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IMPACT OF AGRICULTURAL PRODUCTIVITY ON EMPLOYMENT GENERATION IN NIGERIA, 1986-2011

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Abstract:
The paper investigated the impact of agricultural productivity on employment level in Nigeria for the period 1986-2011. The variables employed in this study include unemployment growth rate, government expenditure on agriculture, government expenditure on education (proxy for human capital), index of agricultural production and foreign direct investment on agriculture. A vector autoregressive was employed after stationarity and co-integration tests were conducted on the variables. The empirical results reveal that long run relationship exists between unemployment growth rate and the other variables. The results further reveal that current level of unemployment is only significantly responsive to its one year lag. However, the impact of unemployment (lag 2), government expenditure in agriculture (lag 2), government expenditure in education (lag 1) and index of agricultural production (lag 2) on unemployment is negative while government expenditure on agriculture (lag 1), government expenditure in education (lag 2), index of agricultural production (lag 1) and foreign direct investment in agriculture (lag 1 and 2) exhibit positive impact on unemployment. The paper recommended that appropriate agricultural policy should be put in place that will make the sector to play its vital role which it use to be in 1970s as the sector is a potential source of employment generation.

Key Word: Agricultural Productivity, Employment Generation, Government Policy, Co-integration and Vector Autoregressive.

Introduction

Agriculture has been an important sector in the Nigerian economy in the past decades, and is still a major sector despite the oil boom. Basically it provides employment opportunities for the teeming population, eradicates poverty and contributes to the growth of the economy. In the 1960s, agriculture contributed up to 64 percent to the country's gross domestic product (GDP) but gradually declined to 48 percent in the 70s and further declined to 20 and 19 percent in 1980 and 1985 respectively, a development attributable to the oil glut of the 1980s (Ukeje, 2003). Nigeria operated a mixed economy at independence in 1960 when her prospect for economic growth was heightened by the dependence on both oil and agriculture. Farming, livestock production, forestry and fishery contributed more than 66 percent of the country's GDP. At the same period, the country was the world's largest exporter of groundnut and palm produce and the third largest producer and exporter of cocoa. The diversity of these natural resources gave each

region a mark of identity. For example, palm produce was largely grown in the East, cocoa in the West and groundnut in the North.

In sub-Saharan Africa (SSA), agriculture occupies a prominent position in the national economies, as the sector serves as a key driver of growth, wealth creation, employment as well as poverty reduction. It is also the leading economic activity in the continent which contributes between 20 and 30 percent of its GDP. In an agrarian economy like Nigeria, the land as a unit for agricultural production provides the needed requisite upon which a sustainable development would blossom. With a population that is largely agrarian, agriculture has traditionally been the main sources of livelihood for the people. It employs over 70 percent of the population and provides the major source of raw materials for the agro-allied industries and acts as potent source of the much needed foreign exchange (Okunmadewa and Olayemi, 1999). However, over the years, the sector has witnessed rapid decline in its role and contribution to national development as it is been abandoned in pursuit of the black gold. This situation started with the oil boom which led to the rapid decline of the agricultural sector. Consequently, Nigeria became a major importer of agricultural products as against its earlier position as a major exporter. This led to a decline of the economically active population in agriculture in Nigeria as well as an increase in the level of unemployment in the region.

The oil boom brought about a distortion in the labour market which in turn produced rippling adverse effects on the production levels of both food and cash crops. Government had paid farmers low prices over the years on the food for the domestic market in order to satisfy urban demands for cheap basic food products. This policy, in turn, progressively made agricultural work unattractive and enhanced the lure of the cities for farm workers. Collectively, these developments worsened the low productivity, both per unit of land and per worker, due to several factors namely: inadequate technology, poor transportation, and environmental degradation, infrastructure, and trade restrictions. As food production could not keep pace with its increasing population, Nigeria began to import food. It thus lost its status as exporter of such cash crops as cocoa, palm oil, and groundnuts (Ogbalubi and Wokocha, 2013). However, efforts been made since late 1970s to revive agriculture so as to make Nigeria food self-sufficient again, generate employment and increase the export of agricultural products have not yield meaningful results.

Since the beginning of 1980s, the economic position of Nigeria has worsened seriously. The per-capita income fall considerably and wage employment has declined (NISER, 1993). On social grounds, the entire society is characterized by high rate of indiscipline, ethnic and religious tensions, marginalization of the vast majority, high rate of unemployment, a week production base, a high rate of crime, wide-spread corruption, wastefulness and mismanagement, rural decay and urban dislocation and the likes. Today, Nigeria is ailing economically not because she is not richly endowed with natural resources, but due to low industrial capacity utilization and dependence on the imported input for the existing manufacturing industries. The external value of naira suffered a severe decline and the rate of inflation is remarkably high. Thus, the question of whether the agricultural sector can absorb the large pool of labour force made redundant or economically insecure in the sector and provide basis for renewed growth have now become the central issues among economists. However, despite the increasing interest in this sector as a tool for actualization of sustainable growth and development, there seems to be dearth of research work in Nigeria. This is the research gap this study intends to fill.

The objective of this study therefore is to find out to what extent has the agricultural sector influenced employment generation in Nigeria. Thus, the paper is structure into five sections. Following the introduction, some relevant literatures were reviewed in section two. Section three discusses the methodology used in the study; the fourth section provides the results and discusses

Adefila and Adeoti (2004) investigated government funding of agricultural sector through annual budgetary allocation in Nigeria. The study which is mainly descriptive revealed that the impact of agriculture in the area of employment generation was enormous as it accounted for between 75 percent and 45 percent share of employment generation in the country between 1990 and 1999, respectively. The study further revealed that government funding of agriculture was rather too low between 1991 and 1998 as the budgetary allocation to agriculture in any particular year was never more than 5 percent of the total budget with the trough at 1.8 percent in 1994 and the peak of 4.2 percent in 1991. Ugwu and Kanu (2012) examined effects of agricultural reforms on the agricultural sector in Nigeria. The economic reform strategies were geared toward the achievement of food self-sufficiency and food security, generation of gainful employment, increased production of raw materials for industries, increased production and processing of export crops, rational utilization of agricultural technologies for the improvement of life of its citizens. The study found that agriculture contributed minimally during the period in terms of output, market, foreign exchange and capital formation or transfer as a result of policy instability, poor coordination of policies, poor implementation and mismanagement of policy instruments and lack of transparency.

Agricultural Development, Unemployment and Poverty Profile in Nigeria

Agricultural productivity can be defined as the index of the ratio of the value of total farm output to the value of the total inputs used in the farm production. Production efficiency means the attainment of production goals without waste. Efficiency is an important factor of productivity growth specifically in developing economies like Nigeria where resources are meager and opportunities for developing and adopting better technologies are limited. Failure to achieve rapid growth in agricultural productivity can result either in drain of foreign exchange or a shift in internal terms of trade against industry and this has seriously impede the growth of industrial production and thus unemployment in Nigeria (see table 1).

Table 1: Unemployment Rate and Index of Agricultural Production in Nigeria

Year	2006	2007	2008	2009	2010	2011
Gen Unemployment Rate	12.3	12.7	14.9	19.7	20.6	23.9
Index of Agric Production (1990=100)	200.1	212.8	226.7	242.1	255.9	270.6

Source: NBS (2012) Report

Today, unemployment rate in is spiraling, driven by the wave of 4 million young people entering the workforce every year with only a small fraction able to find formal employment. The general unemployment rate increased from 12.3 percent in 2006 to 23.9 percent in 2011 (Table 1). Information from World Bank revealed that youth unemployment is thrice the general unemployment. The problem becomes so burdensome that His Excellency, President Goodluck Jonathan affirmed that "*Unemployment among our youth is one of our biggest challenges. The time has come to create jobs and lay a new foundation for Nigeria's economic growth*" FGN (2011). The regional unemployment as shown in Table 2 shows that North Central (NC) region has the lowest unemployment rate. This clearly shows that agriculture has demonstrated an ability to solve the challenge of unemployment, based on the fact that the breadbasket region i.e. "North Central" has most of its population employed in the agricultural sector.

Table 2: Regional Unemployment Rate

Region	N/West	N/East	N/Center	S/West	S/South	S/East
Unemployment Rate (%)	29.0	20.0	9.0	15.0	18.0	18.0

Source: NBS (2012) Report

However, inadequate expenditure and or investment in the sector have not made it viable to generate employment as expected. Figure 1 shows the trend of unemployment rate and index of agricultural production in Nigeria and we can see that index of agricultural production lags behind unemployment rate during the review period. This is a worrisome dimension that needed urgent attention by all stakeholders.

Fig 1: Unemployment Rate and Index of Agricultural Production in Nigeria, 1986-2011

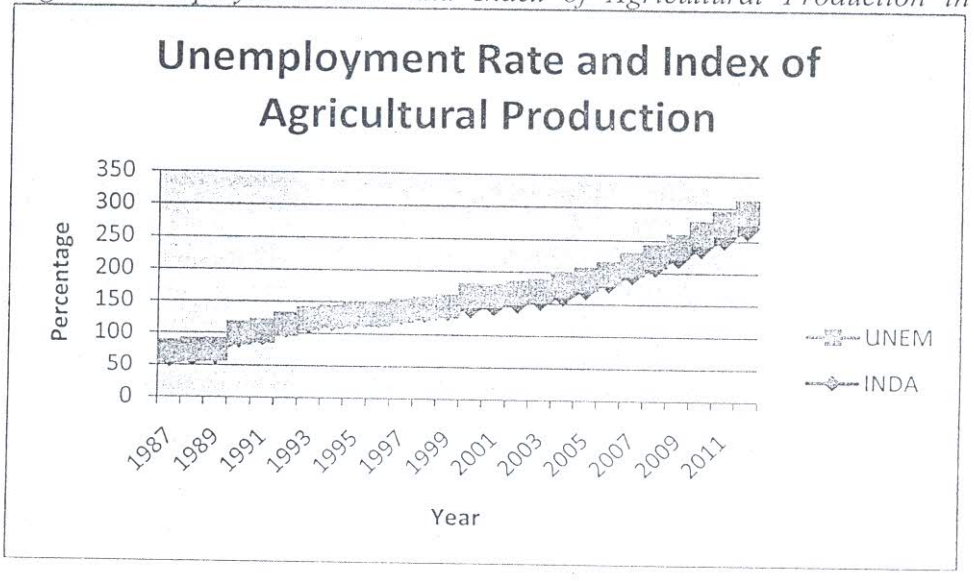


Table 3: Human Development Index, 1975-2005; Ranked Highest to Lowest in 2005

Rank	Country	1975	1980	1985	1990	1995	2000	2005
151	Zimbabwe		0.55	0.579	0.645	0.654	0.613	0.513
152	Togo	0.423	0.473	0.469	0.469	0.514	0.521	0.521
153	Yemen				0.402	0.439	0.473	0.508
154	Uganda			0.42	0.434	0.433	0.48	0.505
155	Gambia	0.29				0.436	0.472	0.502
156	Senegal	0.342	0.367	0.401	0.428	0.449	0.473	0.499
157	Eritrea					0.435	0.459	0,483
158	Nigeria	0.321	0.378	0.391	0.411	0.432	0.445	0.470
159	Tanzania				0.421	0.419	0.433	0.467

Source: CIA (2009), Segun, (2010) and Aiyedogbon and Ohwofasa (2012)

As observed by Garba (2006), the world's per capita income as of 2003 was $7,140. Comparing this to Nigeria's per capita income of $290 makes the country one of the poorest in the world. This relegated Nigeria to the ranks of Togo ($270), Rwanda ($220), and Mali ($210). In terms of the human development index (table 3), Nigeria is ranked 158th of the 159 countries surveyed in 2005 (CIA, 2009). Other indicators of development, such as life expectancy, for which Nigeria is ranked 155th out of the world's 177 countries, and infant mortality, for which Nigeria is ranked 148th among 173 countries, were consistent with Nigeria's low rank in income per capita (CIA, 2009).

Using selected world development indicators, the life expectancy at birth in 2006 for male and female in Nigeria was 46 and 47 years, respectively. Between 2000 and 2007, 27.2 percent of children under five years of age were malnourished. This is alarming compared to 3.7 percent between the same periods in Brazil, another emerging economy (Aiydogbon and Ohwofasa, 2012). These problems are anchored in low level of employment and inability of the agricultural sector to play its pivotal role.

Model Specification

The data used (1986-2011) were culled from the Central Bank of Nigeria, Statistical Bulletin (2010), and the various issues of Annual Report and Statement of Account. The growth rate of the data was modeled while the index of agricultural production is at 1990 level. The growth rate of unemployment used is because reliable data for employment is difficult to come by in Nigeria and most developing countries and Aiyedogbon and Ohwofasa (2012) have also employed similar data. Finally, the econometric package used is the Eview 4.0 P.C for window. The model is specified thus:

UNEM = f(GEA, GEE, INDA, FDIA)..... (1)

Where:

$UNEM_t$ = growth rate of unemployment at time t

GEA_t = Government expenditure in agriculture at time t

GEE_t = Government expenditure in education at time t (proxy for human capital)

IAP_t = Index of agricultural production at time t

FDIAt = Foreign direct investment in agriculture at time t

V = Error term

β_0 = Constant term

β_1-β_5 < 0, parameters to be estimated

It is expected that β_1-β_5 should have a negative correlation with unemployment. This means that an increase in any of these variables decreases unemployment and an increase in employment.

Vector Autoregressive (VAR)

The study utilized VAR model in order to evaluate the impact of unemployment on the macroeconomic variables employed in this study. VAR methodology is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. It allows each variable to be a function of its own past values as well as the past values of the other variables in the system. The VAR form of equation 2 is presented below:

Equation 2a

$$\Delta UNt = \sum_{i=1}^{n} b1t\Delta UNt - 1 + \sum_{i=1}^{n} c1t\Delta GEAt - 1 + \sum_{i=1}^{n} d1t\Delta GEEt - 1 + \sum_{i=1}^{n} e1t\Delta IAt - 1 + \sum_{i=1}^{n} f1t\Delta FDIAt - 1 + e1t$$

Equation 2b

$$\Delta GEAt = \sum_{i=1}^{n} b2t\Delta UNt - 1 + \sum_{i=1}^{n} c2t\Delta GEAt - 1 + \sum_{i=1}^{n} d2t\Delta GEEt - 1 + \sum_{i=1}^{n} e2t\Delta IAt - 1 + \sum_{i=1}^{n} f2t\Delta FDIAt - 1 + e2t$$

Equation 2c

$$\Delta GEEt = \sum_{i=1}^{n} b3t\Delta UNt - 1 + \sum_{i=1}^{n} c3t\Delta GEAt - 1 + \sum_{i=1}^{n} d3t\Delta GEEt - 1 + \sum_{i=1}^{n} e3t\Delta IAt - 1 + \sum_{i=1}^{n} f3t\Delta FDIAt - 1 + e3t$$

Equation 2d

$$\Delta IAt = \sum_{i=1}^{n} b4t\Delta UNt - 1 + \sum_{i=1}^{n} c4t\Delta GEAt - 1 + \sum_{i=1}^{n} d4t\Delta GEEt - 1 + \sum_{i=1}^{n} e4t\Delta IAt - 1 + \sum_{i=1}^{n} f4t\Delta FDIAt - 1 + e4t$$

Equation 2e

$$\Delta FDIAt = \sum_{i=1}^{n} b5t\Delta UNt - 1 + \sum_{i=1}^{n} c5t\Delta GEAt - 1 + \sum_{i=1}^{n} d5t\Delta GEEt - 1 + \sum_{i=1}^{n} e5t\Delta IAt - 1 + \sum_{i=1}^{n} f5t\Delta FDIAt - 1 + e5t$$

Where Δ is the first difference operator, e1t, e2t, e3t, e4t and e5t are random disturbances and n is the number of optimum lag length, which is determined empirically by Schwarz criterion (SC). For each equation in the above VAR, Wald $\chi 2$ statistics is used to test the joint significance of each of the other lagged endogenous variables in equations. Two results obtained from VARs that are useful for analyzing transmission mechanisms are impulse response functions and forecast error variance decompositions. The impulse responses tell us how macro variables respond to shocks in the policy variables, while the variance decompositions show the magnitude of the variations in the macro variables due to the policy variables

Unit Root Test

As most economic variables are non-stationary at their levels, when OLS is applied on these variables they provide spurious results. To avoid this problem unit root test of ADF is applied on these variables to make them stationary. Thus, Augmented Dickey Fuller test will be applied on these variables to check their stochastic properties. The simple AR (1) process is stated thus:

$$y_t = \rho y_{t-1} + \varepsilon_t \quad \text{.....(4)}$$

Where; y_t is a time series, ρ is parameter to be estimated and ε_t is the white noise error term. The ADF test is implemented after subtracting the term y_{t-1} from both sides of the equation.

$$\Delta y_t = \alpha y_{t-1} + e_t \quad \text{.....(5)}$$

Where Δ is the first difference operator and $\alpha = \rho - 1$. The null hypothesis is that H_0: $\alpha = 0$. If the hypothesis is accepted then the variables are non-stationary at their first difference. Higher order difference is required to make the variables stationary. When higher order lags are introduced in the above model then it will changed to the Augmented Dickey Fuller (ADF) model. The ADF assumes that y series is the AR (ρ) process.

$$\Delta y_t = C_t + \theta y_{t-1} + C_{zt} + \sum_{i=1}^{p} d1\Delta y_{t-1} + v_t \quad \text{.....(6)}$$

It can be estimated without including the trend term C_{zt} and intercept term C_1. If the calculated-ratio of the coefficient δ is lower than τ critical value from Fuller table, then it is said that y do not have unit root problem (Ullah et al. 2009).

Co-integration Test

Johansen co-integration test provides the long run relationship between the economic variables and the deepest idea for co-integration test is relevant to the functional form of the model. The co-integration approach was first commenced by (Engel and Granger, 1987). Later on, it was further advanced and changed by (Stock and Watson, 1988 and Johansen and Juselius, 1990). In this study, Johansen maximum likelihood (ML) approach is applied to examine the co-integration among variables. Two statistics i.e. trace test and the maximum Eigen value test are being used for checking co-integration vectors. Co-integration is applied when the following conditions fulfilled (1) All variables are non stationery at their level but integrated at same order. (2) There exists at least one linear relationship among these variables. The model of Johasen co-integration is described thus; The trace statistic for the null hypothesis of co-integrating relations is computed as follows:

$$\Gamma_{trace}(r) = -\tau \sum_{i=1}^{m} \log[1-\lambda_t] \quad \text{..........(7a)}$$

Maximum Eigen value static tests the null hypothesis of r co-integrating relation against r + 1 co-integrating relations and is computed as follows:

$$\Gamma_{max}(r, r+1) = -\tau \log(1-\lambda_{r+1}) \quad \text{..........(7b)}$$

Presentation of Results

Table 1 presents the unit root results for the variables employed in this study which include unemployment rate (UN), government expenditure on agriculture (GEA), government expenditure on education (GEE), index of agricultural production (IAP) and foreign direct investment in agriculture (FDIA). It can be seen that at level, all variables under the ADF test were non-statationary while only GEE was stationary under the Phillips-Perron (PP) test. However, at first or second differencing for ADF test and first differencing for PP test, stationarity was achieved for the variables at 1 percent confidence level.

Table 1: Results of Unit Root Test

Variable	Level	ADF Test	Mickinnon C.V	PP Test	Mickinnon C.V	Level
LUN	I(2)	-5.8809	-4.4415**	-5.5230	-4.3942**	I(1)
LGEA	I(1)	-5.6943	-4.4167**	-9.8282	-4.3942**	I(1)
LGEE	I(1)	-5.1064	-4.4167**	-5.0390	-4.3738**	I(0)
LIAP	I(2)	-16.5389	-4.4415**	-4.8121	-4.3942**	I(1)
LFDIA	I(2)	-5.6316	-4.4415**	-4.4370	-4.3942**	I(1)

Note:
** Significant at 1%

The results in table 2 show that co-integration exists for the series either at the trace or max-eigen value. For example, the trace test indicates 1 co-integrating equation at both 5 and 1 percent level while the Max-eigenvalue test indicates 1 co-integrating equation at the 5 percent level. This means that long run relationship exists between unemployment and the other macroeconomic variables.

Table 2: Results of Co-integration

Null Hypothesis	Alternative Hypothesis	Statistical Value	5 percent critical value	1 percent critical value	Eigen value
Trace Statistics					
$r = 0$	$r \geq 0$	85.3	68.5	76.1	0.81
$r \geq 1$	$r \geq 1$	47.1	47.2	54.5	0.60
Max-Eigen Statistics					
$r = 0$	$r = 1$	38.3	33.5	38.8	0.81
$r \leq 1$	$r = 2$	20.9	27.1	32.2	0.60

VAR Parameter Estimate

The results in table 3 show that the R^2s are robust as they range from 0.87 to 0.99 while the constant is statistically significant only for expenditure in agriculture. The results further reveal that current level of unemployment is only significantly responsive to its one year lag. However, the impact of unemployment (lag 2), government expenditure in agriculture (lag 2), government expenditure in education (lag 1) and index of agricultural production (lag 2) on unemployment is negative. On the other hand, government expenditure on agriculture (lag 1), government expenditure in education (lag 2), index of agricultural production (lag 1) and foreign direct investment in agriculture (lag 1 and 2) exhibit positive impact on unemployment. Apart from FDI in agriculture whose both lags are positive (meaning increase in unemployment or decrease in employment), other variables whose lags are both negative and positive suggest that they are potential sources of unemployment reduction in Nigeria.

In column three, current government expenditure in agriculture is significantly responsive to unemployment (lag 1) and government expenditure in education (lag 2). Similarly, current government expenditure in education is only significantly responsive to foreign direct investment in agriculture (lag 2). Finally, while current index of agricultural production is responsive to its own one year lag and FDI in agriculture (lag 2), current FDI in agriculture is only significantly responsive to its own lag 1.

Table 3: VAR Parameter Estimate
t-statistic in ()

Variable	LUN	LGEA	LGEE	LIAP	LFDIA
LUN(-1)	0.5320* (2.0)	0.9350* (2.3)	0.4375 (0.9)	-0.0112 (-0.9)	-0.0446 (-0.1)
LUN(-2)	-0.0791 (-0.3)	-0.4404 (-01.1)	0.3585 (0.7)	0.0171 (1.3)	-0.1746 (-0.6)
LGEA(-1)	0.1378 (0.6)	-0.4871 (-1.3)	0.2220 (0.5)	-0.0010 (-0.9)	0.0242 (0.1)
LGEA(-2)	-0.0062 (-0.0)	-0.5532 (-1.4)	-0.2344 (-0.5)	-0.0132 (-1.0)	0.2228 (0.8)
LGEE(-1)	-0.0852 (-0.4)	0.8327* (2.3)	0.1621 (0.4)	0.0110 (1.0)	-0.1458 (-0.5)
LGEE(-2)	0.2749 (1.5)	0.2308 (0.8)	0.0487 (0.1)	0.0106 (1.2)	-0.2045 (-1.0)
LIAP(-1)	0.7591 (0.4)	2.6563 (0.8)	2.7893 (0.7)	1.1084* (10.7)	3.6434 (1.5)
LIAP(-2)	-1.5392 (-0.7)	3.4241 (1.0)	-1.6492 (-0.4)	-0.0324 (-0.3)	-0.8774 (-0.4)
LFDIA(-1)	0.0448 (0.2)	-0.1035 (-0.3)	0.1261 (0.3)	0.0056 (0.5)	0.6133* (2.2)
LFDIA(-2)	0.0181 (0.1)	-0.3144 (-0.9)	0.7594* (1.8)	-0.0251* (-2.2)	-0.1784) (-0.7)
Constant	1.4618 (0.3)	-19.7063* (-2.3)	-5.1270 (-0.5)	-0.2130 (-0.8)	-8.1754 (-1.3)
R^2	0.87	0.94	0.92	0.99	0.88
F-stat	7.28	15.86	13.30	416.4	8.28
AIC	1.37	2.22	2.53	-4.69	1.62
SC	1.92	2.76	3.07	-4.14	2.17

Forecast Error Variance Decomposition (FEVD)

Forecast error variance decomposition provides complementary information on the dynamic behavior of the variables in the system. It is possible to decompose the forecast variance into the contributions by each of the different shocks. By definition the variance decomposition shows the proportion of forecast error variance for each variable that is attributable to its own innovation and to innovation in the other variables. Table 4 presents the FEVD of five endogenous variables with concentration based on the 10^{th} period horizon.

Table 4: Variance Decomposition

Variance Decomposition of LUN						
Period	S.E	LUN	LGEA	LGEE	LIAP	LFDIA
2	0.47	98.39	0.61	0.78	0.04	0.18
4	0.58	75.32	10.85	13.38	0.10	0.35
6	0.64	70.52	9.26	12.18	0.17	7.87
8	0.66	67.04	8.66	11.91	0.73	11.66
10	0.68	64.19	8.45	13.90	2.02	11.31
Variance Decomposition of LGEA						
Period	S.E	LUN	LGEA	LGEE	LIAP	LFDIA
2	0.91	22.43	47.98	29.12	0.21	0.26
4	1.01	22.84	39.85	25.82	1.61	9.88
6	1.05	23.33	37.19	24.30	3.05	12.12
8	1.10	21.50	34.17	27.36	5.45	11.52
10	1.15	19.96	31.81	30.17	7.38	10.68
Variance Decomposition of LGEE						
Period	S.E	LUN	LGEA	LGEE	LIAP	LFDIA
2	0.80	9.20	42.13	47.97	0.22	0.50
4	1.04	21.54	27.27	29.29	0.82	21.08
6	1.09	19.93	24.92	29.76	2.85	22.54
8	1.16	18.25	22.86	32.34	5.34	21.21
10	1.20	17.64	21.83	33.56	7.14	19.83
Variance Decomposition of LIAP						
Period	S.E	LUN	LGEA	LGEE	LIAP	LFDIA
2	0.03	4.63	11.54	40.31	42.96	0.56
4	0.06	3.40	11.32	45.52	36.88	2.89
6	0.08	3.00	9.92	49.43	34.93	2.72
8	0.09	5.12	7.54	52.71	32.66	1.97
10	0.10	7.55	6.05	53.77	31.04	1.59
Variance Decomposition of LFDIA						
Period	S.E	LUN	LGEA	LGEE	LIAP	LFDIA
2	0.56	1.92	5.74	5.55	0.67	86.13
4	0.65	12.24	6.84	8.96	3.38	68.59
6	0.78	17.64	6.09	10.96	4.90	60.41
8	0.80	17.31	6.56	11.81	5.53	58.79
10	0.81	18.11	6.36	12.78	5.87	56.88

Based on own shocks (i.e Log UN), it variation ranges from 64.19 to 98.39 percent over the ten-year horizon. On the other hand, the responses of government expenditure in agriculture (LGEA) to shock in unemployment in the 10^{th} year horizon is 8.45 percent, government expenditure in education (LGEE) is 13.90 percent, index of agricultural production (IAP) is 2.07 percent and foreign direct investment in agriculture (LFDIA) stood at 11.31 percent.

In panel two period 10, unemployment explains about 20 percent variation in government expenditure in agriculture, 32 percent due to own shock, 30 percent traced to government expenditure in education, about 7 and 11 percent attributable to index of agricultural production and FDI in agriculture.

On the variation in government expenditure in education, own shocks constitute about 34 percent, 18 percent explained by unemployment, 22 percent by government expenditure in agriculture, 7 percent by index of agricultural production while about 20 percent due to FDI in agriculture. Panel 4 and 5 can be interpreted in like manner.

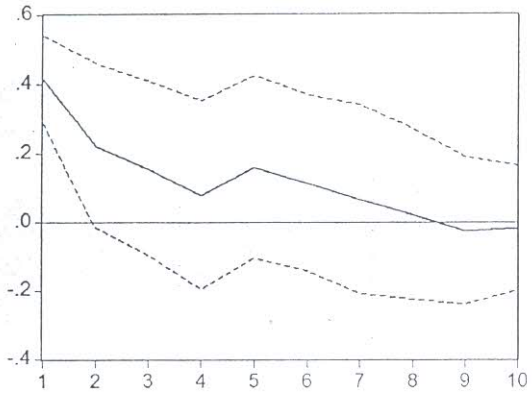
Impulse Response Function

The graph below is used to forecast the response of unemployment to one standard deviation innovation in the endogenous variables for the period 2011-2020. Thus, the response of unemployment to own shock is expected to result in a fall and continuous fall in unemployment so much so that by 2020 unemployment should be very low in Nigeria. Also, the response of unemployment to one standard deviation shock in government expenditure in agriculture (i.e. LGEA(1)) caused unemployment to rise in 2012. However from 2013, unemployment is expected to fall and by the end of 2016 it will be very low which will likely continue till 2020.

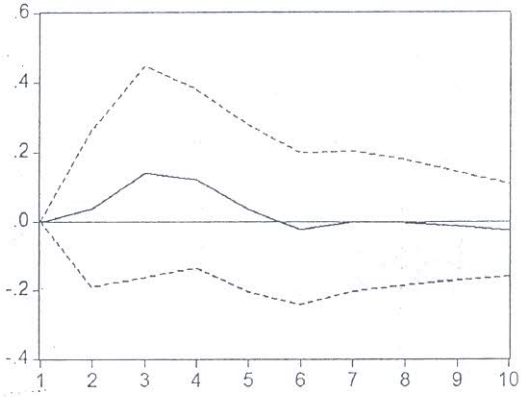
A shock occasioned by government expenditure in education will case unemployment to be high by the end of 2013. It will later fall, reaching zero by 2017 and therefore gradually rise which will extend up to 2020. Similarly, a one standard innovation shock in index of agricultural production caused unemployment to remain stable which is expected to last till about 2015. Thereafter, the trend of unemployment will gradually rise as we approach 2020. Finally, the response of unemployment to one standard deviation shock in FDI in agriculture will cause the former to rise between 2014 and 2018. From 2019 through 2020, unemployment is expected to fall.

Response to Cholesky One S.D. Innovations ± 2 S.E.

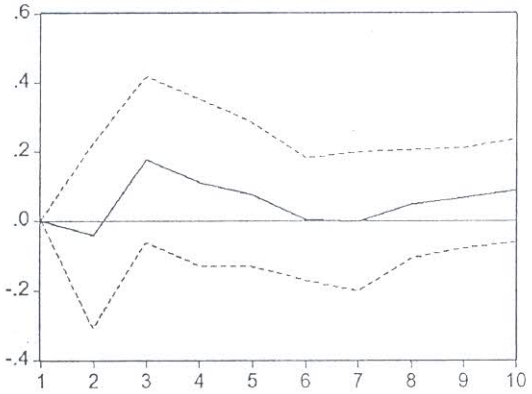
Response of LOG(UN(2)) to LOG(UN(2))



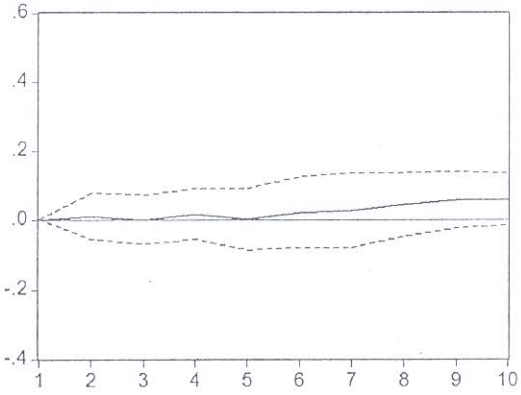
Response of LOG(UN(2)) to LOG(GEA(1))



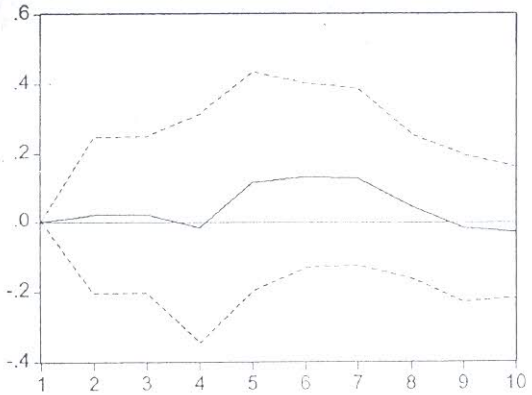
Response of LOG(UN(2)) to LOG(GEE(1))



Response of LOG(UN(2)) to LOG(IAP(2))



Response of LOG(UN(2)) to LOG(FDIA(2))



Conclusion/recommendations

The paper investigated the impact of agricultural productivity on employment level in Nigeria for the period 1986-2011. The paper argued that agriculture has traditionally been the main sources of livelihood for the people as it employs over 70 percent of the population and provides the major source of raw materials for the agro-allied industries and acts as potent source of the much needed foreign exchange. However, over the years the sector witnessed rapid decline in its contribution to national development due to the advert of oil boom in the early 1970s. The variables employed in this study include unemployment growth rate, government expenditure on agriculture, government expenditure on education (proxy for human capital), index of agricultural production and foreign direct investment on agriculture. A vector autoregressive was employed after stationarity and co-integration tests were conducted on the variables.

The empirical results reveal that long run relationship exists between unemployment growth rate and the other variables. The results further reveal that current level of unemployment is only significantly responsive to its one year lag. However, the impact of unemployment (lag 2), government expenditure in agriculture (lag 2), government expenditure in education (lag 1) and index of agricultural production (lag 2) on unemployment is negative. On the other hand, government expenditure on agriculture (lag 1), government expenditure in education (lag 2), index of agricultural production (lag 1) and foreign direct investment in agriculture (lag 1 and 2) exhibit positive impact on unemployment. The variance decomposition results show that agriculture contributes about 8 percent to variation in unemployment while the impulse response function revealed that Also, the response of unemployment to one standard deviation shock in government expenditure in agriculture will caused unemployment to fall and by the end of 2016 it will be very low which will likely continue till 2020.

The study recommendations are that appropriate agricultural policy should be put in place that will make the sector to play its vital role which it use to be in 1970s because results show that currently the sector is potential source of employment. Secondly, agricultural sector should be made top priority for foreign investors as foreign direct investment in the sector does not serve to boost employment at the moment.

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