

Labor Market, Demographic Patterns and Income Inequality in Nigeria

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ABSTRACT This study examines the relationships between labor market characteristics and demographic patterns in Nigeria. The labor market characteristics considered include several income sources such as employed, self-employed, farm, capital and benefit incomes. These different income sources contribute significantly to income inequality. These issues were addressed by designing an income generation model describing the structure of the labor market income for Nigeria. OLS regression base approach, where incomes are a function of education and other demographic characteristics was used. A logit model is specified for labor market participation. The labor market participation is the dependent latent variable capturing the propensity to works in the labor market. The results show that demographics seem to have played a significant role in the labor market outcome, while the disparity of labor market incomes is a specific factor, which explains income inequality among household heads.

INTRODUCTION

This paper examines the relationships between demographic patterns, labor market characteristics and the level of income inequality in Nigeria. The labor market characteristics are employed income, self-employed income, farm income, capital income, benefits and remittances incomes. These different sources of income contribute significantly to income inequality. Income security depends directly on the wage rates received from the labor market (Liebrandt et al. 2001). This implies that having access to wage incomes plays a significant part in attempting to solve the issues related to welfare and inequality in Nigeria.

The determinants of demographic patterns impacting labor markets are gender, education, location of residence, marital status and labor market characteristics and other relevant demographic factors such as fertility, migration and life expectancy (ILO 2010; Fields 2010). These demographic variables have implications on the distribution of households' labor market income both at the micro and macro level.

One of the most important factors that influences labor market and drives income inequality is education. According to Anyanwu (2012), increasing education will tend to reduce poverty and problems of underdevelopment in Nigeria. Aromolaran (2004) examined the influence of education (both own and husband's) on labor force participation of married women in Nigeria

in wage market employment, self-employment and overall labor market participation. The study confirms not only the influence of own education on labor force participation, but also that the husband's education positively influence the labor force participation of married women in Nigeria.

Similarly, Stachi and Temple (2006) reported that uneducated workers are restricted to agricultural sectors whereas the urban sectors is divided between skilled and unskilled work where educated persons decide at first to enter into skilled sectors before resorting to unskilled work if skilled work is unavailable. An increase in the return to education implies a widening of the wage gap between workers with high levels of education and those with low levels of educational attainment. The unequal formation of household sizes also creates wage gaps in household labor market income

White and Rogers (2000) asserted that marriage has a large effect in reducing the risk of poverty and increasing labor market participation. The authors also reported that unmarried individuals and single-parent families are more likely to live in poverty than their married counterparts. This is because compared to unmarried people, married people save a much higher proportion of their income and accumulate more assets. Sackey (2005) used data from the Ghana Living Standard Survey (GLSS4 and GLSS3) to estimate the female labor force participation and fertility models. To do this, a probit and a multi-

nomial model type were specified and estimated. Significant contribution of this study is the negative effect of education on fertility while education and reduced family size increase labor force participation rate in Ghana.

In a bid to examine the influence of religion on female labor force participation across countries, H'madoun (2010) used a probit model with a vector of religious variables among other exogenous predictors and observed that religious women were found to participate less in labor market activities than the non-religious women after controlling for other social and economic variables in the model.

Other factors including social and environmental factors may have a strong influence on labor markets in Nigeria. Olubor (2006) reported issues related to gender and the biological life cycle such as menstruation, pregnancy, birth, breastfeeding, menopause, infertility and general gynecological conditions as factors limiting women's opportunities to develop their own careers.

In the present paper, an attempt is made to examine the relative importance of education, gender, marital status and location of residence in the determination of labor market and inequality. Very little is known about the influence of these demographic variables on labor market participation and inequality in Nigeria. This paper will therefore add to the contribution of the existing labor economics literature by examining the relationship between the demographic patterns and labor market characteristics and inequality in Nigeria.

Objectives of the Study

The objective of this paper is to explore the various forces that impact the distribution of household income. This includes examining the demographic patterns of income in the labor market, changes in occupational choices, particularly the choice between wage work, self-employment (non-farm), self-employment (farm) and other sources of incomes such as capital, benefits and remittances income. The purpose of this analysis is to focus on income inequality since it is more amenable to policy initiatives to reduce inequality.

In order to do this, logit model was used to examine the pattern of income in the labor market and occupational choices particularly the

choice between wage work, self-employed (non-farm), self-employed (farm) and other sources of income such as capital, benefits and remittances incomes on the demographic pattern of the population. The method is used because it considers a greater variety of participation modes such as full-time and non-participants.

To this end, presents the labor market situation in Nigeria, discusses the methodology, discusses the data, presents and discusses the results regarding the distribution of income in the Nigerian labor market, presents and discusses regression results on labor market participation, choice of occupation and labor market income and concludes and make recommendations.

Labor Market Situation in Nigeria

Labor markets in developing country like Nigeria can be distinguished by whether they are formal or informal, or between private and public sector (Fields 2010). The labor market in Nigeria for females differs from that of males most evidently in the participation dimension. For adult males, the labor market participation rate has declined from 73.7 percent in 2000 to 71.7 percent in 2005, and then to 70.6 percent in 2007 (ILO 2010). While the labor market participation rate for females was 38.7 percent in 2007, a rise from 38.1 percent in 2005 and thirty seven percent in 2000, females' participation rates still remain well below males' participation rates.

Table 1 shows the employment rates in Nigeria by age group and sex as of 2008. It can be observed from the table that a high level of inequality exists in the labor market. The highest percentage of men in the labor market is among those aged 45-49 years old (99.2%) compared to just sixty seven percent for their females coun-

Table 1: Employment Rates in Nigeria, within age group by sex as of 2008

<i>Age group</i>	<i>Males</i>	<i>Females</i>
15-19	25.2	1.7
20-24	59.6	28.1
25-29	90.1	39.7
30-34	97.7	41.9
35-39	98.9	51.6
40-44	98.8	57.2
45-49	99.2	67.0
50-54	97.9	69.5
55-59	97.6	61.0
60-64	78.5	41.9
65+	49.1	19.6

Source: ILO 2010

terparts. The highest percentage of females in the labor market (69.5%) is among those aged 50-54 years old. This implies that most females participate in the labor market after their child-bearing age. Table 2 compared the gender specific employment rates among regions in Africa. The table shows that the employment rate of males constitutes the highest percentage of the labor force compared to their females' counterpart in all the regions.

Table 2: Employment rates, ages 15-64, by sex, Nigeria and comparable regional countries, 2006

Countries	Males	Females
Malaysia	78	45
Kenya	68	58
India	78	32
South Africa	60	31
Namibia	46	30
Nigeria	77	42

Source: ILO 2010

METHODOLOGY

This paper analyzes the labor market outcomes resulting from demographic patterns. Demographic patterns means the number of households with particular characteristics such as the number of children per household, number of elderly per household, the educational attainment of household head and the marital status of adults within the household. These different forms of demographics contribute significantly to labor market outcomes.

In this paper, the researcher starts by designing an income generation model describing the structure of the labor market income following the method of Bourguignon et al. (2002). This method provides information regarding the impact of demographic patterns on the labor force participation and income inequality. The wage equation has a long tradition in labor economics and has provided a framework within which the relationship between incomes from the labor market and demographic issues can be analyzed.

In this paper, the regression-based approach was used, which allows the contribution of the regressor to the level of earnings to be isolated and quantified. The approach is relatively simple to implement and complications do not arise as the number of explanatory variable included in the wage equation increases. Studies that have

applied this method in the field of labor economics are found in the work of Li and O'Donoghue (2012). Incomes are a function of education and other demographic characteristics such as gender, marital status and number of children. This functional form addresses determinants of incomes differential across gender and location. The standard Mincer equation assumes that wage determining function of the following form:

$$\ln(Y_{ij}) = \alpha + X_i \beta_j + \varepsilon_{ij} \quad (1)$$

Where $\ln(Y_{ij})$ is the natural log of wages for individual i in sector j , X_i is a function of individual demographic characteristics, occupation and industry and ε_{ij} is a disturbance term. Here, the Mincer equation is adopted to estimate the impact of demographic characteristics on incomes in Nigeria.

Estimating Labor Market Participation

A logit model is specified for labor market participation. The logit model used in this study is as:

$$LMP_i = \alpha + \beta X_i + \varepsilon_i \quad (2)$$

The dependent variable LMP_i is a latent variable capturing the propensity to work in the labor market. If this latent variable is positive, the individual works in the labor market, otherwise does not. The vector X_i is a set of standard exogenous variables that influence labor market participation such as age, educational attainment, marital status and location of respondent whether rural or urban. The model is used to predict the probability of each individual (minimum 16 years of age) to participate in the labor market. Separate logit estimations are used for males and females. Table 3 describes a set of logit equations describing the following labor market characteristics. They primarily relate to labor market characteristics and the presence of other market income sources. The OECD modified equivalence scale was used to calculate the equalized household income. This applies a value of one to the first adult and a value of 0.5 to all other adults and gives a value of 0.3 to each additional child.

Generalised Entropy Class of Inequality

The researcher used the Generalized Entropy Class of Inequality for the decomposition of income inequality. This method can provide a better fit of the actual income distribution and is

considered easy to decompose. The Half Squared Coefficient is employed in this paper (commonly referred to as the Generalized Entropy Class of inequality measures, I_2). The aim of using the GE (2) inequality measure is because the measure is very sensitive to changes at the higher end of the income distributions.

Table 3: Labour market equations

<i>In-work decision</i>	<i>Labour market</i>	<i>Addition</i>
In-Work -1	participation Employee	information Occupation Industry
In-Work -0	Self-employed Farmer Unemployed Retired Student Inactive	
Presence of capital income		
Presence of benefits and remittances		

Explanatory Variables (Labour Market): University educated, Upper secondary educated, Lower secondary educated, Primary educated, Married, Rural, illness, Experience, Experience2, Employed and # Number of children

Explanatory Variables (Earnings): University educated, Upper secondary educated, Lower secondary educated, Primary educated, Married, Rural, illness, Employed and # Number of children

The general formula of the Generalized Entropy Class of inequality measures is given by (3)

Where the y 's are the individual incomes and \bar{y} is the arithmetic average in a population of n individuals. If everyone has the mean income, then the value is zero. The mean income divides the population into an upper tail and a lower tail. In the upper tail, the ratio is above unity and it is below unity in the lower tail. If α is equal to unity, then one would have equal weighing of the ratios. When α is larger than unity, the high incomes have even higher income in the sum and the low-income ratios become even smaller in the measure of inequality. When α is smaller than unity, the lower tail ratios get closer to unity (become more important in the sum) and the higher value incomes get pulled back to the mean.

GE (2) is half of the square of the

$$\text{Coefficient of Variation} = \frac{1}{\bar{y}} \left[\frac{1}{n} \sum_{i=1}^n (y_i - \bar{y})^2 \right]^{1/2} \quad (4)$$

One other measure that is widely used in looking at inequality is the Lorenz curve based measure: the Gini coefficient (fails decomposability generally).

$$\text{Gini} = \frac{1}{2n(n-1)\bar{y}} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j| \quad (5)$$

One of the main axioms which we usually require inequality measures to meet is that of decomposability. This requires overall inequality to be related consistently to constituent parts of the distribution, such as population subgroups. For example, if inequality is seen to rise amongst each subgroup of the population then one would expect overall inequality to also increase. Some measures, such as the Generalized Entropy class of measures, are easily decomposed and into intuitively appealingly components of within-group inequality and between-group inequality. The Gini coefficient fails decomposability generally.

Data

The primary source of data used in this paper is the 2004 National Living Standard Survey, collected by the National Bureau of Statistics (NBS) ¹ Nigeria. It collects information on incomes, labor market status and demographic information, with 19,158 responding households and 92,610 individuals. About 4,017 recorded their incomes, thereby generating data for this study of 15,141 households from 36 states and the Federal Capital Territory (FCT).

According to National Bureau of Statistics 2004, this sample size is sufficient to produce estimates of key variables (at national and regional level) at the ninety five percent confidence level with five to seven percent margin of error. The concept of income used in this paper includes income earned both in cash and in kind. The income aspect is solely based on the determination of earnings and was measured on an annual basis of total income per capita in the survey as constructed from the disaggregated income questionnaire. The inclusion of weights is to ensure that the sample size accurately represents the actual population. Five sources of income were derived from the data. These are employee incomes from wage work, non-farm self-employment incomes, farm incomes, capital incomes derived from asset disposal or rental,

and benefits derived from incomes from old age pension and remittances received.

The education variable was transformed into four broad levels of education that is primary, lower secondary, upper secondary and third level (university). The age variable enables us to construct an age bracket that can be used to identify the children in the dataset. The marital status takes the form of single, monogamous marriage, polygamous marriage, separated, divorced, widowed and informal unions. Monogamous and polygamous marriage variables were combined to represent all individuals who are currently married. The occupation and industry for each individual is clearly given in the data and does not require any transformation.

Summary Statistics

The most important demographic variables used for this paper is presented in Table 4. The gender distribution of the respondents shows that 52.2 percent are male while 47.8 percent are female. Of the entire sample (92, 610 observations), 36 percent represent the population aged less than 15 years old while the remaining sam-

ple representing 63.5 percent are 15 years and above. 36.4 percent of the sample population are never married, 57.1 percent are married, while the rest are either separated / divorce or widowed.

With respect to rural and urban location of respondents, the data shows that majority of Nigerians live in rural areas 76.8 percent, while only 23.2 percent live in urban areas. 28.2 percent of the respondents have university education, 30.5 percent had upper secondary education, while 30,5 percent and 7.8 percent had lower secondary and primary education respectively.

Of the entire sample, about eighteen percent are household heads, while the remaining eighty-two percent are other members of the households. A disaggregation of the heads by gender revealed that 87.5 percent are males while the remaining 12.5 percent are females. The characteristic of large family size in Nigeria is reflected in the fact that the average household includes 6 people.

Many members of the labor force are self-employed (non-farm) rather than in wage employment. The reason for this is connected with the large informal sector, which is the main provider of employment in developing countries. From the data used in this study, the people who are engaged in self-employment constitute 17.2 percent while those who work in the formal or wage sector constitutes 15.7 percent. The highest constituted 62.4 from self-employed (farm) and those who have capital and received benefits and remittances accounted for 1.4 percent, 1.9 percent and 1.4 percent respectively.

RESULTS

The Distribution of Household Income in the Nigerian Labor Market

Table 5 presents the distribution and structure of income from work in the Nigerian labor market. The result shows the average amount of income per household for each source of market income by gender of the head of household and by whether the household head resides in an urban or rural area. Overall, the household heads' income from employment is higher than incomes from self-employment. Farm income constitutes the highest household incomes. The distribution of income by place of residence (urban or

Table 4: Characteristics of the sample population used for the study

<i>Basic characteristics</i>	<i>Details of each variable</i>	<i>Sample size</i>
<i>Age in Years</i>	Average age of household head	48 years
<i>Education</i>	University	28.2%
	Upper secondary	30.5%
	Lower secondary	33.2%
	Primary	7.8%
<i>Household Size</i>	Number of persons per household	6
<i>Rural/Urban Location</i>	Urban	23.2%
	Rural	76.8%
<i>Marital Status</i>	Married	57.1%
	Never married	36.4%
	Divorced/separated	1.9%
	Widowed	4.6%
<i>Gender of Household Head</i>	Male	87.5%
	Female	12.5%
<i>Adults age 16 years and above such as employed, self-employed, farmers, has-capital, benefit and Remittances income</i>	Employed	15.7%
	Self-employed (non-farm)	17.2%
	Farm	62.4%
	Capital	1.4%
	Benefits	1.9%
	Remittances	1.4%

Source: Estimated by the author

Table 5: Average amount of income per household for each sources of market income for males and females and location of residence of household head in the labour market

<i>Sex</i>	<i>Employee income</i>	<i>Self-employed income</i>	<i>Farm income</i>	<i>Capital income</i>	<i>Benefits</i>	<i>Remittances</i>
Males	32421	34159	130581	2714	4255	2059
Females	14088	22931	45923	1769	724	4774
Total	29501	32371	117096	2564	3693	2492
<i>Urban / Rural Residence</i>						
Urban	50917	58407	39505	3595	6412	3400
Rural	11806	10857	181206	1712	1446	1741
Total	29501	32371	117096	2564	3693	2492

Source: Estimated based on 2004 National Living Standard Survey data weighted to represent the entire household population.

rural) shows that the average income for rural paid employees is lower than those in paid employment in the urban areas.

The importance of education in determining the level of household or individual income can-

not be overemphasized. Tables 6 and 7 shows the percentage share of household market income accruing from the various sources (employed, self-employed) and breaks these out according to the educational attainment of

Table 6: Income source as percentage of household market income by educational attainment (males and females)

<i>Education level</i>	<i>Males</i>							<i>Females</i>						
	<i>E</i>	<i>SE</i>	<i>F</i>	<i>C</i>	<i>B</i>	<i>R</i>	<i>Total</i>	<i>E</i>	<i>SE</i>	<i>F</i>	<i>C</i>	<i>B</i>	<i>R</i>	<i>Total</i>
No education	1.5	6.2	90.3	1.0	0.4	0.6	100	2.4	21.6	69.9	0.7	0.2	5.2	100
Primary	7.6	15.2	74.6	0.8	0.4	1.4	100	1.3	26.6	66.0	1.1	0.9	4.1	100
Upper secondary	8.7	20.7	68.3	0.7	0.7	1.0	100	9.2	33.5	47.9	3.2	0.7	5.5	100
Lower secondary	22.6	37.0	34.5	1.4	1.4	1.3	100	24.2	42.0	21.8	5.0	0.4	6.7	100
University	39.6	35.7	35.7	2.4	2.4	1.3	100	78.4	8.1	3.0	2.2	3.4	4.9	100
Total	15.7	16.6	63.3	1.3	1.3	1.0	100	15.6	25.4	50.9	2.0	0.8	5.3	100

Source: Estimated by the author. Note: E= Employed income; SE= Self-employed income; F= Farm income; C= Capital income; B=Benefits, R = Remittances. Source: Calculations based on National Living Standard Survey data weighted to represent the entire household population.

Table 7: Income source as percentage of household market income by urban and rural areas

<i>Education level</i>	<i>Males</i>							<i>Females</i>						
	<i>E</i>	<i>SE</i>	<i>F</i>	<i>C</i>	<i>B</i>	<i>R</i>	<i>Total</i>	<i>E</i>	<i>SE</i>	<i>F</i>	<i>C</i>	<i>B</i>	<i>R</i>	<i>Total</i>
No education	5.0	26.3	63.6	1.5	1.1	2.5	100	0.7	2.8	94.4	0.8	0.2	0.7	100
Primary	18.3	44.8	31.5	1.7	0.2	3.5	100	2.3	6.1	89.4	0.5	0.5	1.1	100
Upper secondary	17.9	49.1	28.6	1.4	1.1	1.9	100	4.1	7.6	86.2	0.6	0.5	1.0	100
Lower secondary	30.3	54.0	7.2	2.2	4.3	2.0	100	11.8	13.2	72.0	0.8	1.0	1.2	100
University	53.9	22.9	11.2	3.1	7.0	1.9	100	20.7	3.5	71.0	1.4	2.5	0.7	100
Total	31.4	36.0	24.4	2.2	4.0	2.1	100	5.7	5.2	86.8	0.8	0.7	0.8	100

Source: Estimated by the author. Note: E= Employed income; SE= Self-employed income; F= Farm income; C= Capital income; B=Benefits, R = Remittances. Source: Calculations based on National Living Standard Survey data weighted to represent the entire household population.

household heads². Tables 6 and 7 further show that those households headed by males and females with university and/or upper secondary education received a higher proportion of their incomes from employment income, but this was higher among females with university education than males. This implies that females with university education are more concentrated in the formal work activity than the males.

Regression Results

Labor Market Participation, Choice of Occupation and Labor Market Income

In this section, the researcher discusses the estimated determinants of labor market participation. Labor market participation is assumed to be a function of the individuals' education,

whether they live in rural areas, whether they have work experience, their marital status and the number of children they have, whether they are sick and if their husbands or wives have died. The population aged 16 years and above was used to estimate labor market participation equations separately for males and females. The researcher employed the logit model to estimate labor market participation because it allows one to consider a greater variety of participation modes, for example, full-time, part-time and non-participation of persons in the labor market. The researcher estimated the model for those who are working (in work), employed, self-employed (non-farm), farmers, having capital and recipients benefits and remittances incomes on demographic characteristics mentioned above. The researcher then estimated the model described in equation 2. The estimated regression results are presented in Tables 8a and 8b .

Table 8a: Labour market participation equation using logit method for in-work, employed, self-employed and farmers as dependent variables for both males and females

Independent variables	Inwork		Employed		Self-employed		Farmers	
	Males	Females	Males	Females	Males	Females	Males	Females
University	0.902* (0.069)	1.730* (0.067)	2.854* (0.101)	4.294* (0.206)	0.216** (0.081)	-1.143* (0.106)	-2.318* (0.070)	-2.329* (0.134)
Upper secondary	0.296* (0.059)	1.958* (0.061)	2.009* (0.104)	2.148* (0.201)	1.361* (0.072)	0.351* (0.079)	-2.421* (-0.071)	-1.188* (-0.086)
Lower secondary	0.308* (0.053)	1.588* (0.047)	1.247* (0.098)	0.612* (0.202)	1.312* (0.068)	0.239* (0.068)	-1.746* (-0.067)	-0.339* (0.072)
Primary	-0.221* (0.082)	1.146* (0.067)	1.182* (0.152)	0.182 (0.315)	1.035* (0.119)	-0.206** (0.108)	-1.441* (-0.113)	0.154 (0.112)
Rural	0.304* (0.041)	-0.276* (0.036)	-1.231* (0.054)	-0.841* (0.094)	-2.101* (-0.052)	-1.976* (0.062)	2.958* (0.059)	2.789* (0.081)
Married	1.698* (0.048)	0.401* (0.052)	-0.022 (0.084)	-0.913* (0.125)	-0.501* (0.067)	-0.194** (0.088)	0.444* (0.066)	0.262 (0.094)
Number of children	-0.121* (0.008)	-0.109* (-0.007)	-0.014 (0.012)	-0.065* (0.025)	0.009 (0.011)	0.043* (0.013)	0.025** (0.011)	-0.024** (0.014)
Widowhood	1.007* (0.117)	1.333* (0.075)	-0.079 (0.220)	-0.818* (0.210)	-0.084 (0.164)	-0.236*** (0.106)	0.244 (0.165)	0.741* (0.113)
Experience	0.135* (0.004)	0.134* (0.004)	0.023* (0.001)	0.034* (0.010)				
Experience ²	-0.002* (0.000)	-0.001* (0.000)	-0.000* (0.000)	-0.001* (0.000)				
Illness	-0.085 (0.059)	0.167* (0.045)	-0.061 (0.088)	-0.108 (0.145)	0.074 (0.082)	-0.133** (0.074)	-0.115* (0.077)	-0.224* (0.080)
Constant	-2.516* (0.078)	-3.813* (0.079)	-2.546* (0.132)	-2.679* (0.249)	-0.435* (-0.086)	0.770* (0.103)	-0.535* (0.086)	-2.007 (0.122)
Log likelihood	-11104.316	-13402.357	-4798.2962	-1652.8592	-5354.9785	-4311.6848	-5828.3524	-3759.159
Chi-square: values	11699.97	4760.98	2726.70	1869.51	2877.96	1489.09	6421.91	2944.11
df	11	11	11	11	9	9	9	9
Significant	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R.-Squared	0.345	0.151	0.221	0.361	0.212	0.147	0.355	0.281
Observations	24930	26352	14476	7548	11476	7548	14476	7548

Source: Estimated by the author based on 2004 National Living Standard Survey data weighted to represent the entire household population.

(*) Significant at 1 percent, (**) Significant at 5 percent, (***) Significant at 10 percent

Table 8b: Labour market participation equation using logit method for has-capital and received benefits and remittances income as dependent variables for both males and females

Independent variables	Has -capital		Received benefit		Remittances	
	Males	Females	Males	Females	Males	Females
University	0.674* (0.057)	1.301* (0.085)	2.406* (0.185)	1.878* (0.164)	0.264* (0.075)	0.092 (0.103)
Upper secondary	-0.072 (0.067)	0.254** (0.109)	2.117* (0.179)	1.662* (0.152)	-0.217*** (0.084)	-0.004 (0.100)
Lower secondary	-0.324* (0.066)	0.033 (0.105)	1.709* (0.158)	1.322* (0.159)	-0.079 (-0.075)	0.239* (0.081)
Primary	-0.489* (0.127)	0.211 (0.153)	1.661* (0.240)	0.997* (0.237)	0.087 (0.124)	0.491* (0.111)
Rural	0.040 (0.053)	-0.153** (-0.074)	-0.247* (0.072)	-0.182** (-0.085)	0.038 (0.066)	-0.343* (0.045)
Married	1.619* (0.068)	0.710* (0.107)	-1.435* (0.096)	-1.525* (0.098)	1.351* (0.081)	0.664* (0.102)
Widowhood	1.101* (0.168)	1.165* (0.139)	-1.147** (0.417)	-1.727* (0.283)	1.772* (0.152)	2.104 (0.114)
Illness	0.019 (0.070)	0.214*** (0.091)	0.042 (0.123)	-0.225 (0.147)	0.432* (0.075)	0.259* (0.076)
Constant	-3.484* (-0.086)	-4.049* (0.131)	-4.171* (0.184)	-3.734* (0.161)	-3.816* (0.104)	-3.579* (0.119)
Log likelihood	-7587.3066	-4144.8701	-3424.3531	-2697.4748	-5576.4129	-5075.371
Chi-square: values	1241.15	315.72	1100.70	949.94	581.99	632.49
d.f	8	8	9	9	8	8
Significant	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R.-Squared	0.076	0.037	0.139	0.149	0.049	0.059
Observations	25204	26486	25204	26486	25204	26486

Source: Estimated by the authors based on 2004 National Living Standard Survey data weighted to represent the entire household population.

(*) Significant at 1 percent, (**) Significant at 5 percent, (***) Significant at 10 percent

The regression coefficients of the logit regression in Table 8a show that for population working (in work), all the variables entered are statistically significant at one percent critical level. Educational attainment, those residing in the rural areas, widowhood and experience and the squared of experience are significantly related to working in the labor market. Apart from the number of children for males and females, residing in the rural areas for females and having primary education for males reduces the participation in the labor market.

For the employed persons, the significant determinants are education, work experience, illness, marriage and residing in rural areas. Illness, widowhood and marriage reduce the participation in the labor market. The result shows that all the employment variables in the regression coefficients are statistically significant, apart from widowhood for males, illness for males and females, number of children for males and females as expected.

Self-employed (non-farm) estimation shows a similar result with the employed. In the regres-

sion coefficients, all the variables entered are statistically significant. University education for females, residing in the rural areas, widows or widowers for males and females and illness for females reduces the probability of being in the labor market. Self-employed (farm) participation in the labor market reduces with education and illness except for primary education among females. As expected, it increases with residing in rural areas, being a widow, number of children and marriage. Males being a widower are not statistically significant. This finding is in line with other studies that the number of children is inversely related to female participations in the labor market (see Ogwumike et al. 2006).

Table 8b presented the regression results of having a capital income, receiving benefits and remittances incomes in participating in the labor market. The regression coefficients show that having capital income increases with university education, widowhood and marriage for males and females and reduces with lower educational attainment especially for males and residing in rural areas for females. Again, the result is in

consensus with the assertion made by White and Rogers (2000) that married people save a much higher proportion of their income and accumulate more assets when compared to unmarried couples. Similarly, benefits received increases with educational attainment and reduce with residing in rural areas, marriage and widowhood. Interestingly, remittances increase with widowhood, marriage, illness for males and females. It also increases among females with lower secondary and males and females with primary education. In terms of the fit of the model the chi-square statistics of the models are highly significant at the respective degree of freedom for each income source (p value = 0.000), which shows, that the relationship between the dependent variables and the models are probably real and not due to sampling fluctuation. The pseudo R^2 vary around 0.151 to 0.361, which are moderate to good value for a logit regression

Estimation of the Labor Market Incomes of Household Members

The researcher used the model described in equation 4.1 to estimate the sources of household market incomes such as employed income, self-employed income (non-farm), farm income, capital, benefit and remittances incomes. The logarithm of the yearly income was used for the estimation of income sources using the Ordinary Least Square (OLS) method. Separate models were estimated for males and females and a dummy variable for rural location was introduced to control for differences across regions. To account for the multiple activities of some employed workers, a dummy variable was introduced in the wage equation taking the value of one if the individual supplies labor as employed wage earner and zero if they do not. The OLS estimation results are presented in Table 9 .

For the estimation of the population working in the wage sector of the labor market shows that educational attainment and being married, significantly and positively influences employment income, while residing in rural areas, being a widow and being ill reduces the probability of increased income in the wage employment sector especially among women. The estimation for income from self-employed (non-farm) followed a similar pattern of the wage employment. The estimates show that educational attainment positively and significantly affects income, except

for females with university education that is not significant. Being married and ill for females, numbers of children, residing in rural areas for males and females affects self-employed income negatively.

The estimation of farm income shows a negative sign but significant being a farmer in the rural areas. The researcher also observed a negative impact for farm income of being a widow or widower. This means a reduction of farm income for being a widow or widower. Ultimately, it is likely going to reduce farm output as fewer individuals now partake in farm work due to the death of their spouse. This implies that the total productivity of the farmers reduces. This result is in line with the finding of Cogneau and Grimm (2002) that doubling the workforce in farming activities leads to around fifty percent increase of agricultural profits.

On the side of the capital income, the regression estimates suggest that educational attainment, marriage and widowhood significantly and positively affect capital income, while residing in rural areas has a significant negative impact on capital incomes. Contrary to capital income, benefit increases with university education but not statistically significant. Marriage and widowhood has a positive and a significant impact on benefits, while residing in the rural areas, and lower educational level affects benefit income negatively. Interestingly, widowhood, educational attainment, being married significantly and positively affects remittances income. Residing in rural areas reduces the remittances on household.

After the estimation, the researcher conducted a model specification test in order to ascertain if the estimated models are specified correctly. The link test model specification was used to do this as reported in Table 9. The transformation of the total income to log of income was used for the estimation of the labor market income in order to reduce multicollinearity in the models. The researcher also crosschecked for multicollinearity among the independent variables using the Variance Inflation Factor (VIF). The VIF helps to indicate how much of the inflation the standard error could be caused by collinearity. Therefore, the outcome of the OLS estimation presented in Table 9 has a linear combination of the independent variables. However, the models upheld the classical assumption relating to the disturbance term that the variance of the error term has a constant variance.

Dimension of Income Inequality among Household Heads in the Nigerian Labor Market

This sub-section examines the level of income distribution by sex and dwelling places. As Table 10 shows the distribution of income inequality and gender analysis based on the Gini index. As one can see inequality is about six percentage points different between males and females (males 0.645 and females 0.603 percent). When estimated based on Theil index inequality is higher for females than males (females 0.645 and males 0.542 respectively). As one can see from the table, within group inequality is almost ninety eight percent of inequality by sex. For urban-rural inequality, the table also shows that inequality index is slightly higher in urban centers (0.686) than in rural centers (0.611) respectively. Based on Theil index measurement, urban inequality is lower than rural (urban 0.334 and rural 0.672). While within group, inequality dominates by almost ninety seven percent.

Furthermore, the result in Table 10 shows the distribution of income inequality by primary employment choice of sex and urban and rural dimension of household heads. As one can see that inequality is slightly higher among self-employed males than females (males 0.587 and females 0.571)³. It also follows similar patterns for employed and farm households, which also account for higher inequality among males than females. Rural areas also account for higher inequality among farm household heads. Within groups inequality still accounts more of the inequality than between groups.

DISCUSSION

This section presents the discussion of the findings of the results. The findings actually reflect the fact that most people in Nigeria engaged in agricultural activities. As Stockl et al. (2012) asserted, agricultural sector is a major contributor to the country's Gross Domestic Product (GDP). These assertions indicated that this sector contributes about eighty percent of the GDP annually and it provides employment for about eighty percent of the population Collier and Gunning (1999). The paper also find out that male earn higher income than female even though they are participating in the same sector in the labor market. This finding is in consensus

with the findings of Ogwumike et al. (2006) and other studies on gender wage differences. As expected male household heads also receive higher capital and benefit incomes than female.

A plausible explanation for the reason why average income by place of residence (urban or rural) is lower among the rural paid employees than urban paid employment is that the urban workforce may have been concentrated at the lower level of the labor market. People, who are self-employed, have capital and received benefit incomes in the urban areas earn substantially higher income than their rural counterparts. Persons who resides in the rural areas and do farm work earn about 4 times higher than persons who resides in the urban areas. Remittances received are higher among male than female and higher in urban areas than rural areas.

Similarly, the proportion of market household income from farm income was the highest for those with no formal education, primary and lower secondary education household heads for both males and females. Interestingly, educational attainment seems to have had little impact on the proportion of market income from capital. The proportion of income from benefits is lowest for males with lower education and highest for females with lower education. For households that received remittances is concentrated among households with lower educational level for both males and females. Furthermore, household heads with university education who engaged in employed work activities are concentrated in the urban areas, while 44.8 percent are those household heads with primary education engaged in self-employed work activities and 63.6 percent of males and 94.4 percent of females are those with no formal education concentrated in farming activities in both urban and rural areas respectively. However, in the rural setting, the distribution of income at all educational levels is concentrated in the rural areas. Remittances received by household heads are higher in urban areas than in rural areas. Considerable differences were however, observed in terms of the employment status of individuals across different level of education

CONCLUSION

In this study, the researcher looked at the labor market outcomes as influenced by demographic patterns. The labor market provides in-

Table 9: Labour market income equation using OLS procedure for males and females (log of earnings as dependent variables)

Independent variables	Employed income		Self-employed income		Farm income		Capital income		Benefit income		Remittances	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
University	1.002* (0.117)	1.876* (0.207)	0.378* (0.099)	0.051 (0.098)	0.062 (0.044)	0.224* (0.080)	0.710* (0.123)	0.447 (0.278)	0.427 (0.276)	0.186** (0.098)	0.108 (0.134)	
Upper secondary	0.585* (0.124)	1.178* (0.218)	0.326* (0.083)	0.563 (0.064)	0.235* (0.047)	0.042 (0.096)	0.671* (0.149)	-0.486** (0.255)	0.117 (0.241)	0.423* (0.112)	0.742*** (0.126)	
Lower secondary	0.579* (0.133)	1.191* (0.264)	0.210*** (0.083)	0.385* (0.061)	0.252* (0.035)	0.126 (0.097)	0.359*** (0.151)	-1.109* (0.260)	-0.557 (0.245)	0.424* (0.107)	0.107 (0.107)	
Primary	0.344 (0.214)	1.03*** (0.466)	0.008 (0.144)	0.273** (0.104)	0.165* (0.057)	-0.028 (0.179)	0.376*** (0.217)	-1.652* (0.533)	-1.090* (0.253)	0.363*** (0.167)	0.372*** (0.145)	
Rural	-0.486* (0.065)	-0.302* (0.106)	-0.451* (0.058)	-0.508* (0.048)	-0.077 (0.052)	-0.402* (0.078)	-0.644* (0.109)	-1.015* (0.097)	-1.147* (0.106)	-0.910* (0.089)	-0.854 (0.145)	
Married	0.316* (0.089)	0.281*** (0.129)	0.323* (0.073)	-0.186*** (0.077)	0.170* (0.050)	0.778* (0.089)	0.219 (0.136)	1.296* (0.180)	1.296* (0.187)	0.595* (0.099)	0.121 (0.121)	
Widowhood	0.151 (0.275)	-0.009 (0.224)	-0.269 (0.189)	0.059* (0.097)	-0.230* (0.061)	0.651** (0.249)	0.629* (0.183)	2.045*** (0.869)	2.007* (0.578)	0.912* (0.200)	0.910* (0.136)	
Illness	0.130 (0.110)	-0.201 (0.172)	-0.019 (0.094)	-0.140* (0.070)	0.010 (0.037)			0.004 (0.164)	-0.268 (0.170)	0.135 (0.102)	0.164*** (0.099)	
Number of children			-0.017	-0.059*	0.044*							
Constant	10.320* (0.139)	9.416* (0.229)	10.539* (0.096)	10.340* (0.087)	9.898* (0.069)	7.880* (0.117)	7.676* (0.171)	7.891* (0.255)	7.384* (0.234)	8.307* (0.128)	8.322* (0.137)	
Adj R-squared	0.070	0.131	0.044	0.096	0.026	0.041	0.094	0.194	0.185	0.095	0.134	
Observations	2196	817	2586	2963	10536	2612	1037	2184	1815	1627	1396	
Link Test												
_hat	7.978** (3.242)	2.298** (2.312)	2.037* (5.389)	9.453* (2.384)	2.616* (3.767)	5.899* (2.951)	0.374* (0.207)	1.087*** (0.446)	0.696* (0.528)	2.611* (2.118)	4.975** (1.906)	
_hat squared	-0.317 (-0.147)	-0.061 (0.109)	-0.048 (0.251)	-0.422 (0.119)	-0.080 (0.187)	-0.299 (0.179)	-4.904 (2.264)	-0.006 (0.032)	-0.023 (0.039)	-0.094 (0.124)	-0.234 (0.112)	

Source: Estimated by the author based on 2004 National Living Standard Survey data weighted to represent the entire household population.

(*) Significant at 1 percent, (**) Significant at 5 percent, (***) Significant at 10 percent

Table 10: Inequality of equivalised market income and by primary employment choice, sex and urban-rural dimension of household heads

<i>Location /Sex /Inequality/Indices</i>	<i>GE(0)</i>	<i>GE(1)</i>	<i>GE(2)</i>	<i>Gini coefficient</i> ⁶	<i>Income share</i> ⁷	<i>Pop Share</i> ⁸
<i>Males</i>	1.103	0.824	1.821	0.645	0.878	0.852
<i>Females</i>	0.907	0.650	0.930	0.603	0.122	0.168
<i>Within Inequality</i>	1.069 (99.2)	0.802 (97.3)	1.771 (99.6)			
<i>Between Inequality</i>	0.009 (0.8)	0.008 (2.2)	0.007 (0.4)			
<i>Urban</i>	1.322	0.993	2.846	0.686	0.311	0.389
<i>Rural</i>	0.900	0.709	1.361	0.611	0.610	0.686
<i>Within Inequality</i>	1.065 (98.6)	0.797 (98.4)	1.765 (99.3)			
<i>Between Inequality</i>	0.014 (1.1)	0.013 (1.6)	0.013 (0.7)			
<i>Employed</i>						
<i>Male</i>	0.809	0.582	0.891	0.562	0.918	0.882
<i>Female</i>	0.579	0.378	0.409	0.475	0.083	0.118
<i>Within Inequality</i>	0.775	0.565	0.873			
<i>Between Inequality</i>	0.007	0.006	0.005			
<i>Urban</i>	0.723	0.551	0.848	0.548	0.787	0.721
<i>Rural</i>	0.891	0.592	0.861	0.568	0.213	0.279
<i>Within Inequality</i>	0.769	0.560	0.868			
<i>Between Inequality</i>	0.012	0.011	0.011			
<i>Self-employed</i>						
<i>Male</i>	0.788	0.617	0.889	0.587	0.781	0.782
<i>Female</i>	0.714	0.618	0.969	0.579	0.219	0.218
<i>Within Inequality</i>	0.773	0.617	0.906			
<i>Between Inequality</i>	0.000	0.000	0.000			
<i>Urban</i>	0.714	0.571	0.807	0.567	0.734	0.708
<i>Rural</i>	0.908	0.737	1.197	0.631	0.265	0.292
<i>Within Inequality</i>	0.771	0.615	0.905			
<i>Between Inequality</i>	0.002	0.002	0.002			
<i>Farmer</i>						
<i>Male</i>	0.847	0.733	1.489	0.617	0.889	0.848
<i>Female</i>	0.944	0.775	1.411	0.637	0.111	0.152
<i>Within Inequality</i>	0.862	0.738	1.503			
<i>Between Inequality</i>	0.008	0.007	0.006			
<i>Urban</i>	1.099	0.956	1.939	0.693	0.172	0.158
<i>Rural</i>	0.526	0.700	1.406	0.605	0.827	0.842
<i>Within Inequality</i>	0.869	0.744	1.508			
<i>Between Inequality</i>	0.001	0.001	0.001			

Source: Calculations based on National Living Standard Survey data weighted to represent the entire household population.

dividuals with opportunities to earn an income and determine their living standards. It also presents different incomes opportunities to participants based on their gender, location and sector of employment.

Previous studies have showed that personal characteristics of the individual predispose him or her to enter the labor market force. For example, age, education, being married especially the females, presence of dependent children and being male and residing in urban areas (which are more industrialized and economically diversified) exerts specific influence on labor

market participation and earnings in the Nigerian labor market.

The logit regression method was used to analyze the impact of demographic characteristics on labor market participation. Differences in earnings are mainly due to the sources of income earning activities where wage differences exist due to the nature of the job. The effect of the number of persons is positive and significant in labor market participation. Similarly, household heads male are much more likely to participate in the labor market force than other members of the households. The OLS regres-

sion also shows that being a widow reduces farm output as few household members now partake in farm work due to the death of their spouses.

In summary, this study confirms the influence of educational attainment, gender, marital status and location of residence on labor market characteristics such as wage income, self-employed income, farm income, capital income, benefits and remittances incomes. The implication is that while household headed by males in Nigeria are asked to respond to the “breadwinner” responsibilities conferred on them by the society via a propensity to participate in the labor market force and have more income earning opportunities, female heads facing similar responsibilities and the need to participate more in the labor market force are likely to be disadvantaged as a result of familial roles as mothers and caregivers.

RECOMMENDATIONS

This section makes some recommendations based on the findings of this study. Labor market participation rate is higher among males than females. There is the need to improve opportunities for females to engage more in income earning activities. Girl child educational and skill acquisition programs should be designed to enhance participation of females in the labor market. There is also need for child-benefit payment for children less than 10 years old to take care of lower mother participation in labor market.

Income inequality is more pronounced among the paid employees than self-employed. The government should continue to address issues of income redistribution policy and the introduction of minimum wage policy in both public and private sectors in order to reduce the wage gap.

Male workers earn higher average income than female workers. However, the paper did not control for age and education. The disparity in earnings might be mainly from informal activities where wage differences exist due to the nature of job.

Rural and urban workers need incentives to enhance their earnings and thus their welfare. Creating appropriate institutions to complement market forces would go a long way in improving quality of products and market opportunities.

NOTES

1. For detailed information about the NLSS, go to www.nigerianstat.gov.ng/NLSS 2004 datasets.
2. It is important to note that we classified the educational level into university education for those individuals with degrees, Upper secondary are senior secondary education for SS1, SS2, SS3 and Diploma certificates. The lower secondary is for junior secondary education known as JSS1, JSS2 and JSS3, primary and no formal education.
3. After the logit regression estimation, `linktest` stata command was used to ascertain if the models is properly specified. The `linktest` uses the linear predicted value (`hat`) and linear predicted value squared (`hat squared`), as the predictors to rebuild the model. The variable (`hat`) should be a statistically significant predictor, since it is the predicted value from the model. This will be the case unless the model is completely misspecified. On the other hand, if our model is properly specified, variable (`hatsquare`) shouldn't have much predictive power except by chance.
4. As a rule of thumb, a variable whose VIF values are greater than 10 may merit further examination. The tolerance defined as $1/VIF$ was used to check on the degree of collinearity. A tolerance values lower than 0.1 is comparable to a VIF of 10. It means the variable could be considered as a linear combination of other independent variables.
5. The result in Table 10 of this study is in line with similar study conducted by Ogwumike et al. (2006) that self-employed inequality is slightly higher in males than females (male 0.42 female 0.41).
6. The Gini of Equivalised Market income is within each sector of residence and sex
7. Income share is the share of total equivalised market income going to each sector of residence and sex
8. Pop Share is the share of sector of residence and sex as proportion of household heads

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