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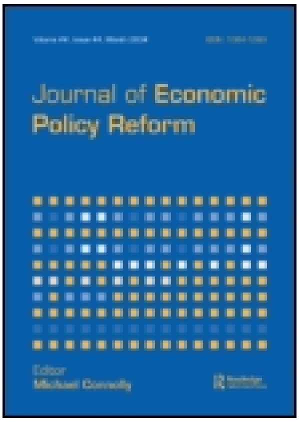

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Income inequality, unemployment, and poverty in Nigeria: a vector autoregressive approach

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Income Inequality, Unemployment, and Poverty in Nigeria: a Vector Autoregressive Approach

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The main features of poverty are low levels of consumption and income, a fact-of-life in most African countries. This paper analyzes the fundamental trends of per capita income, government capital expenditure, the human development index, and the rate of unemployment in the Nigeria. A vector autoregressive model finds that: A reduced unemployment rate improves human development and consequently reduces poverty. As growth in public capital expenditure rises, unemployment falls and the human development index improves. Therefore, infrastructure-based policies, which initially reduce unemployment, will also improve the living conditions of Nigerians in the end.

Key words: Poverty, Unemployment, Standard of living, Income inequality

JEL Code: O55

1 INTRODUCTION

Eliminating poverty and creating equitable income distribution have been the central themes of the debates and ideological struggles in the last two decades in developing Africa. Among economists, poverty has often been defined as a situation of low income or low consumption. Accordingly, people are regarded as poor when their measured standard of living in terms of income or consumption is below the poverty line, which separates the poor from the non-poor. Poverty is a subset of the general condition of deprivation whose dimensions include reduced health and life expectancy, among other conditions. For a country to be developed it must enjoy a positive growth rate, this will help reduce poverty in the long run. However, growth is not sufficient for macro-economic stability; inflation, unemployment, a declining exchange rate, and low capacity utilization should also be avoided.

Several policies have been carried out to ameliorate poverty problems in Nigeria. Nevertheless, these policies have not achieved the desired goals. Even with growth, there it is possible that some people will be enjoying better living conditions while others languish in a state of want for the basic necessities of life. Unless effective efforts are made to alleviate poverty, the condition is compounded and human development is impaired.

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Nigeria is faced with the dilemma on when and how the problems of poverty and inequality should be abated. Several approaches have been advocated, such as rural-based policies and loan schemes but these have not achieved much.

Poverty has been defined as the inability to attain a minimum standard of living by the world Development Report, 1990. The report constructed two indices based on a minimum level of consumption and standard of living. While the first index was a country's specific poverty line, the second was global, allowing cross-country comparison. The United Nations uses other indices as life expectancy, infant mortality rate, primary school enrolment, and the number of persons per physician, for example. Poverty defies objective definition because it is multi-dimensional in nature. Ravallion and Bidani (1994) refer to poverty as a lack of command over basic consumption needs, in other words, an inadequate level of consumption, insufficient food, clothing and shelter (Aluko, 1975). Obadan (1997) discussed the issue of poverty by looking at the general framework of poverty in Nigeria. He sees poverty reduction as a necessary but not sufficient condition for economic growth. He argues that investment in human capital is necessary to equip the poor to enable them share in the benefits of development.

Studies of income inequality and poverty generally take the approach of the individual's human capital, which explains differences in income and consumption between people by looking at difference in individuals and household characteristics. From the studies on LDCs, variations in income from labor source account for a larger percentage of total income inequality than variations in all other income source combined. This explains the fact that labor's functional share of total income is higher than the share from other factors of production (Field, 1980). Therefore, focus should be directed at factors involving human capital.

Omideyi (1988) examines the extent to which high fertility in rural Nigeria influences productivity and the resulting effect on the quality of life. He finds that the size of a family is large in rural Nigeria, and productivity is low. Consequently, income is equally low. Since the level of productivity is low, virtually all the food produced is consumed by the large number of household members, leaving little or no savings and consequently, a poverty trap.

There is no doubt that majority of Nigerians are living below the poverty line as set out by the World Bank (1990). The situation deteriorated by 1995 when there was drastic decline in the purchasing power of the naira, low capacity utilization of industries, collapse of social services and job security. A study conducted by Oyejide (1993) indicated a decline in per capita income from \$870 in 1981 to \$290 by 1990, a 67 percent decline, and an estimated 600 percent decline in urban real incomes during the 1980s. The level of poverty in Nigeria is so high at individual and household levels that increasing number of Nigerians are finding it difficult and clothe themselves and purchase sufficient food (Olowonomi, 1997). An environment of mass poverty cannot promote private investment on a wide scale. Poverty undermines the zeal for investment. Indeed, the experience of many countries where adjustment policies have been implemented has shown that domestic private investment in most cases has fallen. Poverty has a lot to do with the level of savings thus, from both investment and the savings point of view, poverty is bound to affect adversely the growth process.

The "power" theory of poverty provides some insight into the causal factors of poverty. The central argument is that the extent and distribution of poverty is a reflection of the structure of political power in society. A parasitic ruling class, which is incapable of investing looted resources consistently, undermines the ability of the economy to grow. Through mismanagement, corruption, and bad government, a country is left in a circle of poverty and deprivation. In other words, poverty is a characteristic feature of socio-political structure. A major implication of the theory of power for policy is that the solution requires the radical altering of the structure of power in the society. Demery and Squire (1996) examined the relationship between macroeconomic adjustment and poverty in several African countries. They contend that the poor as a whole may benefit from growth despite worsening inequality but the bottom cadre may see their incomes decline. Aikoye (1997) found that there is higher inequality in the poor countries than in the rich nations.

2 THE FACE OF POVERTY IN NIGERIA

Poverty is a ravaging economic and social plague, which affects people all over the world, not only in Nigeria. Approximately, 85 percent of the 70.5 million poor in the developing world are considered to be absolutely poor (World Bank, 1990).

Why is Nigeria in this predicament? The question is inevitable, considering the country's immense human and natural resources. The Nigerian situation is a paradox: it is a country abundant with resources, but inhabited by mostly poor people. By all accounts, Nigeria is a richly endowed country, with abundant human and natural resources that make it, potentially, one of the richest in the world. The country is blessed with productive farmland and rich variety of mineral deposits including petroleum, gas, iron-ore, coal, bitumen and other precious metals and gemstones. Nigeria has the seventh largest oil reserves in the world, earning over 90 percent of its annual revenues from oil resources. Given the estimated population growth of 2.8 percent per annum during the 1980s to 1995 period, the annual growth rate in per capita income was zero in 1992 and negative between 1993 and 1996. In 1997, per capital income increased at the rate of 0.27 percent (see Table 1).

The key economic indicators are shown in Table 1. The liquidity effect of large unsustainable fiscal deficits, financed mainly by the Central Bank of Nigeria (CBN), led to an acceleration of monetary and credit aggregates relative to the targets. The high incidence of budget deficits, in turn makes efforts at economic reforms more difficult. The economic situation has been further compounded by a massive devaluation of the naira particularly within the last 10 years. From a value of N0.89 per $1.00 in 1982, the exchange rose to N105.00 per $1.00 in 1999 (CBN, 2000). The drastic fall in the value of the naira resulted in a rapid increase of debt service in foreign currency and the worsening current account balance of payments.

The country's external debt has also become intractable and the economy suffers the adverse effects of debt overhang – $32.5 billion in 2000. Nigeria spends one third of its budget on external debt service, three times what it spends on education, nine times what is spends on healthcare and 7.8 percent of its export earnings on servicing outstanding debts.

TABLE I Nigeria: Key Economic Ratios and Long term Trends.

Macro/Economic Indicators	*1979*	*1989*	*1998*	*2000**
GDP (US & billions)	47.3	23.8	32.2	34.1
Gross domestic Investment/GDP	22.1	17.7	28.3	24.2
Exports of good and services/GDP	24.8	32.8	33.2	36.5
Gross domestic savings/GDP	27.8	25.3	23.4	18.4
Gross national savings/GDP	26.4	17.0	18.6	13.0
Current account balance/GDP	3.5	–1.0	–9.7	–11.2
Interest payments/GDP	13.2	126.3	87.9	92.8
Total debt service/exports	2.2	20.9	37.7	31.1

Source: Central Bank of Nigeria (CBN), 2000.
*2000 data are preliminary estimates.

TABLE II Some Poverty Indicators.

Year	*Poverty level (Percent)*	*Estimated total population (millions)*	*Population in poverty (millions)*
1980	28.1	65	17.7
1985	46.3	75	34.7
1992	42.7	91.5	39.2
1996	65.6	102.3	67.1

Source: Federal Office of Statistics (FOS), 1999.

Poverty has been on the increase in Nigeria (UNDP Nigeria, 1998; World Bank, 1999), it declined from 46.3 percent in1985 to 42.7 percent in 1992; but rose sharply to 65.6 percent of the population in 1996 (see Table 2). The population of poor Nigerians increased four-fold between 1980 and 1996. Whereas the moderately poor only rose from 28.9 percent to 36.3 percent, the percentage of the core poor increased significantly from 13.9 percent in 1992 to 29.3 percent in 1996. The poor spend three-fourths of their income on food.

In 1985, 49.9 percent of the population in the rural areas was poor, compared to 34.7 percent in urban area. By 1996, 69.8 percent of rural population was poor compared to 58.2 percent of the urban population. The prevalence of poverty varies geographically as well in Nigeria. Poverty level in Nigeria is lowest in the southeast region (53.5 percent) and highest in the Northwest (77.2 percent). The agricultural sector has the highest population of poor people, increasing from 31.5 percent in 1980 to 71.0 percent in 1996 (FOS, 1999).

The issue of unemployment and underemployment also present a major challenge to the Nigerian economy. Despite a number of initiatives to create additional jobs, the national rate of employment has not changed significantly in the last decade. The unemployment rate was 3.5 percent and 3.4 percent for 1992 and 1998 respectively, although an improvement was observed in the period 1995–1996 (FOS, 1999). The trend for under-employment is similar to that of unemployment even though the rate was higher (18.3 percent in 1992, and 18.5 percent in 1998).

In a developing country like Nigeria, where coping strategies compels virtually everyone to be engaged in one type of economic activity or the other, the strict concept of unemployment as internationally defined is insufficient to capture the true magnitude of the problem. Accordingly, open unemployment represents just the tip of the proverbial iceberg and the much more prevalent phenomenon of underemployment gives a more complete picture (Yesufu, 2000). Based on the above, approximately 21.9 percent of Nigeria's labor force had an under-employment problem in 1998. With an estimated active labor force of 55.75 million in 2000 (Yesufu, 2000), this translates to over 12 million Nigerians that are in need of suitable employment

Waste is another reason why there is poverty in Nigeria. The country's limited resources are channeled towards unproductive and abandoned ventures. There are several abandoned federal government projects all over the country. Billions of naira were wasted on various transition programs since 1985 during the military era. The soils are poor and fragile after facing months of intense sunshine followed by seasoned rains that carry away exposed top soil sheets in the southern part of the country. In the northern part, desert encroachment is becoming a growing menace. Overall, these developments are bound to seriously reduce food production and thus reduce the standard of living in the country.

Income inequality has been found to have a major contributing factor to poverty in Nigeria. Efforts, therefore aimed at poverty reduction would need to seek ways to foster growth without exacerbating income inequality in the country. Welfare and poverty reduction can be affected positively by growth in income as well as by improvements in the pattern of income distribution. If, for example, a boom in the oil sector propels growth and if the distribution of oil earnings is highly unequal, poverty reduction will not take place.

The major problem associated with external debt in Nigeria is that most of these loans taken were not used on productive ventures but rather used for projects that cannot pay the debt service and the rest shared in consumption. Unless the world economy and Nigeria's terms of trade recovers, the external debt will become an insurmountable obstacle. In addition, any extra foreign resources the country manages to attract would be used to pay off debt rather than to import more inputs or capital goods.

Widespread corruption, often referred to as "pen robbery" which is more or less a fraudulent practice is prevalent in the Nigerian economy. Banks for instance record the highest number of fraudulent practices running into several billions of naira. This does not suggest that lesser frauds involving lower cadres are not rampant in the country. This increased widespread corruption not only leads to poverty but also perpetuates it. Other causes of poverty in the Nigerian economy include high inflation rate (see Table 3).

Although poverty is a worldwide phenomenon, it has been observed that Nigeria is one of the poorest countries in the world. The situation has reached an alarming state, more than 45 percent of the population live below the poverty line while 66 percent of the poor are extremely poor (FOS, 1999). The UNDP Human Development Report (1995) estimated that the life expectancy in Nigeria is about 50 and that the human development index is 0.406, a standard measure that ranks the country as number 14 out of 174 countries in the world.

In recent times, one of the main agenda items of the world millennium summit that took place in September 2000 in New York, USA, was the eradication of poverty. The gross exploitation, injustice, and corruption unleashed by the various military regimes of the past had left in its wake a trauma on our socio-economic and moral psyche. Besides, the parochial tendencies of those regimes also gave rise to ethnic armies – OPC, Egbesu boys, Arewa Peoples Congress (APC) and others, which appealed to the millions of unemployed youths nationwide. Government programs were not consciously designed for the purpose of poverty alleviation before 1986.

Between 1960 and 1986, however, some programs were put into place: free and compulsory primary education, an adult and mass literacy plan, rural electrification and banking project, operation "feed the nation," the "green revolution," agricultural and river basin development authorities, low cost housing schemes, sanitary programs, urban and rural water supply improvements, small scale enterprises plans, and the National poverty eradication programs. Despite the fact that these programs made some positive impact, they were not sustained for an appreciable length of time due to lack of political will and inadequate involvement of the beneficiaries in these programs.

TABLE III Nigeria's External Debt Profile as of 1995.

Category	*Amount in Billion (US $)*	*% Distribution*
London club	5.2	16.2
Paris club	15.9	49.2
Multilateral: World Bank	3.3	10.3
Others	0.2	0.7
Other bilateral and unilateral	7.5	20.3
Total	38.1	100.0

Source: Federal Office of Statistics (FOS). Review of Nigerian Economy 1997.

The economic crisis in the country in the early 1980s worsened the living standards of the majority of people, particularly the poor. A determined effort of the Federal Government of Nigeria (FGN)/World Bank to redress this crisis through the Structural Adjustment Program (SAP) further worsened the situation of the poor. It was after this period that conscious efforts were made to reduce the hardship on the poor. Consequently, certain poverty alleviation programs were put in place between 1986 and 2002. The multi-sectoral programs are mostly targeted at opening up the rural areas in order to reach the poor. They are purely federal government initiated projects which include; The Directorate of Foods, Roads and Rural Infrastructures (DFRI), the National Directorate of Employment (NDE), the Better Life Program (BLP), the Family Support Program (FSP), the Family Economic Advancement Program (FEAP), the Structural Adjustment Program (SAP) and the Poverty Alleviation Program (PAP).

The sectoral programs were directed at various. The Agricultural sector had programs such as the National Agricultural Land Development Authority (NALDA), the strategic Grains Reserve Program (SGRP), special efforts to encourage artisan fishing were made, and development of small pasture and grazing reserves were created. The health sector had programs like, the Primary Health Care Scheme (PHC), Guinea Worm Eradication Program (GWEP), and Expanded Program on Immunization and Nutrition. The Educational, Transport, Housing, and Manufacturing sectors all had similar programs focused at alleviating poverty. However, all these programs have experienced problems of implementation.

3 DATA DESCRIPTION AND MODEL SPECIFICATION

The causal nexus between income inequalities, unemployment poverty index and government capital expenditure is examined within the context of a four-variable vector auto regressive (VAR) system. The model is specified and estimated using quarterly data for 1986:1–2000:4. The beginning of our sample roughly coincides with the period in which the Nigerian government placed increased emphasis policy reforms. The end of our sample coincides with economic stagnation in Nigeria.

Quarterly data are used for two reasons. First, the size of our system requires quarterly data in order to have enough degrees of freedom for estimation. The second is based on a desire to minimize any problems with temporal aggregation (see Christiano and Eichenbaum, 1987) that might arise with the use of annual data.

A vector autoregressive process of order p, VAR (p), for a system of k variables can be written as:

$$X_t = A + B(L)\,X_t + u_t \tag{1}$$

where X_t is a $(k \times 1)$ vector of system variables, A is a $(k \times 1)$ vector of constants, B(L) is a (k x k) matrix of polynomials in the lag operator L, and u_t is a $(k \times 1)$ vector of serially uncorrelated white noise residuals. The standard Sims (1980) VAR is an unrestricted reduced-form approach and uses a common lag length for each variable in each equation. Likewise, here no restrictions are imposed on coefficient matrices to be null, and the same lag length is used for all system variables.

Four variables are included in the model: real per capita income (PCY); government capital expenditure (GCE); the unemployment rate (UMT); and the Human Development Index (HDI). The data for all variables are obtained from the Central Bank of Nigeria's (CBN) Monthly Report. Prior to estimation of the VAR, augmented Dickey-Fuller tests were employed to check for first-order unit roots. These tests suggested that the first differences of the logs of PCY, GCE, HDI, and UMT should be used in specifying and estimating the model. Based upon the arguments of Engle and Granger (1987), co-integration tests were also performed for the four variables that required differencing to achieve stationarity. Since no evidence of co-integration was found, the system was estimated with differences of all system variables.

4 BASIC RESULTS

The sources of changes in poverty index and unemployment rates are examined through the computation of variance impulse response functions (IRFs), and decompositions (VDCs), which in turn, are based on the moving-average representations of the VAR model and they reflect short-run dynamic relationships between variables. The VDCs show the percentage of the forecast error variance for each variable that may be attributed to its own innovations and to fluctuations in other variables in the system. The IRFs indicate the direction and size of the effect of a one standard deviation shock to one variable on other system variables over time. Since model variables are converted to first differences prior to estimation of the model, the VDCs and IRFs reported here indicate the effects of a shock to the changes in government investment spending on the changes in per capita income unemployment and poverty rates.

More importantly, the equations of the VAR contain only lagged values of the system variables; it is assumed that the residuals of the VAR model are purged of the effects of past economic activity. Any contemporaneous relations among the variables are reflected in the correlation of residuals across equations. The Choleski decomposition is used to orthogonalize the variance-covariance matrix. The variables are ordered in a particular fashion, and, in this way, some structure is imposed in computation of the VDCs and IRFs. When a variable higher in the order changes, variables lower in the order are assumed to change. The extent of the change depends upon the covariance of the variables higher in the order with that lower in the order. Therefore, the orders in which the variable enter the VAR model affect the outcome of the analysis. The preferred ordering in this paper is LGCE, LPCY, LUMT, and LHDI. Accordingly, an increase in government capital spending (LGCE) is assumed to stimulate aggregate demand per head (LPCY), which may boost employment. This tends to reduce the unemployment rate (LUMT), improves the human development index, and consequently reduces the poverty index in the country. (LHDI).

Government capital expenditure and per capita income have positive and significant effects on the human development index. The positive but fluctuating significant effects of these variables implies that increasing both government capital expenditure and per capita income can bring about higher human development index reduce the number of people living below the poverty line.

In the case of unemployment, the effects of all the variables are negative but gradually reducing with time. However, government capital expenditure is positive from fourth to seventh quarter, suggesting longer-lived positive effects. Table 4 reports the VDCs results.

In the case of human development index, most of the variation can be attributed to shocks from per capita income both in the short run and in the long run. A substantial amount of variation in the human development is also explained by shocks from government capital expenditure, while little is explained by unemployment. Similarly, the variation in unemployment can be attributed to changes in per capita income. In contrast to poverty, relatively little proportion of variation in the unemployment rate can be attributed to changes in government capital spending. More proportion of variation is however, explained by human development.

TABLE IV Variance Decomposition.

		Explained by shocks					
Variable	*Period*	*S.E.*	*LGCE*	*LPCY*	*LUMT*	*LHDI*
Government Capital Spending	1	0.083087	100.0000	0.000000	0.000000	0.000000
	3	0.165095	84.46430	13.19053	0.457963	1.887205
	5	0.218728	57.12098	35.68494	2.703479	4.490601
	7	0.267670	38.36816	50.90643	3.844847	6.880566
	9	0.312306	29.30057	57.64116	3.813273	9.245002
Per Capita Income	1	0.082631	3.690637	96.30936	0.000000	0.000000
	3	0.154526	6.025056	90.26691	0.085458	3.622576
	5	0.200833	6.464608	82.94790	0.373267	10.21422
	7	0.242466	6.792730	75.55977	1.053505	16.59399
	9	0.282263	7.606538	69.44158	1.830681	21.12121
Unemployment rate	1	0.083605	1.065569	4.289036	94.64540	0.000000
	3	0.120979	3.838489	8.997219	85.78357	1.380726
	5	0.131497	3.402171	13.92283	73.14454	9.530459
	7	0.137233	3.299942	14.00182	68.90356	13.79467
	9	0.138919	3.419836	13.69129	68.29914	14.58973
Human development index	1	0.034161	1.071014	15.40856	3.133450	80.38698
	3	0.048781	2.228130	17.16661	5.423818	75.18144
	5	0.054168	6.202294	16.24564	8.034274	69.51779
	7	0.056588	10.32728	17.02491	8.052732	64.59508
	9	0.058498	12.04472	19.80937	7.585868	60.56003

5 POLICY IMPLICATIONS AND CONCLUDING REMARKS

From the above results, some deductions can be made as regards the poverty situation in Nigeria. Policies that will improve the human development index, which is the basic poverty index, will not necessarily improve or reduce the unemployment rate. However, a reduced unemployment rate will improve the human development index.

Similarly, as the growth in government capital expenditure rises, unemployment falls and the human development index improves. Therefore, infrastructure based policies, which initially reduce unemployment within the economy, improve the living conditions of Nigerians in the end. An increase in per capita income in Nigeria leads to poverty reduction. In fact, changes in per capital income explain most of the variation in poverty. The policy focus in Nigeria should therefore emphasize infrastructural development leading to more job opportunities, higher level of income per capita and a lower level of poverty.

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