

Distributional Impact of Public Expenditure on Education and Healthcare in Nigeria: A Gender Based Welfare Dominance Analysis

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Abstract

Investing in education and healthcare is one of the suggested ways the poor can escape from poverty, if properly targeted. The two sectors (education and healthcare) in Nigeria have experienced various forms of subsidies but surprisingly, the poverty situation in Nigeria aside from deepening has been severe, pervasive and multi-dimensional with the female folk mostly affected by all counts. Based on the above argument, the study assessed how equitably public expenditure in education and healthcare have been well targeted by gender. The study employed the welfare dominance tests to determine the incidence of expenditure and how subsidy has been beneficial to men and women alike. The study found that primary education was absolutely progressive for both sexes while primary healthcare subsidies were just progressive. Interestingly, secondary education was only progressive for female while tertiary education and healthcare for both male and female were regressive and not pro poor.

Keywords: Distributional pattern, Public expenditure, Welfare, Education, Healthcare, Gender

1. Introduction

The current economic crisis has been a major issue that dominates economic discourse. Different schools of thoughts have different suggestions on what should be done and how it should be implemented, to ameliorate the effects of the crisis. From all the foregoing deliberations, there is a consensus that governments' need to spend more at this time but the counterfactual lies on how much should be spent. Many economists believe that stimulus expenditure must be targeted because such targeted expenditure will have a multiplier effect and at the end affect aggregate expenditure through the revival of the already shrinking trade, declining growth, and rising unemployment as long as the fiscal package is targeted by *impact* (Note 1) as well as *need*. It has been accepted that some sectors especially within the social sector produce faster results through public expenditure than others due to the trickling down effects on other sectors of the economy.

Public expenditure in social services like education, healthcare, etc have been generally considered as the main redistributive (Note 2) or antipoverty policy instrument especially for the developing countries (Bourguignon and Luiz, 2003) just as accessing the actual level and allocation of public expenditure (subsidy) is the key to understanding any government's true expenditure priorities and coherence with the government's policy objectives. This is so because when subsidy is being provided for a particular expenditure which households would have made there is every tendency that the income set aside for that expenditure will be used for another expenditure or better still is saved. The above tasks therefore require an analytical framework to organize data on the government's financial operations which will give insight to how and who benefit from such expenditure or subsidy. Welfare dominance analysis can be a helpful tool for assessing how public expenditure is targeted to the

poor and who benefits from it. It also links information about the subsidy for different kinds of education, healthcare, etc provided by the public sector.

According to Govender (1996:7), "Public expenditure reflects the values of a country – what it values, whose work it values and who it rewards... and who and what and whose work it doesn't... Based on the above situation in Nigeria, the study seeks to answer questions like:

- Who gets the subsidy? Is it gender biased?
- Is it the richest or the poorest quintile?

For this challenge to be met in any sector, policymakers need reliable an up-to-date information on the structure of the sector and finance. The question of whether the benefits of public expenditures in developing countries are equitably distributed by gender has received considerable attention in recent years (World Bank, 2001; Cagatay, et.al. 2000; Elson, 1998). As policy makers and stakeholders become increasingly concerned about gender inequality in society as a whole, it is natural to ask two related questions. First, to what extent does public expenditure mitigate or exacerbate these gender inequities? Second, how can current allocations of public expenditure be changed to improve gender equity?

Nigerian indicators of human development such as education(Note 3), health(Note 4), income inequality (Note 5), etc amidst continuous public expenditure relative to the Gross Domestic Product (GDP) have not been improving, rather differ when it comes to gender (male and female) with the female folk always at the rear. See details in Table 1. The differences in vital education and health statistics in favour of male as against the female is not only observed nationally but by states, regions and location (urban and rural). Clear evidence from the 2004 NLSS revealed that out of the 36 states of the federation, about six (6) have male literacy rate more than 75% while none of the states has that for the female folk. Similarly, about seven (7) states have male literacy rates less than 25% while about 13 states have female literacy rates less than 25%. This situation abound when for more than two decades the three tiers of government (federal, state and local government) have claimed to have committed a substantial percentage of education and healthcare expenditure towards female related issues.

With the above scenario, one is tempted to ask if government expenditure and subsidies have been reaching male and female the same way or biased in favour of a particular sex.. Better still it might be that the socio-economic group(s), which has been targeted, may not be the poor. Public expenditure is known to have direct linkage to the poor through social transfers. Has this been the case in Nigeria? If it has been which gender has benefited more than the other? Can we then conclude that these expenditures are biased in favour of a particular sex? Answers to these questions are what this study is trying to provide.

This study therefore, is set to find the distributional pattern of public expenditure (education and healthcare) by gender (i.e. estimating who has benefited from government expenditure or subsidies in education and healthcare sectors with respect to gender in Nigeria). In other words, the study is set to determine the distribution pattern of expenditure in education and healthcare with respect to gender; and to ascertain if public expenditures in these sectors have been absolutely progressive, progressive, regressive or neutral when compared to the 45⁰ lines and per capita consumption or expenditure.

2. Welfare Dominance Tests: Brief Theory and Empirical

In the words of Tomat (2007), traditionally, the economic literature on the measurement of poverty has been concerned with two questions: the identification of the poor and the aggregation of the information on income and other relevant variables in measures of poverty to be used for comparisons of poverty over time or across different populations. The problem of identification is usually defined along several dimensions that include the choice of the variable measuring economic welfare and the specification of the conditions that qualify individuals as poor in a given population. The problem of aggregation is the problem of choice of the poverty index function and of the definition of the conditions that allow making consistent ordinal comparisons of poverty across different populations.

Public expenditure in social services like education, health care, etc is generally considered as the main redistributive or antipoverty policy instrument in developing countries (Bourguignon and Luiz, 2003) just as accessing the actual level and allocation of public expenditure is the key to understanding any government's true expenditure priorities and coherence with the government's policy objectives (Nicholas and Xiaoyan 1997; 3). This is so because when subsidy is being provided for a particular expenditure which households would have made there is every tendency that the income set aside for that expenditure will be used for another expenditure or better still is saved. The impact of these benefits in the distribution of incomes and expenditures was dealt with in detail by Jean-Yves Duclos & Abdelkrim Araar Springer/IDRC (2006) below thus:

The impact of government benefits and transfers on the distribution of incomes and expenditure can be visualized using curves that are linked to the poverty, social welfare and inequality dominance curves.

In homogenous populations, everyone receives the same utility from a given amount of income. When this is the case, Kakwani (1984) and Shorrocks (1983) have shown that the average utility for one income distribution is no less than the average utility for a second income distribution for all continuous, increasing, concave utility functions if and only if the former distribution generalized Lorenz dominates the latter (Note 6). More generally, assuming that the social welfare function is invariant to a replication of the distribution of utilities (and, hence, invariant to a replication of the income distribution), a straightforward extension of an argument developed for Lorenz domination by Dasgupta, Sen, and Starrett (1973) shows that it is sufficient for the equivalence between welfare dominance and generalized Lorenz dominance to hold that the social welfare function is increasing, symmetric, and quasi-concave for each population size. It is not necessary for the social welfare function to aggregate utilities by taking their average.

The generalized Lorenz dominance criterion can also be applied to distributions of utility. In this case, the Kakwani–Shorrocks Theorem shows that one distribution of utilities is weakly preferred to a second distribution by all inequality averse average generalized utilitarian social welfare functions if and only if the former utility distribution generalized Lorenz dominates the latter. In its inequality averse formulation, average generalized utilitarianism applies a common continuous, increasing, concave transform to each person's utility before averaging across individuals to form the social objective function. Average utilitarianism is simply the special case in which this function is defined using the identity transform.

As Blackorby, Bossert, and Donaldson (2005, p. 143) have noted, average utilitarianism “makes some stark trade-offs: an alternative with a population of any size in which each person is equally well off is ranked as worse than an alternative in which a single person experiences a trivially higher utility level.” The same observation can also be made about any social welfare function that is defined in per capita terms, such as average generalized utilitarianism. As another example of these questionable trade-offs, consider a poor country that experiences a marginal decrease in utility per capita holding the distribution of utilities unchanged as measured by the Lorenz criterion. According to the generalized Lorenz criterion, there has been a loss in social welfare, and this is true even if the population has increased substantially.

Classical utilitarianism does not fare much better, as it suffers from what Parfit (1984) has called the repugnant conclusion. A social welfare ranking of utility distributions is subject to the repugnant conclusion if any distribution in which everyone's utility is positive, no matter how large, is socially worse than some other distribution for a larger population in which everyone's utility is arbitrarily close to zero. Average utilitarianism avoids the repugnant conclusion because the addition of an individual to the population is welfare improving only if his or her utility exceeds the initial average utility level.

Social welfare dominance criteria provide a way of partially ordering distributions based on widely shared value judgments. In practice, the dominance criterion that is most commonly employed is the generalized Lorenz partial order. Implicitly, this dominance criterion measures social welfare in per capita terms. More precisely, as the Kakwani–Shorrocks Theorem establishes, it coincides with the averaged generalized utilitarian dominance criterion. However, as we have noted, per capita measures of social welfare make some trade-offs that many would find unpalatable when the size of the population is subject to variation. Critical-level generalized utilitarianism was introduced as a way of overcoming these concerns. The critical-level generalized utilitarian welfare dominance criterion introduced here measures differences in social welfare in aggregate, not per capita, terms.

Finally to further support the welfare dominance criterion, Sen (1973, p. 76) argued thus

“Treating inequality as a quasi-ordering i.e. as a partial ordering has much to be commended from the normative as well as the descriptive point of view.” The same can be said for social welfare comparisons. The critical-level and critical-band generalized utilitarian welfare dominance criteria introduced here provide alternatives to generalized Lorenz dominance. They are alternatives that we think have much “to be commended.”

Some authors have done quite interesting studies using welfare dominance criteria. Details of their findings are presented thus:

Shiomo Yitzhaki & Joel Slemrod (1987) suggested a method which enables the user to identify commodities that all individuals who can agree on certain weak assumptions with regard to the social welfare function will agree upon as worth subsidizing or taxing in the absence of efficiency considerations. The method was based on an

extension of the stochastic dominance criteria and was illustrated using data from Israel. The methodology states that the conditions (called marginal conditional stochastic dominance rules) required for all individuals with Paretian concave social welfare functions to agree that an increase in the subsidy on one commodity, which is financed by an increase of the tax on another commodity (or a proportional income tax), increases social welfare. If this reform does not increase excess burden, then all individuals will agree on the preferred direction of tax reform. An inspection of Israeli data suggests that these conditions were quite commonly observed in practice, making this a practically relevant point.

Ok and Lambert (1999) showed that one does not have to be a utilitarian to accept Atkinson and Bourguignon's (1987) sequential generalized Lorenz dominance criterion, because the latter is also supported by a much wider class of aggregation functions. They took a minimal stance and showed that it is success to be a weighted utilitarian –with higher weights for the more needy– to accept it.

Applying the welfare dominance tests Sahn & Younger (2000), in their study examined the progressivism of social sector expenditures in eight sub-Saharan African countries. The study employed dominance tests, complemented by extended Gini/concentration coefficients, to determine whether health and education expenditures redistribute resources to the poor. The study found that social services were poorly targeted. Among the services examined, primary education tended to be most progressive while university education is least progressive. The benefits associated with hospital care are also less progressive than other health facilities. The study results also show that, while concentration curves are a useful way to summarize information on the distributional benefits of government expenditures, statistical testing of differences in curves is very important.

Zoli (2003), considered poverty orderings associated with unanimous dominance for classes of poverty measures. The analysis considered both populations composed by homogeneous individuals and cases when individuals differ in needs. The study presented two approaches “dual” to those available in the literature. For both approaches the characterized poverty orderings were associated with those derived from the (absolute) Poverty Gap profiles (or TIP curves) introduced by Shorrocks (1995, 1998) and Jenkins and Lambert (1997). The study approaches were dual to those existing in the literature in that they either (a) provide characterization of results associated with dominance for rank-dependent poverty indices, while existing results are in terms of dominance for additively decomposable indices, or (b) consider additively decomposable indices but specify poverty aversion and poverty sensitivity looking at the individuals poverty gap instead of looking at income levels.

Trannoy & Weymark (2007) investigated social welfare dominance criteria based on critical-level generalized utilitarian social welfare functions through the introduction of an analogue of a generalized Lorenz curve called a generalized concentration curve. The study found that for a fixed critical utility level c , a partial order of utility distributions based on these curves was defined and shown to coincide with the partial order obtained by declaring one utility distribution to be weakly preferred to a second if and only if the former is weakly preferred to the latter for all inequality averse critical-level c generalized utilitarian social welfare functions. An extension of this result that allows for a range of critical levels was also established.

Tomat (2007) applied the welfare dominance in analysing poverty patterns in Italy in 1997-2005 and the study found that income distribution has remained relatively stable during the 1997-2005 periods in Italy however this occurs as a result of different patterns by macro-region. Poverty rates within the period show a tendency to decline in the North and in the Centre and to increase in the South. Moreover, the decomposition by population components revealed that poverty rates have increased in the younger age classes and decreased in the older ones. The study concluded that since there were variations in the age structure of the population by macro-region the decomposition of poverty patterns by age components provides an explanation for the observed differences in the movements of poverty during the sample period. Additional analysis also showed that in all macro-regions socio-economic factors such as the level of educational attainment have a distinguishable effect on the poverty rates and suggests that poverty reducing policies should be primarily directed towards the less educated individuals.

From the theoretical and empirical review done so far, it has been observed that concentration curves are compared to Lorenz curve to determine its degree of pro poor hence the generalized Lorenz dominance criterion provides a partial ordering of alternative income distributions for homogeneous populations. According to this criterion, one income distribution weakly dominates a second if the generalized Lorenz curve for the former lies nowhere below the generalized Lorenz curve for the latter. With a population of size n , for each fraction k/n of the population, $k = 0, \dots, n$, a generalized Lorenz curve plots one n th of the total income of the poorest k people against k/n , with linear interpolation used so that the curve is defined for all points p , $[0, 1]$. This curve is simply the Lorenz curve scaled up by the mean income. This dominance criterion can be applied both when the size of

the population is the same in both distributions and when it is not. Replicating a population and its distribution of incomes has no effect on the shape of a generalized Lorenz curve and, hence, as we have already noted, the generalized Lorenz criterion satisfies Dalton's Principle of Population.

3. Methodology

This study replicated Sahn & Younger (2000) which is a type of incidence analysis. It is generally accepted that measuring and comparing the incidence of the benefits of public services requires three steps. First, we must value the benefit to an individual of going to a public school or receiving healthcare in a public facility. Second, we must rank households, from poorest to richest (quintiles). Third, we need a decision rule that determines when one distribution is better than, the same as or worse than another (welfare dominance tests).

Dominance test in this study was primarily based on ranking the progressivity of benefits of categories of social expenditure (education and healthcare) across all levels (primary, secondary and tertiary). The tests evaluated the distribution of expenditure against two benchmarks looking at whether they are absolutely progressive (i.e. inequality reducing relative to welfare benchmark which is the 45⁰ line), and if they are per capita progressive meaning that households at the lower (upper) end of the income distribution receive at least an equal level of benefit as upper (lower) income households. These tests were necessary (Note 7) because concentration curves are estimated from survey data and are therefore subject to sampling variability hence the need for statistical comparisons.

Several approaches have been applied by various authors in testing for differences in concentration curves or dominance tests depending on the interest of analyst. If the interest is to test dominance of a concentration curve(s) against the Lorenz curve of expenditure/consumption or against another concentration curve estimated from the same sample, then the standard errors for the differences between curve ordinates must be computed though this is complicated by the fact that, in such cases, the curves are dependent. An appropriate variance-covariance matrix which allows for dependence between curves was derived by Bishop et al. (1994) and Davidson & Duclos (1997) (Note 8) to help overcome the problem.

Dominance tests in this study followed the above which was applied by Sahn and Younger (1999, 2000) and O'Donnell et al (2007) but in addition to accounting for the possible dependence between concentration curves, the current study used the covariance matrix for the ordinates estimates which was also used by Sahn and Younger (1999). This was to avoid the fact that statistical tests using only t-tests for the difference between ordinates of two concentration curves at several abscissa (usually 0.1 to 0.9) leading to the rejection of the null hypothesis of non-dominance when one of the ordinates differs statistically in the direction of dominance as long as none of the other pairs indicates a statistically significant result in the opposite direction which has been widely used commonly leads to the acceptance of the null hypothesis quite often. This has resulted to very little to conclude about the progressivity of categories of not only expenditures/consumption but taxes.

However, according to Sahn & Younger (1999), bounding the size of test at the risk of low power is consistent with standard econometric but failure to reject the null hypothesis leads to indeterminate result unless there is an establishment that the two curves cross which can be revealed by two significant differences in ordinates of opposite signs.

Besides the decision rule, the study noted that it is important to choose the number of quantile points at which ordinates are to be compared. If the number of comparison points is too restricted, then dominance across the full range of the distribution is not being tested. According to Howes (1996) it is difficult to find dominance at the extremes of distributions. With reasonably large samples, a popular choice has been to test for differences at 19 evenly spaced quantiles from 0.05 to 0.95 as applied by (Sahn and Younger 2000; Sahn et al. 2000 and O'Donnell et al 2007). Therefore the decision rule will be thus: Using 19 equally spaced ordinates from 0.05 to 0.95, we reject the null hypothesis (non-dominance) in favour of dominance if all t-statistics are greater than the critical value and of the same sign; or we reject the null in favour of crossing if there are at least two significant t-statistics with opposite signs. This means that rejecting the null on non-dominance using the above procedure implies that one distribution is preferred over the other under any social welfare function that favours progressivity.

4. Data and Sources

The survey data for the study was primarily drawn from the Nigerian Living Standard Survey (NLSS) 2003/2004, a welfare monitoring survey collected by the National Bureau for Statistics (NBS) in collaboration with the European Union and the World Bank. The data has 19,158 households with complete information out of the 22,000 households in the sample. These households comprised of both rural and urban households. Broad issues

included in the survey range from access to education, healthcare services, and housing status to possession of assets and other selected living standard indicators. Information were also collected on individual basis for education and healthcare issues and further disaggregated by gender with 40967 responses from male and 39,725 responses from females for education issues as well as 47,208 from males and 45,308 from females for healthcare related issues (Note 9). Here access to education and healthcare were chosen for analysis taking into account their close correlation with welfare status of households. The data contained information on households' total expenditure and households' expenditure on education and healthcare. Data from the survey was disaggregated into state levels, and gender (male and female) in both healthcare and education. Though there were many inconsistencies in the data, to partially overcome this data problem, the study assumes that service access rates for each household group (quintile) in a specific zone overlaps with corresponding rural or urban patterns. This was certain to compromise the degree of analytical insights and policy derivations, which otherwise would have been achieved, by masking existing access differences among local administrations.

Secondary data on actual revenue and expenditures, enrolment rates and visits to healthcare and education centers by gender were also used the augument the survey data.

5. Results, Findings and Discussions

Incidence of benefit for education and healthcare by gender (male and female) is presented as figures 1 and 2 respectively below. The gender analysis used individual as its unit of analysis with responses from 27,845 males and 22,753 females. The study could not use household because the only available household data disaggregated into gender used the household head. Using household head to represent gender have been criticized by Muthwa (1993:8), stating "within the household, there is much exploitation of women by men which goes unnoticed when we use poverty measures which simply treat households as units and ignore intra-household aspects of exploitation. The use of individual by the study was based on the argument by Moser (1998), which implies that a focus on what the poor aspire to, what they have, and how they make use of it, allows for a much more holistic, person-oriented, appreciation of how survival is negotiated. Similarly, González de la Rocha & Grinspun (2001:59-60) both observe that "analysing vulnerability requires opening up the household so as to assess how resources are generated and used, how they are converted into assets, and how the returns from these assets are distributed among household members." Based on the forgoing argument, the study used individual as unit of analysis instead of the head of the household to represent the gender dimension.

Visual inspection of figures 1 and 2 revealed an absolute progressivity for primary education (Figure 1) and primary healthcare (Figure 2) for both males and females; absolute progressivity for female secondary education, progressivity for male secondary healthcare and regressivity for both male and female tertiary education and healthcare. The progressivity or regressivity of male secondary education could not be determined using the concentration curve. The absolute progressivity for primary education and healthcare for both sexes corroborated the general findings on incidence to household groups but progressivity for male secondary healthcare contradicts the general findings by household groups for healthcare.

The above findings were through a mere inspection of the concentration curves. To ascertain whether such progressivity or regressivity were significant, the study conducted a dominance tests using figures 1 and 2. Table 2 presents the dominance tests results for social services (education and healthcare) relative to the Lorenz curve and the 45-degree line in Nigeria by gender. This dominance tests results is country specific (Nigeria) following the above process and method to ascertain whether social services (education and healthcare) (1) are absolutely progressive (i.e. the concentration curve is above 45 degree line implying that the poor receive more benefits than the rich in absolute terms), (2) are progressive (i.e. the concentration curve is above the expenditure distribution (Lorenz curve), implying that the poor benefit more in relative terms), and (3) can be ranked or ordered by their degree of progressivity.

Based on the results from the t-tests for the differences between ordinates of two concentration curves at 19 abscissa as interpreted and presented in Table 2, the study found that with the exception of primary education service, no service was absolutely progressive for both male and females, hence the study cannot reject the null that their concentration curves are equal to or above the 45-degree line. This finding corroborates the finding by Sahn & Younger (2000) for seven African countries namely Ghana, South Africa, Guinea, Ivory Coast, Madagascar, Tanzania and Uganda. Based on the same results, the study found tertiary education and tertiary healthcare for both male and female concentration curves as statistically dominating services or services where the poorer households receive less benefit in per capita terms than households at the upper end of the expenditure distribution. Also, the study found statistically significant crossings for primary healthcare for both male and

female disaggregated concentration curves as well as progressive girls' secondary education. Tertiary education for both sexes revealed regressivity or services less concentrated among the poor.

The finding of female progressivity in secondary education in Nigeria could be attributed to the fact that secondary education in Nigeria are normally in three forms viz: boys, girls and mixed. Also, it has been observed by most studies that Girls' secondary schools are more in number than their Boys' counterparts and per capita expenditure for such public Girls' secondary schools are far higher than public Boys' secondary schools in order to encourage girls' education. Such arrangement of providing separate schools for males and females may have given the female folk a lee way in secondary education than secondary healthcare where both sexes are required to use the same facilities, hence religious and cultural beliefs may have inhibited a particular sex from not using these services the way they ought to. This finding was supported by Akanji et al (2003) and Amakom & Obi (2007). Therefore, it may not be surprising to see benefits accruing to females higher than that of males in public secondary schools.

Also female absolute progressivity in secondary education may have been induced by the education policy for most northern states where female education is free irrespective of the background and social status of the parents. The only issue here is that of service quality which the concentration curves have not captured. It is an issue of concern because analysis by Akanji et al (2003) reveals that up to 40% of the capital expenditure across public girls secondary schools goes into home economics while 50% of capital expenditure goes to science equipments in public secondary boys schools with only about 5% going to science equipment in public girls secondary schools.

Comparison between the Lorenz curve for expenditure and various categories of social services revealed dominance of social services such as primary healthcare both male and female concentration curves as well as female secondary education. Such findings indicate that such services were progressive hence the study cannot reject the null of non-dominance between public primary healthcare for male and female as well as female secondary education and the Lorenz curve. This findings show that such social services were more progressive than the distribution of expenditure (Lorenz curve).

6. Conclusion

Assessing the actual level and allocation of public expenditure (subsidy) is the key to understanding any government's true expenditure priorities and its coherence with the government's policy objectives. Two important sectors (education and health) which the state pursues a variety of economic, social and political goals were identified and the distributional pattern of government subsidies was analyzed. This is because besides the targeted programs of food and housing subsidies, access to and provision of basic levels of education (primary, secondary and tertiary) and preventive health care services have been accepted as central to increasing the welfare of the poor. If subsidies to the two sectors are pro poor (progressive), it implies that the poor benefit more than the rich and vice versa. The result has revealed the distribution patterns in terms of gender showing who benefits from subsidy in education and healthcare.

Therefore for a country like Nigeria in the current economic crisis to develop, there is need for more investments in the improvement of education and healthcare and making sure that these subsidies are evenly distributed to males and females alike. If this is achieved, it can now be said that subsidies are well targeted with a possible attendant of more people especially the female folk who are more vulnerable escaping from poverty.

Redefining and sharpening the role of government in such areas has become one of the key issues in modern development policy and for this challenge to be met in any sector, policymakers need reliable and up-to-date information on the structure of the sector and its financing which this present study has provided. Findings from this study has provided a basis for understanding government's financial operations which will ultimately contribute to the goals of resource usage efficiency and fairly balance spread of budget allocation and subsidies.

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Notes

Note 1. By impact targeting we mean generating for every dollar added to the short-run deficit, the largest possible increase in GDP i.e. a situation where the stimulus package will produce the maximum stimulus through a expenditure where it is most likely to be spent by recipients. On the other hand by need targeting we mean, the objective of assisting those households that need it most.

Note 2. Equity issue is one yardstick for evaluating performance in fiscal policy. This is because the public expenditure is indisputably a key government tool for the implementation of social, political and economic policies and priorities.

Note 3. Adult literacy rate is still struggling to leave 62%, a position it has maintained for more than five years now

Note 4. Health poverty in Nigeria is at a different dimension when the percentage of people that has access to clean/safe water and essential drugs is compared to other Sub-Saharan African countries (SSA).

Note 5. Income Inequality is becoming a special feature of the Nigerian economy, which has helped tremendously in increasing poverty severity, pervasiveness and depth. Much of the income of the nation is concentrated in the hands of the few privileged ones. This has continued to the extent that in Nigeria the middle class has died naturally because you either belong to the rich or the poor class. When Nigeria is compared with other African countries like Ghana, Egypt and Algeria the gap between the rich and the poor in Nigeria is observed to be far wider

Note 6. This is referred to as Kakwani–Shorrocks Theorem

Note 7. It is true that visual inspection of a concentration curve in comparison with the 450 line or another concentration curve like the Lorenz curve (per capita expenditure/consumption) may give an impression of whether there is dominance but clearly this inspection may not be sufficient to conclude whether or not dominance is statistically significant. In order to make inferences about dominance, the standard errors of the concentration curve ordinates must be computed in addition to their point estimates.

Note 8. Davidson & Duclos (1997) thus derived an estimator which is a distribution-free standard error for the difference between two concentration curves that may be dependent. Such estimator was used to establish a confidence interval around the estimated concentration curves and then tested for significant differences between them with the null hypothesis that the ordinates of two concentration curves are equal at each of 19 evenly spaced abscissa. According to Howes (1996), the null hypothesis of equality will be rejected if all 19 ordinate pairs are significantly different.

Note 9. This individual disaggregation enabled the study to draw concentration curves by gender

Table 1. Vital Nigerian Statistics by Gender

	Male	Female
Population (2006 census)	71,709,859	68,293,683
Adult Literacy Rate-English	62.6	46.4
Adult Literacy Rate-Any Language	74.6	56.8
Primary School Gross Enrolment	96.1	88.5
Primary School Net Enrolment	63	59.8
Secondary School Gross Enrolment	76.2	72.5
Secondary School Net Enrolment	45.4	45.9
Land Ownership	38.1	7.2
Access to Credit	11.6	9.8
Decision making at Household Level	74.3	72.9
Decision making at Community Level	23.8	4.1
Sub-Degree Total Enrolment (2005)	40,383	22,483
Undergraduate Total Enrolment (2006)	475,577	214,404
Postgraduate Diploma Total Enrolment (2006)	14,268	3,471
Masters Total Enrolment (2006)	18,865	7,535
Ph.D Total Enrolment (2006)	4,661	1,845
Academic staff of Universities	22,858	4,624
Commonwealth scholarship	7	2
British Educational Award	71	10
<i>Political Offices Holdings</i>		
Counselors	8,454	270
Local Government Chairpersons	760	14
House of Representative members	339	21
Senators	105	4
Governors	36	0

Source: Annual Abstract of Statistics, 2007

Table 2. Dominance Results for Social Services (Education and Healthcare) Relative to the Lorenz Curve and the 45-degree line by Gender in Nigeria

	Primary Education		Primary Healthcare		Secondary Education		Secondary Healthcare		Tertiary Education		Tertiary Healthcare	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Male	+	+	+	x	x	--	--	--	--	--	--	--
Female	+	+	+	+	+	--	--	--	--	--	--	--

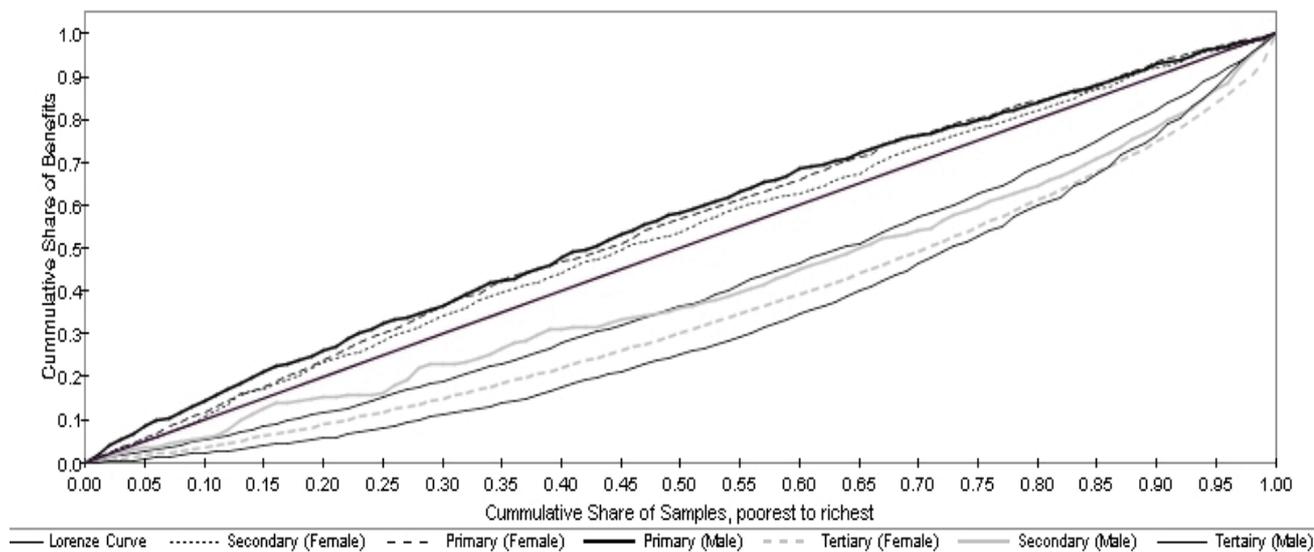
Notes:

- (1) compares the column’s concentration curve with the Lorenz curve for per capita household expenditure
- (2) compares the column’s concentration curve with the 45-degree line
- ‘+’ indicates that the benefits from the column’s service are more concentrated among the poor than per capita expenditure (Lorenz curve) (for (1)) or an equal per capita distribution (for (2))
- ‘--’ indicates that the service is less concentrated among the poor
- ‘x’ indicates that the concentration curves cross

If the curves are statistically insignificant from one another, the corresponding cell is blank

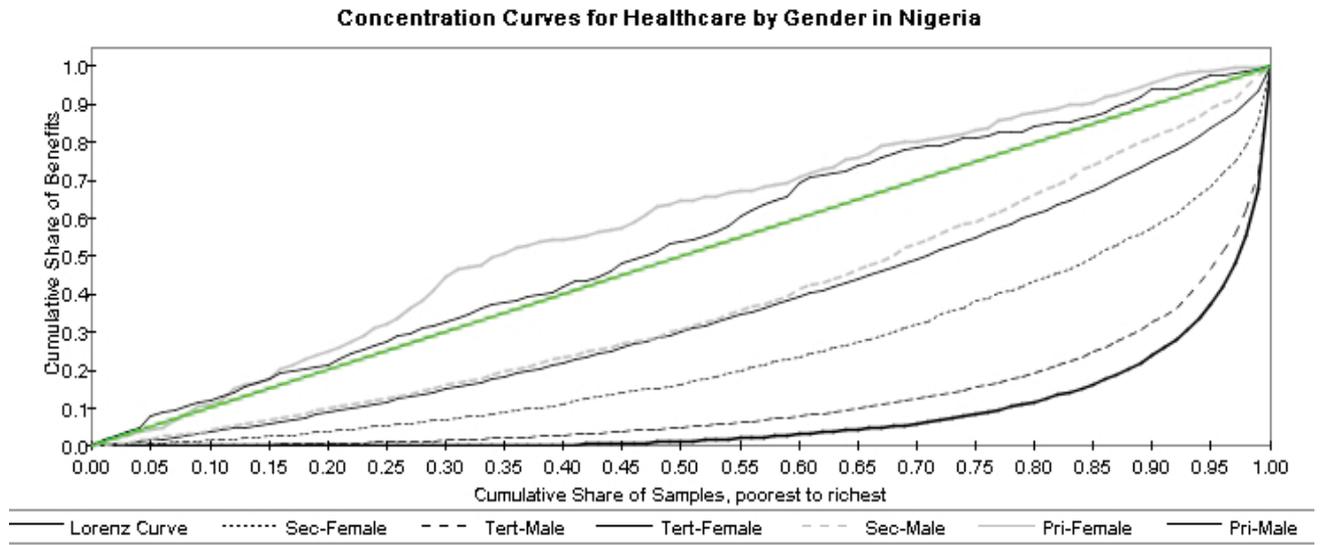
Source: Authors Computation

Concentration Curves for Education by Gender in Nigeria



Source: By authors

Figure 1. Concentration Curves for Education by Gender in Nigeria



Source: By authors

Figure 2. Concentration Curves for Healthcare by Gender in Nigeria