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The Role of Education in Female Labor Force Participation in Nigeria

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***Abstract**: Labor force participation of females in developing countries has been the subject of many studies recently. In countries like Nigeria, labor force participation and employment sector of females has been changing as more females get education. In this study, we analyze the effect of education on the labor force participation of females in Nigeria. By using the General Household Survey of 2013 we study labor force participation decision of females. After controlling for socio-demographic factors and utilizing a logit model, we find that effect of education on female labor force participation fallows inverse "U shape" pattern. Labor force participation increases up to high school but then decreases with a higher education degree.*
***Keywords**: Female Labor Force Participation, Logit Model, Household Survey*

I. Introduction

The participation of female in labor force has been on stage of debate for over three decades in many countries around the world. An interesting development in the labor market is the increasing proportion of female in labor force in both developed and developing countries. The increasing participation of women in paid work has been driving employment trends and gender gaps in labor force. In Africa, women were not regarded as anything but rather as homemakers who oversee and coordinate the affairs of the household, they were always at home while their husbands and sons are out working in the farm. However, while at home they (women) were not sitting down idle doing nothing but rather engaged themselves in doing one or two things such as manual processing of food crops and other farm produce in addition to their home duties. But today there are visible changes in the perception of women (unlike before), they now have greater opportunities for education whereby they constitute themselves into various organizations aggressively fighting for the role of women as opposed to restricting them to home activities.

In Nigeria today the rate of female participation has increased from 12% to 50% of the work force due to more participation of women furthering into higher education. However there are distinct differences that exist in the types of occupation entered by women and men. Women tend to get more jobs in administrative, clerical, personal services and sales occupation. Apart from moving into law, medicine and accountancy, there was no similar movement into science, engineering, Information Communication Technology (ICT) and the skilled trades.

Before the introduction of western education in Nigeria, women were largely regarded as second-class citizens. The main duty of women aside from catering for the entire household was to reproduce. Girls were married off in their teens; as a result of our cultural attitudes where the girl's child education is not what parent bothered about. They believed that girls should be married off, raise their children and care for their husbands. But the age of entry into marriage differs across the different region in Nigeria, people in the northern part of the country married out their children at earlier ages than people from the southern part. Western education and religion (Christianity) have encouraged the people from the south, especially in western Nigeria to delay their marriage.While in the East, the Igbo people do not enter into early marriage because of high customary bride price. Female labor force participation in Nigeria can be examined from three main angles, namely agriculture, informal sector and formal sector.

Oyekanmi (1986) and Adekanya (1990) highlighted the role of Nigerian women in agriculture. As in other part of Africa, Nigerian women worked side by side with men in agriculture with some marked division of labor between them. Men tend to perform the tedious work of falling the trees, gathering and burning of bush and making ridges while women on the other hand are involved in planting of seeds particularly food crops, harvesting, transportation, processing and selling of farm product. According to two studies conducted by the Economic Commission for Africa, women provided 60-80 percent of the labor input in African agriculture particularly in food processing and food trade (Adekanya, 1990).

The informal sector of employment of women covers some activities such as trading, domestic service, sewing, hairdressing as well as involvement in craft and cottage industries. The informal trading sector seems to be the most popular occupation of women in Nigeria most especially in the Western states. For instance, while

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women in Eastern states are more of farmers, those in the Western states are more of traders.The participation of women in labor force in the North is relatively low due to the act of keeping women in seclusion (Ojo, 1997).

Although in general terms, women constitute relatively low proportion of formal sector of employment in Nigeria, their rate of participation has been on gradual increase over the years. For example, in 1956, women constitutes only 2.1 percent of wage earners, and the number rises to 3.8 percent in 1959, 10.8 percent in 1985 and is currently about 45-50 percent. The level of female participation in Federal Civil Service rose steadily from less than 10 percent in 1990 to about 14 percent in 2005 (FOS, 2006).Female labor force participation rates are generally lower than that of male and tend to be higher in rural areas than urban areas. Nigerian women were involved in subsistence farming in the past, which include bush clearing, planting, harvesting, transportation and sales of farm produce. They are also engaged in petty trading which involved the sale of various agricultural products. As a result of these the number of women who are into formal jobs are relatively low than those engaged in petty trading.

One of the most and common employments of the Nigerian females as at now is teaching because the married women can go along with their household activities and bearing of their children responsibilities. Most men tend to allow their wife to work when it comes to the aspect of teaching especially in the northern region.For other sectors the men prefer their wife to remain full time housewife. However, this is not so in the regions like the south, east and west. That's is why the gap difference between number of employed males and females is wide. Men appear to dominate all form of work except for petty trading.

The National Bureau of Statistics publications (2010) also shows that despite the great improvement over the years very few women relatively to men secure jobs. The rate of female labor participation (% of female population ages 15 and above) in Nigeria was 38.90 in 2008 and 39.20 in 2009, (World Bank, 2010). Though the figure shows that there has been a great improvement but yet much still need to be done, becausethe analysis indicates that number of males employed are far beyond the number of females during the period under investigation. But several policies have been formulated to further increase female participation in labor force with the most important being the Millennium Development Goals. Hence there is need for the empirically informed policy formulation.

This paper is intended to examine the participation of female labor force in Nigeria economy. It has been found out that more women are now participating in the labor force but quite a number of women are still laid back due to a number of reasons. Therefore I use a cross – sectional data from National Bureau of Statistics on general household survey 2012/2013 to analyze the labor force participation of women in Nigeria.

There have been a number of studies by several authors on why women get involved in labor force in Nigeria. According to Olusoji (2006) who investigated the determinants of female labor participation in Nigeria, using a survey carried out between January and October 2001.He suggested that the number of hours worked are determined by the respondents income, family size, relationship with household head, sector of participation, education and location. The researcher also opines that women with tertiary education work fewer hours than older and married women.

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. His findings show that own as well as husband's education at all levels positively influences labor participation in different degrees in wage, self and total employment. Similarly, Bibi andAfzal (2012) examined the factors, which affect the decision of married women to participate in labor force. They found out education of the respondent, number of the off springs, number of dependents, family size, income of husband, monthly expenditure of family, positive attitude of husband and family towards the job of women, job satisfaction has positive impact on the labor force participation of married women. While age of the respondent, living with husband, satisfaction of house wives with their current life, restrictions from family regarding job negatively affect the decision of married women to participate in labor force.

Ackah et al (2009) investigated the determinant of female labor force participation in Ghana, they express that both women's educational attainment and fertility determine women's labor force participation in Ghana. The study showed that women with primary school education/above are more economically active than those with no education. Also Sackey (2005), used data from Ghana living standard survey to estimate the female labor force participation and fertility models. Whereby it's assumed that the two concepts (labor force participation and fertility decisions) are strongly linked with each other and as such it should be studied together. The significant studied of this study is the negative effect of education on fertility while education and reduced family size increase labor force in Ghana.

In South Africa female labor force participation has increased substantially over the past two decades (Ntuli, 2004). But despite the advances in female educational attainment and the expansion of the market economy, the rate of female labor force participation is still low compare to their male counterparts (Ntuli, 2004; Serumagaet al. 2004). For instance, in 2004 the labor force participation rate in South Africa was 62% for males

compared to females with 46%.Ntuli (2004) also further investigated that under the apartheid system, black women were subjected to intense discrimination and their full integration into the labor market was hampered. But with the end of the apartheid system in 1994, the government brought in some fundamental constitutional changes to increase women's access to the labor market. Laws were introduced to usher in greater equity to the treatment of women in labor force such as the Employment Equity Act of 1998 and Skills Development Act of 1998.

Some of the studies mentioned above uses macro level data simply analyzing the trend in labor force participation without econometric model. Other empirical studies that use cross-section data outlined above examined female labor participation from different perspective and different areas. This study investigates female labor participation covering the whole of Nigeria and focusing on the role of education. In addition, we use the most recent and comprehensive data set available for Nigeria.

II. Data

The data used in this study comes from the Nigeria General Household Survey for the year 2013 prepared by National Bureau of statistics (NBS). "General Household Survey" is one of the major sources of providing information on socio-economic status of household, employment status of members of the household, their annual incomes, monthly consumptions and expenditures in Nigeria.The household questionnaire provides information on demographics; education; health, labor and time use, food and non-food expenditure, household nonfarm income generating activities, food security and shocks, safety nets, housing conditions, assets, and other sources of household income. Some information was collected only in the post-planting visit, some only in the post-harvest visit, and some in both visits. Labor force participation is determined as follows. If the person answered yes to any of the following questions, the person is counted in labor force. In the last 6 months, "Have you worked for anyone who is not household member", "Have you worked on a farm owned or rented by household member", "have you worked on your own account". This is not traditional way of determining labor force participation. Our measure considers anyone who worked for some time in the last 6 months in labor force. Thus, labor force participation rate calculated with this method will be higher than traditional labor force participation rate. Because of the limitations in data we were unable to pursue traditional way of calculating labor force participation.

Since our interest is on the labor force participation of females, we restrict our data set to females who are at the age of 16 or above. Our final data set includes 964 nationally representative females. In order to find the effect of education on labor force participation we first create 5 categories for the education level of a female: (1) No education i.e. those without any education; (2) completed primary school; (3) completed secondary school; (4) completed high school; (5) completed higher education. In addition to education level, we also control for marital status, religion, age, and urban/rural residence.

Table 1 shows the descriptive statistics of all variables that are used in this study. As shown in the first row of the table on average 55% of women are in labor force. The average age of women in labor force is 32. It is also shown that 54% of females are married in our samples. About 64% of females live in rural areas. 5% of our sample is Christian. Finally, for the education, we see that 15% have no education at all. 28% is primary school graduate, 11% middle school graduate, 30% high school graduate, and 15% graduated from a higher education institute.

In Figure 1 we see how labor force participation in Nigeria has changed over time. We see that labor force participation for females rose steeply from 1990 to 2005. After 2005 the increase continues but at a lower rate. In contrast, labor force participation of males is in decline. While female labor force participation for females increased from 40 % to 50%, for males it decreased from 61% to 51% over the last 20 years. This change is mostly due to the changing roles of females in the society as well as increase in the number of females who get education.

Figure 2 shows how female labor force participation changes by different age groups. We see that both in urban and rural Nigeria, as age increases labor force participation first increases up to the age of 35-45, and then it decreases again. The inverse "U shape" trend in labor force participation with respect to age exists both for urban and rural areas. In early ages, due to the factors of being single and having education, some females might be unwilling to work. Likewise, after the age of 55, because of physical conditions, and health problems, we might observe a decrease in labor force participation. In Figure 3, we plot labor supply participation of females with respect to different education levels. It is observed that both in urban and rural areas women with no education and primary school education has the highest participation rate. This seems surprising given the opportunities educated women have in job market. However, we should keep in mind that anyone who worked in the last 6 months is counted in labor force in our data. This might explain why women with lower education level have higher participation than women with higher education level. To isolate the effect of education on labor force participation after controlling other determinants, we need an econometric model. The next section will develop an econometric model and analyze the effect of education level on female labor force participation.

III. Econometric AnalysisAnd Results

Since our dependent variable takes the value of 1 and 0, using OLS may not be a good idea. OLS is subject to some problems in probabilistic models. Non-normal distribution of error terms, heteroscedastic variance of error terms, estimated probabilities being greater than 1 or lower than 0, and R^2 being very low. (Gujarati 2009) For qualitative response models, an alternative to OLS isLogit model.

Let's define Y as;

Y_i=1 if the person is in labor force

Y_i=0 if the person is not in labor force

Cumulative logistic function can be written as;

$P_i = E(Y_i = 1|X_i) = 1/1+e^{-Zi}$

Where $Z_i = \alpha + \beta X_i$

X_i: vector of independent variables

P_i gives us information about independent variables and it shows us probability of being in labor force for personi. By using the variables mentioned above, we can write log-likelihood function as follows:

$L_i = \ln(P_i/1-P_i) = \alpha + \beta_1 Age + \beta_2 MaritalStat + \beta_3 Religion + \beta_4 Urban + \beta_5 NoEduc + \beta_6 PrimarySchool + \beta_7 MiddleSchool + \beta_8 Highschool + \beta_9 HigherEduc + u_i$

α veβ_1 ,.....β_9 are regression coefficients.

P_i : dependent variable (=1 if the person is in labor force, =0 if not)

u_i : stochastic error term.

Table 2 presents logit regression results. The results suggest that age, marital status, urban, primary school, middle school, high school variables are significantly affect female labor force participation. The interpretation of logit regression results is complicated. Interpretation of marginal effects is easier and more meaningful. Hence, we present marginal effects in Table 3. Marginal effects are calculated at the mean values of the variables. For dummy variables such as marital status and education, marginal effect shows the change in probability when dummy variable changes from 0 to 1. According to the results *Age* variable is significant at 1% significance level. The coefficient 0.012 suggests that as age increases by one, the probability of labor supply participation increases by 1.2 % percentage points. In other words as the person gets one year older, probability of being in labor force increases by 1.2 %. This result is inline with the literature. Lisaniler andBhatti (2005),Faridi et.al (2011), andBibiandAfzal (2012) find that age has a positive effect on labor force participation.*Urban* variable is also significant at 1 % significance level. The coefficient -0.117 implies that on average a female who lives in urban area has 11% lower probability of being in labor force compared to a female who lives in rural area. This result seems counter-intuitive due to the fact that there are more job opportunities in urban areas. However,in rural areas agriculture sector employment is more common and our labor force participation calculation counts everyone who worked at some point in the last 6 months in labor force. This might be the reason why female labor force participation is higher in rural areas in our analysis as shown in Figure 2, and Figure 3. Marital status is also considered to be an important determinant of labor force participation for females. Helen et al. (2015) runs two separate analyses for urban and rural female labor force participation in Nigeria. They find that marital status significantly and positively affect labor force participation in rural areas but not in urban areas. Smilarly, Oladejo et al., (2011) analyzed women participation in agricultural production in Egbedore Local Government Area of Osun State, Nigeria. Theirresults revealed marital status had significant impact on the women labor force participation. Our results in Table 3 show that marginal effect of being married on labor supply participation is 0.238 and it is significant at 1%. This means that married women have 23% higher probability of being in labor force. This result might be unexpectedbecause of the cultural beliefs in Africa, which usually prevent women from taking up paid jobs. Also, having children (which is not controlled in this study) should increase reservation wage, which reduces the probability of being in labor force. However, especially the rural areas are characterized by relatively poor families that the woman may not have a choice other than take up paid jobs in order to increase the total household income to meet the challengesof modern age. The religion variable is found to be insignificant determinant of female labor force participation. There seems to be a problem with the measure of religion in our data set. The data shows that only 5 percent of the sample belongs to Christian faith. However, in reality about 46% of the population is Christian.[3] So, there is a serious measurement error in this variable. Helen et al. (2015) find that being Muslim or traditionalists reduces the probability that a woman would take up paid jobs in Nigeria.Education is usually found to have a positive effect on female labor force participation. Lisaniler and Bhatti (2005), Ackah et al. (2009), and Bibi and Afzal (2012) find a positive association of education with female labor force participation. Helen et al. (2015) also finds that literacy significantly increases the probability of being in labor force for urban areas, but it does not have a significant effect in rural areas. Our findings are

[3]"Religious Adherents, 2010 - Nigeria". World Christian Database.

somewhat the same as the literature. According to the results in Table 2 and Table 3, it can be seen that educated females have higher probability of being in labor force than uneducated ones. "No Education" variable is our reference category and it is left out in the regression. Primary school, middle school and high school graduates are more likely to participate in labor force compared to uneducated females. The result about females with higher education is surprising. Probability of being in labor force for higher education graduates are not significantly different from those with no education. Two things in our analysis might cause this unexpected result. First, the definition of labor force participation that we used in this study makes labor force participation of uneducated females upward biased. If an uneducated person has worked even for a few hours in the last six months, we consider her in labor force. However, this person may not have interest in working full time, or being in labor force. If a female with higher education degree worked at some point during the last six months, she most likely has a permanent job and she is in labor force now. Second, reservation wage of educated females can be higher than market wage. This may push them our of labor force. Overall, our results support the idea that education is positively associated with labor force participation for females. However, due to the limitation in our data about determining labor force participation, we find unexpected result for women with higher education.

IV. Conclusion And Policy Suggestions

The main goal of this paperis to determine factors influencing female labor force participation status and, in particular, to investigate its relationship with education, using descriptive statistics and binary logistics regression.

Female labor force participation in Nigeria has increased from 38% to 50% over the last 25 years. More women now furthering their education; i.e. they have greater opportunities for education than before. They now constitute themselves in fighting for the liberalization of women as opposed to restricting them to the home activities. The result of our analyses shows that the level of education is one of the factor that influences women's position in the labor force, though of recent, more women are coming out to further their education into higher level. As the level of education increases, the chances of women to stay at home (as full housewives) decreases. Similarly, theage of a woman has a strong influence on the decision of women to participate in labor force. Marital status of women equally has a significant effect on their participation in Nigeria labor force because having children and other marriage responsibilities affect opportunity cost of working.

In conclusion, we note that the finding of this study are very enriching and contributes to literature about female labor force participation in Nigeria significantly. One of the objectives of Nigerian government is to improve on female representation nationwide. This representation mostly should appear in the labor market. There has been significant improvement in female education over the years but a lot more should be done.

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Table 1: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Labor force	964	0.55	0.48	0	1
Age	962	32.25	13.52	16	82
Marital status	964	0.54	0.49	0	1
Rural	964	0.64	0.47	0	1
Urban	964	0.35	0.47	0	1
Religion	964	0.05	0.21	0	1
No Education	964	0.15	0.36	0	1
Primary School	964	0.28	0.45	0	1
Middle School	964	0.10	0.30	0	1
High School	964	0.30	0.45	0	1
Higher Educ.	964	0.14	0.35	0	1

Table 2: Logit Regression Results

Dependent Var: Female Labor Force Participation

	Coefficient	Std. Error	z	P>|z|
Age	0.052***	0.007	7.330	0.000
Urban	-0.497***	0.159	-3.130	0.002
MaritalStat.	1.026***	0.161	6.370	0.000
Religion	-0.217	0.319	-0.680	0.498
Primary School	0.566**	0.240	2.360	0.018
Middle School	0.297*	0.304	0.980	0.780
High School	0.519**	0.242	2.140	0.032
Higher Educ.	-0.225	0.268	-0.840	0.402
Constant	-1.822	0.304	-6.000	0.000

*, **, *** shows significance at 10%, 5% and 1% respectively

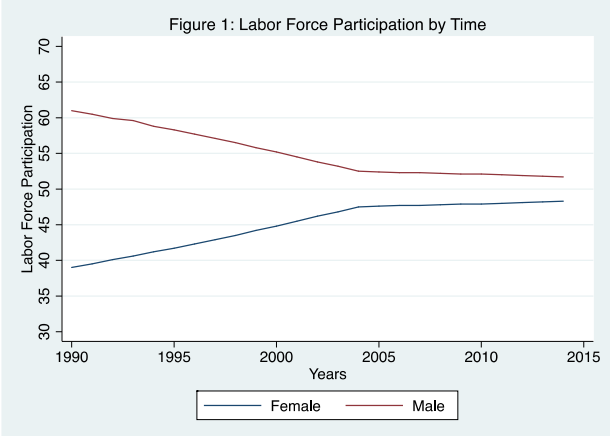
Table 3: Marginal Effects of Logit Regression

Dependent Var: Labor Force Participation

	Marginal Effects dy/dx	Std. Error	z	P>|z|	Mean Value
Age	0.012***	0.002	7.450	0.000	32.25
Urban	-0.117***	0.038	-3.110	0.002	0.35
MaritalStat.	0.238***	0.036	6.540	0.000	0.54
Religion	-0.052	0.078	-0.670	0.506	0.05
Primary School	0.127**	0.051	2.480	0.013	0.28
Middle School	0.067*	0.066	1.020	0.083	0.10
High School	0.117**	0.053	2.230	0.026	0.30
Higher Educ.	-0.053	0.065	-0.830	0.409	0.14

dy/dx shows for dummy variabels the change is from 0 to 1.

*, **, *** shows significance at 10%, 5% and 1% respectively



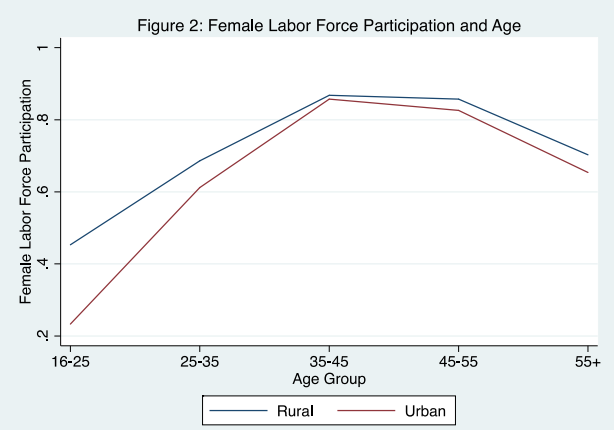


Figure 2: Female Labor Force Participation and Age
Female Labor Force Participation
.2
.4
.6
.8
1
16-25
25-35
35-45
45-55
55+
Age Group
Rural
Urban

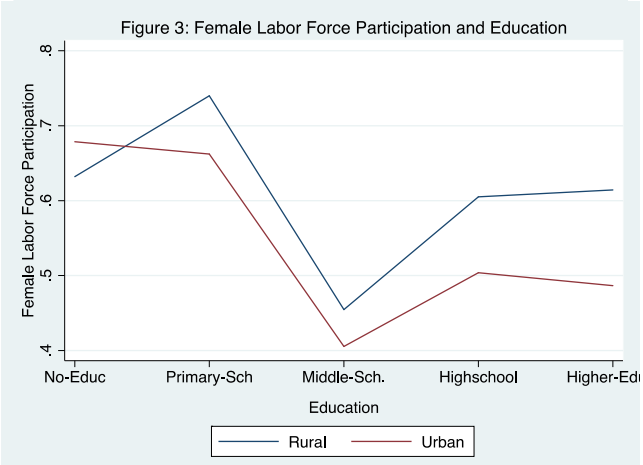


Figure 3: Female Labor Force Participation and Education
Female Labor Force Participation
.4
.5
.6
.7
.8
No-Educ
Primary-Sch
Middle-Sch.
Highschool
Higher-Edu
Education
Rural
Urban