International Journal of Agricultural Management & Development (IJAMAD)
Available online on: www.ijamad.com
ISSN: 2159-5852 (Print)
ISSN:2159-5860 (Online)

Trade Liberalization, Exchange Rate Changes, and the Competitiveness of Carbohydrate Staple Markets in Nigeria

Maduabuchi Mkpado[1*] and C.J. Arene[2]

Received: 16 January 2012,
Accepted: 2 March 2012

Abstract

This study examined the effects of trade liberalization and exchange rate changes on carbohydrate staples in Nigeria. Secondary data published from 1974 to 2006 on cassava exports and rice imports as well as non-tradable carbohydrate staples were used. It was hypothesized that exchange rate changes and trade liberalization via price relatives, trade intensity and nominal protection coefficient have affected prices of carbohydrate staples in Nigeria. Results show that the effects of trade liberalization on prices of non tradable carbohydrate staples were mixed. Trade liberalization accounted for most changes in the price of non tradable rice than other crops. World prices positively affected the prices of maize and non tradable rice. Also increasing exchange rate will lead to increase in price of non tradable rice due to price competition with imported rice. The intensification of liberalization exercise from the removal of quantitative restriction to use of tariff, among other recommendations, should be encouraged because it can be a remedy to the negative impact of increase in the trade intensity and erosion of nominal protection coefficient on prices of the non tradable crops.

Keywords:
Trade Liberalization, Exchange Rate, Carbohydrate Staple Markets, Nigeria

[1] Department of Agricultural Economics and Extension Federal University of Oye-Ekiti, Nigeria
[2] Department of Agricultural Economics University of Nigeria, Nsukka
** Corresponding author's email: manotejah341@yahoo.com*

INTRODUCTION

Carbohydrate foodstuffs, derived from cereals and tubers, are major parts of food consumed in Nigeria (Ogundele, and Okoruwa, 2006). Food insecurity in the country is often worsened by the ban on importation of rice and wheat. This is because Nigeria's population is growing rapidly at the rate of 3 percent per annum while the growth rate of food production is at one percent per annum (Achike, 2004). The liberalization of trade during the Structural Adjustment Programme (SAP) era, subsequent removal of some import prohibition and input subsidy and implementation of programmes to improve domestic food production for possible export have exposed small scale farmers, who are major crop producers, to more economic pressure in competing with large scale farmers elsewhere. Arene and Mkpado (2004) opined that this economic pressure is more severe when the people prefer imported goods to domestic ones. Changes in trade policy may have offered some form of protection to these local farmers. For instance, prior to the adoption of ECOWAS common trade tariffs, rice, which is the major imported carbohydrate staple, was heavily taxed such that about ₦5 billion from rice tax could be invested into agriculture during annual budgets (FGN, 2004). Trade liberalization has resulted in exportation of cassava - a carbohydrate crop from Nigeria since 1990 (Eurostat, 2000). Currently, Nigeria is the world largest producer of this crop for more than 7 years now, producing 37,504,100 tons in 2010 (FAOSTAT, 2005, FAOSTAT 2010).

In order to achieve the millennium development goals, Nigerian government has instituted the National Economic Empowerment Development Strategy (NEEDS), and more recently, a seven point agenda policy instrument. The objectives of the policy instruments with respect to agriculture include achieving food security, poverty eradication and creation of a responsive modern and globally competitive sector that will ensure higher income for farmers and rural dwellers. To achieve this laudable objective, the federal government of Nigeria has put in place a number of programmes and projects for increasing agricultural production such as the presidential initiative on cassava, fadama development projects, national special programme on food security, and National Export Promotion Council which encourages Nigerian exports and so on. There is need to assess the sustainability of such government interventions within the liberalization era by determining the effects of exchange rate and trade policy variables that indicate liberalization namely varying tariff rates, nominal protection coefficient and trade intensity on domestic pricing system as it affects target clients of the programmes and projects for national development and poverty reduction. The ability of small-scale carbohydrate food crop farmers to attain profit maximization goals or satisfy their subsistence food security needs is influenced by the prevailing policy environment especially in this era of globalizing economy.

Increasing agricultural output and exports are among the rationale for the introduction of SAP, liberalization policy and devaluation of Nigeria's currency. The effects of SAP and policies to cushion it have continued to affect macroeconomic variables especially the pricing system in Nigeria in relation to international trade. The prices of agricultural products influence their production and revenue of farmers due to cost of production, depreciation and abolition of agricultural marketing boards. The domestic price of agricultural commodities is essentially a function of exchange rate policy, trade liberalization and substitution of one crop for another especially with respect to crops that serve similar purposes such as those of the class of cereals and tubers, which can serve as sources of carbohydrates. Fluctuations in prices of agricultural output increase risks and uncertainties associated with the industry and possible investment.

Agricultural trade policies with respect to SAP can be divided into 3 phases namely pre SAP, during SAP and post SAP trade policies. The 1960s-1985 was the pre SAP era characterized with highly regulated exchange rate and quantitative restrictions. Import and export duties as well as controlled exchange rate were the major trade policy instruments prior to and many years after independence. Due to the suspension of dollar-gold convertible on 15 August 1971, Nigeria adopted a new system of exchange rates with effect from 23rd August 1971. This was classified into two namely contracts dominated by US dollars and contracts dominated by pound sterling. The Central Bank of Nigeria (CBN) initially maintained a fixed buying and selling rate for the naira which increased/improved with the oil boom). The system of trying to fix exchange rate dominated the pre SAP era; this policy tried to reduce the magnitude of changes of the exchange rate. However since the introduction of SAP, exchange rate changes

have been more pronounced. This could have been affected by the devaluation of the naira. However, there has been gradual increase in exchange rate since the introduction of SAP from ₦2.02 at the end of 1986 to ₦127 dollar by the end of 2006, while during the pre SAP era it was less than one naira to the dollar.

The main explicit instruments of pre-SAP era policies were export duties, taxes and centralized marketing (Marketing Board). Export duties ranged from 5 and 60 percent from 1960-1970. But by 1973 export duties were abolished in order to revive agricultural export, which was affected by the "Dutch disease" as a result of oil boom. Import duties on food commodities such as maize, rice, wheat and sorghum were raised to between 50 and 100 percent from 1978 to 1982. Government subsidies on fertilizers and other agro-chemicals, improved seeds and capital equipment particularly tractors were about 50 percent for tractors and 85 percent for others (Oyejide, 1986). Quantitative restriction in the form of import and export bans placed on certain agricultural commodities as well as reinforced centralized marketing to improve government revenue characterized 1981 to early 1986. Table 1 describes trade experiences.

The SAP era (1986-94) and afterwards featured the devaluation of the naira (Table 1), abolition of import and export licensing requirement except for fertilizer and few other commodities between 1986 and 1988. Foreign exchange control system by C.B.N was abolished but replaced with Bureaux de change as authorized dealers. The marketing board was scraped in 1986. This was followed by further reduction in export duties and the removal of export prohibitions for many agricultural crops except food grains (cereals). The effect of customs and excise tariff consolidation decree of 1988 is extended list of banned imports by 1991 to about 20 percent of industrial and 30 percent of agricultural products (Soludo, 1995). Import duties were designed to discourage importation of non-essential raw materials as well as inputs and commodities that have local substitutes, especially in the agricultural sector. Import prohibition was thus shortened from 76 to 16 items (Falusi, 2005). This list favoured rice importation and some products of rice, maize and wheat (Ogunkola, 2003). Between 1989 and 1991 tariff rate rose from 100 to 300 percent on food stuffs, foot wears, transport equipment and chemicals (Soludo, 1995). Outright prohibition was on many food staples excluding rice (Falusi, 2005).

Nigerian government had de-emphasized the use of import prohibitions since 1995 (during post SAP policies) by replacing it with a new seven-year tariff reform with frequent adjustment and changes in the tariff structure. The high import duties in 1995 were reduced after 1999 (Falusi, 2005). But by 2004 the tariff rate averaged about 25 percent with some exceeding 100 percent. The introduction of ECOWAS common tariff has further reduced tariff structure from 100-25 percent (FGN, 2004). Nigeria maintained a 150 percent ceiling rate binding on all agricultural products. In general, recourse to

Table 1: Trends in exchange rate trade liberalization variables and tradable carbohydrate trade performance in Nigeria (1974 – 2006)

Year	Exchange Rate	Price of Cassava Chips In US$	Price of Rice in US $	Quantity of Rice Imported (In '000 Metric Tones)	Cassava Export (In Metric '000 Tones)	Nominal Protection Coefficient for Cassava	Nominal Protection Coefficient for Rice
1974-77	0.628	177.0	357.8	117.4	0.00	0.57	0.95
1978-81	0.589	145.0	404.8	559.6	0.00	1.11	1.32
1982-85	0.763	155.8	202.0	450.0	0.00	4.67	2.32
1986-89	4.491	151.5	265.5	305.0	0.00	7.60	2.83
1990-93	19.925	166.3	289.3	316.5	10.40	1.10	8.0
1994-97	81.100	145.3	307.8	423.6	200.50	0.90	2.02
1998-2001	95.783	97.3	231.8	990.7	18.00	1.50	1.51
2002-2006	128.27	82.6	227.0	1438.1	1338.30	1.32	1.19

Source: Calculated from ESCB/FAO (2000), The Guardian (2007), NBS Trade Summary

quantitative restriction on imports is on the decline though the ban on importation of maize, sorghum, millet, wheat flour, vegetables, plastic articles and all types of meat exist (Ogunkola and Bankole, 2005). On the other hand, government has been trying to expand export with establishment of NEPC. As mentioned earlier one of the food crops that benefited from this arrangement since 1990 is cassava.

Effects of trade policy and its liberalization on agriculture have attracted the attention of researchers. But the experience of carbohydrate food crops especially in Nigeria has been neglected. For instance Osuntogun, *et al.,* (1993) examined some strategic issues for promoting Nigeria's non-oil export while Nwosu (1992) made a general assessment of SAP on Nigerian agriculture. Ihimodu (1993) examined SAP in all context of enhancing agricultural development. Adubi and Okunmadewa (1999) examined the relationship between price and exchange rate volatility on export and import prices in the context of dynamic adjustment involving currency devaluation in Nigeria. Studies that have tried to fulfill this specific need include those by Chidebelu *et al.,* (1998), Philips (1996), Ayichi (1997), Okoli and Okoye (2005), Arene and Okafor (2000), Arene and Odusolu (1998), and Arene (2000), These studies have concentrated on effects of price and exchange rate on export of one or a few of the following crops: cocoa beans, groundnuts, cotton, palm produce and cassava. Only the study by Okoli and Okoye (2005) involved cassava. It appears that the experiences with food crops are neglected. Also studies on effects of exchange rate and its volatility or risk have concentrated on its impact on tradable crops. But since exchange rate changes could pass through to domestic prices, there is need to investigate its effect on the prices of non tradable crops.

Opinions of researchers still vary on the effects of trade policy on agriculture. To illustrate, Mwase (1998) noted that liberalization and privatization of agricultural marketing was a major 'U'-turn in Tanzania's cashew economy, which resulted in easier access to foreign exchange and inputs, privatization of input purchases, processing and export of cashews which enhanced competition, increased producer prices and prompt payment to farmers. Kidane (1999) noted that in Ethiopia farmers responded positively to devaluation via increase in Real Exchange Rate (RER) by diverting both human and material resources at their disposal to the production of coffee, which had continued to be the major source of foreign exchange. While in Ghana, the reverse was the case because Assuming-Brempong (1994) noted that exchange rate changes and trade policies, which tend to protect importable crops, have adversely affected the production of exportable crops by reducing incentives for production of exportable crops relative to non tradables.

This work is specifically aimed at providing empirical evidence of the effects of trade liberalization on prices of carbohydrate staples in Nigeria. The questions this study addressed that are relevant to government objective of increasing food production and ensuring food security in Nigeria are: Will Nigerian carbohydrate crop farmers still have price advantage in the presence of competition with imported foodstuffs serving similar purposes? Will there be a drastic shift and abandonment of the carbohydrate food crops enterprises with complete reliance on rice importation? What is the prospect of cassava export in relation to rice importation in improving the prices of non tradable carbohydrate staples in Nigerian? Specifically, what are the effects of trade liberalization variables on prices of carbohydrate staples in Nigeria? The extent to which trade liberalization policies have affected prices of carbohydrate staples alongside changes in per capita income (PCY) is still a grey area to economists and policy makers. The ability of small-scale carbohydrate food crop farmers to attain profit maximization goals or satisfy their subsistence food security needs is influenced by the prevailing policy environment especially in this era of globalizing economy. The need, therefore, to empirically examine the effects of trade liberalization and exchange rate changes on prices of crops and hence ascertain their implications on the livelihood of farmers in Nigeria cannot be over emphasized.

The broad objective of the study was to examine the effects of trade liberalization and exchange rate changes on prices of carbohydrate staples in Nigeria. It aims at identifying economic variables that are associated with trade liberalization and exchange rate changes that affect prices of non tradable carbohydrate staples. Specifically the study aims at:

1- examining the effects of trade intensity and exchange rate changes on prices of carbohydrate staples in Nigeria.

2- determining the impact of price of im-

portable rice relative to price of exportable cassava on prices of carbohydrate staples in Nigeria.

Theoretical/Analytical framework, the Model and methodology

It is true that both farm gate prices and domestic prices are distorted by agricultural and trade policies. Trade policies under liberalization exercise affect farm gate prices more than agricultural policies because government policies will remove subsidies to farmers which will expose farmers to market force which trade policies influence (Tshibaka, 1986; Oyejide, 1986). With respect to Nominal Protection Coefficient, trade policy can be classified as protective or otherwise. Nominal Protection Coefficient measures the deviation of domestic price from boarder price. It is not necessarily tariff but a composite designation of government's interventions that can influence prices such as legislative prohibition, tariffs, exchange rate, and so on. When the value of Nominal Protection Coefficient (NPC) is one it implies liberalization and efficient use of resources in the subsector. The NPC can indicate liberalization or otherwise as a result of government intervention (see equation 19 for methods of its calculation).

Sectorial and sub sectorial agricultural trade policy have been characterized by a trend from quantitative restriction to use of tariff during the period under study. An index can be constructed with respect to liberalization exercise in the country. Its interpretation will be possible and more encompassing and informative in measuring episodes than use of dummy variable. The sub sector also witnessed the use of exchange rate and prices as trade policy variables that have played parts in the sub sector besides some level of trade protection.

With a small open economy producing three types of goods in the carbohydrate crop family namely exportable crops, importable crops and non tradable crops; foreign prices, nominal exchange rates, export subsidies/taxes and import duties determine the domestic nominal prices of exportable (P_x) and importable (P_y); while supply and demand factors (which are a function of trade and exchange rate policies) determine the domestic nominal prices of non tradable goods, P_z. The economy is characterized with low capital/human ratio. This paper adopted the use of price relative approach as employed by Oyejide (1986), Asuming-Brempong, (1994), Reinika (1994) and advocated by Collier *et al.,* (1999).

One of the advantages of the use of price relatives in the context of Low of One Price (LOP) is the ability of the law to reflect the effects of exchange rate on prices if the world prices are expressed in domestic currency. But to reflect the effect of exchange rate, the study has carefully expressed the price of the tradable crops in their foreign currency. The basic regression model is presented as follows (the statistical suitability of inclusion of these variables namely NPC, OP, Ex and ID in the model is seen from the fact that the estimated results have tolerable Durbin Watson statistics and the coefficient of determinations is not very high):

In the context of our study, Cassel's law can be mathematically represented as follows:

$P_x=P_x^* E_o (1-t_x)$.....(1)

$P_y=P_y^* E_o (1+t_y)$.....(2)

Where: P_x = Price paid to the exportable crop producer in domestic currency (domestic currency influenced by exchange rate liberalization).

P_x^* = World price of exportable crop in foreign currency

E_o = Nominal/official exchange rate

t_x = Export tax (export tariff rate)

P_y = Price paid to importable crop producer in Naira (domestic currency).

P_y^* =World price of importable crop in Dollar (foreign currency)

t_y = Import tariff rate.

With a small open economy producing three types of goods in the carbohydrate crop family namely exportable crops, importable crops and non tradable crops; foreign prices, nominal exchange rates, export subsidies/taxes and import duties determine the domestic nominal prices of exportable (P_x) and importable (P_y); while supply and demand factors (which are a function of trade and exchange rate policies) determine the domestic nominal prices of non tradable goods, P_z. Establish a relative price structure from (1) and (2) by introducing farm gate prices of non tradable commodities (P_z):

$$P_x/P_z = \left(P_x^*/P_z\right) E_o (1-t_x) \quad \text{.....(3)}$$

$$P_y/P_z = \left(P_y^*/P_z\right) E_o (1+t_y) \quad \text{.....(4)}$$

Equations (3) and (4) indicate that the real exchange rate and tariff provide a measure of the

relative price of importable and exportable to home goods in the Nigerian economy. Demonstrate that domestic prices of importable crops relative to exportable crops depend on world prices, trade regimes and tariff rate or other policy measures by dividing (4) with (3).

$$Py_Z/P_X = \left(P_Y^*/P_x^*\right) \quad \frac{1+t_y}{1-t_x} \quad \ldots\ldots\ldots(5)$$

Equation (5) illustrates that price relatives of importable to exportable in domestic currency is a function of world prices and trade policy-tariffs. If the ratio $[P_y^*/P_x^*]$ is a constant and the exchange rate is fairly stable each year, which can lead to internal equilibrium, then the following conditions will hold

$Q_t=Q_x[P_x/P_z]+Q_z[P_y/P_z]$…….....……(6)

Where $Q_x^{\downarrow}>0$ and $Q_z^{\downarrow}<0$

Q_T = Total output

Q_X = output of exportable

Q_z = output of importable

$C_z[P_y/P_z]=Q_z[P_x/P_z]$…….....……(7)

Where C_Z = consumption of non tradable

In order to improve internal equilibrium, government may manipulate trade policy instrument (tariff) by introducing distortions/subsidy such that difference exist between t_x and t_y. If import duties are higher than export duties, the equilibrium price P_Z of non tradable will rise by an amount that is less than t_y but greater than t_x ($t_y > \acute{P}_Z > t_x$). The difference between t_y and t_x can be decomposed into (t_y-d) and (d-t_x) as:

$t_y-t_x = (t_y-d) + (d-t_x)$ ……..…..…….. (8)

It implies that producers in the import competing sector receive an implicit subsidy given by (t_y-d) rather than dealing with nominal import tariff rate t_y, where as (d-t_x) represents implicit tax (subsidy) associated with export; d, represents increase in the price of non tradable. The import and export duties will determine relative prices which will induce substitution to give $\acute{P}_Z$. Since P_Z existed at t_x, and change in $\acute{P}_Z$ is as a result of increase in t_y, then d is represented as

$d= t_x+w\ (t_y-t_x) = wt_y + t_x\ (1-w)\ t_x$ .....(9)

Where *w* is a parameter measuring substitution with respect to prices, which will be discussed later.

Recall that from (7), demand/consumption of non tradable equals its output. Q_Z and C_Z can also be defined as:

$Q_z = q_z\ [P_y/P_z, P_x/P_z, K, L, T]$……..(10)

$C_z=C_z\ [P_y/P_z, P_x/P_z, Y]$….....……....(11)

Where: K = Capital; L= Labour; T = Technology; Y = income or GDP

K, L, and T represent the productive capacity of the economy, while Y pays for what is produced. They can be held together as constant to examine the comparatively static properties of the model where the primary interest is the movement of relative price. Thus, after an initial displacement, the system achieves a new equilibrium where:

$$\hat{Q}_Z = \hat{C}_Z = (\eta_Y - E_Y)\left(\hat{P}_Y/\hat{P}_Z\right) + (\eta_X - E_X)\left(\hat{P}_X/\hat{P}_Z\right) = 0 \quad (12)$$

Where: η_y and η_x = demand elasticity for non tradable with respect to the prices of importable and exportable E_y, and E_x the corresponding supply elasticity (supply elasticity of non tradable) with respect to the price of importable and exportable, respectively.

^ = Proportion change

Equation (12) can be simplified as:

$\psi_y(\acute{P}_Z - \acute{P}_y) + \psi_X\ (\acute{P}_Z - \acute{P}_X) = 0$.....(13)

Where $\psi_y = \eta_y - E_y$; $\psi_x = \eta_x - E_x$

But change in domestic consumption includes: $\psi_y(\acute{P}_y - \acute{P}_X)$, because total consumption C_T in the economy is given as:

$C_T = C_Y[P_Y/P_Z]+C_Z[P_Y/P_Z]+C_X[P_X/P_Z]$…….(14)

Where C_Y = Consumption of importable

C_Z = Consumption of non tradable

C_X = Consumption of exportable

The C_T is affected by demand and supply elasticities as a result of substitution among the carbohydrate staples, such that:

So that by rearranging and simplifying (15), it gives

$$\psi_y\left(\hat{P}_z - \hat{P}_Y\right) + \psi_X\left(\hat{P}_Z - \hat{P}_X\right) + \psi_Y\left(\hat{P}_Y - \hat{P}_X\right) = 0 \quad (15)$$

So that by rearranging and simplifying (15), it gives (16)

$(P_Z - P_X) = w\,(P_Y - P_X)$.....(16)

Where $W = \Psi_Y/\Psi_Y + \Psi_X$ (with $0 \leq w \leq 1$) is the parameter representing substitution coefficient referred to in equation (9). Equation (16) has captured the effects of possibility of substitution on price competition. Equation (16) can be rewritten as:

$D\ Ln\ [P_Z/P_X] = W\ D\ Ln\ [P_Y/P_X]$.....(17)

Where: D represent the derivative of the natural logarithm of the variables in bracket. Integrating equation (17) and assuming that w is a constant gives.

$Ln[P_Z/P_X] = A_o + W\ln\ [P_Y/P_X] + e$.....(18)

Where: A_o = constant; e= error term

Equation (18) captured the substitution effect as a result of price competition between importable commodity and non-tradable in the presence of exportable crop. Per capital income (PCY) has to be introduced to capture some income effects on prices. Other variable that affect prices are exchange rate, trade intensity, index of the liberalization exercise and the Nominal Protection Coefficient (NPC). The Nominal Protection Coefficient (NPC) may denote the interaction between tariffs and exchange rate as it measures the deviation of domestic wholesale price from world market price. NPC is presented as:

$NPC_j = P^d_j/P^b_j$.....(19)

where: P^d_j = The domestic price commodity *j*
P^b_j = The border price of commodity *j* expressed in domestic currency.

When these variables are taken into account the estimable equation becomes:

$$\text{Ln}\ P_z/P_X = a_0 + b_0 \ln P^*_Y/P^*_X + C_0 \ln \frac{NPC_y}{NPC_x} +$$

$D_0 \ln OP + E_o \ln Ex + F_o \ln ID + G_o \ln PCY + e$.....(20)

Where: W= b_0 and C_0
P^*_X= World price of exportable crop in foreign currency
P^*_Y= World price of importable crop in foreign currency
PCY = Per capita income measured in dollar
NPC_y = Nominal protection coefficient of local rice
NPC_x = Nominal protection coefficient of exportable cassava
P_z = Farm gate prices of non-tradable expressed in dollar.
P^d_j = The domestic price of commodity, *j*
P^b_j = The border price of commodity, *j*, expressed in domestic currency.
Op = trade intensity (rice import + cassava export)/ GDP of agricultural crop sub sector
Ex = exchange rate
ID[1] = sum of liberalization index with respect to sub sector (effective ban without documentation of illegal trade = 0, quantitative restriction or ban with documentation of illegal trade =1, use of tariffs = 2. This variable is important given that the use of tariff has been at ad valeom)

The estimable equation (20) was applied to 5 different non tradable crops namely maize, millet, sorghum, local rice and yam, respectively; their prices were presented as P_{Z1}, P_{Z2}, P_{Z3}, P_{Z4}, and P_{Z5}, respectively. The variables are all logarithmic transformation. PC-GIVE statistical software was used in the analysis. The analysis began with examination of time series properties of the variables used in the study. The time series properties were investigated and their order of integration determined using the Augmented Dickey Fuller (ADF) unit root test. The ADF regression takes the form:

$$DX_T = \beta_O + \beta_1 X_{T-1} + \beta_i \sum DX_{T-i} + \ell \quad ...(21)$$

D = difference operator/ difference term
X= individual variable at a time T
β = coefficient; = error term

[1] *Specifically with respect to rice importation Ogundele and Okoruwa 2006 identified the policy environment in the sub sector. They outlined pre ban, ban and post ban periods with respect to rice. The pre ban period was from 1971-1985, while the ban period was from 1986-1995. However, they maintained that illegal trade made the ban to be quantitative restriction instrument. Available data and literature support cross border trade during that period (FAO 2000). But from 1995-2007, Nigerian government has used tariff as main liberalization instrument. On the other hand cassava moved from limited tradable to tradable crop. From 1974 -1989, it was a limited tradable crop while from 1990 till date it is a tradable crop. One can easily identify a trend from quantitative restriction to use of tariff during the period under study. This is used as index in this study.*

The null hypothesis is that $\beta 1 = 0$. Rejection of the null hypothesis suggests that the series is non-stationary; and has to be differenced at least once in order to make it stationary. The ADF test was performed up to 2-lag length. Next was the ADF and Johansen test for co integration relation (Johansen, 1992). Where co integration exists, error correction model (ECM) is estimated. If not, the analysis continues without the ECM mechanism

The values of the regression coefficients have to indicate nature of the effects of trade liberalization variables (measured as price relatives of importable to exportable, and nominal protection coefficients) and per capita income on prices of non tradable relative to price of cassava, which were the aim of the study.

3.1 Coverage: The study covered a period of 32 years from 1974 to 2006. Data collected for the period included price of imported rice, price of exported cassava, and the prices of the following non tradable crops: maize, millet, sorghum, local rice and yam.

3.2 Data Collection: Secondary data were obtained from International Center for Trade and Statistics Data Base (COMTRADE), UNCTAD's Trade Analysis and Information System (TRAINS),. This was used to guide the authors with respect to HS-Code. The FAO Statistics Data Base, Publications of Central Bank of Nigeria, Nigerian Ports Authority, National Bureau of Statistic, Nigerian Export Promotion Council, and The Guardian were used to trace information on trade and marketing of carbohydrate staples. These helped to provide information on HS-6 tariff line. Data such as domestic and border prices of the following crops: maize, millet, sorghum, local rice, foreign\imported rice, cassava, yam and cocoyam were collected. Data on trade regime policies such as tariff structures, cost of insurance and freight, and in cases where free on board were applied, were also sourced.

Data analysis

Normality test

Normality test was carried out to determine the reliability of the emerging result. The normality test shows that all the variables had normal distribution. This is because the Chi-square values are significant at 5% probability level. The result was presented in table 2.

Time series property

The unit root tests are presented in Tables 3. They showed the order of stationary of the variables for different periods in years that the variables were used for the analysis. Since the variables are of the order of integration, it requires text for establishment of proper criteria for inclusion of error correction mechanism in the model (Table 3).

Determination of appropriate condition for inclusion of error correction mechanism

Table 4 showed the variables whose Augmented Engle- Granger Test supported co-integration.

All the residual variables for the period 1974-2006 were stationery and their ADF supported co integration. Thus, appropriate conditions for co integration relationship between dependent variables and corresponding independent variables has been ascertained for estimation of error correction model where necessary (Johansen, 1992)

Descriptive statistics result

An examination of the price changes in line the major economic policy changes which can be grouped under pre SAP, during SAP and post SAP is presented graphically in figure i.

The pre SAP era witnessed the introduction of the marketing boards. From 1974 to 1985 (before the introduction of SAP in 1986), there were minimal price changes in all carbohydrates staples in Nigeria. From 1986 to 1994 –during the SAP era, the prices increased gradually, with the price of local rice above others. The immediate post SAP era (from 1995- 1999) witnessed greatest increase in prices of the commodities, with the price of millet exceeding others. This period is followed by a gradual decrease in the prices of millet, sorghum and yam while the prices of maize and cassava increased slightly.

Estimated results

Effects of trade liberalization and exchange rate changes on price of non-tradable maize

The regression equation for estimation of the effects of trade liberalization and exchange rate changes on prices of non-tradable maize in Nigeria is presented in table 5. The F-ratio, R^2 and Durbin Watson are 3.066, 0.48 and 1.85 respectively. These show that the result is acceptable because these statistics are within the acceptable limits. The significant explanatory variables are price of imported rice relative to price of exportable cassava and nominal protection coefficient of non-tradable rice relative to that of exportable cassava.

Table 2: Results of normality test of the data

Variables	Chi-square Value	Level of Significant
P_Y^*/P_X^*	8.0569	0.0001**
NPC_y/NPC_x	6.0981	0.0476*
Open	39.734	0.000**
P_{Z1}/P_{XT}	50.343	0.0000**
P_{Z2}/P_{XT}	29.820	0.0000**
P_{Z3}/P_{XT}	21.481	0.0000**
P_{Z4T}/P_{XT}	6.2544	0.0438*
P_{Z5T}/P_{XT}	18.013	0.0001**
Exchange rate	21.413	0.000**
Index	43.465	0.000**
PCY$	23.813	0.0000**

Source: Computed From Field Data; *, ** = Sig. at 5% and 1 % levels respectively.

Table 3: ADF unit root test

Variables	At data level	At 1st difference
DL P_Y^*/P_X^*	-6.3897**	-4.7878**
NPC_y/NPC_x	-5.7630**	-4.6715**
Open	-3.4946**	-2.8515**
P_{Z1}/P_{XT}	-6.7561**	-3.7733**
P_{Z2}/P_{XT}	-6.0706**	-3.7719**
P_{Z3}/P_{XT}	-7.2310**	-5.5748**
P_{Z4T}/P_{XT}	-5.8814**	-4.6154**
P_{Z5T}/P_{XT}	-6.6245**	-4.8998**
DL Open	-6.4930**	-5.4823**
DD Exchange Rate	-3.6056**	-2.8868**
DL Index	-2.8827**	-2.8581**
PCY$		

Critical values: 5% = -1.954; 1% = -2.649; ** P<0.01
Source: calculated from data

Price of imported rice relative to price of exportable cassava (P_Y^*/P_X). Has a positive effect on the price of non-tradable maize. A similar result was obtained in Ghana by Asuming-Brempong (1994). He reported that the domestic price of sorghum relative to maize will increase by 52% as a result of 1% rise in domestic price of rice relative to maize (both of which are tradable cereals) (Table 5).

The nominal protection coefficient of non tradable rice relative to that of tradable rice (NPCY/NPCX) had a negative impact on the price of non tradable maize. Increase in the nominal protection of non tradable rice will tend to reflect on increase in its price but such price deferential will be at the detriment of price of non tradable maize. It implies that people would tend to prefer the consumption of non tradable rice to maize given price competition. This could be because local rice is a closer substitute to imported rice than maize.

The significant error correction mechanism shows that the speed of price adjustment in the long run is 62%. It implies that maize has a fairly high speed of adjustment to trade policies.

Effects of trade liberalization and exchange rate changes on prices of non-tradable millet

The regression equation for estimation of the effects of trade liberalization and exchange rate changes on price of non tradable millet in Nigeria is presented in table 6. The result is acceptable because the F-ratio, R^2 and Durbin Watson are respectively, 2.4598, 0.43 and 1.61 which are within the acceptable limits. The significant explanatory variables are degree of openness and trade liberalization index (Table 6).

The degree of openness is negatively related to the price of non tradable millet. It indicates that as trade in the sector increases, substitution of imported millet with imported rice adversely affects the price of millet. It implies that peoples' consumption preference shifts from millet, thus, a reduction in the price of millet.

Trade liberalization index which is used to designate a shift from quantitative restriction to use of tariffs had a positive impact on price of non tradable millet. As tax (tariff) on a commodity tends to push its price upwards, millet can benefit from such price increase.

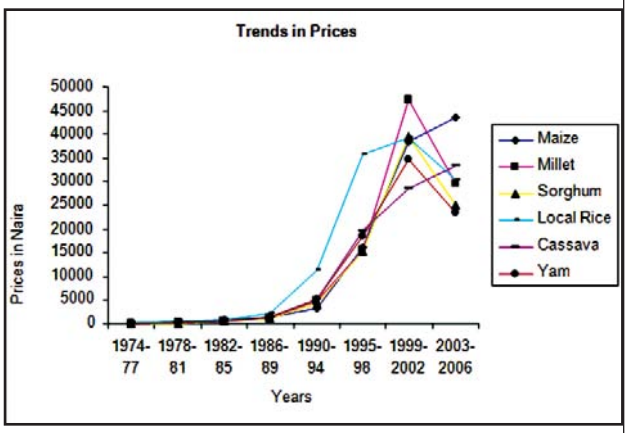

Figure 1: Trends in prices of carbohydrates staples in Nigeria; Source: Calculated from data

The significant error correction mechanism shows that the speed of price ad*justment in the long run is 42%. This means that the adjustment of price of millet to trade polices is relatively slow.

Table 4: ADF unit root test for determination of variables whose ADF values support cointegration test (Augmented Engle- Granger Test for Co integration)

Variables	At data level	At 1st difference
Ln P_{Z1}/P_{XT} Ln P_Y^*/P_X^* Ln $\frac{NPC_y}{NPC_x}$; ln Open; ln Index ln *PCY*	-3.4946**	-2.8515**
Ln P_{Z2}/P_{XT} Ln P_Y^*/P_X^* Ln $\frac{NPC_y}{NPC_x}$; ln Open; ln Index ln *PCY*	-2.5231*	-2.5589*
Ln P_{Z3}/P_{XT} Ln P_Y^*/P_X^* Ln $\frac{NPC_y}{NPC_x}$; ln Open; ln Index ln *PCY*	-2.7194**	-2.5462*
Ln P_{Z4T}/P_{XT} Ln P_Y^*/P_X^* Ln $\frac{NPC_y}{NPC_x}$; ln Open; ln Index ln *PCY*	-4.4439**	-3.4111**
Ln P_{Z5T}/P_{XT} Ln P_Y^*/P_X^* Ln $\frac{NPC_y}{NPC_x}$; ln Open; ln Index ln *PCY*	-3.0174**	-2.3947*

Critical Values: 5% = -1.954; 1% = -2. 649; *P<0.05, **P<0.01 Source: Calculated from data

Effects of trade liberalization and exchange rate changes on price of non-tradable sorghum

The regression equation for estimation of the effects of trade liberalization and exchange rate changes on price of non-tradable sorghum in Nigeria is presented in table 7.

The result is acceptable because the F-ratio, R^2 and Durbin Watson are 3.473, 0.51 and 1.77 respectively which are within the acceptable limits. The significant explanatory variables are degree of openness and trade liberalization index. This result is similar to what was obtained in the case of millet; hence similar explanation may hold for sorghum. The significant error correction mechanism shows that the speed of price adjustment in the long run is 36%. This means that the adjustment of price of sorghum to trade policies is relatively slow. It may be informative to note that the cultivation and consumption of millet and sorghum in Nigeria do not cut across all cultures

Effects of trade liberalization and exchange rate changes on prices of non tradable rice

The regression equation for estimation of the effects of trade liberalization and exchange rate changes on price of non tradable rice in Nigeria is presented in table 8. The result in table 8 is acceptable because the F-ratio, R^2 and Durbin Watson are respectively, 5.24, 0.62 and 1.65 which are within the acceptable limits (Table 8).

The significant explanatory variables are price of imported rice relative to price of exportable cassava (P_Y^*/P_X), and nominal protection coefficient of non tradable rice relative to that of exportable cassava (NPCY/NPCX), exchange rate (EX), and trade liberalization index (Index).

Price of imported rice relative to price of exportable cassava (P_Y^*/P_X), has a direct effect on the price of non tradable rice. Asuming-Brempong (1994) also had a similar report. He noted that the domestic price of millet relative to maize will increase by 0.80% as a result of 1% rise in the domestic price of imported rice relative to maize.

The nominal protection coefficient of non-tradable rice relative to that of tradable rice (NPCY/NPCX) also had a positive effect on the price of non tradable rice. Increase in the nominal protection of non-tradable rice will tend to reflect on increase in its price and decrease in the relative price of exportable cassava. This is in line with Oyejide's (1986) report that much

Table 5: Effects of trade liberalization and exchange rate changes on price of non-tradable maize

Independ variabl MAIZE	Coefficients/ Marginal effects and t- values of the independent variables			
	Dln P_{Z1T}/P_{XT}	Stand. Error	t-value	t-probability
D Ln P_Y^*/P_X^*	0.51657	0.26o76	1.921	0.0465
D Ln $\frac{NPC_y}{NPC_x}$	-0.49851	0.28661	1.739	0.0953
DLn Open	-0.10713	0.13497	0.794	0.4355
DDlnEX	-0.0693	0.47744	0.020	0.9846
Dln Index	0.16156	0.48107	0.336	0.7400
D Ln *PCY*	0.020086	0.11131	0.180	0.8584
Ecm-1	-0.61877	0.18587	3.290	0.0029
Constant	0.071012	0.11101	0.640	0.5287
F-ratio	3.066			0.0197
R^2	0.48			
Durbin Watson	`1.85			
A0	0.5447			
RSS	6.825			

Calculated from data: 1974-2006; D= Deference Operator; Ln =Log

of the protection for import competing activities has been at the expense of the exportable sector.

Exchange rate (EX) has a positive relationship with the price of non-tradable rice. This crop (non tradable rice) is the closest substitute to tradable rice. Thus it is expected that exchange rate pass through will be fully expressed in this case. This could be through prices of imported intermediate goods, which are reflected by the share of imports and through prices of domesti-

Table 6: Effects of trade liberalization and exchange rate changes on price of non-tradable millet

Independ variabl MILLE	Coefficients/ Marginal effects and t- values of the independent variables			
	Dln P_{Z2T}/P_{XT}	Stand. Error	t-value	t-probability
D Ln P_Y^*/P_X^*	0.16562	0.44958	0.368	0.7160
D Ln $\frac{NPC_y}{NPC_x}$	-0.11464	0.22738	0.5042	0.6189
DLn Open	-0.045178	0.02848	1.816	0.0809
DDlnEX	-0.52756	0.38863	0.136	0.8932
Dln Index	0.63130	0.38516	1.639	0.1148
D Ln *PCY*	0.072657	0.08845	0.821	0.4198
Ecm-1	-0.42151	0.17443	2.496	0.0240
Constant	0.06310	0.088379	06.4	0.4948
F-ratio	2.4598			0.0487
R^2	0.43			
Durbin Watson	1.61			
A0	0.4103			
RSS	3.7039			

Calculated from data: 1974-2006 D= Deference Operator; Ln =Log NS=Not Significant.

Table 7: Effects of trade liberalization and exchange rate changes on prices of non-tradable sorghum

Independ variabl sorghu	Coefficients/ Marginal effects and t- values of the independent variables			
	Dln P_{Z3T}/P_{XT}	Stand. Error	t-value	t-probability
D Ln P_Y^*/P_X^*	0.161725	0.41881	0.380	0.7029
D Ln $\frac{NPC_y}{NPC_x}$	-0.05879	0.2171	0.270	0.7827
DLn Open	-0.02066	0.01064	2.021	0.0019
DDlnEX	-0.38998	0.36945	1.056	0.3021
Dln Index	0.69699	0.35581	1.959	0.0624
D Ln *PCY*	0.09367	0.082124	1.173	0.2526
Ecm-1	-0.35509	0.17234	3.546	0.0508
Constant	0.06603	0.081838	0.046	0.4280
F-ratio	3.473			0.0110
R^2	0.51			
Durbin Watson	1.77			
A0	0.40131			
RSS	3.7039			

Calculated from data: 1974-2006; D= Deference Operator; Ln =Log, NS = Not significant

cally produced goods whose resources for their production competed with the exportable. Kwanashie *et al.,* (1998); Adubi and Okunmadewa, (1999) and Kidane, (1999) as well as Okoli and Okoye, (2005) have noted that exchange rate was a major determinant of exports. This study upholds the concept of exchange rate pass through.

Trade liberalization index (Index) which is used to designate a shift from quantitative restriction to use of tariffs, had a positive effect on price of non tradable rice. As tax (tariff) on a commodity tends to push its price upwards, so non tradable rice can benefit from such price increase.

The significant error correction mechanism shows that the speed of price adjustment in the long run is 82%. This means that the adjustment of price of non tradable rice to trade policies is very fast, hence it is the closest substitute to tradable rice

Effects of trade liberalization and exchange rate changes on price of non-tradable yam

The result is acceptable because the F-ratio, R^2 and Durbin Watson are respectively 3.5, 0.52 and 1.57 which are within the acceptable limits. The significant explanatory variables are degree of openness and trade liberalization index. This result is similar to what was obtained in the case of millet and sorghum; hence similar explanation may hold for yam as shown in table 9.

Increase in the nominal protection of imported rice over exportable cassava negatively affected the price relative of non tradable yam It implies that increase in the nominal protection coefficient of imported rice leads to a decrease in the price incentive for production of non tradable yam; and an increase in the price incentive for production of exportable cassava. The result illustrates that the nominal protection coefficient, is eroded by trade liberalization exercise except in non tradable rice and cassava, which has taken advantage of world price. This has indicated a shift in resource allocation to favour cassava production and export as well as non tradable rice. The result is in consonance with the result of the study by Asuming-Brempong (1994), which shows that the effects of trade liberalization in Ghana were mixed because some crops were favoured while some were not. Increase in the protection of importable crop tends to increase the relative price of non tradable, which would tend to decrease the price incentive for production of exportable. Increase in the trade intensity has negative impact on the prices of non–tradable yam. This indicates that as the volume of imported substitute (rice) increases people will prefer its consumption to that of the mentioned non-tradable yam (see table 9).

Table 8: Effects of trade liberalization and exchange rate changes on price of non-tradable rice

Independ variabl LOCAL R	Coefficients/ Marginal effects and t- values of the independent variables			
	Dln P_{Z4T}/P_{XT}	Stand. Error	t-value	t-probability
D Ln P_Y^*/P_X^*	0.62435	0.2743	2.277	0.0324
D Ln $\frac{NPC_y}{NPC_x}$	0.17693	0.10352	1.733	0.0901
DLn Open	0.018859	0.65510	0.288	0.7760
DDLnEX	0.14450	0.06210	1.851	0.0867
DLn Index	0.23774	0.11851	1.885	0.0490
D Ln *PCY*	-0.00228	0.053589	0.048	0.9664
Ecm-1	-0.81855	0.23081	3.546	0.0017
Constant	0.00245	0.05381	0.046	0.9640
F-ratio	5.2401			0.0011
R^2	0.62			
Durbin Watson	1.65			
A0	0.2623			
RSS	1.5826			

Calculated from data: 1974-2006; D= Deference Operator; Ln = Log

The results do not reveal much on the consumption preference of the populace. It could be that income of the majority has not been able to allow them make substantial substitution given the poverty level of the country; besides these food crops are staples and it is expected that their demand will be income inelastic as it is with many agricultural crops.

The significant error correction mechanism shows that the speed of price adjustment in the long run is 62%. This means that the adjustment of price of non-tradable rice to trade polices is fast, and hence it is affected by trade policy.

Summary and conclusion

The results illustrated the Nigerian experience of trade liberalization in the carbohydrate sub sector. The findings are in line with existing theory that effects of trade liberalization on prices of non tradable is ambiguous in the short run. Nigeria's Structural Adjustment Programme (SAP) has focused on liberalization of commodity markets in all sectors of the economy. Particularly in the liberalization and growth phase of adjustment process which started in 1986, flexible exchange rates for the naira were affected, and administrative prices for major tradable crops were abolished. The macroeconomic environment generated under the SAP and its effect on small-holder farmers who produce the bulk of Nigeria's agricultural output have direct implications for resource allocation and aggregate agricultural output. This study has provided empirical evidence of the policy and price linkages in the carbohydrate sub-sector of Nigeria's economy. More specifically, the effects of trade liberalization and exchange rate changes on prices of carbohydrate staples in Nigeria have been examined.

Effects of trade intensity and exchange rate changes on prices of carbohydrate staples and impact of price and other of economic variables associated with trade liberalization on prices of non tradable carbohydrate staples were identified through the examination of the effects of trade intensity and exchange rate changes on prices of carbohydrate staples, and determination of the impact of price of importable rice relative to the price of exportable cassava on prices of carbohydrate staples. Using secondary data, the study shows that trade liberalization and exchange rate changes, together with other trade policies e.g. nominal protection co-efficient, tariffs, and price relative have had substantial impact on prices and by implication on resource allocation among carbohydrate staples in Nigeria.

There was absolute increase in output from 1986-1989 to 2002-2006. This is indicative of

the impact of trade liberalization policy which characterize the periods from 1986 to 2006. In terms of pricing, there was a gradual increase in absolute prices and the per capital income which are similar to increases in exchange rate changes during the period. This is indicative of relative decreases in prices and per capital income due to devaluation of the naira, increased production cost, and abolition of marketing boards which encouraged export drive (increased output), but discouraged absolute increases in output and income as a result of high cost of marketed (or purchased) inputs e.g. fertilizers.

In terms of price relatives the effects of trade liberalization and exchange rate changes on prices of carbohydrate staples in Nigeria have been mixed. Trade liberalization accounted for most of the changes in the prices of non tradable maize and local rice but not a determinant of price of non tradable yam, increase in the nominal protection co-efficient for rice over exportable cassava negatively affected the price relative for non tradable maize and yam. It is also a positive determinant of the price of non tradable rice. Increase in trade intensity has a negative impact on prices of non tradable millet, sorghum and yam. There may not have been much revelation on the consumption preference of the populace as indicated by the insignificant effect of consumer price index.

It is, therefore, concluded that maize and local rice farmers can increase prices of their products with increase in price of imported rice while yam farmers may not take such an advantage. The implication of increase in nominal protection coefficient for imported rice is a decrease in the price incentive for the production of non tradable maize and yam and an increase in price incentive for the production of exportable. Protection is eroded by trade liberalization exercise except in non tradable rice and cassava which have taken the advantage of world prices. A panacea for falling prices of non tradable millet, sorghum and yam as a result of increased trade intensity can be through moving from quantitative restriction to use of tariffs indicated by the trade liberalization index which had a positive effect on prices of the stated non tradable crops. Low per capita income of consumers has not permitted substantial demand; besides, these food crops are staples and it is expected that their demand is income inelastic as it is with many food crops.

Based on the findings from the study, it is recommended that:

1- Government initiatives on cassava and rice production should be extended to the studied non-tradable carbohydrates staples in order to increase their output and processing for possible

Table 9: Effects of trade liberalization and exchange rate changes on prices of non-tradable yam

Indepenc variabl YAMS	Coefficients/ Marginal effects and t- values of the independent variables			
	Dln P_{Z5T}/P_{XT}	Stand. Error	t-value	t-probability
D Ln P_Y^*/P_X^*	0.080035	0.36831	0.217	0.8299
D Ln $\frac{NPC_y}{NPC_x}$	-0.3835	0.18544	2.068	0.0500
DLn Open	-0.01753	0.008470	1.980	0.0846
DDLnEX	-0.13934	0.33151	0.420	0.6782
DLn Index	0.24061	0.30874	0.779	0.4437
D Ln *PCY*	0.04711	0.71729	0.568	0.5758
Ecm-1	-0.61622	0.21258	2.899	0.0081
Constant	0.3194	0.072196	0.442	0.6623
F-ratio	3.55			0.0098
R^2	0.52			
Durbin Watson	1.57			
A0	.35125			
RSS	2.8379			

Calculated from data: 1974-2006; D= Deference Operator; Ln =Log, NS = Not significant.

exportation so that such crops can take advantage of international prices.

2- Liberalization exercise should be intensified through the relaxation of quantitative restriction to use of tariff in order to correct the negative impact of increased trade intensity and erosion of nominal protection on prices of the non tradable crops.

ACKNOWLEDGEMENTS

The authors are very much obliged to African Economics Research Consortium (AERC) for financial, material and technical assistance. They also acknowledge with thanks the useful suggestions and comments from Group D resource persons; and are grateful to the researchers in the same group for their contributions to the improvement of the study that led to development of this paper.

REFERENCES

1- Achike, A.I. (2004). Macro-economic Picture of Nigerian Agriculture: Strategic Analysis of Development Constraints and Priorities in Southern Nigeria. Updates on Agriculture and conflict July, USAID Mission Abuja Pp. 3-14

2- Achike, A.I., Agu, C., & Oduh, M. (2005). Impact of Common External Tariff and Economic Partnership Agreements on Agriculture in Nigeria. Technical Report submitted to OXFAM GB.

3- Adubi, A.A., & Okunmadewa, F. (1999). Price, Exchange Rate Volatility and Nigeria's Agricultural Trade Flows. A Dynamic Analysis. *AERC Research* Paper 87, Nairobi, Kenya.

4- Arene, C.J. (2000). Exchange Rate Policies and the Production of Major Cash Crops in Nigeria. Modeling, Measurement and Control, 22 (3): 25-36.

5- Arene, C.J., & Okafor, A.O. (2000). Exchange Rate Liberalization as a Policy Instrument for Stimulating Non-Traditional Agricultural Exports in Nigeria Economic Affairs. 46(4): 234-247.

6- Arene, C.J., & Odusolu, G.O. (1998). Exchange Rate Reform as a Policy Instrument for Stimulating Smallholder Agricultural Investment Demand and Output Supply in Nigeria Economic Affairs. 43(4): 232-240

7- Arene, C.J., & Mkpado, M. (2004). Counter Urbanization and Agricultural Production in Nigeria Journal of Rural Development. 23(1): 73-81.

8- Asuming-Brempong, S. (1994). Effects of Exchange Rate Liberalization and Input Subsidy Removal on the Competitiveness of Cereals in Ghana Issues in African Rural Development. 2, Pp. 43-59.

9- Ayichi, D. (1997). An Econometric Study of Export Supply Responses of Major Nigerian Agricultural Commodities to Price and Exchange Rate Regimes Ph.D. Thesis, Department of Agricultural Economics, University of Nigeria, Nsukka.

10- Chidebelu, S.A.N.D., Ayichi, D., & Okoye, C.U. (1998). The Impact of Price and Exchange Rate Fluctuations on Volume of Agricultural Export Commodities. The Case of Natural Rubber, 1970-1990. Ibadan. NISER/SSCN National Research in Nigeria.

11- Collier, P., Greenaway, D., & Gunning, J.W. (1999). Trade liberalization: A Methodological Framework in Oyejide A. *et al.,* (eds) Regional integration and trade liberalization in Sub Saharan Africa Vol. 1 Macmillan Press Ltd London

12-ESCB (2000). International Trade in Cassava Products An African Perspective Basic Food Stuffs Service (ESCB) of the F.A.O. Commodity Trade Division Report September

13- Falusi, A.O. (2005). Macro-Economic Reforms and Agricultural Development in Nigeria: A Preliminary Assessment. Keynote Paper of 19th Annual Farm Management Association of Nigeria Conference Proceedings Pp. 2-16.

14- FAO (2004). Food and Agriculture Organization Year Book.

15- FAO (2005). Production Year Book FAO Rome

16- FAO (2006). Roots. Tubers, Plantains and Bananas in human Nutrition 2005-2006. FAO\corporate Document Repository Retrived from http://www.ajol.info/index.php/ajb/article/viewFile/60344/48581..

17- FAO (2006). Commodity Market Review 2005- 2006. FAO\Corporate Document Repository Retrived from http://www.fao.org/docrep/008/a0334e/a0334e00.htm

18- FAOSTAT (2005). Output of cassava. Retrived from http://www.faostat.org/stats

19- FAOSTAT (2010) Output of cassava. Retrieved from http://www.faostat.org/stats

20- FGN (2004). Federal Republic of Nigeria "2005 Appropriation Bill Speech Vanguard. Pp, 14-16 www. Vanguard Media Ltd.

21- FOS (2004). Federal Office of Statistics Annual Abstract of Statistics, Abuja, Nigeria.

22- FOS 1990-2006. Nigerian Foreign Trade Summary Federal Office of Statistics /National Bureau of Statistics Abuja

23- Ihimodu, I.I. (1993). The Structural Adjustment Programme and Nigeria's Agricultural Development. Monograph Series No 2 National Center for Economic Management and Administration, Ibadan, Nigeria.

24- Johansen, S. (1992). Testing Weak Exogeneity and Order of Cointegration in UK Money Demand Journal of Policy Modeling. 14, 313 – 334.

25- Johansen, S., & Juselius, K. (1992). Testing

structural analysis of co integration vectors. Journal of Economic Dynamics and Control, 12, 231 – 54.
26- Kidane, A. (1999). Real Exchange Rate Price and Agricultural Supply in Ethiopia: The Case of Perennial Crops. AERC Research Paper 99.
27- Kwanashie, M., Ajilima, I., & Garub, A. (1998). The Nigerian Economy: Response of Agriculture to Adjustment Policies. AERC Research Paper 78.
28- Kwanashie, M., Garbu, A., & Ajilima, I. (1997). Policy Modeling in Agriculture: Testing the Response of Agriculture to Adjustment Policies in Nigeria. AERC Research Paper 57.
29- Mwase, N. (1998). Economic Liberalization and Privatization of Agricultural Marketing and Input Supply in Tanzania: A Case Study of Cashew Nuts. AERC Research Paper 86
30- NBS 2000-2004. National Bureau of Statistics, Annual Report Various Issues, Abuja, Nigeria.
31- NEPZA (2006). Nigerian Export Processing Zone Authority: Free Trade News, 2nd Edition, Vol. 2, P. 4
32- Nigerian Customs, Excise Consolidation Decrees Various Issues Abuja Nigeria.
33- Nwosu, A.C. (1992). Structural Adjustment and Nigerian Agriculture: An initial Assessment Staff Report No AGES 9224. Economic Research service USDA, Washington, D.C.
34- Ogundele, O.O., & Okoruwa, O.V. (2006). Technical Efficiency Differentials in Rice Production Technologies in Nigeria. AERC Research paper 154.
35- Ogunkola E.O., Bankole, A.S., & Adewuyi, A.O. (2005). An Evaluation of the Impact of Trade and Investment Policy Reform in Nigeria" A Final Report submitted to AERC Nairobi Kenya
36- Okoli, E.N., & Okoye, C.U. (2005). Analysis of Factors Influencing Cassava Exports in Nigeria Proceeding, of 19th Annual Farm Management Association of Nigerians Conference Pp, 68-72
37- Olusegun, A.J. (2006). Dynamic acreage response of selected individual crops to price risk in Nigeria *African Journal of Economic Policy* 13 (2): 81-104
38- Osuntogun, A.C., Edordu, C., & Oramah, B.O. (1993). Promoting Nigerian Non-oil Export: Analysis of some Strategic Issues Final Report. AERC, Nairobi, Kenya.
39- Oyejide, T. A. (1986). Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria Research Report No 55. Washington D.C., International Food Policy Research Institute.
40- Phillip, D.O.A (1996). Responsiveness of selected Agricultural Export Commodities to Exchange Rate Devaluation in Nigeria: An Econometric Analysis Economic and Financial Review, 34, No. 2.
41- Reinika, R. (1994). How to Identify Trade Liberalization Episodes. An Empirical Study on Kenya CSAE Working Paper
42- Soludo, C.C. (1995). An Evaluation of Structural Adjustment Programmes in Africa: Issues, Methods and Consequences for Nigeria in Contemporary Issues in Social Sciences edited by J.I. Onuoha and J. O. C. Ozioko, Acena Publishers AP, Pages 59 – 103.
43- The Guardian (2007). Nigeria's Agricultural Export Jumps to $111.2 Million in the First Quarter. The Guardian News Paper Tuesday July 9 P. 21
44- Tshibaka, T. B. (1986). The Effects of Trade and Exchange Rate Policies on Agriculture in Zaire; Research Report 56, Washington D.C., International Food Policy Research Institute.
45- Tunji, A. (2001). An Overview of the Nigerian Rice Economy The Nigerian Institute of Social and Economic Research (NISER), P.M.B. 5, University Post Office. Ibadan– Nigeria Retrived from http://www.unep.ch/etu/etp/events/Agriculture/nigeria.pdf