Total Import

(ii) Terms of Trade (TOT) = $\frac{\text{Unit price of export}}{\text{Unit price of import}}$.

RESULTS AND DISCUSSION

Trend in rubber export

The total volume of rubber exported had a decreasingly fluctuating pattern as shown in Table 1 and Figure 1. In 1970, 59285 metric tonnes (mt) was exported. It however decreased to 14575 mt in 1980. The low quantity exported in 1980 could be attributed to the low world price, low output/production and general recession in the world economy (Abolagba et al, 2003)

The largest quantity of rubber exported during the period under review was recorded in 1996 with

Table 1. Rubber export and its Determinants

Year	Producer Price(USD/T)	Export Qty(mt)	Import value 1000 US	Export value 1000 US	Output Qty (mt)	Import Qty (mt)	Exchange rate
1970	305.0	59285.0	30.0	0.0	65300.0	104.0	0.7143
1971	250.0	50285.0	39.0	0.0	61800.0	138.0	0.6955
1972	272.0	41162.0	34.0	0.0	57100.0	77.0	0.6579
1973	553.0	49385.0	60.0	0.0	66300.0	185.0	0.6579
1974	659.0	59685.0	65.0	0.0	78000.0	338.0	0.6299
1975	565.0	47843.0	4.0	0.0	67800.0	6.0	0.6159
1976	919.0	27420.0	23.0	0.0	52500.0	20.0	0.6265
1977	565.0	24829.0	0.0	0.0	59300.0	0.0	0.646
1978	602.0	29447.0	0.0	0.0	57500.0	0.0	0.606
1979	705.0	26.0	576.0	0.0	56000.0	500.0	0.5957
1980	887.0	14575.0	0.0	0.0	45000.0	0.0	0.5464
1981	983.0	23573.0	0.0	0.0	60000.0	0.0	0.61
1982	1.0	26815.0	0.0	0.0	50000.0	0.0	6729.0
1983	966.0	28611.0	0.0	0.0	45000.0	0.0	0.7241
1984	981.0	28800.0	0.0	0.0	58800.0	0.0	0.7649
1985	839.0	29100.0	110.0	0.0	60000.0	71.0	0.8938
1986	593.0	33822.0	107.0	0.0	60000.0	84.0	2.0206
1987	243.0	33822.0	55.0	0.0	55000.0	40.0	4.1079
1988	330.0	55345.0	1872.0	9073.0	81000.0	1016.0	4.5367
1989	270.0	49320.0	1290.0	15090.0	132000.0	803.0	7.3916
1990	174.0	61499.0	1685.0	11547.0	147000.0	996.0	8.0378
1991	535.0	38813.0	305.0	13955.0	155000.0	177.0	9.9095
1992	724.0	66172.0	728.0	5945.0	129000.0	543.0	17.2985
1993	1.0	82788.0	711.0	72.0	130000.0	357.0	22.3268
1994	1.0	76000.0	280.0	0.0	105000.0	140.0	21.8861
1995	1.0	99723.0	393.0	0.0	125000.0	230.0	21.8861
1996	2.0	113028.0	393.0	0.0	130000.0	230.0	21.8861
1997	2.0	86604.0	393.0	0.0	120000.0	230.0	21.8861
1998	2.0	74000.0	393.0	0.0	120000.0	230.0	21.8861
1999	626.0	38000.0	393.0	0.0	107000.0	230.0	92.338
2000	584.0	36000.0	164.0	150.0	107000.0	20.0	101.697
2001	627.0	30000.0	10.0	1020.0	108000.0	7.0	111.231
2002	793.0	24000.0	88.0	219.0	112000.0	71.0	120.578
2003	881.0	17203.0	0.0	740.0	142000.0	0.0	129.22
2004	863.0	24000.0	94.0	1688.0	142000.0	30.0	134.731
2005	1.0	24000.0	17.0	2500.0	150000.0	0.0	131.661
2006	921.0	2707.0	36.0	6733.0	142000.0	1.0	128.65
2007	852.0	2837.0	413.0	7932.0	143000.0	35.0	134.05
2008	1385.0	3398.0	436.0	12035.0	110000.0	76.0	132.37
2009	589.0	2581.0	436.0	6453.0	145000.0	76.0	132.6
2010	586.0	4176.0	10.0	17581.0	143000.0	0.0	148.68
2011	658.0	5413.0	71.0	36096.0	143000.0	16.0	146.2
2012	592.0	3684.0	71.0	17751.0	143000.0	16.0	150.2
2013	592.0	3700.0	444.0	17800.0	143000.0	86.0	156.0

Source: FAO Database 2016

130,000mt .This could be attributed to the emergence of the Structural Adjustment Programme (SAP) of the Federal Government in 1985.Part of the policy thrust of SAP was liberalizing the country's external trade and payment systems and adopting appropriate measure to

giving the private sector a larger role in the domestic economy. This included reducing import and export taxes and eliminating export and import prohibitions. The structural change accounted for the rise in quantity exported from 1985 to 1996 (Abolagba et al 2003).The

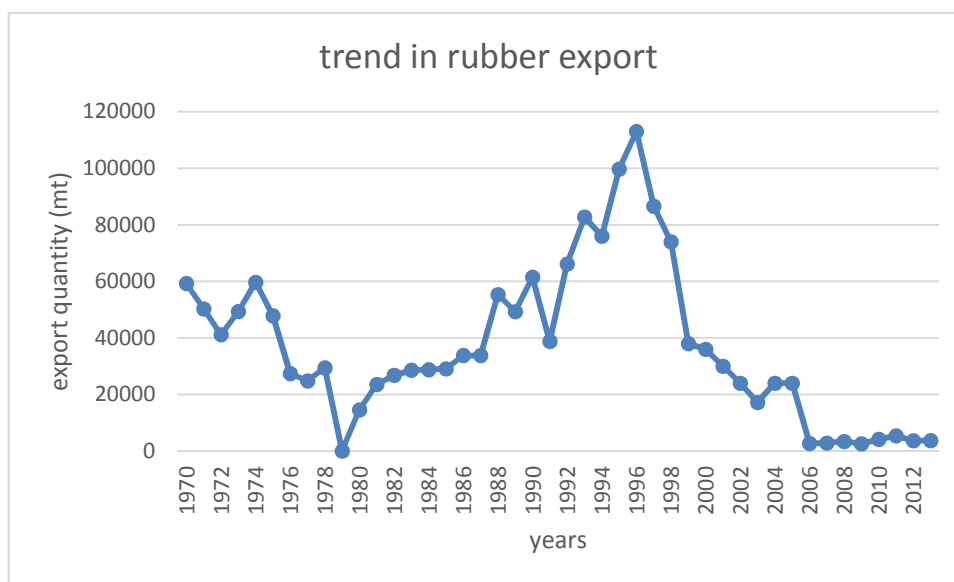


Figure 1. Graph Showing Trend In Rubber Export

Table 2. Performance of rubber export

Terms of Trade (%)	Net exports (USD)
1,507	\$ 172,150.00

Source: Computed from FAO Database, 2016.

Table 3. Ordinary Least squares estimates for rubber export

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	29943.994	11327.237		2.644	.012
	Pt	-28.270	8.577	-.353	-3.296	.002
	Qt	.201	.140	.276	1.436	.160
	Imp	-12.941	12.511	-.117	-1.034	.308
	Dt	.009	.025	.033	.348	.730
	Nt	-372.527	79.813	-.810	-4.667	.000
	Int	1438.595	579.481	.342	2.483	.018
a. Dependent Variable: export						

F=16.816
Adjusted R² =0.688

increase in export quantity was not however maintained after 1996, as the policy thrust of SAP could not be sustained and this resulted in steady decline in the quantity of rubber exported up to 2013 with export as low

as 3700mt.As export is declining so also is rubber production .Rubber is the second largest non-oil foreign exchange earner. Despite favorable prices, production has fallen from 155,000 tons in 1991 to 143000mt in

Table 4. Correlations of coefficients of variables with respect to rubber exports.

Correlations								
		Xt	Pt	Qt	Imp	Dt	Nt	iterestrate
Xt	Pearson Correlation	1	-.683**	.010	.418**	.120	-.537**	.287
	Sig. (2-tailed)		.000	.948	.005	.439	.000	.059
	N	44	44	44	44	44	44	44
Pt	Pearson Correlation	-.683**	1	-.148	-.325*	-.241	.287	-.256
	Sig. (2-tailed)	.000		.338	.031	.115	.059	.094
	N	44	44	44	44	44	44	44
Qt	Pearson Correlation	.010	-.148	1	.166	.360 ⁺	.699**	.749**
	Sig. (2-tailed)	.948	.338		.281	.017	.000	.000
	N	44	44	44	44	44	44	44
Imp	Pearson Correlation	.418**	-.325*	.166	1	.001	-.319 ⁺	.338 ⁺
	Sig. (2-tailed)	.005	.031	.281		.996	.035	.025
	N	44	44	44	44	44	44	44
Dt	Pearson Correlation	.120	-.241	.360 ⁺	.001	1	.254	.318 ⁺
	Sig. (2-tailed)	.439	.115	.017	.996		.096	.036
	N	44	44	44	44	44	44	44
Nt	Pearson Correlation	-.537**	.287	.699**	-.319 ⁺	.254	1	.399**
	Sig. (2-tailed)	.000	.059	.000	.035	.096		.007
	N	44	44	44	44	44	44	44
Int	Pearson Correlation	.287	-.256	.749**	.338 ⁺	.318 ⁺	.399**	1
	Sig. (2-tailed)	.059	.094	.000	.025	.036	.007	
	N	44	44	44	44	44	44	44
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

2013. Low yield, ageing trees, and lack of proper equipment have inhibited production (Hassan 2015).

Performance of rubber exports using Net export and Terms of Trade.

The performance of rubber export can be examined within the context of foreign earnings and imports by the

sector. As indicated in the methodology, the performance of rubber export in foreign earnings is examined within the framework of net export and terms of trade.

The Terms of trade in the rubber sub-sector of agriculture in the Nigerian economy is 1,507%, this implies that the country is accumulating more revenue from exports of natural rubber than it is spending. The net exports value is \$172,150.00 and the sign is positive. The

value of natural rubber exported during the period under review is higher than the value of rubber products imported. Nigeria therefore had positive balance of trade from 1970 to 2013 .It can therefore be deduced that rubber exports can adequately finance rubber imports.

Factors that influence rubber export using linear regression analysis and Correlation analysis.

Ordinary Least Squares (OLS) method was used to determine variables affecting export of natural rubber.

The result of the OLS method is presented in Table 3 .regression analysis was carried out using linear function. The F value (16.816; P <0.01) is significant at 1%, implying that the model is appropriate for this study. The Adjusted R² is 0.688. Implying that the independent variables explain 68.8% of the variation in rubber export. Producer price (Pt) (-28.270), Exchange rate (Nt) (-372.527) were significant at 1% level of probability. The interest rate (Int) (1438.595) was significant at 5% level of probability.

The sign on producer price is negative .The implication is that a reduction in producer's price will encourage an increase in export. This finding is in agreement with Reed (2012).The negative relationship between producer price and export is synonymous with a producer with the objective of disposing products will most likely give out the products at a reduced price with the consequent increase in sales but the moment the producer price is increased, sales will likely drop. The sign on exchange rate was negative. This finding is in agreement with Mesike (2005) who also reported a negative relationship between rubber export and exchange rate. This implies that the lower exchange rate that occurred during the devaluation of domestic currencies led to increased exports .Interest rate is another significant variable with a positive sign on it. The implication is that an increase in interest rate either by impacting on the cost of capital or influencing the availability of credit can stimulate an increase in exports (Acha 2011).As the positive relationship between investment and economic development is well established, it therefore becomes expedient for any economy that wishes to grow to pay proper attention to changes in interest rate. Nigeria being a country in dire need of development cannot overlook the important role interest rate could play in this direction.

The result of the Pearson correlation is presented in Table 4. The following variables were found to be significant: producer price, import quantity and exchange rate at the 1% level of probability. The sign on producer price is negative, this implies that the lower the producer price, the higher the export of rubber. This result shows that producer price has a relatively strong relationship (68.30%) to export of rubber. The sign on import quantity

is positive and has a weak relationship (41.8%) export of rubber .This implies that an increase in export of rubber will result in an increase in foreign earnings that will encourage an increase in importation of products especially rubber products not produced in the country .This result is also in line with Keynesian theory which among other things stated that export raises more foreign exchange which is used to purchase (import) commodities which is a motivating factor for the economic growth of any nation. While the appropriate sign on exchange rate is negative and contributes 53.70% to export of rubber. This result is also in line with the OLS estimate for rubber export .This result is in line with Aliyu (2011) who noted that appreciation of exchange rate results in increased imports and reduced export.

CONCLUSION

Nigeria earned substantial foreign earnings from rubber exports based on the outcome of the analysis on Terms of trade and net exports .However fluctuation in quantity of rubber exported during the period under review as observed from the graph showing the trend in export have raised concern about the country's future growth potentials and self-sustainability especially now that it is becoming difficult for the country to continue operating a monolithic economy based on crude oil exports. This Paper has established major determinants or significant variables of the export of natural rubber through the OLS and further analysis through the Pearson correlation coefficient .Manipulations of these determinants will lead to an increase in exports and subsequently increase substantially the country's foreign reserve.

RECOMMENDATION

The result of the Paper showed that exchange rate, interest rate, import quantity, producer price have key roles to play in the export of natural rubber. The paper also acknowledged that the reforms under the Structural adjustment programme with reference to exchange rate significantly enhanced the export of rubber. In order to improve the export of natural rubber, the following steps are necessary:

1. The policy of input subsidy for rubber production should be put in place by the relevant authority to enable the rubber processors purchase rubber at reduced prices .This policy of input subsidy will help the producers to cut down on their cost of production and this will in turn bring down the farm gate price.
2. Government should encourage the export promotion strategies in order to maintain a surplus balance of trade

and also conducive environment. Adequate security, effective fiscal and monetary policy, as well as infrastructural facilities should be provided so that foreign investors will be attracted to invest in rubber subsector of the economy.

3.To implement interest rate policy that will encourage investment in the agricultural sector especially the rubber sub-sector.

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