Application of Truncated Distributions to Poverty Analysis among Etsako People of Edo State, Nigeria.

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Abstract: *The rational for undertaking this study is to expound on the fact that public and self-employed people who earn income may not be out of poverty. To demonstrate this notion, a truncated poverty distribution analysis is explored in this study. Basically the study targeted both public and self-employed individuals within the study area to examine the existence of poverty among them. The method of data collection employed in this analysis involves the use of questionnaire to elicit information from subjects drawn from Etsako people of Edo State in Nigeria. A lucid analysis was carried out by using truncated distributions techniques such as: Box plot, Histogram, Normal plots and Quartiles plot to examine the level of poverty among public and self-employed individuals within the study area. The analysis reveals that there is a high measure of poverty especially among the self-employed individuals while the incidence of poverty is even among the public employed individuals. The study therefore recommended that a subjective minimum wage of ₦63,000 per month should be considered as monthly salary for public employed individuals, while other incentives such as tax reduction, free and affordable education, free and affordable health care, interest free loan, increase emphasis on non-oil exports et cetera, should be implemented to enable citizens move out of the poverty threshold.*
Key words*: Domain constraints, Income earners, Poverty line, Etsako People, Truncation.*

I.   Introduction

Poverty is a phenomenon that exists when people lack the means of satisfying their basic needs. This problem has bedeviled people of all ages, colour, religion and ethnicity. Poverty is a world-wide problem however; it is more intense and exasperating in the developing countries than the developed countries. A high percentage of Nigerians both in public as well as the self-employed are low income earners, they earn wages far below the international poverty line. Most Nigeria workers receive a starvation wage and over 75% of them live in abject poverty[1]. Statistics shows further that poverty level increased from 28.1% in 1980 to 46.3% in 1985, it increased further to 65.5% in 1996 and 71.3% in 2005[2] . The precarious situation of low-income earners in Nigeria is even more worrisome as they have to survive in the face of high inflation and also cater for dependants' relatives as well[3]

In Nigeria and other Sub-Sahara African countries poverty is caused by a diverse of factors, phenomena and practices. Such scenarios that often inform poverty can be looked at from both domestic and international perspective.   At the domestic level, factors such as economic mismanagement, corruption, embezzlement of public funds, low level of income, low level of investment in human capital development, inadequate provision of infrastructural facilities and social services etc stands out as the main culprits.[4&5]

At the international level factors that contribute to poverty includes: the distribution of trade in value added product, inequitable distribution of global resources, worsening debt-overhang, deepening global recession, shock wave of globalization etc which favour the industrialized countries more than the developing countries[4].

Some international agencies including the World Bank have listed Nigeria is a poor country. Specifically Nigeria has been ranked in the poverty index to be 152 out of 158 countries[6] (Premium times, 6th Feb 2018). Similarly, a UN report on Nigeria's Common Country Analysis (CCA)) states that, over 80 million of her population are living below the poverty line[7]. The UNCCA Report on Nigeria stated specifically in part that;

"Nigeria economy is currently in a recession and it is estimated that government revenue have fallen by about 33% which has resulted in a decline of about 0.36% of the country's GDP in the first months of 2016"

An interesting scenario plays itself out in the Nigeria context where most public and self- employed individuals who receive wages or profit at the end of every month still live below the international poverty line.
Statement of Problem for the Study.

Different scholars have explored the various attempt made by past administration in Nigeria to alleviate poverty. It has been noted that former President of Nigeria General Ibrahim Babangida in 1986 established the Directorate of Food, Roads and Rural Infrastructure (DFRRI), which was intended to provide better roads, electricity and potable water and toilets for rural dwellers. The regime further established the Peoples Bank of Nigeria and Better Life Programme however all the above listed programmes of General Ibrahim Babangida did not live up to the expectations of people in Nigeria consequently, the regime did not succeed in alleviating poverty[8].

Equally, in 1993 the Family Support Program (FSP) and the Family Economic Advancement Program (FEAP) both intended to care for the poor was initiated by the General Sanni Abacha's regime. The Family Support Program through Government funding and taxation made billions of Naira but majority of the money was misappropriated, embezzled and wasted[8]. Consequently the programmes did not achieve the desired outcome of alleviating poverty in the country.

The democratic government of former President Olusegun Obasanjo evolved a lot of policies ranging from privatization, commercialization, and deregulation of the economy as well as the introduction of the Universal Basic Education. The establishment of the National Open University of Nigeria (NOUN), and the Nigeria Economic Policy (NEP), focusing on: market orientation, private sector-led development approach, highly competitive environment, technology driven, broad-based policies. The government also launched the National Economic Empowerment and Development Strategy (NEED) in 2004. All the above listed programmes were geared towards achieving the agreed Millennium Development Goals (MDGs) and reducing poverty in Nigeria[9]. The program is seen as an improvement over the previous Nigerian government poverty-reduction programmes.[10].According to a 2008 analysis, the program has been able to train 130,000 youths and engaged 216,000 people, but most of the beneficiaries were non-poor. [11]. Hence, as laudable as the programmes were little success was recorded in the area of poverty alleviation.

The government under late President Shehu Musa Yar'Adua introduced the 7- point agenda in 2007 at the wake of his administration. The MDGs and the attendant 7-points agenda have their foundation in the economic growth model of the neo-classical theory, which states that: long term poverty reduction requires sustained economic growth, which in turn depends on technological advancement and capital accumulation.[12] The Yar'Adua's 7-Point Agenda includes; .Power and Energy, Food Security, Wealth Creation, Transport Sector, Land Reforms, Security, and Education. It will be difficult to carry-out an objective critique of the Yar Adua poverty alleviation programmes given the very short tenure of the administration coupled with the ill health of the late president, however the fight against poverty continued to the next administration of president Goodluck Jonathan.

Under the administration of President Goodluck Jonathan the Transformation Agenda was initiated which was meant to touch every aspect of the socio-economic and political life of the nation. Certain key areas of the Transformation Agenda were summarized by the National Planning Commission blueprint to include job creation, good governance, agriculture, security, power sector among others. The Job Creation Policy measures enunciated for job creation and productivity in the Transformation Agenda period among others includes; creation of five (5) million new jobs annually, a youth employment safety net support program such as conditional cash transfer and vocational training , development of industrial clusters, reviewing of university curricula to align with industry job requirements and promotion of apprenticeship/work experience programmes.[13]. Despite the well articulated programme by President Jonathan to alleviate the poverty situation in Nigeria, the poverty situation did not witness any drastic improvement within the period.

Nigeria's current President Muammadu Buhari on assumption of office also followed the foot-step of his predecessors by establishing programmes such as;
- The N-power job creation for the teaming unemployed in Nigeria.
- Free School feeding programme for primary schools pupils
- Government Enterprise Employment programme (GEEP)

One may note that President Buhari's programmes has faced a lot of criticism right from inception, this may be confirmed by the continuous poor rating of Nigeria on poverty index despite Buhari's laudable programme[14]. This is further confirmed by the UN Human Development Index in 2016 rated Nigeria as the 3rd poorest country in the world[15].

It is even more disturbing that despite the huge human and material resources that have been devoted to poverty reduction by successive governments in Nigeria, no noticeable success have been achieved in that direction. Although, predicted poverty reduction policies by different governments vary significantly depending upon the rate and nature of poverty related policies, actual evidence suggests that the depth and severity of poverty is still at its worst state in Nigeria.[16] Both public and self-employed individuals in Nigeria are continually confronted by poverty, giving all the definition that human decency may entail, including living in rotten tenements, poor medical services, lowered standard of education, etc.

From the foregoing, it is observed that despite the programmes and policies that have been put in place by successive government to alleviate or eradicate poverty in Nigeria, the incidence of poverty level in Nigeria has been galloping since 1980.[17] Giving the forgoing, this study presents a distinct truncated analysis to show that workers in Nigeria still live below the poverty line of $1.25 per day and to suggest possible ways that will be helpful in alleviating poverty specifically among public and self-employed individuals in Nigeria.

Rational for the study.

The rational for this study is to investigate the incidence and depth of poverty in Nigeria using empirical evidence from Etsako People in Edo State. This will be accomplished based on the following specific objectives:

(i) To examine if the public and self-employed individual's per capital incomes fall below 50% of the median.
(ii) To investigate the level of poverty based on social status of public and self-employed individuals in Nigeria.
(iii) To investigate the feasibility of constructing a poverty line that will be implemented in Nigeria using data from Etsako people in Nigeria.
(iv) To suggest possible ways to improve upon the poverty alleviation policies in Nigeria.

Review of Relevant Literatures

The poverty situation in Nigeria is quite disturbing because both the quantitative and qualitative measurements attest to the growing incidence and depth of poverty in the country[16]. This situation however, presents a paradox considering the vast human and physical resources that the country is endowed with. It is even more disturbing that despite the huge human and material resources that have been devoted to poverty reduction by successive governments in Nigeria, no noticeable success has been achieved in this direction because reports at various time has estimated that 67% of Nigerians are poor, 43% are reported to live in the rural areas.[7]

Although a universally adopted poverty definition is still elusive because of the different and various meaning and interpretation of poverty, most scholars view poverty conventionally as a result of insufficient income for securing basic goods and services, while others see poverty partly as a function of education, health, life expectancy, etc. [1] However, the poor have been identified by using a separate criteria of the level of consumption and expenditure.[18]

Extreme poverty, absolute poverty, destitution, or penury, was originally defined by the United Nations as "a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information.[19] It depends not only on income but also on access to services. Extreme poverty, which widely refers to earning below the international poverty line of $1.25/day (in 2005 prices), was set by the World Bank, this measure is the equivalent to earning $1.00 a day in 1996 US prices, hence the widely used expression, living on "less than a dollar a day". However this has been review to $1.90 as at 2015. World Bank, but the $1.25 per day is still mostly used.[20]

Poverty can be structural (chronic) or transient.[5] While the former is defined as persistent or permanent socio-economic deprivation and it is linked to a host of factors such as lack of skill for gainful employment, limited productive resources, endemic socio-political and cultural factors and gender, the latter is defined as temporary or transitory and it is linked to natural and man-made calamities. Transient poverty can be easily reversed but can become structural if it persists.[5] The universal definition of poverty is the inability to attain a social acceptable minimum standard of living[12].

It has been observed that, at least for the case of developing countries, attention is often focused less on inequality and income distribution than on poverty[22]. One of the main features that characterize this literature is the construction of poverty lines and head-count ratios. Poverty lines are usually constructed by resorting to some arbitrary procedure that includes a type of threshold.[23]

Types of Poverty

Poverty can be categorized into absolute and relative poverty. Absolute poverty is a condition characterized by severe deprivation of basic human needs. Such basic human needs includes: food, housing, water, healthcare, access to productive resources including education, working skills and tools, the political and civil rights to participate in decisions concerning socio-economic conditions.[24] The World Bank on the other hand defined poverty as a condition of limited malnutrition, diseases, illiteracy, squalid surroundings, high infant mortality and low life expectancy which is beneath any reasonable definition of human decency. [20]

Relative poverty is seen as a measure of income inequality or the part of population with earnings less than some fixed proportion of median income. It reflects the social inclusion cost and equality of opportunity in certain parts and space, it mostly depends on social context.[25]. Relative poverty is very often used by most international agencies such as; UNDP, OECD, UNICEF etc.

Causes of poverty in different societies.
Studies have shown that a combination of factors contributes to the incidence of poverty in any society.[26] Such factors as it relates to the Nigeria context includes;
- Unemployment
- Laziness
- Inequality
- Low economic growth performance
- Macro economic shocks and policy failure
- Labour market deficiencies
- Human resource development
- Ill-health/disease
- Debt burden
- Poor governance
- Environmental degradation
- Crime and violence

Need to measure poverty.
The need to measure the scale and intensity of poverty is any society is hinged on the following reasons as advanced by some authors includes;[26]
- To determine a yardstick for measuring standard of living.
- To choose a cut-off poverty line, which separates the poor from the non –poor (indication of how many
- people are poor).
- To take account of the distribution of standard of living among the poor.
- To help in the comparison of poverty overt time, among individuals, group or nations.
- To serve as a guide for policy on poverty alleviation.

Axioms of poverty measurement
In poverty measurement, certain axioms should be noted, those axioms includes;[27]
a) Focus axioms**:** This class of axioms requires a poverty index to be insensitive to incomes above the poverty line. This is a natural consequences of the fact that only people below the poverty line count in poverty analysis. Therefore, poverty indexes are not concerned about what happens above the poverty line. There are two versions of this axiom which are;
- Standard focus axiom (SF); this axiom states that given two income distributions of the same size where the incomes of the poor are the same in both cases, the poverty index measured on either distribution should give the same value.
- Generalised focus axiom (GF); this axiom states that given two income distributions of different sizes where the incomes of the poor are the same in both cases, the poverty index measured on either distribution should give the same value.
b) Monotonicity axioms This class of axioms requires that if the income of a poor individual who is below the poverty line increases, the poverty index should decrease. Also there are two versions of monotonicity:
- Strong monotonicity axiom (SM); this axiom states that a poverty index should decrease whenever the income of a poor individual rises.
- Weak monotonicity axiom (WM) – A poverty index should decrease whenever the income of a poor individual rises, provided that this individual remains poor.
c) Transfer axioms; this class of axioms is very important in poverty measure. In its general form, it requires a poverty measure to decrease after a progressive transfer and to increase after a regressive transfer. Four versions of transfer axioms exist whci are;
- Minimal transfer axiom (MT); this requires that the poverty index decrease (increase) after a progressive (regressive) transfer among two poor individuals remaining poor after the transfer, i.e. with the same number of poor people before and after the transfer.
- Weak transfer axiom (WT); this requires that the poverty index decrease (increase) after a progressive (regressive) transfer from an individual either above or below the poverty line to a relatively poorer individual. Also in this case the number of poor people must be the same before and after the transfer.
- Strong upward transfer axiom (SUT); this requires that the poverty index decrease (increase) after a progressive (regressive) transfer when the poorest of the two individuals is poor both before and after the transfer and the richer of the two individuals may be either poor or non-poor as a result of the transfer.

- Strong downward transfer axiom (SDT) – This requires that the poverty index decrease (increase) after a progressive (regressive) transfer from a relatively richer person, who may or may not be poor, to a poor person who may become non-poor after the transfer.
d) Symmetry axioms. Under this class of axioms, the following sub-axiom are included:
- Scale invariance (SI); this axiom requires that the invariance of the poverty index if all incomes of poor individuals and the poverty line be scaled by the same factor. A poverty index satisfying this axiom is called a relative poverty index.
- Translation invariance (TI); this axiom requires that the invariance of the poverty index, when all income s of poor individuals and the poverty line be either increased or decreased by the same absolute amount. A poverty index satisfying this axiom is called an absolute poverty index
- Principle of population (PP); this axiom requires that the poverty index be invariable when identical populations are replicated and pooled. In poverty analysis, this axiom is sometimes called Size Independence Axiom (SIN).

Different types of poverty measurement .
There are different measures used in determining the level of poverty in any society depending on the type of poverty in question. Some of the poverty measures are briefly highlighted below:
i. Living Standards: This is usually measured by using the consumer's income or spending, however, current consumer spending is more preferred to income in measuring current living standard.[28] Current consumption spending is preferable because in the first instance, instantaneous utility depends directly on consumption, not on income as the case may be. On the other hand current consumption is a better indicator of long-term average well-being since it shows information about income at other dates both past and future.[29] This measure is very useful in agrarian economies such as the Nigeria scenario where income often vary over time in fairly predictable way. This measure is questioned on the ground of faulty submissions by respondents.
ii. Poverty Line: This is defined as the monetary cost to a given person at a given place and time of a reference level of welfare. [30] People who do not attain the median value are deemed poor. This is more acceptable while we are dealing with absolute poverty than when we are dealing with relative poverty.
   Essentially there are two types of poverty lines analysis viz: Objective poverty line and Subjective poverty line.
- Objective Poverty Line: This approach justifies an attempt to anchor the reference utility level to attain basic capabilities of which the most commonly identified relate to the adequacy of consumption for living a healthy and active life including participating fully in the society.[31] There are two methods of measuring objective poverty line which are food energy intake method and food component method.[32]
- Subjective Poverty Line: This approach states that the circumstances of an individual relative to others in some reference group influence perceptions of well-being at any given level of individual command over commodity. Scitovsky (1978) reported in Olatomide Oluwa (2012; 28)[5], pointed out that "by this view the dividing line between necessities and luxuries turns out to be not objective and immutable, but socially determined and ever changing"
   Poverty line analysis and measurement can be further extended to Absolute poverty and relative poverty by employing relevant mathematical corollary. For example Absolute poverty can be measured in the following ways:
a) Head-Count Ratio (HCR): This measure explains the ratio of the number of poor people to the total population of the country based on the poverty line decided, this gives the proportion of the population with income below the poverty line. [33] The measure has its short-coming based on the fact that it treats everyone below the poverty line equally without taking into cognizance the severity of the poverty.
b) The poverty gap/income shortfall: According to the World Bank report this measure takes the difference between the poverty line and mean income of the poor and expressed it as a ratio of poverty line. [34] It measures the amount of money it would take to raise income of the average poor individual up to the poverty line.
c) Composite Poverty Index: This measure is attributed to Amartya Sen. It incorporates the head-count index, the income gap and the Gini coefficient.[35] It is express mathematically as

S = H [L + (1 – I) Gp]
Where
S = *Sen* poverty index
I = The average income shortfall as a percentage of the poverty line
H = Head-count ratio
Gp = Gini Coefficient among the poor

The major shortcoming of this poverty measure is that, it is more responsive to improvements in the head- count than it is to reduction in the income gap or to improvements in the distribution of income among the poor.

d) The Physical Quality of Life Index (PQLI): This measure is attributed to Morris.[36] The index measures how well societies satisfy certain specific "life-serving social characteristics" or achieved well-being; hence its focus is on social development.[37] The measure is based on three social indicators viz: infant mortality, life expectancy and basic literacy. The measure can be expressed mathematically as follows:

PQL = F(IM, e, Lit)

Where

IM = Infant mortality

e = life expectancy

Lit = literacy

The indices formed from these three indicators are summed up and the average is taken as the PQL thus;

$$PQL = \frac{[IM + eI + LitI]}{3}$$

Where;

IMI = infant mortality index

eI = life expectancy index

lit I = literacy index

e) The Human Development Index (HDI): The UNDP devised the HDI as its most recent composite index for measuring poverty.[38] The HDI has its focus on human development by incorporating both income and non-income factors. It uses three human development variables which are: income, knowledge and longevity. The longevity variable is used as a proxy for life expectancy at birth (e_o), knowledge is measured by literacy, while income is measured by the societies per capital income (Y). This can be captured mathematically as follows:

HDI = f(e_o, Lit, Y)

Where:

e_o = Life expectancy at birth

Lit = Literacy rate

Y = Per capital income

Poverty line analysis can also be applied to relative poverty in different societies. Under this scenario, relative poverty measures define the segment of the population that is poor in relation to the set of income of the general population. Such a poverty line is set at one half of the mean income or at the 40th percentile of the distribution. Foster et al proposed a number of (FGT) poverty indices based on a single formula, capable of incorporating any degree of concern about poverty through the poverty aversion parameter which is known as the P – alpha measure of poverty or the poverty gap index. [39]

$$Pá(y, z) = \frac{1}{N} + \frac{\Sigma(x-y)}{2} á$$

Where

Z = the poverty line

n = total sample population

y = income of the household

á = FGT parameter which takes the value of 0, 1 & 2 (depending on the degree of concern about poverty).

e.g if á = 0 the index becomes

$$Po = \frac{q1}{n} + \frac{qh}{n}$$

This is equal to the head-count ratio. If the degree of aversion is increased such that á = 1 the index changes to:

$$P_1 = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{Z - y_i}{Z}\right)$$

At this point the head-count ratio is multiplied by the income gap between the average poor person and the poverty line hence the index measures the depth of poverty and it is referred to as 'income gap' or 'poverty trap' measure.

If the á level is increased to 2 (á = 2) then the index allows for concern about the poor through attaching greater weight to the poverty of the poorest than those just below the poverty line, this is expressed below as;

$$P_2 = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{Z - y_i}{Z}\right)^2$$

The above equation satisfies the Sen-Transfer axiom which states that when income is transferred from a poor to a poorer person, measured poverty decreases.

The need for truncated poverty analysis

Truncated distributions arise in practical statistics in cases where the ability to record, or even to know about occurrences is limited to values which lie above or below a given threshold or within a specified range. Truncation is a characteristic of a distribution from which sample data are drawn which has application in empirical model (Robert, 1995)[40]. Truncated distribution also refers to a random variable whose "natural" range is (-∞, ∞), but is constrained to assume values only within a certain range limits in say k_i which is random and may have values within the range: - ∞ < k < ∞.

Truncated effect arises when one attempts to make inference about a larger population from a sample that is draw from a district sub-population, for example, studies of income based on income above or below some poverty line for inference about a whole population. This may be that there is no interest beyond the truncation point.

II.   Materials and Methods

The study adopted the following materials and methods in achieving a robust analysis of poverty distribution among public employed and self-employed individuals in Etsako West Local government of Edo State in Nigeria. A total of 782 individuals (both males and females in households) were targeted for the study.

Study design: A descriptive survey design using cross-sectional data is adopted in the study by designing and administering a structured questionnaire to respondents that were randomly selected from the three (3) Local Government Area that makes-up Etsako people in Edo State.

The study area description. The Etsako people are to be found in the Northern part of present day Edo State in Nigeri. When the Kukuruku Division was established in 1919 as an administrative unit in the former Benin Province, the people were grouped into Etsako District as one of the three districts included within it; the other two being Akoko-Edo and Ivbiosakon [41]. The main occupation of Etsako people is fairly divided between peasant farmers and craft-men (self-employed) and public worker (government employed) in the ratio of 80% to 20%.

Sample Size: Seven hundred and eighty-two (782) respondents were targeted in the study area.

Sample size calculation: The sample size used in this study was estimated using the sample size table[42] . The target population of the study made up of 139933.86 household. This is arrived at by using a population projection of 2.6% on the 2006 census figures for the area[43&44] . The number of actual returned questionnaire is 621 representing 79.4 percent. This is considered very high given the nature of the questions asked which has to do with respondent's income.

Subjects and selection method: Non random sampling procedure was adopted in this study to enable respondents who have the typical characteristics under investigation to be selected. Data were collected on household size, different livelihood diversification strategies, Income and household expenditures, Access to health services, ownership of land or house, size of monthly income, size of dependants, monthly income saved, expenses and monthly expenses on assets among others, to allow for collective inputs that will truly reflects in constructing a representative poverty line or threshold within the study area.

Statistical Analysis.

Percentage Statistics and truncated distribution plots using the S-Plus programme 4.5 version for computing t he mean, variances and the respective distribution function f(x) and cumulative function F(x) for each of the demographic statistical data obtained from the instrument administered was carried-out. Income threshold line for this study was derived by using the following equation;

If *X* is a random variable representing the right truncated version over the interval [-∞,b], where −∞< b <∞. Note that it is not necessary that $b \leq 0$ or $b \geq 0$. The Pdf, mean, variance, Cdf of *X* are given by:

$$f(x) = \frac{\varphi(x)}{\phi(b)} \qquad (1).$$

Where:

$$\alpha = \left(\frac{b-\mu}{\delta}\right), \varphi(.) = Pdf \text{ and } \phi(.) = \text{Cdf}.$$

$$E(x) = \mu = \int_0^\infty xf(x)dx \qquad (2).$$

$$\text{Var(x)} = \int_0^\infty [x - E(x)]^2 f(x)dx \qquad (3).$$

$$F(x) = \frac{\phi(x)}{\phi(b)} \qquad (4).$$

Thus, the mean obtained using approach (2) above, represents the threshold line. Income earners below this line are regarded to be poor and those above this poverty line are termed non-poor. Various household characteristics shall be depicted by truncated distribution graphs using the threshold line as a bases for deciding the poor and the non-poor. However, the global standard of $1.25 per head per day will equally be considered on the truncated distribution to examine what it amounted to in the peculiar situation.

III.   Results

Responses to various questions from the instrument relating to incomes from public employed individuals, earnings of self-employed individuals and required income needed by individuals to achieve the global standard of $1.25 per day are used in plotting the truncated distribution graphs such as: Box plot, Quartiles, Standard Normal distribution and Histogram normal distribution etc which is presented below;
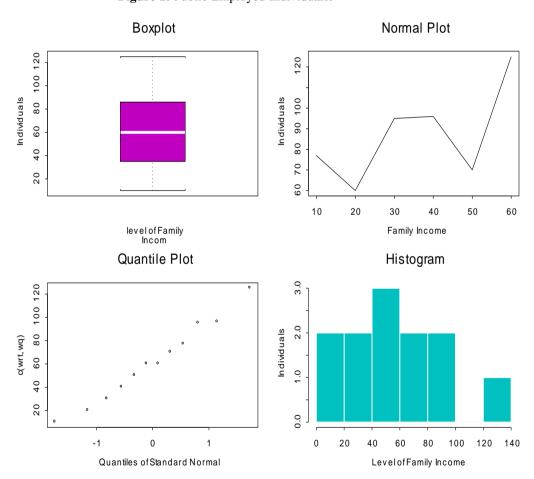
Figure 1: Public Employed Individuals**.**

Sources: Field Survey Data, (2017).

From figure 1 above, four truncated distributions are portrayed to examine the level of poverty among the public employed individuals; The Boxplot depicts that the income distribution is normal, judging from the estimation of the median line. The distribution of income earners above $1.25 (N350) per head per day is even, meaning that, about 50% of public employed individuals earns income that is enough to escape them from poverty level of $1.25(N350) per head per day.
The Quantile-Quantile plot (QQ-plot) further revealed that the level of income distribution among the respondents is near normally distributed, that is, about 50% of public employed individuals earns an income that is enough to remove them from poverty. The histogram further buttress the depiction and portraits of the QQ-plot.
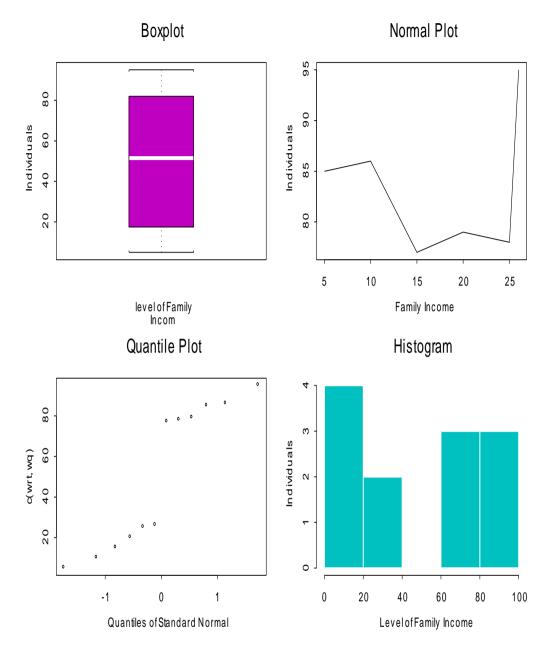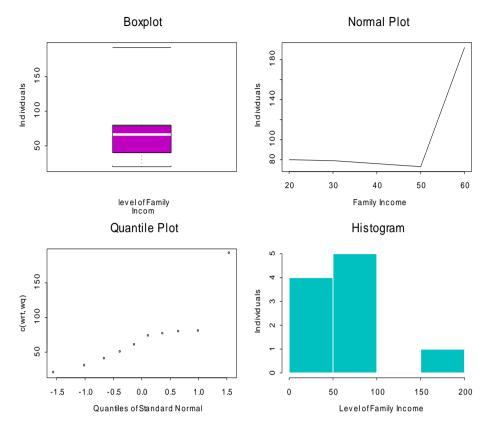
Figure 2: Self-Employed Individuals.

From figure 2, The Boxplot depicts that the distribution of earnings of self-employed individuals is not normal, it is positively skewed showing that earnings of self-employed individuals is more concentrated on the lower end. The QQ-plot and the normal histogram further confirm that above 60% of self-employed individuals live below the poverty threshold.

Figure 3: Minimum income required to makes ends meet**.**

Sources: Field Survey Data,(2016).

From figure 3, the Boxplot show that there were some outliers in the analysis, meaning that most respondents wished for an income that is quite superfluous, more than enough to meet their needs and expenses. Hence, the distribution is not normal; more respondents wanted a huge income to sustain them and their family, making the distribution to be positively skewed. The QQ-plot further confirms this trend and the histogram is not normally distributed .The flat bars of the Histogram indicate that most of the respondents would want a very high measurable income to sustain them adequately. This confirm the fact that their current income is not enough to lift them out of the poverty threshold.

Table no 1; Income distribution of Demographic Characteristics .

	Income of public employed persons. (000)	Self Employed persons. (000)	Income Required To make ends meet. (000)	
Mean Income.	33.5	16.83	38.20	
Maximum Income.	51.00	26.00	51.00	
Minimum Income.	5.00	5.00	10.00	
% Below the Poverty line.	49.8%	60.2%	80%	

Source: Field survey, 2017.

IV.   Discussion

The results of our empirical investigation have clearly shown that public employed individuals in Nigeria are still living in poverty, especially the low income earners, because their monthly salary cannot guarantee that a good and quality living. Specifically, our empirical results indicated that approximately 50% of them live below the poverty threshold. This is rather appalling because public employed workers are by definition expected to live a good and quality life so that they can represent the best interest of the country.

Our empirical findings further show that most of the self-employed individuals live below the poverty threshold, this is not surprising given the current global economic meltdown where business activities are the hardest hit. The global economic meltdown have impacted more negatively on the businesses in the developing countries consequently more self-employed individuals have been pushed below the poverty threshold.

Finally, the empirical evidence indicated that most families needed a high minimum income that will move them out of the poverty threshold. This is confirmed by our analysis which clearly shows that about 80% of the respondents needed a high income to enable them move above the poverty threshold.

V. Conclusion

The rational for this study is to analyse the incidence of poverty among Etsako people of Edo State in Nigeria using truncated distribution on collected data from public and self-employed individuals within the study area. From the results of our analyses, it is discovered that the incidence of poverty is evenly distributed among public employed individuals meaning that about 50% of public employed individuals are living below the poverty line of $1.25 per day.

The incidence of poverty is more pronounced among the self-employed individuals in the study area. From our analysis it is observed that about 60% of the totals self-employed within the study area live below the international poverty line. This specific finding shows that the global economic meltdown had more adverse effect on the self-employed in line with similar findings.[7] The results of our analysis is further confirmed by empirical revelation that the average income in the study area is below the international poverty threshold because there are more self-employed individuals in the study area than public employed individuals.

Finally, the study revealed that people's perception of an adequate income to lift them above the poverty line is high, this revelation confirm the argument that the current income of public workers is not enough to lift them out of poverty. This is in line with the findings of Nigeria Labour Congress report, on the need to increase public minimum wage to N54, 00 per month[45]

One must note however that poverty should be seen as a national problem rather than as an individual condition. The problem affects the society as a whole and as such if the problem must be tackled, it must involve a change in the structure of the society through concerted effort of wealth redistribution.

Recommendations

Based on the findings of this study, the following suggestions are offered as a way of reducing the incidence of poverty in the study area and by extension, in the Nigerian Society:

There is the need by Nigeria policy operators to embark on a policy of economic diversification by reducing its over-dependence on oil export and placing more emphasis on non-oil exports such as mining, agriculture and commerce, this will ensure more jobs for the unemployed, is in line with the neo-classical theory, which states that: long term poverty reduction requires sustained economic growth, which in turn depends on technological advancement and capital accumulation.

Nigeria government must reduce the cost of governance, improve investment climate, ramp-up efforts at tackling corruption and roll back government from business.

The present minimum wage of N18,000 paid to public workers should be increased to N63,000, (N350 per day for an average family of six). Other incentives such as a reduction in the tax rate, free and quality education, free or affordable health care etc. should also be considered because this will enable both public and self-employed individuals to have more disposable income that will move them out of poverty.

Finally, the enhancement of education opportunities should be a topmost priority because education is a fundamental link out of poverty due to its capability to break the vicious circle of poverty across generation. consiquently, Nigeria education policies should be targeted more at the poor and the vulnerable members of the society, the Universal Basic Education (UBE) represents a positive step in this direction.

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