Effect of Education Status of Women on Their Labour Market Participation in Rural Nigeria

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Abstract   Women form almost more than half of the total population in rural Nigeria. Participation of Women in Labour Market activities in rural Nigeria has been on the increase in recent times. It is widely held that female education plays a pivotal role in increasing women participation in Labour Market activities. The present study endeavours to investigate the effects of different levels of education on women labour market participation in the study area. The study is based on the 2009/2010 NLSS data collected through field survey by Nigeria Bureau of Statistics (NBS). To achieve the objective of the study, a control function is estimated. The results of the estimated model show that educational attainment levels significantly affect Women Labour Market Participation (WLMP). WLMP rises with increasing level of education. Age has a non-linear effect on women labour force participation, increasing at first and then decreasing later in life. Marital status, Father's education, mother's education and land size and the dummy variables of the Geopolitical zones are all positive and significant with north central having the least coefficient of 0.077. On the other hand, numbers of children and health status have negative and significant effect on women labour participation. The results of the study conclude that female education is necessary to ensure effective participation of women in labour market activities.

Keywords   Education Status, Women, Labour Market Participation, Control Function

1. Introduction

Women Labour Market Participation (WLMP) in rural Nigeria has been on the increase in recent times. WLMP is generally associated with education which is viewed by human capital theorists as a form of self-investment that, in the aggregate, improves the cognitive skills possessed by the work force and thus enhances labour productivity and efficiency which in turns increase wage earning and alleviate poverty.

Basic education is critical to participation and productivity in economic. It serves the dual purpose of increasing both empowerment and economic growth. In the first instance education allow people to be more aware of their responsibility and their fundamental and qualified rights. It opens up an opportunity to know how to do things better. This in turn, not only increase individual income, it increases that of the nation and thus economic growth aims at improving people's life[1]. Education is also consider to be a basic and obvious process by which skills, knowledge and attitude are acquired for the performance of socio-economic responsibilities, social integration, improving personal

competence, and seeking better opportunities[1]. The role of education in the process of rural development and economic growth, brought into prominence by the early theorists in the 1960s and 70s, has been the centre of much debate over the years. Educating women has a positive effect on their labour supply due to several reasons. Sociological theories assert that education provides necessary job qualifications, raises earning power and occupational goals, and induces women to seek employment outside previous conventional roles. Hence, greater access to formal training and employment opportunities is usually associated with greater female participation in the labour market[2]. Investment in human capital development, such as education, is found to contribute significantly to economic development and growth as it raises labour productivity and induces an efficient allocation of resources[3]. Investing in education will not only increase the rate at which female adopt new innovations but also influence their income-generating activities[4].

Female labour force participation in developed countries has been treated in a number of studies and found to be positively influenced by education[5]. For developing countries,[6],[7] also[8] documented women's participation in the labour force and contribution to development. In these countries the bulk of women's work takes place in non-market activities in the home or the informal sector. The contribution of women to both formal and informal sector

activities has been recent, but is increasing with the expansion of the market economy and advances in women's educational attainment.

Nigeria is the most populous country in sub-Saharan Africa and is also termed the ninth most populous country in the world. According to the 2006 National Census, Nigeria has a population of about 150 million almost 50% of which are women. Reference[9] reported that 70% of these women population reside and work in the rural areas. This implies that too many Nigerian women largely live in poverty, lacking access to basic education, decent nutrition, adequate health and social services which education and participating in labour activities will alleviate. In Nigeria, Women Labour Market Participation (WLMP) has been on the increase in recent times in all geographical locations (i.e., urban and rural). WLMP though increasing is still lowers than that of male; about 56.4% of males and 32.38% of the female population were economically active. In 1990 it increases to 36 % and further to 39% in 2009[10].

Participation of women in labour market activities appears to be influenced by factors such as age, marital status, eucationion, cost of living, religion, ethnicity etc. But the emphasis in literature is that education is a major determinant of Women labour market participation [11];[7]; [12]. However the rate at which education engendered increase in WLMP is not clear especially in rural Nigeria. Thus, the need to examine the extent of Female education and its effect on their labour market participation. This research work therefore seeks to answer the following questions. In what market activities are women engaged? What is the influence of education on women labour market participation? The main objective of the study is to examine the effect o t of education on female labour participation in rural Nigeria. The specific objectives are to: identify the labour market activities of women in rural Nigeria; determine the influence of education on women labour market participation.

The study is planned into five sections. Introduction is presented in the first section. The second section provides the review of literature. In the third section, the data, sampling procedures and analytical methods was discussed. The results of the estimation are presented in the fourth section. We have offered some concluding remarks and policy implications in the last section.

2. Conceptual Framework and Previous Literature

2.1. Conceptual Framework

The human capital theory formed the basic theory behind this study. The theory suggests that education is an important determinant of women participation in labour activities. An increase in the level of woman's education is expected to have a positive effect on labour force participation while a negative effect will follow a lower level. Also, a concave relationship between age and labor force participation is consistent with human capital theory and suggests that labor force participation increases with age up to some point, and then declines.

2.2. Literature Review

The relationship between education and female labour force participation has been summarized by[13] under three hypotheses: the opportunity cost hypothesis, the relative employment opportunity hypothesis, and the aspiration hypothesis. First, the opportunity cost argument conceives that there is a positive relationship between educational investments and earnings potential, education raises the opportunity cost of economic activity, thereby giving people a positive incentive to seek employment[14]. Lastly, the aspiration hypothesis is based on the human capital hypothesis that women with higher levels of education are more likely to participate in the labour market. From this viewpoint that income aspirations and expectations of people are strongly determined by levels of education, more - educated women are expected to have higher income aspirations over their less-educated counterparts and therefore tend to be more active in the labour market[15].

Reference[16] studied female labour force participation in Bolivia. She used data from the second round of the 1989 Integrated Household Survey (SIH), a biannual survey carried out by the National Statistical Institute of Bolivia (INE). The results revealed that 44 percent of the sample of women works for pay. In general, women who have lower levels of education than men are more heavily concentrated in the informal sector[17]. Probit estimates of the labour force participation function shows the greatest likelihood of working for pay among women ages 35 to 44 but the probability declines among older women. Unmarried women and heads of household are more likely to work than are married women. Women high school students are less likely to participate in the labour market than those who are not. In contrast, attending, or having completed a technical school, teacher's college, or university degree has a highly significant, positive effect on the probability of labour force participation. Pregnancy has the expected negative impact: women who were pregnant in a given year had a lower probability of participating in the labour market than women who had not been pregnant. She also reports that language skills also have a significant impact on labour force participation: bilingual women participate at a higher rate than women who speak only Spanish.

Reference[18] studied female labour force participation in Chile using data from the National Socio-economic Survey (CASEN) of Chilean households conducted in 1987. In general, Chile is a relatively developed labour market. However, women constitute only about 28 percent of the labour force. Female labour force participation is less than half that of males. The author investigates why, in the face of the rapid equalization of education levels across sexes, female labour force participation rates have not increased to

levels observed in industrialized countries. The results of probit estimates for the labour force participation of women aged 14 to 65 years are as follows: higher degrees are positively associated with the probability of labour force participation; the age profile of female labour force participation is an inverted U-shape; married and cohabiting women are less likely to work for pay than are those who are single or separated; being head of household is positively correlated with the probability of labour force participation; higher household income (total income of other members of the household) increases the likelihood of working for pay.

Reference[19] Observed their study that in Colombia, Women's labour force participation increased from 19 percent in 1951 to 39 percent in 1985. The authors attempted to identify factors that influence a woman's decision to participate in the labour market using data from the 1988 National Household Survey conducted by the Statistics Administrative Department (DANE) in the largest Colombian cities. They estimate a probit model in which the probability that a woman Colombian cities. They estimate a probit model in which the probability that a woman will participate is estimated based on her parental status, age, education level, the size of the household in which she lives, and her status as head of household or otherwise. The probit coefficients show that the probability of participating increases steadily with each additional level of completed education. A larger household has a positive, although small, effect on a woman's decision to work for pay. By contrast, being head of household has a substantial positive impact. As in many other studies, the presence of young children is shown to reduce the probability that a woman will work for pay. In Colombia, however, even women with young children continue to be heavily represented in the informal sector.

Reference[20] studied female labour force participation in Costa Rica. The author found that education has a powerful positive effect on the probability of female labour force participation: more educated women are more likely to participate in the market and are more likely to be employed. Using the results of probit estimates for female labour force participation, the author predicts the probability of labour force participation for each characteristic holding other characteristics constant at their means. The author found that labour market activity are participation, the author predicts the probability of labour force participation for each characteristic holding other characteristics constant at their means. The author found that high school graduates have the highest probability, 54.2 percent. Married women are less likely to participate than unmarried women, 17.7 percent versus 40.4 percent. The more children a woman has, the less likely she is to participate in the labour market. A female head of household has a higher likelihood of participating, 34.1 percent, compared to 22.7 percent probability for a woman who is not head of household. Finally, women who live in rural areas are less likely to participate in market activities.

Reference[21] used data from the 1987 Ecuador Household Survey that was conducted in urban households in the three largest cities, Quito, Cuenca and Guayaquil, to study the increase in female labour force participation which their estimates show had increased to 50 percent. They also found that more educated women are more likely to participate in the market and more likely to be employed; marital status and being head of household are the most important social determinants of both labour force participation and employment: i.e., wives with working husbands are much less likely to participate in the labour market than female heads of household. Women with young children are also less likely to work for pay.

Reference[22] examined female labour force participation in Guatemala. The data source was the 1989 National Socio-Demographic Survey (ENSD), carried out by the Statistical National Institute. Results from probit equations estimation are that schooling level is an important determinant of labour force participation; that number of children and marital status have the expected negative and significant impact on participation; that participation peaks between the ages of 30 and 34, dips for women aged 35 to 39, and then rises again; that being head of household increases the probability of participation, as does living in Guatemala province and living in an urban area; that a woman from an indigenous group is less likely to participate in the labour market; and that household income has a positive effect on participation, as[20]) reported for Chile.

Reference[23] used probit equations to investigate the factors that influence a woman's decision to enter the formal labour market or the informal sector in Honduras. The data used in their analysis come from the 1989 national survey, the Honduras Household Permanent Survey of Multiple Purposes (EPHPM). It is assumed that the decision to work and the decision regarding which economic sector to enter (formal or informal) are made simultaneously. Their results revealed that holding all other variables at their mean values, the probability of participation increases substantially with each additional level of education completed. However, women with college degrees actually have a lower probability of participation than women with completed secondary education. They also found that Women's labour force participation rates by age group show the familiar inverse U-shape. Women's labour force participation peaks between ages 35 and 45 and then declines. They found further that having children aged six years or less reduces the probability that a woman will work.

Reference[24] analyses women's labour force participation in Mexico. She focuses on factors that have been shown in previous studies to influence the decision to enter the workforce such as age, education level, presence of young children, marital status, and household wealth. The probit coefficients show that probability of participation in the labour market decreases as women become older although it remains relatively high even at older ages. Her analysis shows that with increased levels of education, women are more likely to participate in the labour market. Steels' study shows that women in Mexico are actually more

likely to participate when there are children in the household, unlike most studies which indicate that the presence of at least pre-school aged children reduces the probability of labour force participation.

Reference[25] studied women's labour market participation in Peru where it increased from 34 to 43 percent between 1970 and 1985 in urban areas. He used the probit estimates to predict the effect of changing certain characteristics holding other characteristics constant at their mean. He finds that women with university rather than secondary or post-secondary diplomas have substantially higher labour force participation, and that single women participate in the labour force more than married women (14.9 percent versus 5.52 percent, respectively). Finally, the predicted participation rate for women is the highest in Lima (15 percent) followed by other urban areas (9 percent) and rural areas (6 percent).

References[26] and[23]. Both studies used the same data source, the Household Survey data, for 1987 and 1989, respectively, and the same methodology. They estimated a probit equation for a sample of working and nonworking women. Not surprisingly, results of the papers are quite similar: education has powerful effects on labour force participation as the human capital literature suggests. The probit coefficients show that the probability rises steadily with each successive level of education.

Reference[27] In a descriptive study, analyzed women in the Venezuelan labour market, focusing on their labour force participation and their income. They used aggregate data from the National Census since 1950. Their results showed that older women, "cohabitors" and those with the lowest level of education increased their labour force participation, as a strategy to cope with reduced family income.

Reference[28] reported on the determinants of labour force participation of women in Venezuela for the period 1980-2000. Among the factors that influence Venezuelan women's labour force participation, the authors point out, are income level, education, and the development of political and social institutions. Age is also important: the highest labour force participation, 46 percent, is observed for those between the ages of 30 and 39.

3. The Data, Sampling Procedures and Analytical Methods

The study made use of the Harmonized National Living Standard Survey (NLSS) that was carried out between September 2009 and August 2010. According to National Bureau of Statistics (NBS) 2010 a two- staged stratified sampling technique was used. The first stage involves the Enumeration Areas (EAs), while Housing Units constitute 2nd stage. Clusters of 120 housing units called Enumeration Areas (EAs) were randomly selected per state. The second stage involved random selection of 5 housing units from selected EAs. This produced 50 households per LGA and 38,700 households nationally. However, data available for women in rural areas was 70,374 which formed the sample

frame of this paper.

Statistical tools used in data analysis include descriptive analysis and control function regression model. The descriptive statistics included frequency, means, percentages, tables and standard deviation. These were used to categorize women by market participation and socioeconomic characteristics. The control function was used to analyze the influence of education on women labour market participation.

3.1. Control Function

The control function approach is used to correct for biases that arise as a consequences of selection and /or endogeneity [29];[30],[31]; and[32],[33]. It deals with selection bias in the correlated random coefficient model but it can be applied in more general semi-parametric settings[34];[35]. The idea behind the control function analysis is to model the dependence of the outcome unobservable in a way that allows us to construct a function K such that, conditional on the function, the endogeneity problem disappears.

Following[31];[36]) the estimation strategy may be summarized as follows.

$$FP = w_1\alpha_{Fp} + \beta E + \varepsilon_1 \qquad (1)$$
$$E = w_2\alpha_e + \varepsilon_2 \qquad (2)$$
$$N = 1(w_2\alpha_p + \varepsilon_3 > 0) \qquad (3)$$

where,

FP, E, N are female participation, education, and an indicator function for selection of the observation into the sample, respectively; w_1 = a vector of exogenous covariates; w_2 = exogenous variables, consisting of w_1 covariates that belong in the female participation equation and a vector of instrumental variables, w_2, that affect education, E, but have no direct influence on female participation, FP; α, β and ε = vectors of parameters to be estimated, and a disturbance term, respectively. Equation (1) is the structural equation of female labour participation whose parameters are to be estimated. Equation (2) is the linear projection of the potentially endogenous variable, E, on all the exogenous variables, w_2, i.e., a reduced form linear probability model of education. The third equation (3) is the probit for sample selection. It is the probability of an inclusion of factors that can affect female labour participation. It helps to correct sample selection bias in the parameters to be estimated. To accommodate any non-linear interactions of unobservable variables with the female labour participation regressors, and to account for sample selection bias, equation (1) can be rewritten as

$$FP = \delta_0 + w_1\alpha + \beta E + \delta_1 V + \gamma (V \times E) + \theta (E \times R) \quad (4)$$

Where

V = Fitted residual of education (observed value of E minus its fitted value), derived from a linear probability model;

VxE = Interaction of the fitted education variables residual with the actual value of education;

R = the exogenous variables that are correlate with education;

θ = the effect of a unit increase in the interaction term;

µ = composite error term.

In equation (4), the terms V and VxE are the control function for the effect of the unobservable factors that will contaminate the estimates of the structural parameters.

The reduced form education residual, V, serves as the control for unobservable variables that are correlated with E. In particular, if an unobserved variable is linear in V, it is only the intercept, δ_0 that is affected by the unobservable and thus the IV estimates of equation (4) are consistent even without the inclusion of the interaction term. The interaction term, (VxE), controls for the effects of any neglected non-linear interaction of an unobservable variable with controls for the effects of any neglected non-linear interaction of an unobservable variable with education. Specifically, if the effect of E on female participation is influenced by an unobserved variable, say, a (which is correlated with E), this unobserved influence (a x E) is relegated to the structural error term and its source neglected during estimation. The estimated coefficient on E contains this neglected effect of unobserved variables; other structural coefficients may be similarly affected. Inclusion of the interaction term, (a x E), in equation (4) purges the estimated coefficients of the effects of unobservable[36].

Table 1.   List of Variables for Empirical Analysis

Variables	Description of Variables
Ageyrs	Age in years
Ageyrssq	Age in years squared
PEduc	Primary Education (Yes =1, 0 if otherwise)
SEduc	Secondary education (Yes=1, 0 if otherwise)
TEduc	Tertiary Education (yes=1, 0 if otherwise)
Marst	Marital status (married=1, 0 if otherwise)
HHsize	Household size in numbers
Hltstatus	Health status (Was the women sick in the last 2 weeks? (Yes=1, 0 if otherwise
Non-labour Income	Income from other sources in naira
Eduexp.	Educational expenses in naira
Father's wk	Father's work (Farming=1, 0 if otherwise)
Father's edu.	Father's education (formal=1, 0 if otherwise)
Mother's wk	Mother's work (Farming=1, 0 if otherwise)
Mother's edu.	Mother's education (Formal=1, 0 if otherwise)
Own land	Ownership of land (Own land=1, 0 if otherwise)
Nth_central	North central Geo-Political Zone (GPZ) (Yes=1, 0 if otherwise)
Nth_east	North east GPZ (Yes=1, 0 if otherwise)
Nth west	North west GPZ (Yes=1, 0 if otherwise)
Sth-east	South east GPZ (Yes=1, 0 if otherwise)
Sth- south	South south GPZ (Yes=1, 0 if otherwise)

The interaction (multiplication) of V with E captures the idea that the size of a varies non-linearly with E. Thus, its unobserved and neglected effect (a x E) changes in a non-linear way as E changes, the polynomials of the fitted residual term, V, and its interactions with exogenous covariates, i.e. w_2, can also be included in equation (4). The IV estimates of equation (4) are unbiased and consistent only when one or the other of the following conditions holds (a)

the expected value of the interaction between education and its fitted residual (V x E) is zero; (b) the expected value of the interaction between education and its fitted residual (V x E) is zero; (b) the expectation of the interaction between education and its fitted residual is linear (see[30]).

4. Results and Discussion

4.1. Descriptive Analysis

Table 2.   Descriptive Statistics of Some Selected Socio-economic Variables

Variables	Frequency	Percentages
Age		
15-30	31926	45.4
31-50	24459	34.8
51-65	9385	13.3
65 and above	4604	6.5
Total	70374	
Mean 52.91	**SD** 16.740	100
Mode 60		
Educational status		
No Formal Education	38008	54.0
Primary	19816	28.2
Secondary	10256	14.6
Tertiary	229	3.3
Total	70374	100
Marital status		
Married	51441	73.1
Divorced/Separated	923	1.3
Widowed	3874	5.5
Single	14136	20.1
Total	70374	100
Occupational status		
Unemployed	22307	31.7
Wage Employment	45932	65.3
Self-Employment	2135	3.0
Total	70374	100
Household Size		
1-3	15483	22.0
4-6	28975	41.2
7-9	18078	25.7
10-12	7838	11.1
Total	70374	
Mean	5.65	100
Mode	5	

Source: Computed from Analysis Result 2011

The preliminary analysis of the study is concerned with establishing descriptive statistics of some selected variables. The preliminary analysis aims to give an overview of the variables and provide the behavioural patterns of variables. Table 2 presents the results of the summary statistics of the descriptive analysis. The result shows that about 80.20 percent of the women in the study area fall within the age range of 15-50 while about 19.80 percent are more than 51years of age. This shows that an average rural woman is in her middle years; as a result, she will be strong enough to get engaged in labour activities that will bring in more money to take care of the household. The mean age was 36.66 years while the standard deviation was ±16.74 and modal age was 30 years. It also revealed the educational status of the women.

The educational status has been divided into four groups- no formal education, primary education, secondary education and tertiary education. The table reveals that a larger proportion of the women 54.0 percent have no formal education while 46.0 percent have formal education. Among those with formal education, 14.6 percent have secondary education while less than 4 percent have tertiary education. It shows further that about 73 percent of the rural women are married while 26.9 are not married among this, 5.5 percent are widowed while about 20.1 per cent are single. Pertaining to occupational status, the table shows that women who engaged in self- employment activities dominated the study area with about 65 percent. Those in the wage employment are in the minority with less than 4 percent. About 63 percent of the households in the rural area were less than seven. The table also shows that the mean household size was approximately 6 while the modal household size was 5. This revealed that a typical rural household is not large. This might lead to a limited supply of labour to the farm. This might be as a result of increase in rural-urban migration.

4.2. Distribution of Economic Activities of Women in Rural Nigeria

Table 3 present a breakdown of the entire economically active female population by sector of principal activity in the rural area. It reveals that while 73.15% are involved in farm activities, 26.85% are into non-farm activities. The farm activities are primarily for production in agriculture, forestry and fishing. The non-farm activities are in manufacturing, sales and services. There are several activities under each of the farm and non-farm categories as shown in table 33. Beginning with farm activities, agricultural which comprise livestock and Crop production has the highest percentage (69.73%) while forestry has the lowest (0.34%); it is evident that agriculture is the dominant industry absorbing the women. This is not surprising since Nigeria is to a large extent predominantly an agricultural economy and the bulk of its populace resides in rural areas. This implies that women may be more vulnerable to poverty.

In the non-farm sector, women are more in the service sub-sector (13.36%) followed by sales (6.82%) and lastly manufacturing (6.60%).The result further revealed that the highest percentage of women in the service subsector are Housekeeper (including maids and related work) followed by Teachers, Professional Nurse and Labour representing 3.03%, 1.90%,1.31% and1.4% respectively. Engineering and Mail Distributors are the least in that sub-sector with both having 0.05% each. Other related activities engaged in by women are Clerical-related activities (0.69%), bricklaying (0.23%), hairdressing (0.69%), and religious work (0.46%), Government Executives (0.51%), transport (0.11%) to mention but few. The fact that a high population of women engaged primarily in services activities suggest that the dominating activities in rural Nigeria may belong to low-productivity, low-income activities that may not lift people out of poverty. Also the low involvement of women in services activities such as Engineering (0.11%),

Medical/dentistry (0.11%), Architecture (0.11%) and Accounting (0.11%) attest to the fact that the educational level of most women in the rural area is low.

Table 3. Percentage Distribution of Economic Activities of Women in Rural Nigeria

Occupation code	Frequency	Percentage
Production		
Agricultural	49072	69.73
Forestry worker	239	0.34
Fishing	2168	3.08
Sub-total	**51479**	**73.15**
Manufacturing		
Spinners weavers	1766	2.51
Food and beverages	887	1.26
Tailor, dressmaker	1605	2.28
Blacksmith	35	0.05
Miners	77	0.11
Chem. Processors	77	0.11
Sculptor/painter	197	0.28
Sub total	**4644**	**6.60**
Sales		
Proprietor /wholesale	2674	3.80
Sales workers	1928	2.74
Sales suppliers and buyers	197	0.28
Sub total	**4799**	**6.82**
Services		
Architect	77	0.11
Engineering	35	0.05
Building caretaker	120	0.17
Medical, dentistry	77	0.11
Professional nurse	922	1.31
Accountants	77	0.11
Economist/insurance	77	0.11
Lawyer	162	0.23
Technical	120	0.17
Teachers	1337	1.90
Housekeeping*	2132	3.03
Hairdressers	486	0.69
Legislative officer	162	0.23
Farm manager	162	0.23
Clerical related	486	0.69
Government executive	359	0.51
Trans. And Com. Supplies	77	0.11
Mail distributors	35	0.05
Restaurant	443	0.63
Service worker	605	0.86
Plumber/welder	35	0.05
Bricklayer	162	0.23
Transport	35	0.05
Labour	802	1.14
Religious worker	324	0.46
Sub-total	**9452**	**13.34**
Total	**70,374**	**100.00**

Source: Computed from Analysis Result 2011 * Include Maids and related activities

It is observed that Sales is an important activity commonly adopted by women to generate earning in addition to those provided by other sectors. In this sector, Women are more in Sales at wholesale level accounting for 3.80% of total Sales activities. Other commercial workers account for 2.74% while those engaged in buying and selling of goods account for 0.28%. Women participation in trading is not unexpected, since virtually anyone with a little start-up capital can engage in one form of retailing or another.

The result in table 3 also revealed that the most important activities among the women in manufacturing subsector comprise Spinners weavers (2.51%), tailoring/dressmaking (2.28%), Food and beverages (1.26%) while Blacksmith has the lowest percentage (0.05%).

The gradual growth of micro enterprises has somehow opened an avenue for women's participation in manufacturing and food processing enterprises.

4.3. The influence of Education on Women Labour Market Participation

The results of the three different models used to estimate the influence of education on the labour force participation of women in this study. These are the OLS, IV and Control function (using Heckman). The OLS model was estimated with actual level of education. Since education and female labour participation decisions are simultaneously determined, this variable would be endogenous and hence correlation with the error term would give biased and inconsistent estimates of the parameters. In order to test for endogeneity of the education variable in the female labour participation equations, instrumental variables estimates was used in place of actual values and test of endogeneity applied. The instruments used in this study is family background variables which according to[37];[38] is one of the two main groups of instruments for education. The control function approach was applied for heterogeneity correction. There are two key assumptions underlining this estimate: (a) the sample on which female labour participation is estimated is non-random, and (b) the interaction between unobservable variables and the correlates of female labour participation is non-linear. Accordingly, generated inverse of the Mills ratio in censored samples is introduced into the female labour participation equation through the Heckit procedure to account for sample selection bias. Also, newly generated residual is included via control functions to account for correlations of female labour participation with unobservable.

The results in table 4 shows an improvement in the value of Adj.R^2 from 0.32 in OLS estimate where actual year of education was used to 0.37 in IV where education was instrumented. The result of the OLS and the IV estimates present baseline results of the study. The IV estimate (0.172) of the coefficient on education is about five times as large as the OLS estimate (0. 034). This suggest that there is no significant reverse causality, since there is increase in the coefficient of education and the Adj. R^2 in the IV estimate compare with the OLS estimate. This therefore indicates that education is exogenous which is consistent with findings from previous studies[39].

Comparing the estimate of IV with that of the control function approach revealed the problem due to endogenity and neglected non-linearity. The coefficient of Education in the control function model (0.847) is about four times more than that of the IV estimate (0.172). This further confirms that education has effect on women labour participation. This is in line with previous studies by[40] also[41].The estimated coefficient (0.248) of the education residual is statistically significant at the 5 percent level. Also, the coefficient (0.025) of the inverse of the Mills ratio is statistically significant at the 1 percent level, this according to[42] suggest that sample selection bias is a problem in the data set. The control function is therefore an appropriate estimation strategy since it takes into account both the endogenity of education and the heterogeneity of the response of women labour participation to education. This Heterogeneity is associated with the unobserved ability and motivation of an individual and if this unobserved individual effect is correlated with the regressor of the model, the simple estimations with OLS are inconsistent. Inclusion of the control function variable, (VxE), in the women labour participation equation thus purges the estimate of the effect of heterogeneity. Therefore, the result of the control function approach model is discussed in detail.

The result revealed that the women's age has quite a sizeable impact on their labour market participation decision (LMP). Women labour market participation decision (WLMP). WLMP increases with age. The rate of participation of women in the labour market is expected to increase by about 20.8 percent with age. With regards to education, the results confirm previous results that indicate a strong positive relationship between educational attainment after completing basic primary education and the involvement of woman in labour activity. Education plays a vital role in determining the WLMP decisions. Educational qualification raises the job opportunities of women. It was observed that women participation in labour market increases as the level of education increases. It increases by 22 percent and 31 percent with primary education and secondary education respectively. On the completion of tertiary education, participation increases by 54 percent. The similar results were found by[43].

Thus, there is clear evidence to conclude that the women with higher level of education are more likely to participate in the labour market activities.

With regards to marital status, in contrast to findings of studies on female labour force participation that married women are less likely to work than unmarried women. Presumably, this reflects a higher reservation wage resulting from access to their spouses' incomes. This result revealed that married women are more likely to work than singles because they are able to secure capital through their husbands to start up small enterprises or use their husband's connections to obtain wage employment. This is consistent with non-pooling of incomes within the household—a

plausible situation in this African context.

Table 4. Estimation of the influence of education on women labour participation functions under Different Approaches

Variables	OLS	IV	Control Function (using Heckman)
Ageyrs	0.015 (2.02)**	0.123 (11.5)***	0.208 (2.219)**
Ageyrssq	-0.071 (1.19)	-0.200 (16.4)***	-0.639 (-2.150)**
PEducation	0.034 (2.77)*	0.172 (8.70)*	0.220 (1.780)*
SEduc	0.110* (1.741)	0.210* (1.692)	0.307* (1.802)
TEduc	0.256** (2.352)	0.276** (2,410)	0. 548** (2.208)
Marst	0.139 (1.81)*	0.205 (9.98)***	0.250 (3.700)***
HHsize	0.179 (3.56)***	0.249 (14.3)***	0.447 (-3.400)***
Hltstatus	-0.081 (1.66)*	-0.603 (20.3)***	-0.660 (-3.250)***
Non-labour Incom	-0.054 (1.31)	-0.151 (14.2)***	-0.430 (7.530)***
Eduexp.		-1.340 (15.79)***	0.001 (0.300)
Father's wk		-1.416 (14.78)***	-0.106 (0.0450)
Father's edu.		0.083 (0.88)	0.189 (1.730)*
Mother's wk		-0.156 (0.83)	0.066 (1.530)
Mother's edu.		0.320 (2.30)**	0.741 (2.280)**
Own land		-0.124 (1.53)	-0.251 (1.880)*
Nth-central	0.077 (5.47)***	-0.199 (1.25)	-0.633 (2.100)**
Nth-east	-0.052 (5.62)***	-0.172 (1.71)*	0.208 (2.340)**
Sth-east	0.058 (1.16)	0.203 (1.48)	0.762 (1.960)*
Sth- south	-0.710 (7.42)***	0.261 (4.78)***	0.848 (1.960)*
Ssth-west	-0.094 (9.99)***	0.114 (2.51)**	0.234 (2.100)*
Cons.	-1.028 (10.7)***	0.276 (2.12)**	-6.688 (1.590)
Reduced form education Residual			0.248 (2.87)***
Education status x Education residual			0.0473 (1.85)*
Inverse mills Ratio			0.025 (0.77)***
R^2	0.32	0.37	
Adj. R^2	0.34	0.43	
Wald statistics			1643.24 (0.0000)

Source: Computed from Analysis Result 2011Significant at * 1%, ** at 5%, ***10%

Likewise household size has strong positive influence on the WLMP. This is so because, the pressure on the financial resources in households comprising of more members is high which induce women to participate in earning activities. Similarly, parent's education has a significant positive relationship with the WLMP. However, the education of mother has more effect and significant association with WLMP showing that daughters of educated mothers are more likely to be educated and to participate in the labour market. For example, an increase in mother's level of education will increase women participation in the labour market by 74 percent. Similarly residing in the southern geopolitical zones (GPZ) increases the rate of women participation in labour activities with the south-south having the highest coefficient of 0.84 indicating that residing in the south-south will increase WLMP by 84% compare to the reference group.

Non-labour income is another important factor influencing the LFP decision of women. The estimation results suggest that the increase in Non-labour income reduce the rate of women participation in the labour market. Thus, the women receiving income from other sources such as remittance rent etc. are less likely to participate in the labour force. Also, the women's LMP decision is inversely and strongly influenced by bad health status. Deteriorating health will decreases the rate of LMP of women by about 66 percent.

Similarly land size has a negative effect on WLMP decision. For example, increase inland size reduces WLMP by 25percent. Thus, the estimates show that women belong to relatively rich families will participate are less in income generating activities.

Finally, the results show that women residing in the Northern geo-political zones (GPZ) are less likely to participate in market activities with north east having the highest coefficient of 0.63 implying a 63 percent reduction in LMP of women residing in that GPZ. This is so because the purdah custom restricts most northern women in rural areas from acquiring education and also participating in labour market activities.

5. Conclusions and Recommendations

The study investigated the effect of education on women labour market participation in rural Nigeria. The study provides empirical evidences that women's educational level is one of the main factors determining women's labour market participation in rural Nigeria. The study concludes that Age, Marital Status, Household size are some of the factors influencing the labour market participation of women positively and significantly, while Agesquared, non-labour income, health status, ownership of land are some of the factors reducing the women labour market participation. Therefore, it may be concluded that the higher the level of education, the higher the likelihood of women's participating in labour market activities. Base on the findings, reform actions should be directed towards provision of higher

education to the females' especially in rural areas. It is observed that healthy females are more likely to participate in rural market activities. Consequently, rural health infrastructure is needed to be improved.

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