

## Estimating Economic Growth and Inequality Elasticities of Poverty in Rural Nigeria

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**Abstract:** In order to achieve poverty reduction, both economic growth and equity have assumed a central place. It is against this background that this paper analyzes income growth and inequality elasticities of poverty in Nigeria over a period of time. The results are based on the analysis of secondary data obtained from National Consumer Survey of 1996 and 2003/2004 Nigeria Living Standard Survey. We use changes in mean per capita expenditure as a yardstick of economic growth and adopt simple but powerful ratio estimates of Economic Growth and Inequality elasticities of poverty. The growth elasticity of poverty indicates that 1 percent increase in income growth will lead to 0.624 percent reduction in poverty. The inequality elasticity of poverty shows that a decrease of inequality by 1 percent would have decreased poverty by just 0.34 percent. The result implies that what matters for poverty reduction is mainly accelerated economic growth, redistribution and reductions in inequality

**Keywords:** Economic growth, elasticity, inequality, poverty reduction, rural Nigeria.

### INTRODUCTION

The establishment of the Millennium Development Goals has set poverty reduction as a fundamental objective of development. In recent years, there has been an upsurge of interest in the impact of development on poverty. Poverty has increasingly become a major global issue, with halving extreme poverty by 2015 constituting the first, and perhaps the most critical, goal of the Millennium Development Goals (MDGs).

Since the 1980s, the poverty rate has been trending significantly downward in all regions of the world except in sub-Saharan Africa (SSA). The ratio of poverty for all less developed countries (LDCs) fell from 27.9% to 21.1%, but the ratio for Africa actually increased from 44.6% to 46.4% (Ravallion and Chen, 2004). Against this background it is not surprising that several recent papers argue that most African countries will not achieve the target of reducing poverty by half by

2015 (Fosu, 2008; UNDP, 2003; Hanmer and Naschold, 2000). In the last two decades in Nigeria, there has been little or no progress made in alleviating poverty despite the massive effort made and investment into many programmes established for that purpose. For instance, Canagarajah, *et al.*, (1997), reported increased level of poverty over the period spanning the 1980s and 1990s in Nigeria and inequality was established with an increase in the Gini coefficient from 38.1 per cent in 1985 to 44.9 per cent in 1992. Results of the 1996/97 National Consumer Survey showed that about 56 percent of Nigerians live below the poverty line. In 1985 about 43 percent were below the figure at 34.1 percent at 1985 prices. In 1992, 46.4 million Nigerians were said to be living in absolute poverty, out of which 80.2% or 37.7 million are in the rural areas (Ogwumike, 1996). The marginalization of the rural areas through urban-biased development policies is

largely responsible for the high poverty incidence in the rural areas (Obi, 2007). These statistics indicate a worsening poverty situation in the country and a cause for concern (Okunmadewa, 1999).

The most frequently advocated manner to achieve such poverty reduction is through economic growth (Arsenio and Fuwa, 2003). Growth has therefore traditionally been considered the main engine for poverty reduction. As reported by the World Bank (World Development Indicator, 2002), real per-capita income in the developing world grew at an average rate of 2.3 percent per annum during the four decades between 1960 and 2000. This is a high growth rate by almost any standard. In order to achieve reduction in poverty, however, income growth has to be equitably distributed (Kalwij and Verschoor, 2007; World Bank, 2006). Thus, the current thinking on how best to achieve poverty reduction, both economic growth and equity have to assume a central place in development strategies. Further, equity is seen not only as of intrinsic importance but also of instrumental importance through its impact on the rate at which economic growth leads into poverty reduction. Essentially, economic growths are associated with policies of reduced poverty and income redistribution among the mass majority especially the rural dwellers.

What is more, evidences in the literature point to the increasing level of income inequality in developing countries including Nigeria, over the last two decades (e.g. Addison and Cornia, 2001; Kanbur and Lustig, 1999). Thus, to attain the objective of reducing poverty in Nigeria, the pre-occupation of the government has been the growth of the economy as a pre-requisite for improved

welfare. To this effect the government therefore initiated several economic reform measures which include Economic Stabilization measures of 1982, Economic Emergency Measures in 1985 and Structural Adjustment Programme (SAP) in 1986. Components of SAP include market- determined exchange and interest rates, liberalized financial sector, trade liberalization, commercialization and privatization of a number of enterprises (Aigbokhan, 2008). Specialized agencies were also established to promote the objective of poverty reduction. These include Agricultural Development Programmes, Nigeria Agricultural, Cooperative and Rural Development Bank, National Agricultural Insurance Scheme, National Directorate of Employment, National Primary Health Care Agency, Peoples Bank, Urban Mass Transit, mass education through Universal Basic Education (UBE), Rural Electrification Schemes (RES) among others. The recent effort is based on the seven point agenda. Like earlier reform packages, the strategy considers economic growth as crucial to poverty reduction. The major issues of the seven point agenda include: power and energy, food security, wealth creation and transportation. Others are land reforms, security and mass education.

Additionally, attention to the importance of income distribution in poverty reduction seems to be growing. Whether growth reduces poverty, and whether in particular growth can be deemed to be "pro-poor", depends, however, on the impact of growth on inequality and on how much this impact on inequality feeds into poverty (Araar and Duclos, 2007). This paper is thus set to analyse the growth and inequalities of poverty, that is, by how much does poverty decline in percentage terms with a

given percentage rise in economic growth and inequality in Nigeria. Technically, the *growth elasticity of poverty* is the rate of reduction in poverty resulting from a 1% increase in average income. If, for example, the growth elasticity of poverty is 2, then we would expect an increase in average income of 2% per year to yield a reduction of 4% per year in poverty. Previous research has shown that the value of the growth elasticity is lower in countries with higher inequality, as measured by the Gini coefficient (Ravallion, 2001, Hanmer and Naschold, 2000). This means that policies which reduce inequality will increase the amount of poverty reduction associated with economic growth. This is not to say such policies will necessarily lead to more poverty reduction, as they may also lower the rate of economic growth. This is the well-known trade-off between growth policies and redistribution (Anderson, 2005).

The rest of the paper is organized as follows: section two considers the theoretical framework and literature review while section three describes the methodology adopted in the study. Section four presents and discusses the results. Section five concludes and recommends policy options to alleviate poverty and reduce inequality.

### LITERATURE REVIEW

De Janvry and Sadoulet (1995) concluded that during recessions inequality rises, while positive growth rates are distribution-neutral. Bruno et al., (1998), using data from forty-five countries each with at least four or more distributional surveys over at least two decades, found the effect of growth on inequality to be indeterminate.

Productivity - raising redistribution ensures that distribution does not reduce poverty at the expense of growth, and produces sustainable poverty reduction. Enhancing asset ownership for the poor is the clearest way to accomplish this. Investment in infrastructure, credit targeted to the poor, land redistribution and education can all be important mechanisms to make growth 'pro-poor' (Anderson, 2005). If redistribution is used to reduce poverty, be it transitory or structural, then key policy issues are redistribution from whom, to whom, and by what mechanism? The loss and gain of distributive programmes on income groups, and their reaction to these losses and gains will depend on the nature of the programme. Similarly, the administrative burden will vary by programme. It might be argued that re-distributive land reform, from large landowners to landless peasants involves a one-off administrative cost, which, once implemented, can be left to generate a more equal distribution and lower poverty levels. On the other hand, a redistribution of income, without asset redistribution, must be implemented by a continuous application of progressive taxation and equity-biased public expenditure. Land redistribution unaccompanied by rural development expenditure might generate a class of poverty-stricken smallholders. Most of the land redistribution programmes in Latin America, even those that radically changed ownership patterns (as in Peru), proved in practice to be poverty-generating rather than poverty-reducing (Thiesenhusen, 1989).

Like land redistribution, progressive taxation would appear to be an obvious vehicle for redistribution. However, studies of tax incidence and impact reach mixed conclusions. Some

indicate that progressive taxation is a limited tool for reducing inequalities in income distribution, usually as a result of evasion by the rich. A study of Latin America concluded that tax systems did not contribute significantly to the reduction of inequality (Alesina, 1998).

Studies of public education typically show that expenditure on primary and secondary education reduces inequality, and expenditure on tertiary education has a regressive impact. In this context, Alesina maintained that subsidising higher education at the expense of primary and secondary education reduces the re-distributive impact of public spending, because these subsidies will accrue to the middle or high-income groups.

Many papers recently focused on the statistical relationship between economic growth and poverty reduction across countries and time periods. Many of them - for instance Ravallion and Chen (1997), de Janvry and Sadoulet (1998), Dollar and Kraay (2000) - are based on linear regressions where the evolution of some poverty measure between two points of time is explained by the growth of income or GDP per capita and a host of other variables, the main issue being the importance of GDP and these other variables in determining poverty reduction. Other authors- for instance, Ravallion and Huppi (1991), Datt and Ravallion (1992), Kakwani (1993) fully take into account the poverty/mean-income/distribution identity in studying the evolution of poverty and its causes. In particular, they are all quite careful in distinguishing precisely the effects on poverty reduction of growth and distributional changes. At the same time, their analysis is generally restricted to a specific country or a limited number of countries or regions: Indonesia, regions of Brazil

and India, Cote d'Ivoire, etc. The work of Bourguignon however proposes a methodology that is less demanding. It relies on functional approximations of the identity, and in particular on an approximation based on the assumption that the distribution of income or expenditure is Log-normal.

There are at least three approaches available to estimate the elasticity of poverty with respect to growth. One method is to use information on poverty, inequality and per capita income and run the regressions on the log variables to extract the desired elasticities. The coefficients of the regression provide the required elasticities. This method is frequently used in cross-country studies (e.g. Ali and Thorbecke, 2000, Fosu, 2002), where data on poverty and inequality are not available for more than one period in a given country. The second approach is to use the ratios of changes in poverty to changes in growth over a given period as a measure of the elasticity of poverty with respect to growth when such data is available (Ravallion, 2000). The third approach is based on decomposition of a poverty measure into growth and inequality components (see e.g. Kakwani, 1990; Datt and Ravallion, 1992; Bourguignon, 2002; and Kraay, 2004). This approach basically decomposes the change in the measure of poverty into the components of economic growth and change in income inequality. The data requirement for this approach is minimal (one period information on distribution of income is sufficient). The discussions about the possibility of achieving the MDG1 in Africa is based mainly on the last method since the data available on poverty and inequality for most African countries is limited to one period. The method of

decomposing changes in poverty into the components of growth and income distribution change provides a measure of point elasticity, while the other methods provide an arch measure of elasticity or an average measure of elasticity. Results from analysis by Bigsten and Shimeles (2005) shows that high-inequality and relatively high-income countries (e.g. Namibia, South-Africa, Senegal, Gabon, Zimbabwe) had higher elasticity of the iso-poverty curve, indicating that redistribution policies may be effective tools in dealing with poverty in those countries. For instance, if we take South-Africa, at the poverty line close to 750\$ per person a year, a one percent decline in the measure of income inequality needs about 9% decline in per capita income to remain on the same poverty level. That means that the joint effect of a reduction in per capita income lower than 9% and a one percent decline in the Gini would be a reduction in poverty. This means that it takes a large reduction in per capita income following a one percent reduction in the Gini for poverty not to decline, and any increase in income inequality must be compensated by a large per capita income increase if the existing level of poverty is to be maintained.

The second point to note is that, for low-income countries, such as Burundi, Burkina Faso, Niger, Ethiopia, Tanzania and Zambia, the room for poverty reduction via redistribution is very limited. A one percent reduction in income inequality would only need a small change in per capita income to stay on the same level of poverty. Likewise, the effect of rising income inequality on poverty would be offset by a low rate of growth in per capita income. An increase in inequality may not be a significant poverty threat if there is a high

rate of growth in these countries (McKay 2004, Fosu, 2009).

Fosu (2009) explored the extent to which inequality influences the impact of growth on poverty reduction, based on a global sample of 1977-2004 unbalanced panel data for SSA and non-SSA countries. Several models are estimated, with growths of the headcount, gap and squared gap poverty ratios as respective dependent variables, and growths of the Gini and Purchase Power Parity (PPP) -adjusted incomes as explanatory variables. For both SSA and non-SSA samples and for all three poverty measures – headcount, gap and squared gap – the paper finds the impact of GDP growth on poverty reduction as a decreasing function of initial inequality. The study additionally observes that higher rates of increases in inequality tend to exacerbate poverty, with the magnitude of this effect rising with initial income. The income-growth elasticity, moreover, tends to increase with mean income relative to the poverty line. It has been estimated that for any appreciable reduction in poverty to be achieved in sub-Saharan Africa, an annual growth rate of 6.5% is required (World Bank, 1996). For Nigeria, whose growth has been described as less pro-poor, it is estimated that, given a population growth rate of 2.9%, the country's growth elasticity with respect to poverty is -1.45 (World Bank, 1996; HDR, 1996), which implies that a 1% increase in income reduces poverty by 1.45%. This study will provide a more recent information on how poverty has been responding to growth over the last two decades.

**METHODOLOGY**

**Sampling procedure and sampling size**

The study made use of data collected from the National Consumer Survey of 1996 and 2003/2004 Nigeria Living Standard Survey. The national consumer survey of the Federal Office of Statistics (Now National Bureau of Statistics) is a nationally representative survey covering about 10,000 households. A two- stage sampling design was used for the survey. Also, the stratification criteria were based on the state of residence and the locality (urban/rural). The survey contains detailed information on the income, expenditure and consumption of household members.

The National Living Standard Survey NLSS is based on the National Integrated Survey of Household (NISH) framework. The NISH is an ongoing programme of household surveys enquiring into various aspects of households. The population census enumeration areas (EAs) constituted the primary sampling units while the housing units were the secondary sampling units. In each state, a sample of 120 EAs were selected for the survey, while 60 EAs were selected for Abuja. At the second stage, a selection of 5 housing units from each of the selected EAs was made. Thus, a total of 600 households were randomly interviewed in each of the states and the FCT, summing up to 22,200 households (FOS, 2003). However, 14,515 rural households whose responses were consistent were used for analysis in this study.

The questionnaires were designed to obtain information from various members of the household, including husbands, wives and adult children. These data were used for determining poverty status, for estimating poverty status

regression and for analysing inequality in the rural sector.

**Estimation methods**

**Growth elasticity of poverty**

In order to answer the question of the extent to which economic growth reduces poverty that is, how much does a given rate of economic growth (by economic growth we mean increase in average income) reduce poverty, the paper considers what is technically described as growth elasticity of poverty. In other words, the decline of poverty in percentage terms with a given percentage rises in economic growth.

Given the two time period of our data, we adopt simple but powerful ratio estimates of growth and inequality elasticities of poverty. We use the notation  $\eta_g$  for growth elasticity of poverty,  $\Delta p$  as the change in poverty between the two periods  $t_1$  and  $t_2$ .  $p$  is poverty level in the base year,  $\Delta g$  is income growth between the two periods and  $g$  is growth in the base year. Thus, the growth elasticity of poverty is written as:

$$\eta_g = \frac{\Delta p / p}{\Delta g / g} \dots\dots\dots(1)$$

It is good to note that the expression in the numerator is the relative change in poverty and the expression in the denominator is the relative change in growth.

**Inequality Elasticity of Poverty**

Similarly, inequality elasticity of poverty can be stated as:

$$\eta_i = \frac{\Delta p / p}{\Delta gini / gini} \dots\dots\dots (2)$$

Where  $\eta_i$  is the inequality elasticity of poverty,  $\Delta p$  is the change in poverty between the two periods  $t_1$  and  $t_2$ .  $p$  is poverty level in the base

year, while  $\Delta$  gini and gini are change in inequality between the two periods and gini is the inequality in the base year.

## RESULTS AND DISCUSSIONS

### Growth Elasticity of Poverty

As defined earlier, growth elasticity of poverty is the rate of reduction in poverty resulting from a 1% increase in average income. If, for example, the growth elasticity of poverty is 2, then we would expect an increase in average income of 2% per year to yield a reduction of 4% per year in poverty. In this study, the growth elasticity of poverty is found to be -0.624. It means a 1 percent increase in growth will lead to 0.624 reduction in poverty or a 1 percent increase in growth from 1996 to 2004 would have led to 0.624 decrease in poverty. The growth elasticity of poverty in Nigeria is considered low generally. Aigbokhan (2008) found estimated growth elasticity of poverty to be -0.64 compared with calculated value of -0.79 which are consistent with Ram's (2006) contention that a value of the order -1 is more realistic for developing countries context. This may have been aided by high initial inequality as gini for 1996 is 0.49 while for 2004 it is 0.4882. Previous research has also shown that the value of the growth elasticity is lower in countries with higher inequality, as measured by the Gini coefficient (Ravallion, 2001; Hanmer and Naschold, 2000). This means that policies which reduce inequality will increase the amount of poverty reduction associated with economic growth.

### Inequality Elasticity of poverty

The inequality elasticity of poverty was calculated to be -0.34. This means that if we

decrease inequality by 1 percent, poverty is going to reduce by 0.34 percent.

Lastly, the results indicate that though there is growth, poverty is declining at a lesser rate than the growth rate. i.e growth is at higher rate than the rate at which poverty is decreasing. The reason for rapid economic growth in the country in 2004 may be as a result of the re- invigoration of the reform programmes by the democratic government in 1999. The privatization programme, commenced a decade earlier was continued in the major sectors of the economy. Deregulation of the downstream sub sector was introduced, designed to allow for variable petroleum product prices across the country instead of a regime of uniform prices that existed until 2000. As stated by Iradian, (2005), higher growth in per capita income is associated with higher rates of poverty reduction. Poverty would increase if the adverse impact of an increase in inequality more than offsets the reduction in poverty associated with growth. For the same growth in per capita income, poverty will be reduced more in countries with low initial inequality than in countries with high initial inequality. Other things being equal, growth leads to less poverty reduction in unequal societies than in egalitarian ones.

Lastly, the most pressing issue for research is whether governments can reduce inequality without adversely affecting the rate of economic growth. Nevertheless, there is the need for researchers to document precisely *how much* additional poverty reduction, or additional pro-poor growth, could be brought about from a reduction in inequality, assuming that the latter *could* be achieved without a large adverse effect on the growth rate.

## CONCLUSION

The growth elasticity of poverty is very low. Inequality elasticity of poverty is also low. It means the kind of poverty reduction taking place in Nigeria is not enough to reduce poverty and inequality significantly. Although growth is taking place, poverty is declining at a lesser rate than the rate at which growth is taking place.

The fact that overall rural income distribution did not improve despite government interventions perhaps indicates that the growth process in Nigeria is actually unequalizing. The unequalizing effect is not strong enough to completely offset the poverty-reducing effect of rising per capita income. The picture painted by the results of this research suggests that the success of the ongoing poverty reduction efforts will have to be not just the rise in per capita income, but also how to ameliorate income inequality. While increasing poverty is an indication that something is fundamentally wrong with the development efforts, increasing inequality signals either the unevenness of growth, the unevenness of the distribution, the weak pathways in the spread of the benefits of growth, or the lack of anti-poverty reducing policy instruments.

## Recommendations

Reducing poverty will only become feasible when the livelihoods of the rural poor are improved directly. This can be achieved through anti-poverty policies, and targeting schemes (with the poorest smallholders who produce for subsistence and have limited engagement with markets as the main focus) which are expected to impact both on poverty and on inequality.

The conditions for pro-poor growth are those closely tied to reducing the disparities in

access to human and physical capital, and sometimes also to differences in returns to assets, that create income inequality and probably also inhibit overall growth prospects.

A low growth elasticity of poverty as recorded in this study suggests that what matters for poverty reduction is mainly accelerated economic growth, income redistribution and reduction in inequality. The poverty elasticity can be influenced by the mix of government (and of course other) expenditure, and other institutional incentives. Studies carried out by Besely and Burgess, (2000); White and Anderson, (2000) indicate that even modest reductions in inequality can have a large poverty reducing impact.

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