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Full Length Research Paper

Food security and Food liberalization in Nigeria Agricultural trading system

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It is a fact that the unilateral trade liberalization of 1986 did not produce any sustainable impact on the development of agriculture in Nigeria. It is however, not clear whether the Uruguay Round Agreements on Agriculture (URAA) and the optimism of the Doha Round and its Agenda (DRA) has done any better. Even then Nigeria's external trade has been conducted within the framework of neutrality or open trade, consistent with the WTO provisions. This to a reasonable extent has engendered some sectoral as well as factoral effects. This paper investigates the effects of agricultural trade liberalization on food security in Nigeria. It is observed that in spite of the numerous policy measures to enhance food production, food demand has consistently outstripped supply with increasing number of people becoming more vulnerable. The paper proposed measures to mitigate the adverse effects of trade liberalization on domestic food security.

Key words: Nigeria, trade regimes, food security.

INTRODUCTION

By the end of the second half of 1986 it was clear that Nigeria had fully adopted the International Monetary Fund (IMF) induced structural economic reforms whose main focus is liberalization among others. The adoption was premised on the believe that the weaknesses of economics of control trade will prevent the enjoyment of the benefit of openness (Ojo and Obaseki, 2001). The major issue inherent in the Structural Adjustment Programme (SAP) is a reasonable measure of openness to be perceived through liberalization of external sector and deregulation. Although, the policy was targeted at restructuring the economy away from over dependence on the oil sector (among others) for government revenue and foreign exchange earnings, the spill over effect of the policy can be traced to the major contending sectors in the economy (Ojo, 1999).

Following the Doha Rounds Agreement on Agricultural (DRAA) trade, many developing countries have started breathing air of relief, with the view that agricultural superpowers will start to respect trade rules, but this had not happen. In rich countries, agriculture represents a small share of national income and employment, typically less than 2%, whereas, in developing countries, it is as much as 35%.

In spite of these statistics, developed countries use subsidies and other production incentives to skew the benefits of agro-trade in their favour in flagrant disobedience to the rule of engagement. In the same vein, the rampant dumping, and smuggling and under invoicing of food importation occasioned by the policy of open trade paced the domestic food producers at a disadvantage position. The effect on local food production stimulates a question on food security.

An overview of food situation and trade liberalization in Nigeria

The analysis of the impact of trade regime on food security has a long history particularly for developed countries. Many studies using developing country data have also come out much more recently. Nigeria had experimented two distinct trade regimes, the control (restricted trade) and the open trade. The philosophy of controlled trade regime embodied a regime of regulation that uses both direct and indirect instruments of control in the conduct of external trade and payments. The basic rationale for control regime is to achieve efficiency, stability and firmness in the face of market failure (Vitas, 1992), as the condition for competitive equilibrium is not

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Table 1. Consumer price index (1981 to 2005), 1985 = 100.

Year	All items	Food
1981	51.2	50.1
1983	67.9	67.3
1985	100	100
1987	116.1	108.7
1989	272.7	298.1
1991	330.9	345.9
1993	751.9	800.2
1995	2,040.4	2,017.7
1997	2,863.2	2,864.2
1999	3,273.3	2,995.5
2001	4,458.0	4,257.8
2003	5,827.1	3,432.3
2005	6502.7	3,950.5

The central bank of Nigeria – statistical bulletin.

satisfied. The experience of many developing countries including Nigeria, in the use of control regime indicates dismal economic consequences (Ojo, 1994).

The Nigerian experience in economics of regulation and control spanning about 25 years beginning at independence is very revealing. On the other hand the liberalization regime, which is the idea of neutrality in trade policy, and synonymous with globalization- a process through which an increasingly free flow of ideas, people, goods services, culture and capital leads to the integration of economies and societies across the globe (Ndiyo and Ebong, 2003). Proponents often argue that openness enhances the standard of living and prosperity to the participating countries, through rising incomes and transfer of modern technologies from advanced economies to less developed economies. In addition, it is believed that the process promotes human freedom by spreading information and increasing choices (Annam-Yao, 1996).

Over the last three decades, foreign trade and the cross -border movement of technology, labour and capital have been massive and irresistible. But in recent years, concerns have grown about the negative aspects of openness and questions are being asked as to whether developing countries actually share in its benefits. The beliefs that openness favour only the advanced capitalist economies and that volatile capital markets hurt developing countries the most, have led economists and other researchers to direct their research energy to the issues generated by the regime of open trade.

The issue is how best to manage the process of the regime of openness so that its benefits are widely shared while its costs are minimized. One of the leading cost and issues that has dominated the debate is the question of food security. As a developing country, Nigeria occupies a weak position in the world economy and therefore, the phenomenon of free trade across the globe might represent a constraint to agricultural development and in particular food production. Recent trends in the widening gaps between food import and export raises a serious concern about the food security in today's Nigeria. This also raises concern about the genuine pursuance of the anti-dumping and safeguard measure contained in the Doha round agreement on agriculture (Ogunkola, 2003).

Since the second half of 1986 when the country embraced the implementation of trade liberalization, Nigeria had remained a leading importer of food items. This is inspite of the fact that about 65% of the total labour force was engaged in small–holder food production that contributes about 35% of the Gross Domestic Product (GDP). The major food items imported are rice, wheat, maize, or their products, sugar and dairy products, majority of which comes from the USA, EU, who are major actors in the Doha round and who grant subsidies to agricultural products and hinder market access to its agro-commodities from other developing countries – Nigeria inclusive.

The cheap food imports reduce the market for domestic agricultural product and leave many farmers and workers in the agro- allied industries without source of income unless they are able to switch to more profitable production (Nyangito, 2003). This implies that even if low-cost food supplies are plentiful many may not be able to access them. The above position was further reinforced by rising trend of food prices in Nigeria. According to a survey by Central Bank of Nigeria (CBN), 2003, and the Federal Office of Statistics (FOS) the domestic producer prices of major food items have been on the rising trend since 1999. The increase in price was attributable to the increased cost of transportation occasioned by upward adjustments in the prices of petroleum products and to the deplorable state of infrastructural facilities, which increased the cost of evacuating farm produce to the markets. The price support programme of the federal Government of Nigeria (Okuneye, 2001) pushed up prices by mopping up excess grains from the nation's strategic grains reserve programe. The net effects of these have imposed a serious pressure on availability and access to food and thus causing food insecurity. This scenario could probably have been accentuated by the rising trend of foreign exchange, which tended to increase the prices of imported farm inputs. With the identification of cassava as another tradable product from Nigeria, Garri, an important staple food from cassava is gradually becoming unavailable and inaccessible. The implication of these on food security is worthy of investigation (Table 1).

The table shows a rising trend in the consumer price index for all items and food. In particular the relationship between all items and the food price index calls for close scrutiny. This is because the food price index accounted for a sizeable proportion of the all items consumer price index. This high food price index is a clear evidence of

Table 2. Trend of nutritional intake in Nigeria 1970 to 2001.

Year	Daily per capital carbohydrate	Daily per capita protein (grm)	Daily per capita fat. (grm)
1970 – 80	2038.3	46.9	54.9
1981 – 1985	2000.4	47.4	53.4
1986 – 1989	2183.6	51.6	54.0
1990 – 1994	2656.1	58.4	60.8
1995	2801.8	63.0	63.4
1996	2781.0	62.5	67.4
1997	2791.3	63.2	68.0
1998	2837.4	04.0	68.0
1999	2833.4	64.5	70.1
2000	2850.1	65.2	68.5
2001	3062.2	58.4	72.1

ADB 2003.

food insecurity.

Christiansen et al. (2000) and Ruel et al. (1998) were unanimous on the fact that food security has to do with access of all person to adequate diet at any point in time to live an active live and healthy life. This can only be guaranteed not only by availability but also by access and utilization (Chung et al., 1997) . By implications the food unsecured economy is at the risk of losing availability, which is a function of total food supply, access to food, which is a function of farm-gate prices and utilization, which is a function of nutrient content. The most important limiting factor to food security apart from those related to natural factors are high rate of inflation, exchange rate misalignment deteriorating terms of trade, removal of subsidies on agro – allied inputs which have not only inhibited availability but have also restricted the access, (Sen, 1981; Sergeldin, 1989; Ali and Pitkin, 1991; sen, 1998; Garret, 2000; Smith and Haddad, 2000; Wilson, 2001). Other factors may include availability of agricultural resources, inadequate infrastructural facilities and demographic factors (Ayres and McCalla, 1996).

The end of 1986 saw the review of the trade and exchange rate policies in line with the principles of open trade. For instance the export duties were reduced and export prohibition was cancelled out. About the same period the list of banned items (rice, maize, wheat and their products) were also reduced. Import licensing for many imports were abolished, except that of fertilizer. The effects of these gave an uninhibited access of imported food to Nigerian food market to the detriment of domestic food farmers. By and large, food imports suppressed domestic production, as farmer could not face the competition from the highly subsidized food export of the western agricultural superpowers. Between 1986 and 2003, the real exchange rate of Naira had depreciated by more than 95% thereby further worsening the terms of trade.

The trend and structure of food insecurity in the developing countries at the turn of the new century has assumed alarming dimension. About 800 million people, one-sixth of the developing worlds population do not have access to sufficient food out of these about 180 million are in sub-saharan African, Pinistrup – Andersen et al. (2001). Nigeria with a staggering population of 120 million in the sub-region will certainly have a lion share of these marginal groups. This assertion is evident in Nigeria according to the daily calorie intake per capital (Table 2). Between 1970 and 1974 the per capita calorie intake stood at 2102.1 and by 1980 to 1984 it had dropped to 2004.4. There was however, some progressive increase from 2183.6 in 1985 to 2801.8 by 1995 and by the year 2000 to 2850.1. Much of these are obtained from importation. It is obvious that food security may manifest in term of hunger, starvation, and malnutrition and most especially among women and children. The risk factors are in most cases lost of productivity, illness and or death.

Table 2 showed data up to 2001, the current trend is not in any way different the above picture as demonstrated by other similar indicators. The observable fluctuations in the values above can be attributable to deliberate neglect of the agricultural sector, as petroleum became the commanding height of the foreign exchange earner in Nigeria. This may have been galvanized by macroeconomic instability, the problem of policy – mix and arising cost of farm inputs (Osagie, 1983; Adeboye, 1989; Anyanwu et al., 1997).

The pattern of food security coincidentally has reflected the different trade regimes that were operated in Nigeria. This is manifested in the food import – export gap. The food export bill was US$ 0.57b in 1980 but declined steadily to US $0.27b by the end of 1985 and first quarter of 1986. This period coincided with the period of trade restriction in Nigeria. This is to be understood as food

Table 3. Value of major food import (=N= Million) 1970 to 2005.

Year	Food and live animal	Beverages and tobacco	Animal and vegetable oil and fats	Total food import
1970	57.7	4.0	0.8	62.5
1975	298.8	48.1	24.7	471.60
1980	1437.5	12.1	115.0	33,480
1985	1199.0	9.4	71.0	27,075
1990	3474.5	228.7	228.7	88,560
1995	88349.9	3020.5	8306.5	126,200
2000	113630.5	6740.8	14444.6	178,760
2005	226121.5	13645.1	34699.7	366,450

Federal office of statistics/central bank of Nigeria.

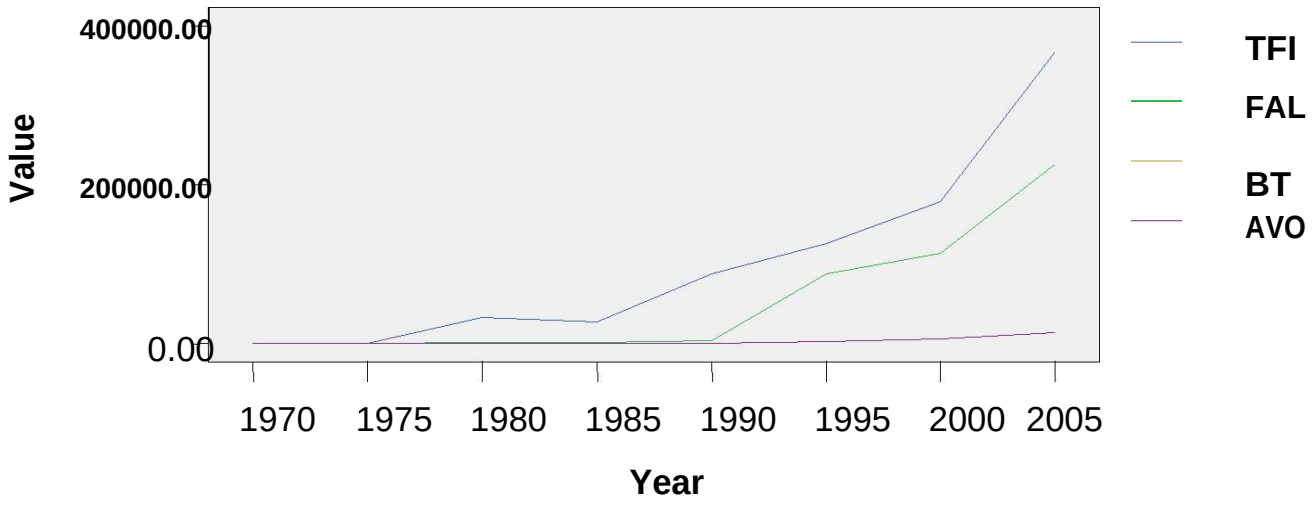

Figure 1. Value of major food import in Nigeria (=n= million) 1970 to 2005.

export was discouraged to facilitate food self-sufficiency. But by the second half of 1986 when trade liberalization was adopted, food export began to increase by leap. For instance food export rose from US$ 0.34b in 1995 to US$ 0.39b in 1996. In the same vein, the food import bill that was US$ 2.16b in 1990 dropped to US$0.93b in 1985, this drop is also traceable to the trade restriction (Close Trade Regime) of 1981 to 1985. By 1990, food import bill rose steadily from US$0.43b to US$0.53b and US$0.66b in 1995 and 1996 respectively. The trend has since been on the increase with an estimated growth rate of 6.8%. The food export – import gap, which had reduced in the early part of 1980s have since been widening due to liberalization of trade (Table 3 and Figure 1).

Although, there were a couple of measures undertaken to reverse the trends, but could not produce any desired effect as a result of some demographic factors and inadequate policy – mix which have produced counteracting effects. This policy–mix ranged from exchange rate misalignment, removal of subsidies on agriculture, expansionary fiscal and monetary policy and enthronement of market forces as the policy of open trade progresses.

The model

The distributional impact of trade regime plays an important role in the assessment of the welfare costs. What are the instruments that could be used to alleviate or minimize the costs and what aggregate economics costs. While the effects on income and poverty are microeconomic issues, the issues of food security have strong macroeconomic linkage with trade regimes. Researchers have employed different methods to investigate the effects of different trade regimes on macroeconomics issues (Hoarrison and Hanse, 1999; Bayer et al., 1999; Pissarides, 1997)

In this study, we employed Computable General Equilibrium (CGE) to model the effect of trade regime on

food security in Nigeria. We commenced by taking a look at the factors of food security and used external sector variable as shifters. The factors are availability, access and use.

Availability index

$Q = f(q^{dd,}, q^{m})$

where Q = total quantity of food requirement which is also a function of import aggregation and export transformation, q^{dd} = domestic output of food requirement, q^{m} = imported component of food requirement, A_o = is the externality parameter (latreitte and Varaudaki, 1996).

This is defined as:

Q = F (M, q^{dd}) – import aggregation function, X = F(E, q^{ds}) – Export transformation function.

Accessibility index

$C^{p} = f_1 (M^{p}, D^{p})$ consumer price, $X^{p} = g_1(E^{p}, D^{p})$ producer price; $M^{p} = K^{m}$ average import prices of food; $E^{p} = = K^{e}$ average export prices of food; $M/q^{dd} = f_2 (M^{p}, D^{p})$ imports demand function; $E/q^{ss} = g_2 (E^{p}, D^{p})$ export demand function; M, E = imports ; Export, q^{dd} = imported component of food requirement; q^{ss} = domestic supply of food; Demand − Supply = Equilibrium; $^{m}M - {}^{e}E = B$ = net capital flow; ^{m} = world prices import, ^{e} = world prices import; M^{p} = domestic price of import; M^{e} = domestic price of imports,

Utilization index

$U = f_3 (N_t)$

where $N_t = f_4$ (C, P andT), C= carbohydrate, P = protein, T = fat and oil.

From the aforementioned definitions, a summary of the estimable equations are obtained and outlined under as follows:

1. Total food requirement

$Q = {}_0 + {}_1 q^{d}_t + {}_2 q^{m}_t + {}_t$

2. Imports transformation function

$I = [{}_0 + {}_1 M_t + {}_2 q^{dd}_t + {}_t$

3. Export transformation function

$E = {}_0 + {}_1 E_t + {}_2 q^{ds}_t + {}_t$

4. Consumer price determination function

$C^{p} = {}_0 + {}_1 k^{m} + {}_2 k^{e} + {}_3 X^{p} + {}_t$

5. Imports demand function expressed in terms of export demand

$M/q^{dd} = {}_0 + {}_1 k^{m} + {}_2 k^{e} + {}_3 E/q^{ds} + {}_t$

6. Net food balance

$B = {}_0 + {}_1 {}^{m}M - {}_2 {}^{e}E + {}_t$

DATA, MEASUREMENT AND ESTIMATION

The data for the study were obtained from the two principal sources: The CBN and the FOS. The data covered the period 1981 - 1985, the period of trade restriction and 1986 - 2003, the period of open trade regime and covers the period for which reliable data are available. The total food available is measured in terms of the domestic food production and imported quantity. The domestic food price is measured in terms of average composite consumer price index. The exchange rate is measured in terms of the parallel market premium because it reflects the excess demand for tradable and for foreign assets that are not met by the official forex market. The more controls there are on the official forex market the larger is the premium on the parallel market exchange rate, because the larger will be the excess demand for tradable. The premium is therefore related to variation in the trade restrictions or openness (Garba and Usman, 2005).

The nature of time series data induced this paper to characterize the time series property of the variables in the model. In this connection, the Augmented Dickey- Fuller (ADF) and the Philips-Perron (PP) tests were employed. The test performed considered both the null hypothesis of a random walk with a constant drift and a random walk with a constant drift and trend term. In general, the results of these tests indicated that while some variables were integrated of order one I (I) some were of order zero I (0). The results further confirmed that differencing once was all that was required to bring these variables to stationary. It could therefore be concluded that these variables have unit roots. The estimation results are presented in the Table 4.

The regression result and structural estimation

The model presented above was estimated with both linear and non-linear techniques using the Econometrics View (Eveiw) 6.0. Where necessary a lagged dependent variable was included as a regressor. This was necessary for the purpose of dynamism, which characterized the time series data. Besides, the study involves agricultural production, which normally requires some time lag. The results of the regression are hereby reported below.

Regression result (1981 to 1985)

In the bid to avoid the econometric problem that may arise from small sample, for
1981 – 1985, we employed quarterly data and as such
we had 20 observations giving us (20-n) degree of freedom.

Equation 1. Total food requirement:

$$Q_{TF} = 42.3 + 0.945 q^{st}_{d} + 0.090 q_{m}^{dd} - 0.045\ Q_{TFt-1}$$
$$(21.4)\quad (3.040)\quad (0.209)\quad (0.010)$$
$$R^2 = 0.993 \qquad DW = 2.00 \qquad F = 52.96$$

Table 4. Unit root test for the variables in first difference.

Variable	ADF-test		PP-test		Remark
	Untrended	Trended	Untrended	Trended	
Exchange rate	-1.05411	-1.25823	-1.056001	-1.76379	1(0)
Net capital flow	-4.914201	-4.93081	-6.77289	-6.75186	1(0)
Food import	-0.24005	-2.61479	0.38747	-1.92718	1(1)
Food export	-2.51444	-2.04284	-0.10704	-1.90946	1(1)
Net food export	-5.32813	-5.39584	-5.24711	-5.32709	1(0)
Price of import	2.51444	-2.04284	-0.10704	-1.90946	1(1)
World price of export	-3.57214	-3.48621	-3.94995	-5.90076	1(0)
CPI	5.89107	4.401478	-6.69522	-5.72275	1(0)
Critical values levels (i) 1%	-3.6752	-4.3082	-3.6667	-4.2950	
(ii) 5%	-2.9665	-3.5731	-2.9632	-3.5671	

Authors data analysis 2005,*All data are expressed in logarithm.

Equation 2. Import Transformation Function:

$M_t = 15.02 – 0.283q_{mt}dd – 0.73\ q_{mt}$
dd (10.10) (2.001) (-4.099)
$R^2 = 0.988$ DW = 1.97 F = 57.44

Equation 3. Export transformation function :

$Ln\ E_t = 0.279\ LnE/q^{ss} – 0.538Ln.q_m dd$
(3.380) (-2.060)
$R^2 = 0.907$ DW = 1.95 F = 173.9.

Equation 4. Consumer price index:

$C^p{}_t = 0.020 – 0.283K^m{}_t + 0.327K^e{}_t – 0.316\ x^P{}_t$
(0.012) (1.923) (3.014) (4.112)
$R^2 = 0.971$, DW = 1.99 F = 162.4.

Equation 5. Import demand function:

$M/q^{dd} = 0.164 – 0.317K^m + 0.239K^e + 0.197\ /q^{ss}{}_d$
(3.011) (-4.231) (1.681) (4.110)
$R^2 = 0.997$ DW = 2.11 F = 68.77

Equation 6. Net food balance:

$B= 142.11 – 0.251\ ^m{}_m\ x\ 0.421^e$
(2.432) (-6.125) (2.425)
$R^2 = 0.894$ DW 2.31 F= 162.52 (Note:
T – statistics are in parenthesis)

Regression result (1986 – 2005)

Equation 1. Total food requirement

$Ln\ Q_{TF} = 1.37Ln\ q^{ss}{}_d + 1.62\ Ln\ q^{dd}{}_m + 0.091\ Ln\ Q_{TFt-1}$
(16.214) (10.113) (4.342)
$R^2 = 0.92$ DW = 1.99

Equation 2. Import transformation function:

$Ln\ M_t = -1.521\ Ln\ M^p{}_t + 0.179Lnq^{dd}{}_{mt}$
(-3.274) (7.451)
$R^2 = 0.943$ DW = 1.98 F = 132.31

Equation 3. Export transformation function:

$Ln\ E_t = 0.535Ln\ E_t – 1.270Ln\ q^{ss}{}_t$
(1.231) (-2.344)
R2 = 0.98 DW = 2.161 F = 47.65

Equation 4. Consumer price index:

$Ln\ C^p{}_t = 1.033Ln\ K^m{}_t + 0.069Ln\ ^K e_t + 0.158Ln\ X^P{}_t$
(6.432) (1.542) (4.012)
$R^2 = 0.96$ DW = 2.03 F = 68.92

Equation 5. Import demand function:

$Ln\ M/q^{dd}{}_m = 0.935Ln\ K^m – 0.053Ln\ K^e - 1.404Ln\ E/q^{ss}{}_d$
(4.213) (2.334) (3.221)
$R^2 = 0.892$ DW = 1.84 F = 48.65

Equation 6. Net food balance:

$Ln\ B_{Ft} = 0.994\ Ln_m\ M – 0.79Ln\ ^e E$
(3.224) (-1.324)
$R^2 = 0.86$ DW = 2.16

DISCUSSION OF THE RESULTS

There are six equations, five of which are behavioural while one is the equilibrium condition. The equation are estimated for two distinct trade regimes 1981 to 1985 wherein we have a regulated restriction trade regimes and 1986 to 2005, when the economy operated an open trade regimes. The Equation 1 for 1980 to 1985 is a model of total food requirement (Q_{TF}). This is composed of domestic food supply ($q^{ss}{}_d$), the imported food component ($q^{dd}{}_m$) and lagged value of the dependent variable. The model showed a general good fit as indicated by the inferential statistics. All the parameters are statistically significant except the intercept term of consumer price model. The domestic food supply

accounted for about 95% of the total food requirement and only 9% of the total variation in total domestic food requirement is accounted for by the imported food components and about 4.5% of the total variation in the domestic food requirement is accounted for by the lagged dependent variable. The implication of this result is that for the period under review the domestic production does not give room for insecurity.

Equation 2 is the import transformation function. The negative intercept terms show that import represents a withdrawal from the economy. All the variables are significant at 95% confidence level. The coefficient of domestic price of imports (Mtp), accounted for about 74% of the total important transformation. It is the valuation of the food imports in terms of the domestic price of imports. The magnitude of the coefficient is not in anyway surprising as it reflects the exchange rate in the unofficial forex market and which in turn reflects the excess demand for foreign exchange that could not be met by the official exchange rate. The coefficient of $q_{mt}^{dd,}$ which stood at –0.283, indicates the magnitude of import demand for food. It is indicative of the size of imports. This though small does not signify non-importation of food. Over all the equation has a good fit a 0.988 and Durbin-Watson statistics of 2.07. This is not to be a surprise because it is possible for the Mpt to granger cause qmtdd but not vise visa. This probably accounted for the value of Durbin-Watson statistics of 1.97 showing a slight positive collinearity.

Equation 3 is the export transformation function. The intercept terms in this function is not significant, so, it was suppressed. The export transformation is expressed as a logarithms function of export demand (E/q^{ss}_d), (which is the ratio of the total food export to that of domestic food supply (q^{ss}_d) and that of imported component of food requirement. The coefficient of E/q^{ss}_d shows that about 27.9% of the total variation in export is accounted for by (E/q^{ss}_d) for the period under review. The variable (q^{dd}_m) representing food import (q^{dd}_m) is though significant is inversely related to the export transformation. This statistics implies that the amount of export that had to exchange for food is grossly skewed against the economy, as more export has to be put in place to obtain a small amount of food imports for the period. The elasticity of transformation is -0.54.

Equation 4 is the consumer price index, which is a function of the average world price of import (K^{m}_t) and the average domestic prices of export (K^{E}_t) and inversely related to domestic product prices. There are two variables that demonstrate a positive effect on the price index. But for the period under review, the average world price of import does not have a significant effect on the consumer price index. It however, accounted for only 28.3% variation in the consumer price index. The average world price of export accounted for about 32.7% variation in the price index while domestic producer prices accounted for 32% of the total variation. These statistics is an indication of absence of imported inflation during the period. Equation 5 states the import demand for food. About 32% of the change in food import demand is accounted for by the trade weighted world price of imports, while the weighted world price of export explains about 24% of change in the food import and the ratio of export to the domestic food supply accounted for only 19.7%. This result further reinforces the claims that food import represents a small proportion of the food requirement.

Equation 6 is the balancing equation to depict the situation in which the food requirement will be in a state of equilibrium. The next food balance is explained by price weighted import and export price weighted domestic food supply. All the variables are significant and both accounted for variation in the net food balance. The result obtained is similar to the once already reported above with food import and export accounting for 95.1% and 42.1% respectively. This period attest to the sweeping claims that for the period 1980 to 1985, when a regime of trade restriction was in force, the economy was food secured. The value of food imports accounted for about 25.1% variation in the net food balances while domestic food supply accounted for 42.1%. The value of food import though negatively signed is also found to be insignificant. This is an indication of net food surplus for the period under review.

The result for 1986 to 2005

These set of equations reported here are estimated on the incremental values. This is to enable us to determine the effect of policy change on annual basis for the period. The log-linear form of the equations is reported because they show better fit than the ordinary linear form. The parameter therefore expresses the relative elasticity's. All the equations here are expressed in log-linear function because of our inability to determine the exact relationship. The estimates of the respective parameters represents the estimates of the elasticities of the variables are incremental values.

The incremental food requirement (Equation 1) is food import elastic. This is found to be more elastic than incremental domestic food supply. The lagged value of the exogenous variable are included to serve as the adjustment or shift factor. In absolute term, the import component of total food requirement (1.622) is larger than that of the domestic food supply (1.37). The import transformation function (equation2) measures the change in the import that is accounted for by change in the domestic price of imports and import component of food requirement. The Ln M^{p}_t is more elastic than that of Ln q^{dd}_m and accounting for 0.521 of the total variation in incremental imports. The inclusion of the lag exogenous variable accounted for the value of DW statistics of 1.99.

The export transformation function, (Equation 3) also

meets the priori expectation. The parameter is rightly signed and shows that the Ln E_{tt} is Ln q^{ss}_{d} elastic. This indicates that a unit increment in export will be accounted for by 1.53 changes in average export of food holding the domestic food supply constant. The domestic food supply is inversely related to the Export. This implies that a unit increase in E_t will account for about 1.27 increases in Ln q^{ss}_{d}. This can be interpreted to mean that the probability that decline in domestic food supply will be account for by a unit change in export is 1.27%. The economics of this result is an indication that a unit increase in export of food will lead to more than proportionate seduction in domestic food supply. The advent of open trade, which encourages export of food from a net food importer as, indicated by Equations 1 and 2 has the tendency to further reinforced the food insecurity. This is demonstrated by Equation 3 as analyzed above.

The consumer price index as shows by (Equation 4) measures the relative change in world price of food imports to the tune of over 100% while the world price of food export accounted for only 69% change in the consumer price Index. The producer prices marginally accounted for about 15% of the change in the consumer price index. This can be taken to be an evidence of imported inflation, occasioned by food importation, which characterized the regime of open trade.

Equation 5, which is the equation of interest express the demand for food import as a function of weighted average world price of food import, the weighted average world price of food export and food export demand from Nigeria. The weighted average world price of food import accounted for about 93.5% of the change in food import demand. This is by far a large proportion of the total food requirement and which signifies the relative importance of that source in the economy. The weighted average world price of food export is not only negatively related to the demand for food import but also statistically insignificant. The weighted average world price of food export accounted for about 5.3% change in food import demand. This is interpreted as indicating that food import price policy may have induced undue reliance on food importation. This observation was better captured by the equation on net food balance. The change in food import, which is positively related to net food balance accounted for about 94.9% change in food requirement while the change in food export accounted for about 4.11% change in food balance.

CONCLUSION AND RECOMMENDATION

The data available to this study showed that Nigeria had fully complied with the policy of open trade through adoption of the structural adjustment program. However, reforms in the agricultural sector still remained constrained by both trade and non-trade factors. The trade policy during the 1986 to 2003 did not impact on the development of the agriculture sector and major policy efforts did not address the fundamental problem of food production.

The results obtained in this study suggest that the capacity to develop appropriate apparatus for equitable food production and distribution in the face of globalization is weak. This is evident from the experiences obtained from the two regimes. This is a testimony to the failure of policy, given the nation's economic fortune, available land, abundant rainfall, vast water resources and favourable weather devoid of vagaries of seasonal misfortunes. It is in this context that the following recommendations become very necessary:

(i) In general it is important that developing countries and indeed Nigeria should seek greater concessions in the next trade round in the use of support measures and effective implementation of agreements on agriculture.
(ii) Nigeria should adopt a tactical implementation of agreements on agricultural reforms and in particular food policy. This may take the form of:

(a). Identification and empowerment of large target farmers as strategic food growers.
(b). Because of the prevalence of smallholders, an agricultural technology revolution, which takes cognizance of size peculiarity, becomes necessary.
(c). Address the problems of post-harvest storage and provide incentive for technological development in the agro industry. By this the producers of import substitutes will be protected.

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