

Macroeconomic Environment and Agricultural Sector Growth in Nigeria

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Abstract: Several macroeconomic policies have been used in Nigeria, which have directly and indirectly influenced agricultural output growth. This paper assesses the macroeconomic policies adopted in Nigeria and the effect of these policies on agricultural output growth overtime. The results show that the country's exchange rate regime has not encouraged agricultural export lately. Although credit to the sector had no significant effect on agricultural output growth, its availability greatly depends on how high the nominal interest rates are. On the whole, macroeconomic policies that reduce inflation, increase foreign private investment in agriculture, introduce favorable exchange rates, make agricultural credit to have significant effect on agricultural output growth would be invaluable in fortifying government expenditure in the sector and ensure agricultural output growth in Nigeria.

Key words: Macroeconomic environment • Agricultural output growth • Nigeria

INTRODUCTION

In Nigeria, the agricultural sector has been invaluable in supporting economic growth and development since 1960. In fact before the discovery and exploration of petroleum, the Nigerian economy depended on funds generated from agricultural export expansion for the development of other sectors of the economy. Due to its important role in nation building, the agricultural sector has continued to be a target of government policies overtime.

Efforts to fortify the Nigerian agricultural sector have a long history. At independence in 1960, the first task of government was the development of high level manpower resources [1]. This was in addition to funding agricultural research and extension activities, farm settlement schemes, plantation agriculture, cattle ranches and irrigation project. In 1971, government established the agricultural research council and introduced the National Accelerated Food Production Program in 1973. Between 1974 and 1980 government embraced the direct food production policy, introduced the model farms, the Nigerian Grains Production Company, the Nigeria Root Crop Production Company, the Naiwa Mechanized Farm Limited, the Nigerian Dairy Company Limited and the Nigerian Poultry Production Company. Also, government established the Department of Agricultural Cooperatives, provided support to the small farmers and commenced the

pilot phases of the Agricultural Development Project, established the Agricultural Project Monitoring and Evaluation Unit to monitor agricultural project of government and established new research institutes. Other programmes introduced to fortify the sector were the Strategic Grains Reserve Program, the Operation Feed the Nation, the River Basin and Rural Development Authorities, the Land Use Act, the Green revolution program and the Federal Agricultural Coordinating Unit [2]. By 1986 government deemphasized the direct food production policy and adopted an integrated approach that combined agricultural with rural development. As a result of this new agricultural development thrust, government established the Directorate for Food, Road and Rural Infrastructure to construct and maintain feeder road. However, by 1988 government agricultural policy thrust was directed at providing support services while all aspects of agricultural production and marketing including input supply as well as agricultural mechanization were to be handled by the private sector [2]. To enhance the provision of the support services in all parts of the country, government established the Agricultural Development Projects in all state of the federation and established the National Agricultural Land Development Authority. With the growth in the number of government agricultural development programmes, one expected meaningful agricultural output growth, positive change in farm sizes and general development in the

sector over time. Unfortunately the index of real agricultural sector GDP shows complete absence of any substantial growth. For example, the growth rate in real GDP of agriculture between 1981 and the year 2005 fluctuated between -13 and 65.13. Table 1 shows the growth rate in real agriculture GDP. According to this table, the growth rate in real GDP agriculture was positive in 1982, between 1987 and 2003 and negative by 1983 to 1986, as well as 2004 and 2005.

On the other hand, the index of real GDP for agriculture fluctuated from 100 in the base year to 98.44 in 1986, from 136.35 in 1987 to 141.37 in the year 2000, increased steadily to 165.13 in the year 2003 and then dropped to 71.79 by the year 2005.

Usually several factors can be said to be responsible for the dismal performance of the Nigerian agricultural sector. Pre-eminent among these factors is the macroeconomic environment. The macroeconomic environment comprises fiscal, monetary, exchange rate, income and other policies that are used to regulate production activities not only in the agricultural sector but in the other sectors of the economy. Unfortunately, macroeconomic policy outcomes vary greatly depending in part on the policy targets and instruments used [3]. However, several authors [4-6] agree that agricultural production marketing and financing decisions are influenced by the macroeconomic environment. More so, Garba [7] and Akpokodje [8] confirm that major macroeconomic policy shifts heighten agricultural policy instability. This paper assesses the macroeconomic environment in Nigeria and analysis the effect of the macroeconomic policies on agricultural output growth over time.

MATERIALS AND METHODS

The Study Area: The study area is Nigeria. It has an area of 923,769 square kilometers and a population of about 88 million people. It is bounded on the West by the republic of Benin and the republic of Niger; on the East by the republic of Cameroon; on the north by Niger and Chad republics and on the South by the Gulf of Guinea. The climate is equatorial and semi-equatorial. There are two seasons; the wet and the dry season and agriculture is a major employer of labour.

Source of Data and Data Analysis: This study uses principally secondary data obtained from the Central Bank of Nigeria the Nigerian National Planning Commission. Existing literature indicate that prices, government

Table 1: Growth rate of real gdp-agriculture

Year	Index of real GDP Agric	Growth rate
1981	100.00	
1982	103.85	3.85
1983	96.20	-3.80
1984	90.59	-9.41
1985	100.13	-0.13
1986	98.44	-1.56
1987	136.35	36.45
1988	136.35	36.35
1989	105.30	5.30
1990	118.43	18.43
1991	122.71	22.71
1992	128.07	28.07
1993	132.39	32.39
1994	127.60	27.66
1995	131.19	31.19
1996	137.68	37.68
1997	143.18	43.18
1998	143.76	43.76
1999	143.33	43.76
2000	141.37	41.37
2001	159.08	59.08
2002	163.39	63.39
2003	165.13	65.13
2004	69.52	-30.48
2005	71.79	-28.21

Source: CBN Statistical Bulletin (Various issues)

expenditure in agriculture, volume of credit to the agricultural sector, nominal interest rate and exchange rate which are indicators of monetary, exchange rate and price policies determine activities in the agricultural sector [7,8]. Consequently, in this study, data on exchange rate, nominal interest rate, world prices, credit to the agricultural sector and government expenditure on the agricultural sector, inflation rate and foreign private investment in agriculture were obtained between 1970 and 2005 and used as indicators of the macroeconomic environment. The method of data analysis is the multiple regression analytical technique (Ordinary Least Square Procedure). The problem of autocorrelation and multicollinearity were aborted by the use of relevant econometric tests, namely; the Durbin Watson test, the F-test, the t-test and the coefficient of multiple determination.

The structural response function used by Fosu [9], Amin [10], Kwanashie *et al.* [5] and Umoh [11] were adapted and used in this study.

Consequently, the model postulates that the index of agricultural production is a function of the indicators of the macro economic environment, namely; foreign exchange rate (F), nominal interest rate (N), credit to the agricultural sector (A), world prices (W), government expenditure on agriculture (G), rate of inflation (L), foreign private investment in agriculture (P) and time (T).

Consequently, $Y = f(F, N, A, W, G, L, P, T)$

The implicit form of the model is given as:

$$Y = a + b_1 F + b_2 N + b_3 A + b_4 W + b_5 G + b_6 L + b_7 P + b_8 T + u$$

Where

- Y = Index of agricultural production
- F = Foreign exchange Rate
- N = Nominal Interest rate on loans
- A = Credit to Agricultural sector in Naira.
- W = World Prices of agricultural produce in Naira per tone
- G = Government Expenditure in Naira
- L = Inflation Rate in Percentage
- P = Foreign private Investment in Naira
- T = Time trend representing technological change overtime.
- a = Intercept;
- $b_1 - b_8$ = Coefficients,
- u = Stochastic disturbance term.

RESULTS AND DISCUSSION

Many macroeconomic policy strategies have been tried in Nigeria in an attempt to meet the objectives of diversifying the production and support base away from dependence on petroleum, among other things. In particular several efforts are identifiable in the area of exchange rate, fiscal, income and monetary policies. For instance, the exchange rate policy adopted as many as three strategies, namely; pegging of the Naira exchange rate to the Dollar; the dual exchange rate regime of 1995 to 1999 and allowing the exchange rate to be determined by forces of demand and supply. The fiscal policy strategies adopted in Nigeria so far included the introduction of value added tax to replace sales tax, the abolition of excise duties, regulation of custom and excise tariff from time to time and the retention of tariff concession granted to the transport sector, among others. Similarly, the strategies of the income policy have included wage freeze of 1976/77,

7% wage increase of 1977/78, increase in minimum wage and allowances of 1980, among others. Apart from these, the Structural Adjustment Policy (SAP) introduced in 1986 set in motion a stream of reforms that completely reversed the effect of the macroeconomic environment on many sectors of the economy. The reforms of the SAP used several policy instruments. First, there was a recall of Naira counterpart of outstanding external payment arrears to the Central Bank of Nigeria, second, there was increase in permissible credit expansion in 1988, third, there was increase in commercial bank cash ratio requirement which started in 1989, fourth, there was also the introduction of cash ratio requirements for merchant banks and raising of the liquidity ratio of commercial banks from 25 to 30%, fifth, there was the lifting of credit ceiling for healthy banks and increase of minimum cash reserve requirements of banks from 3 to 6% in September 1992. On the whole, during SAP, efforts were made to strengthen bank supervision and new banking standards were introduced minimum capital was increased, special interest on agricultural loans was abolished and subsidy on agricultural inputs were removed. In the post SAP period, more macroeconomic policies were introduced which brought about more financial reforms. As a consequence of the new policies a number of micro credit programmes have been introduced, government merged the Nigeria Agricultural Cooperative bank, the Peoples bank and the Family Economic Advancement Program to form the Nigerian Agricultural Cooperative and Rural Development Bank in the year 2000. By the year 2004 the minimum capitalization of banks was raised to twenty five billion Naira, all public sector funds were withdrawn from commercial banks and mergers as well as acquisitions were allowed as a means of consolidation of banking institutions. Also, community banks were converted to micro finance banks and their minimum capitalization was raised to a minimum of twenty million Naira of shareholders fund unimpaired by losses [12].

Unfortunately, existing data suggest that the macroeconomic environment created by the macroeconomic policy strategies were not agricultural sector friendly. For example, the exchange rate regime has not resulted in any meaningful export of agricultural produce over time. For example, Table 2 shows that between 1982 and 1993 agricultural export was only 2.71 percent of the total export, on the average; the yearly percentage of agricultural output in the entire export was highest in 1988 (6.3%) and lowest in 1992 (1.2%).

The proportion of agricultural export in the entire export increased from 2.02% in 1982 to 3.58% in 1983 and

Table 2: Percentage of agriculture in total export

Year	Agric export (%)	Other export
1982	2.03	97.97
1983	3.58	96.42
1984	2.62	97.38
1985	2.08	97.92
1986	4.90	95.10
1987	2.95	97.05
1988	6.35	93.65
1989	2.11	97.89
1990	1.71	98.29
1991	1.31	98.69
1992	1.20	98.80
1993	1.7	98.30
Mean Exchange	2.71	97.29

Source: CBN Statistical Bulletin (various issues)

Table 3: Maturity structure of commercial bank loans (1980-1996)

Year	Percentage of loans that mature in one year	Percentage of loan that mature after five years
1980	78.38	4.86
1981	68.59	6.01
1982	78.70	5.70
1983	81.40	2.00
1984	79.36	5.51
1985	82.08	5.00
1986	81.96	4.70
1987	80.82	4.50
1988	83.31	3.90
1989	46.92	2.33
1990	82.01	5.30
1991	82.31	4.87
1992	82.66	5.84
1993	83.11	5.33
1994	84.40	4.59
1995	83.96	4.72
1996	83.00	5.00

Source: CBN Stat. Bulletin [13,14]

Table 4: Mean Volume of Credit to Agricultural Sector in real terms

Year	Mean volume of credit to Agricultural (Million Naira*)
1970-1974	1.25
1975-1999	4.91
1980-1984	12.34
1985-1989	16.21
1990-1994	14.72
1995-1999	15.45
2000-2005	42.45

Source: CBN Statistical Bulletin (various issues), *120 Naira = 1 US dollar

then declined to 2.08% by 1985. In 1986 when SAP was introduced the percentage of agriculture in the entire Nigerian export increased to 4.90% and then gyrated to 6.35% by 1988 and then declined steadily to 1.20% and 1.70% in 1992 and 1993, respectively.

More so, the macroeconomic environment culminates in the financial sector giving mostly short term loans. This is evident from the distribution of loan maturities in the economy. According, to Table 3 over 68% of the commercial bank loans had loan maturities of one year or less between 1980 and 1988. By 1989, only 46.92% of the loans had maturities of one year and less, but beginning 1990, over 80 percent of commercial bank loan to the economy had maturity of within one year. Loans with short maturities are mostly operating loans, which are inadequate for the acquisition of intermediate and fixed assets that are invaluable in improving the capital base of the sector.

Besides, an assessment of credit to the agricultural sector in Table 4 shows that between 1970 and year 2005 the real credit to agriculture was consistently low.

It was 1.25 million on the average between 1970 and 1974, 4.19 million Naira on the average in 1975-1979; 12.34 million on the average from 1980 to 1984; 16.21 million Naira in 1985 to 1989; it was 14.72 million on the average in 1990-1994; 15.45 on the average in 1995-1999 and moved to 42.45 million in the year 2000-2005.

Effect of the Macro Economic Policies on Agricultural Output Growth: The effect of these macroeconomic policy strategies on the agricultural sector is captured in the following regression equation.

$$Y = 70.06 - 0.14 ER + 1.11 NR + 9.89 AC + 4.23E - 0.03WP + 9.02 E - 0.05GE$$

$$t = 6.38^* \quad t = -1.86^{***} \quad t = 2.52^{**}$$

$$t = 0.19 \quad t = 2.841^* \quad t = 2.241^{**}$$

$$- 0.155INFR + 3.38E - 0.02 FPN - 0.45T$$

$$t = -1.26 \quad t = 3.672^* \quad t = 0.90$$

$$R^2 = 96\%; \text{ Adjusted } R^2 = 94\%$$

ST. Error 9.68; F. Value 72.043* Durbin Watson = 1.741.

This result shows that the explanatory variables explained 94 percent of the total variables in the index of agricultural production, all the explanatory variables were

collectively relevant as evident in the F – statistic being significant 1% level and the Durbin Watson statistic is plausible. However, credit to the agricultural sector, inflation rate and technology changes were not significant in their effect on the index of agricultural output whereas the exchange rate regime, nominal interest rate, world prices, government expenditure and foreign private investment in agricultural were significant in their effect on the index of agricultural output. It is also clear from the regression analysis that exchange rate is negatively related to the index of agricultural production. Consequently, at favorable exchange rates, more agricultural outputs would be produced.

Against the apriori expectation, the nominal interest rate is positively related to the index of agricultural production. This implies that at higher nominal interest rate, more credit facilities are made available to the operators of the Nigerian agricultural sector; but at lower nominal interest rate, credit facilities are no more widely available. The index of agricultural production is also positively related to world prices of Nigerian major agricultural commodities. This implies that better world prices would enhance agricultural output growth. Similarly, the index of agricultural production was positively related to government expenditure on agriculture and had no significant effect on agricultural output growth. Consequently, more government investment would greatly enhance agricultural output growth. The index of agricultural production is negatively related to the level of inflation, implying that as inflation becomes high the index of agricultural production declines. Foreign private investment in agriculture is positively related to the index of agricultural production whereas technology is inversely related. This confirms that the level of technology used in the Nigerian agricultural sector has been grossly inadequate.

CONCLUSION

An intuitive appeal of the salient points of the theories of economic growth clearly indicates that sustained growth in per capita agricultural output is possible through capital accumulation and technical progress, among other things. More so, the theories of agricultural development, particularly, the High- pay-off-input theory emphasizes that sustained agricultural output growth can be achieved by applying high pay-off inputs as well as new technologies like improved planting materials, fertilizer, irrigation facilities, improved livestock species and motorized equipment. This study confirms

that the technological progress is limiting, as well as credit to the agricultural sector. Invariably the macroeconomic environment has not been able to support the operators of the agricultural sector to acquire high-pay-off-inputs that are invaluable in improving the capital base of the agricultural sector. Intermediate and fixed assets make up the capital base of the farm business and contribute significantly to the size of the farming operation. Therefore their acquisition is important to the growth and development of the agricultural sector and access to external financing would be invaluable in accelerating the growth process. In view of these, macroeconomic policies that enhance favorable exchange rates, make agricultural credit widely available at low interest rate, reduce the rate of inflation, increase foreign private investment in agriculture, would not only fortify government investment in the sector but would be invaluable in supporting agricultural output growth in Nigeria.

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