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Determinants of Labour Force Participation in Nigeria: The Influence of Household Structure

Prof. Fadayomi, T.O¹ and Prof. Olurinola, I. Oluranti²

Abstract

This study examines, empirically, the influence of household structure on labor market participation in Nigeria, using the data collected by the defunct National Manpower Board in the Nigerian Labour Market Survey conducted in year 2005. In addition to other traditional explanatory variables, the study employs other variables measuring the influence of household characteristics of the studied population in the determination of participation rates. The method of data analysis is two-fold. The first is the descriptive analyses of the characteristics of the labour force in Nigeria, while the second employs both the probability and logit regression models in estimating the labour force participation rates. Both methods of analyses were carried out using the SPSS software. The study establishes the relative importance of the household structure in influencing labor force participation of household members while the other traditional economic and socio-demographic variables conform to *a priori* expectations. In line with the findings, a gender-friendly policy that addresses the constraints facing women's work and their full participation in the labor market is advocated.

Keywords: Labor force, participation rate, labor market

JEL Classification: J21, J22

1. Introduction

Until the early 1970s, studies of the labor force have concentrated on the developed countries. Also, most of these studies emphasized the determinants of the size of the labor force and the patterns of labor force participation placing emphasis on the personal, gender, household and labor market characteristics, and some relevant demographic factors such as fertility, urbanization and migration.

¹ Department Of Economics, Elizade University, Ilara-Mokin, Ondo State Nigeria.
Email: olo_oye2005@yahoo.com

² Department Of Economics And Development Studies, Covenant University, Ota, Ogun State, Nigeria.
Email: olu.ogunrinola@covenantuniversity.edu.ng

The theoretical and conceptual frameworks of these studies provided the platform for subsequent studies of the labour force, largely initiated by the International Labor Organization (ILO) in the developing countries in the 1970s. While the studies of the labor force carried out in the developing countries varied considerably in terms of their explanatory and labour force variables as well as in the statistical techniques adopted, they provide a rational framework for further analytical works on the labor force.

In Nigeria, labor force sample surveys have been carried out by the official statistical agencies since 1965/66 and subsequently analyzed in the most common and easily presentable form through cross-tabulations. This form of analysis is limited as it is impracticable to classify individuals by many variables i.e. to control for the influence of other determinants of participation. Therefore, the simple cross-tabulations found in the official statistical reports may not reveal the actual relationships between labor force participation and the hypothesized determinants as well as the relative importance of the latter on labor force participation.

What follows in the rest of this paper are, the theoretical and empirical works on labor force participation mainly in the developing countries, including Nigeria; the conceptual framework and the model of the study, our findings and finally, the policy implications and conclusions.

2. Some Theoretical and Empirical Works on Labour Force Participation

The theoretical outlook on labor force participation reflects how an individual makes choice among alternative uses of his/her time. According to the labour force participation theory, the manner in which individuals allocate their time depends on choices between work and leisure in response to a wage increase (Mincer, 1962). On theoretical grounds, an increase in the individual's wage rate could lead to (a) the income effect, which is negative, i.e., the increase in income leads to a demand for more leisure and consequent reduction in time allocated to work, (b) the price (or substitution) effect, which is positive, i.e., the rise of wages leads to an allocation of more time to work than to leisure. Therefore, the proportion in which time will be allocated between work and leisure given a change in the wage rate depends on the relative values placed on additional income and on leisure by an individual.

However, Mincer (1962) points out that the labor force participation of married women should not be construed only in terms of allocation of time between market work and leisure, since work at home is another activity which most women are engaged in. Therefore, the choices faced by married women can be categorised into three: leisure, work at home and work in the market. In utilizing the labour force participation theory in a developing economy like that of Nigeria, there are issues that require some special attention. First of all, there is a tenuous link between the labor force concepts and the labor force variables often used in empirical studies.

Economic theory assumes that individuals allocate their time between market work and other activities in finely divisible units e.g. hours of work, whereas the actual measured variables are whether an individual is in the labor force or not, whether employed or not, and whether formally and fully employed or works below full-time, among several other factors. Although the theoretical concepts of economic models take into account the family context within which married women participate in the labor force, by treating labor force participation generally as a matter of individuals' choices under the condition that the real wage increases, many empirical analyses neglect other conditions that are likely to affect an individual's participation or non-participation.

To view socio-economic behavior like that of labor force participation as an individual decision-making process is one approach. Another approach is to view such a micro-economic behavior as a household decision-making process. The latter makes the assumption that individual behavioral decisions are made interdependently. It states that they are part of a larger behavioral framework which links the household's behavior through a process of simultaneous and recursive links. For example, in a household, the school enrolment of children will directly affect employment of mother and vice-versa. If the mother is employed and contributes to household income, it is likely that the household can afford to send the children to school. Conversely, if the children attend school, it is more likely that the mother works because school enrolment will reduce child employment and increase the household income needs (Peek, 1978). This illustrates how a household tends to decide simultaneously on the employment of wife and children's school enrolment.

The labor force participation studies in the developing countries have tried to translate the general propositions of labor force participation in the developed countries into models for empirical work. Attempts have been made to find measurable variables to reflect the determinants of labor force participation by looking at a combination of personal characteristics, among other variables. Such personal characteristics include age, marital status, education, presence of children, household size, wage/income, migration status and health status, among others.

Other variables of interest are household characteristics such as relationship to head, husband's occupation, husband's income, husband's employment status-for married women; and the labor market macro-variables such as, the level of unemployment, level of urbanization, type of employment, agricultural employment, proportion of children enrolled in school, and so on (Standing and Sheehan eds., 1978; Magidu 2010).

Based on the theoretical analyses discussed above, several empirical studies have been conducted in many countries. For example, 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 (both bundled and unbundled) on labor force participation, but also that the husband's education positively influence the labor force participation of married women in Nigeria. The methodology of study relies on the use of linear probability regression model towards the estimation of three labor supply functions on female labor force participation. The results show that own as well as husband's education at all levels positively influence labor participation in different degrees in wage-, self-, and total employment in Nigeria.

Aminu (2010) used the General Household Survey data of 1998/99 and 2007/2008 to estimate the determinants of labor force participation and earnings in wage employment in Nigeria. In the study, Aminu used three models to verify his hypotheses and these models are: the probit model of labor force participation; the multinomial logit models of labor force participation, and the Mincerian human capital model. The contribution of the study to the already vast literature on labor force participation is the inclusion of an important household variable – the presence/absence of an elderly female in the household – which is hypothesized to have a positive effect on both male and female participation rate in the wage employment sector of Nigeria. As expected *a priori*, the presence of elderly female persons increases the probability of labor force participation across all sectors of wage employment for males and females in the 2007/08 GHS data set; while it exercises negative and positive influences on private and public sectors' employment respectively in 1998/99 data sets.

The Mincerian human capital model estimated shows the influence of the traditional human capital variables – education (both total and disaggregated by levels), labour market experience and its square, and urban/rural residence) – on the different wage employment sectors studied for the data sets of 1998/99 and 2007/08. The use of two data sets for this study made possible a comparative analysis with respect to determinants of labor force participation and earnings in the Nigerian economy. Other studies on Nigeria which are not too different from Aminu's include: Anugwom (2009); and Uwakwe (2004).

In Ghana, Sackey (2005) conducted a study on the effect of formal education on female labour force participation using data from the Ghana Living Standard Survey (GLSS4 and GLSS3). The study's underlying assumption was that the two concepts – labor force participation and fertility decisions – are strongly linked and as such they should be studied together. To do this, a multinomial probit and was specified and estimated.

The study found a negative and statistically significant relationship between fertility; while education and reduced family size increase labor force participation rate among women in Ghana.

In her bid to examine the influence of religion on female labor force participation across countries, H'madoun (2010) specified and estimated a probit model with a vector of religious variables among other exogenous predictors. The data for the study were obtained from the 2005 wave of the World Value survey, where 26,711 women in the age range 18 to 55 years in 48 countries were selected for the study. Like many other studies of this nature, the 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. The shortcoming of the study, in our view, is the fact that all the 48 countries were lumped together in the analysis without being disaggregated for country-specific peculiarities. Even when one of the regression equations reported country-fixed effects, no clear explanation was given for how this was carried out. A disaggregation by, for instance, level of economic and social development might possibly have shown different results for developing countries (like Mali, Rwanda, etc) and developed ones (like France, Britain, Sweden, etc).

In the present study, an attempt is made to explore the relative importance of the household structure in the determination of labor force participation in Nigeria. This is further premised on the thesis that the household continues to play an important role in the Nigerian society in the allocation of resources to its members and in expected contributions by its members to the survival of the household as a primary and decision-making unit.

3. The Conceptual Framework and the Method of Study

3.1 The Conceptual Framework

The general conceptual framework adopted in this study is that the labor force status of each member of the household is a part of a large set of decisions. One of these decisions is whether the individual's wants either to work or seek work in the labour market and such decision is influenced by a combination of individual attributes.

Some of these attributes include the level of educational attainment, health status and other stock of competencies, which are acquired with household resources. Others are labor market variables like the region of residence or region of origin which reflect the relative abundance of formal employment opportunities, and their household structure.

The import of the household structure like household size, relationship of each member of the household to the head of the household, and whether the individual belongs to either a male or female-headed household determines how the individual's disposition to work or seek work could be depressed or enhanced by other important influences coming from his or her primary family unit.

It is hypothesized that the individual's disposition to work or seek work could be depressed or enhanced by a host of factors in the household or family unit such as pressure to meet a lot of financial obligations to other members of the household or to combine work in the market place with household work or to cover the financial obligations created by ill-health or the temporary loss of gainful employment by other "bread-winners" in the household.

3.2 The Data and Method of Study

3.2.1 The Data

The data base of this study is the Nigerian labor market survey carried out in 2005 by the defunct National Manpower Board. The study was carried out with a view towards the continual monitoring of developments in the Nigerian labor market. The study relied on the 1991 National Population Commission's enumeration areas (EAs) from which 1,130 EAs out of the total 209,501 EAs in the country were randomly selected. At the end of the exercise, a total number of 11,281 households in 1,129 EAs were covered, giving a response rate of 99.8%. In total, 57,547 individuals made up of 52% of males and 48% of females were covered in the survey exercise.

Another important source of data for this analysis is the website of the International Labour organization (ILO). The Key Indicator of the Labour Market (KILM) published by the ILO and made available on her (ILO's) website provided time-series data on the LFPR disaggregated by age and sex. The breakdown of the labour force by sex and age group gives a profile of the distribution of the economically active population within the country by sex and by the following standardized age groups: 15+, 15-24, 15-64, 25-54, 25-34, 35-54, 55-64 and 65+. For the purpose of comparative analysis, a calculation of the LFPR was also carried out for the year of the survey of the NMB's micro-data. Both the cross-section and the time series data were used where appropriate.

3.2.2 The Models

The usual foundation for the model of labor force participation is the neo-classical theory of utility maximization in which the individual or the household chooses between work or leisure or a suitable combination of both given the going wage rate.

The utility maximizing agent compares the utility from work and/or leisure and makes a choice under the usual assumption of rationality. Thus the random utility model is defined as:

$$U^k = U^k(X'\beta^k) \dots\dots \dots (1)$$

Where k =1 if the individual or the household decides to work and zero otherwise.; U is the utility being maximized and X is the vector of factors determining U. Since U^k and β^k (k=0,1) are not directly observable, the final outcome (whether to work or not) is observed while the coefficients of β 's are estimated using any adopted econometric technique. Two vectors (\mathbf{X}_i and \mathbf{H}_i) of variables are posited to be influencing the dichotomous participation rate which is the dependent variable LPF_i which takes value 1, if the respondent works in the labor market and zero otherwise. The vector \mathbf{X}_i is a set of standard exogenous variables that influence labor force participation such as age, educational status, marital status, sex, region of residence, location of respondent whether rural or urban, and so on. The vector \mathbf{H}_i is a set of household variables which includes whether the respondent is head on non-head of household, the gender of the household head (whether the household is male- or female-headed), the size of the household, and status of the other members of the household (whether wife, son, daughter or other blood relations).

The following two basic logit models are estimated in this study:

$$LPF_i = \alpha_0 + \alpha_X \mathbf{X}'_i + \mu_1 \dots \dots \dots (2)$$

$$LPF_i = \beta_0 + \beta_X \mathbf{X}'_i + \beta_H \mathbf{H}'_i + \mu_2 \dots \dots \dots (3)$$

In equation (2) we examine the partial effects of standard exogenous predictor variables on labor performance of respondent in the sample. In equation (3) we add the household variables to the standard exogenous variables influencing labor supply to verify their effects on participation.

4.0 Results and Discussion

4.1 Basic Characteristics of the Nigerian Labor Force

The total labor force size that was captured in the NMB study is 20,842 representing 36% of total respondents. The gender distribution of the respondents shows that 52% are male while the remaining 48% are female. Out of the entire sample, 20,914 representing 36.5% are less than 15 years of age while the remaining 36,058 respondents representing 63.5% are 15 years and above.

Three-tenths of the studied population are in the 'Single' category, 36% are Married while the rest are either separated/divorced or widowed. Since the study covered the entire nation, every region of Nigeria is represented. North-Western Nigeria recorded the largest percentage of respondents of 21.2%; this was followed by the South-West region with 20.6%, the North Central and South-East followed with 15.9% and 15.4 respectively while the South-South and North-East each recorded 14.3% and 12.7% respectively. In the entire country, the South accounts for 50.21% of the labor force while the remaining 49.79% are from the North.

With respect to rural/urban location of respondents, the data shows that majority of Nigerians live in the rural areas (77%) while only 23% are in the urban centres. Fifty eight percent of the respondents are literate while the rest are not and this pattern is reflected in the educational distribution of the respondents. For instance, over 40% had no formal education, while 28% and 23% had primary and secondary education respectively. Only 9% of the respondents had tertiary educational background. Since the study was household-based, the data generated captured the household structure of respondents. Of the entire sampled persons, 8,565 representing about 18% are household heads, while the remaining 82% are other members of the households. A disaggregation of the heads by gender revealed that 85% are male while the remaining 15% are female. The characteristic large family size of Nigerians is reflected in the household size of the respondents. Fifty-six percent of the respondents are from households having 7 or more persons, 33% are from households having 4-6 persons while the remaining 11% are from 1-3 persons households.

The distribution of employment among the labor force shows that many members of the labor force are in self-employment as compared with those in wages and salaried employment. The reason for this is not unconnected with the large informal sector which is the main provider of employment in developing nations. From the data used in this study, the self-employed constitute 75% of total employment while wages and salary employment constitute 23%. The rest are the business owners who are employers of labor (1.7%) as well as the paid apprentices (0.6%). A further analysis of the data regarding the sector of employment of those employed shows that majority are in the Agricultural sector (48%), those in the Services sector are (46%) while the remaining 6% are in the Manufacturing sector.

With respect to the level of income, 45% of the employees earn less than the then minimum wage of ₦7,500 per month while 55% of the workers earn ₦7,500 and above. The overall average monthly wage and salary is ₦15,425, with those in the Agricultural sector receiving the lowest, that is ₦11,880 per month; followed by those in Manufacturing who earn a monthly average of ₦17,258; while those in the Services sector earn the highest which is ₦18,800 per month. The latter feature is not far-fetched in an economy dominated by agriculture, limited manufacturing, and non-industrial services, such as trading and goods distribution.

A further analysis of the data of the Nigerian labor market shows that the aggregate unemployment rate was 11% (in 2005 when the data was collected), while the severity of unemployment varies by age, region of residence and household status of respondents. For instance, the South-South suffers the highest unemployment rate of 18% while the North Eastern Nigeria has an unemployment rate of 7%. In terms of rural/urban settlements, the urban areas experience a higher rate of unemployment than the rural areas; the literates suffer higher unemployment rate than the illiterates, while the youths (15-24 age cohort) experience a higher unemployment rate than the older age grades. In terms of gender, the males bear the brunt of higher unemployment rate of 12.3% compared to the rate of 10.3% for the females. However, when the household heads are disaggregated by gender, it is clear that the female heads suffer a slightly higher rate of unemployment (3.7%) than their male counterparts (3.2 %).

Another important feature of the Nigerian labor market is the level of underemployment – both visible and invisible – that is present in the system. The visible underemployment manifests in various forms – those working less than the desired number of hours per day or less than the number of days per week, as well as those whose skills and intellectual capacities are not fully utilized. The invisible aspect of underemployment has to do with those that are fully occupied, either in terms of the number of hours or days worked but are earning less than they are qualified to earn per given period of time. For the studied population, the level of underemployment by the number of hours worked is 29%, those whose capacities are not fully utilized are 21% while those that are earning less than the then minimum wage of ₦7,500 per month is 45%.

4.2 Trends and Patterns of Labor Force Participation in Nigeria

Based on ILO time series data from 1980 to 2010 and the data from the 2005 cross-section study for all the members of the labor force, the Labor Force Participation Rate (LFPR) for males in the 15+ age cohort declined steadily from 77% in 1980 to 63% in 2010 (Table 1). In contrast, the female LFPR increased steadily from 36% in 1980 to 47.8% in 2010.

The youths in the 15-24 years age cohort records the lowest LFPR which, for both sexes, rose from 32% in 1980 to 37.4% in 2010. For all the members of the labor force, the males in the 25-54 and 55-64 age cohorts record the highest LFPR for the period 1980 to 2010. The former age grade maintains a male LFPR of about 96% from 1980 to 2009; while the female participation rate rose steadily from 46% in 1980 to 54.3% in 2010. The latter age cohort (55-64 years) exhibits the highest female labor force participation ranging from 59.9% in 1980, dropped to 50.6% in 1990 and rose steadily to 64.1% in 2010.

In general, over the period of 1980 through 2010, the female labor force participation rates have been on the rise for all age groups. In contrast, the participation rates for the males have been on the decline. The rise in female labor force is expected and this is due to several factors such as increasing educational attainment of women, the resulting decline in the fertility level, the increased emphasis on gender equality, the desire to enjoy a higher quality of life as national per capita income rises, and several others. The decline in the male labor force participation may not be unconnected with factors like the reduction of work hours per week due to union agitation in the formal sector, massive lay-off due to unfavorable economic climate, among many other factors.

The last column of Table 1 shows the LFPR calculated by the authors from the NMB's micro-data of 2005 and distributed by gender and age group. As in the time-series LFPR for the period 1980-2010, the cross-section LPFR follows almost the same pattern among different age groups and gender. The males participate more than the females and that participation peaks at age-group 55-64 for all age groups and for both males and females. As expected, the youths (15-24 age cohort) and the senior citizens (65 years and over) participate less than the other age groups. It is interesting to note that the overall participation rate for 2005 from both the time-series data and that of cross-section are comparably close. While the ILO figure for participation is 56.2, the one calculated from the NMB data series is 57.2.

4.3 Factors Affecting Labor Force Participation in Nigeria

From the NMB cross-section data set of 2005 the detailed labor force participation rates reported in Table 2 were computed. The result in the table shows the distribution of labor market participation by several factors such as personal characteristics of respondents, region of origin, as well as household characteristics of respondents. The personal characteristics affected labor force participation in the expected direction. For instance, age and LPFR move in the same direction until age 64 when participation dropped sharply as from age 65. The males participate more than the females. The married are more active in the labor market than the singles while the divorced/separated group has the highest participation level among the different sub-categories in the marital status variable.

With respect to education, those with no formal education plus those with primary education have the same level of participation of 58-59%. The secondary school graduates exhibits reduced participation of about 49% due mostly to further acquisition of formal education. The tertiary education graduates exhibits the highest level of participation of 74% among the respondents classified by educational attainment.

The variables describing the household characteristics of the labor force reveal several important relationships with the labor market participation.

These variables are: Household size, Status in the household (head, non-head), Relationship to the head, and gender of head of household (female-head, male-head). The household size and participation in the labor market moves in opposite direction for all respondents in the working age group. For 1-3 member households, participation rate is 68%, while it is 61% and 52% for 4-6 member- and 7+ member households respectively. Such inverse relationship between household size and participation rate may be due to the age-structure of such household members, since young children of 6 years and less are more demanding of their parents' (especially mothers') time. In line with the apriori expectations, household heads participate more (88.4%) than the non-heads (45.3%). In terms of relationship to the head, the husbands participate more (90%) than the wives (50.9%); sons and daughters participate less than other blood relations whose participation rate is 41.8% in contrast to 31.9% and 27.2% for sons and daughters respectively.

The last three columns in Table 2 shows the distribution of the labor force participation rates of household heads by gender and the criteria listed in the first column of the same table. The table shows that the heads have higher participation than the aggregate participation rates as shown in the 'All Labor force' and 'All Heads' columns of the table. Among the heads, a disaggregation by gender shows that the male heads participate more than the female heads for all the criteria listed. In total, while the male head exhibit a participation rate of 90.4%, the female heads have a rate of 78%. It should be noted however that while all males have a participation rate of 64%, male heads' participation rate is 90.4%; and while all females have 49.7% participation rate, the female heads' rate of participation is 78.2%. This result is in line with *a priori* expectation. This is because the household heads have the responsibility of providing for the household members, and as such, they are expected to have a higher taste for money income and market work in order to be able to meet up with such household financial responsibilities (Finegan and Bowen, 1969 op.cit.).

The distribution of participation rate of household heads by gender and household size shows that participation rates increases with household size (up to six members in the household, and declines a little, thereafter) for the males while it declines with the increasing size of household members for the females.

As the household size increases, the females tend to be more preoccupied with household activities required by other members of the household. This becomes more intensive the larger the number of under-six children and other members that are in the household. With respect to age, the result shows that at all age groups and educational levels, the male heads participate more than their female counterparts. For the male and female heads, participation is highest at age 25-54 and 55-64 years respectively. Participation rate is lowest for male and female heads at age 65 years and over.

In terms of marital status, married male heads have the highest rate of participation (91.7%) in the labor market, while the separated/divorced has the highest participation rate (92.5%) among the female heads; an indication of the locus of considerable financial pressure and responsibility in the households. In contrast to the picture of participation for all labor force members that shows higher participation rates among the non-literates as compared to the literates; the literate heads (male and female) participate more than the non-literates. This may be the outcome of the literate heads understanding their household roles and responsibilities better than the non-literates and are therefore more active in the labor market. With respect to the region of origin, the heads in the North and South of the country have almost equal participation rate of about 90%.

4.4 Determinants of Labour Force Participation: Empirical Result from Logistic Regression

We estimated the models described in the basic equations 2 and 3 in Section 3 of this paper. The estimation results of the binary logit models are summarized in Tables 3 to 6. In line with the postulates of equation 2, the traditional variables (viz: age, square of age used to capture the non-linearity assumption in age-labor force participation profile, education, marital status, gender) are entered in the first step of the estimation procedure, while the labor force participation (a dummy variable) is the dependent variable. The results are shown in Table 3 as Regression 1 and Regression 2. In Regression 1, all the variables entered are statistically significant at 1% critical level while the quantitative variables (age, square of age, and education) are positively related to labor force participation as expected. Apart from the stratum (rural/urban location) variable which is negative, all other qualitative variables are positive on their influence on labor force participation. The last columns of Regressions 1 titled Exp(B) reports the log of odds ratio of labor force participation with respect to each of the explanatory variables.

In line with the estimated Exp(B) coefficient; age, education, being married, residing in the South, and being male increases labor force participation, while living in the urban area decreases it.

The fit of the model is shown by the Chi-square statistic which is high (13,261) and statistically significant ($p < 0.01$); while the two values of Pseudo R^2 (Cox & Snell and Negalkerke) show that the predictor variables explain between 31% and 42% of the outcome variable.

In Regression 2 we show the effect of different categories of the same variable (e.g. age) on labor force participation decision. Compared with the reference age category of persons aged 65 years and over, participation in the labor force is higher at younger ages. In fact, participation increases by age from 15 to 64 years.

With respect to educational categories, those who are uneducated have much higher probability of being in the labor force than the educated. The much lower effects of education at the levels of primary and secondary education on the labor force compared to the tertiary level and the uneducated cannot be divorced from their expectations of getting formal wage employment rather than seek jobs in the informal, rural and urban sectors. The divorced, separated and the widowed (which is the reference group in the marital status variable) demonstrate higher participation than the married and the single (who are largely young, school-going and still dependent on the household resources). Apart from the single, this phenomenon could be expected on the account of the absence of the usual male "breadwinner". This condition is likely to intensify their financial pressure and responsibility to other members of the household, given the usually large household size.

Table 4 shows the effect of the introduction of one of the household structure variable (size of the household) into the estimated logit model and the results are as shown in Regressions 3 and 4. The introduction of the actual value of the household size increased the Pseudo R^2 to between 32% (Cox and Snell) to 43% (Negalkerke) in Regression 3. Surprisingly, the variable does not significantly contribute to the level of labor force participation in a statistical sense while the other variables in the regression estimate remain statistically significant at the 1% level. However, when sub-divided into categories, both *hhsz1* (1-3 members) and *hhsz2* (4-6 members) are statistically significant and the change in the log of odds [$\text{Exp}(B)$] shows that each category of household size increases labor force participation relative to the reference category which is *hhsz3* (7 members and over).

In Table 5, the result of the introduction of another household variable on labor force participation is presented. Heads and non-heads of households are expected to behave differently in the labor market in terms of their participation because of the different financial pressure and responsibilities they are likely to face in usually large households, with many dependents and poor employment prospects. This conjecture was confirmed in the empirical analysis as shown by regressions 5 and 6.

The results show that all the variables in the regressions are statistically significant at the levels indicated while the addition of the new variable has increased the Pseudo- R^2 to between 33% (Cox and Snell) and 44% (Negalkerke). In regression 5, the household head variable reports an odds ratio of 5.09 indicating that the heads are over 5 times more likely to participate in the labor force compared to the non-heads who are the reference category. Regression 6 shows, in sub-category form, the impacts of the non-heads in labor force participation.

The result shows that husbands participate more than other non-head members of the household. These results are in line with the apriori expectations.

The influences of other sub-variables of Status in the household (heads and non-heads) are also empirically verified using the interactive relationship between those variables and other explanatory variable in the model. For instance, how does the participation rate of male heads differ from those of the female heads? Do the heads in the urban locations behave differently from those in the rural areas with respect to labor market participation? The result in Table 6 provides some empirical verification for the interactive variables Head*Male, Head*Urban, Head*South, and Head*Literate. Three out of the four interactive variables in Regression 8 are statistically significant at the indicated critical levels. In addition to the fact that heads participate more than the non-heads; the male heads, the heads in South Nigeria and the literate heads have the odds of participating more than the reference groups (of female heads, heads in the North and non-literate heads respectively) in each case. In terms of the fit of the model, the Chi-square in both regressions are high and statistically significant at the respective degrees of freedom while there is a marginal improvement in the Pseudo-R² as reported in Table 6.

5. Summary and Concluding Remarks

In this study, we proposed that individual decision-making in matters of labor force participation is influenced simultaneously by the household structure. We also postulated that the individual's disposition to work or seek work could be influenced by a host of factors in the household or family unit, such as pressure to meet a lot of financial obligations to other members of the household or to combine work in the market place with household work.

First of all, we confirmed previous studies that the personal characteristics of the individual predispose him or her to enter the labor force. In the Nigerian case study, age, education, being married, residing in the Southern part of the country (which is more industrialized and economically diversified) and being male increase labor force participation, while living in the urban area decreases it.

The latter finding, which is unexpected, may be due to the prevailing high rate of urban unemployment vis-à-vis the relatively high opportunity for under-employment in the rural economy.

Our findings, in respect of the stated propositions, show that both male and female heads of households have much higher labor force participation rates than all males and females respectively in the study. The fact that the heads of households participate more in the labor market is in line with *a priori* expectation of heads having higher taste for money income and market work in order to meet up with the household financial responsibilities. When the participation rates of heads of households by gender and household size are calculated, participation rate increases with household size for male heads and it declines for the female heads.

While household size might represent the index of financial pressure and responsibility faced by male heads, the contrasting participation of female heads vis-à-vis household size might be indicating that as the household size increases, the female heads tend to be more pre-occupied with household activities required by other members of the household. These household activities become more intensive the larger the number of young dependent children and other members that are in the household. Another indication of the financial pressure and responsibility, deriving from the household structure, is the fact that married male heads compared to other male heads, and the separated and divorced female heads compared to other female heads, have the highest participation rates.

The bi-variate analyses of participation on the account of household size was confirmed when we examined its net effect in a logit model. When sub-divided into categories, the effect of household sizes between 1 to 6 persons is positive and significant on labor force participation. Similarly, household heads, male heads, husbands are much more likely to participate in the labor force than non-heads, female heads, and other members of the households respectively.

In summary, this study confirms the influence of household structure on labor force participation in Nigeria in terms of one's household status which confers certain responsibilities as is the case of heads of households, husbands vis-à-vis other members of the household; and household size which represents an index of financial pressure and responsibility for male heads of households but, in contrast, an index of household work and responsibility for female heads of households.

The implication is that while male heads and husbands in the Nigerian households are able to respond to the "bread winner" responsibilities conferred on them by the society via a higher propensity to participate in the labor force and have more income-earning opportunities, female heads facing similar responsibilities and the need to participate more in the labor force are likely to be disadvantaged as a result of familial roles as mothers and care-givers. This would require a gender-friendly policy that addresses the constraints facing women's work and fuller participation in the economy.

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Appendix

Table 1: Labour Force Participation Rates in Nigeria (1980-2010)

AGE	GENDER	ILO'S TIME SERIES DATA (SELECTED YEARS)								NMB
		1980	1985	1990	1995	2000	2005	2009	2010	2005
15+	M	77.4	77.2	75.7	74.8	56.0	73.7	73.4	63.0	64.0
	F	36.4	36.7	36.1	37.0	38.3	38.7	39.2	47.8	49.8
	MF	56.6	56.6	55.6	55.6	56.0	56.0	56.2	55.0	57.2
15-24	M	45.7	46.3	44.4	43.7	43.0	41.7	40.4	40.0	25.1
	F	18.2	19.5	19.5	19.5	19.6	19.5	19.4	34.5	26.9
	MF	32	32.9	32.0	31.6	31.4	30.7	30.0	37.4	25.9
25-54	M	95.9	96.6	96.7	96.7	96.6	96.3	96.0	75.8	86.2
	F	46.2	45.9	45.4	47.5	49.9	50.7	51.5	54.3	62.5
	MF	70.8	70.9	70.8	71.8	72.9	73.3	73.7	65.2	74.6
55-64	M	93.2	91.6	89.9	89.7	52.6	89.1	89.2	78.2	94.0
	F	59.9	54.4	50.6	51.6	52.6	52.5	52.9	64.1	76.8
	MF	75.6	72.1	69.3	69.8	70.3	70.1	70.2	70.8	87.2
65+	M	74.0	58.5	50.3	49.7	49.1	49.1	49.0	64.8	46.1
	F	18.9	27.0	29.3	30.3	31.2	29.9	29.2	44.8	36.5
	MF	43.1	40.9	38.7	39.1	39.3	38.7	38.3	54.1	42.7

Source: kilm.ILO.org (2013) and NMB (2005).

Table 2: Labour Force Participation Rates

Main Variables	Derived Variables	ALL LABOUR FORCE	HOUSEHOLD HEADS		
			MALE	FEMALE	ALL HEADS
AGE	15-24	25.9	80.1	53.9	75
	25-54	74.6	96.0	87.1	94.9
	55-64	87.2	95.1	91.8	94.5
	65+	42.7	48.8	45.0	48.0
	All AGE GROUPS	57.2	90.4	78.2	88.6
SEX	Male	64.0			
	Female	49.7			
	Total	57.2			
MARITAL STATUS	Never Married	32.0	79.7	79.8	79.7
	Married	73.0	91.7	71.9	90.7
	Divorced/Separated	75.9	89.2	92.5	91.2
	Widowed	64.6	69.4	76.0	75.1
LITERACY	Literate	56.4	92.2	83.6	91.4
	Non-literate	59.0	86.5	74.2	83.6
HOUSEHOLD HEADS BY GENDER	Male Head	90.2	90.4	78.2	88.6
	Female Head	78.2			
	Total	88.4			
STATUS IN HOUSEHOLD	Head	88.4			
	Non-Head	45.3			
	All HH Members	57.2			
EDUCATION	None	59.2	86.0	71.6	82.9
	Pry	58.1	92.4	88.6	91.9
	Sec	48.5	91.7	85.9	91.1
	Tertiary	73.8	95.2	85.1	94.4
	TOTAL	57.6	90.5	78.2	88.6
REGION OF ORIGIN	Southern Nigeria	60.7	91.4	73.2	89.9
	Northern Nigeria	53.5	89.6	80.5	87.8
RELATIONSHIP TO HEAD OF HOUSEHOLD	Husband	90.0			
	Wife	50.9			
	Son	31.9			
	Daughter	27.2			
	Other Relation	41.8			
HOUSEHOLD SIZE	1-3 Members	68.3	88.4	81.5	86.7
	4-6 Members	61.3	93.1	79.7	91.9
	7 Members and over	52.1	89.2	75.1	87.2

Source: Computed by the authors from NMB data set.

Table 3: Logistic Regression of The Influence of Traditional Variables on Lfp

	REGRESSION 1				REGRESSION 2			
	B-Estimate	Std. Error	Wald	Exp(B)	B-Estimate	Std. Error	Wald	Exp(B)
Constant	-7.518*	0.096	6.165E3	0.001	-1.096*	0.076	206.558	0.334
Age (Actual)	0.340*	0.005	4.370E3	1.404				
Age-Squared	-0.004*	0.0001	3.578E3	0.996				
Age1: 15-19					0.446*	0.067	44.244	1.563
Age2: 20-54					1.894*	0.062	945.910	6.645
Age3: 55-64					2.446*	0.090	739.194	11.543
Age4: 65+					r			
Education (Years)	0.036*	(0.003)	155.103	1.037				
Educ1: None					1.023*	0.047	469.578	2.780
Educ2: Primary					-0.521*	0.049	114.911	0.594
Educ3: Secondary					-0.598*	0.045	178.367	0.550
Educ4: Tertiary					r			
Marital Status: Never Married					-2.081*	0.072	831.763	0.125
Married	0.816*	0.032	638.84	2.250	-0.434*	0.064	45.614	0.648
Divorced/Sep/Widowed	R				r			
Stratum: Urban	-0.175*	0.032	30.577	0.840	-0.147*	0.031	21.898	0.863
Region: South Nigeria	0.492*	0.028	305.66	1.635	0.530*	0.028	356.328	1.699
Gender: Male	0.908*	0.028	1.045E3	2.479	1.093*	0.029	1.422E3	2.983
N	35,588				35,588			
-2 Log Likelihood	39305.259				36122.805			
Chi-Square: Value	13261.162				12463.465			
d.f.	7				11			
Sig.	0.000				0.000			
Pseudo R-Squared:								
Cox & Snell	0.311				0.295			
Nagalkerke	0.418				0.397			

Dependent Variable: Labor Force Participation Rate r= Referenced categories.

*Means: Significant at 1% critical level

Table 4: Logistic Regression of Traditional and Household Variables on Lfp-1

	REGRESSION 3				REGRESSION 4			
	B-Estimate	Std. Error	Wald	Exp(B)	B-Estimate	Std. Error	Wald	Exp(B)
Constant	-5.764*	0.119	2339.981	0.003	-1.316*	0.078	283.509	0.268
Age (Actual)	0.320*	0.005	3759.28	1.377				
Age Squared	-0.004*	0.0001	3348.65	0.996				
Age1: 15-24					0.443*	0.068	42.950	1.557
Age2:25-54					1.904*	0.062	942.164	6.714
Age3: 55-64					2.473*	0.090	748.832	11.858
Age4: 65+	r				r			
Educ (year)	0.049*	0.003	260.383	1.050				
Educ1: None					1.051*	0.048	489.552	2.861
Educ2: Primary					-0.564*	0.048	132.854	0.569
Educ3: Secondary					-0.632*	0.045	196.837	0.531
Educ4: Tertiary								
Marital status: Never married	-1.759*	0.077	526.260	0.172	-1.994*	0.073	751.851	0.136
Married	-0.495*	0.068	52.639	0.610	-0.388*	0.065	35.678	0.678
Divorced/Separated/Widow	r				r			
Stratum: Urban	-0.170*	0.032	28.149	0.844	-0.149*	0.032	22.264	0.862
Region: Southern Nigeria	0.519*	0.028	333.041	1.681	0.516*	0.028	335.549	1.676
Gender: Male	1.086*	0.030	1332.002	2.963	1.092*	0.029	1404.95	2.982
Household size (Actual)	0.0001	0.001	2.634	0.105				
HH size1: 1-3					0.607*	0.042	211.759	1.836
HH size2: 4-6					0.277*	0.029	90.094	1.319
HH size3: 7+	r				r			
-2 Log Likelihood	34709.940				35870			
Chi-Square: Value	13848				12715.970			
d.f.	9				13			
Sig.	0.000				0.000			
Pseudo R-Squared:								
Cox & Snell	0.322				0.300			
Nagelkerke	0.433				0.403			

Dependent Variable: Labor Force Participation Rate r = Referenced categories.

*Means: Significant at 1% critical level ** Means: Significant at 5% critical level

Table 5: Logistic Regression of Traditional and Household Variables on Lfp-2

	REGRESSION 5				REGRESSION 6			
	B-Estimate	Std. Error	Wald	Exp(B)	B-Estimate	Std. Error	Wald	Exp(B)
Constant	-2.514*	0.091	766.485	0.081	-1.506*	0.082	336.595	0.222
Age (Actual)								
Age Squared								
Age1: 15-24	1.205*	0.076	251.648	3.338	0.890*	0.071	156.726	2.435
Age2:25-54	2.511*	0.070	1289.279	12.323	2.216*	0.065	1153.462	9.168
Age3: 55-64	2.904*	0.097	901.734	18.240	2.667*	0.093	826.892	14.545
Age4: 65+	r				r			
Educ (year)	r				r			
Educ1: None	1.078*	0.048	493.978	2.937	1.076*	0.048	492.764	2.934
Educ2: Primary	-0.583*	0.050	137.671	0.558	-0.581*	0.049	138.096	0.559
Educ3: Secondary	-0.597*	0.046	171.940	0.551	-0.647*	0.046	201.791	0.524
Educ4: Tertiary								
Marital status: Never married	-1.234*	0.078	252.559	0.291	-1.784*	0.078	525.326	0.168
Married	0.056	0.069	0.657	0.418	-0.624*	0.067	87.513	0.535
Divorced/Separated/Widow								
Stratum: Urban	-0.183*	0.032	32.657	0.832	-0.202*	0.032	39.773	0.817
Region: Southern Nigeria	0.484*	0.029	286.537	1.623	0.516*	0.029	326.188	1.676
Gender: Male	0.575*	0.032	319.602	1.777	1.661*	0.041	1619.924	5.263
Household size (Actual)								
HH size1: 1-3	0.402*	0.043	86.318	1.494	0.464*	0.043	117.783	1.591
HH size2: 4-6	0.285*	0.030	92.707	1.330	0.255*	0.030	74.067	1.291
HH size3: 7+	r				R			
Status in HH: Head	1.628*	0.049	1098.926	5.092				
Non-head: husband					0.169**	0.095	3.151	1.185
Son					-1.421*	0.052	739.432	0.241
Daughter					-1.506*	0.080	336.595	0.222
Wife & Others	r				R			
-2 Log Likelihood			34580.938				34934.433	
Chi-Square: Value			14005.331				13651.836	
d.f.			14				16	
Sig.			0.000				0.000	
Pseudo R-Squared:								
Cox & Snell			0.325				0.319	
Nagelkerke			0.437				0.428	

Dependent Variable: Labor Force Participation Rate r = Referenced categories.

*Means: Significant at 1% critical level

** Means: Significant at 5% critical level

Table 6: Logistic Regression of Traditional and Household Variables on Lfp-3

	REGRESSION 7				REGRESSION 8			
	B-Estimate	Std. Error	Wald	Exp(B)	B-Estimate	Std. Error	Wald	Exp(B)
Constant	-1.739*	0.089	381.216	0.176	-2.506*	0.100	625.64	0.082
Age (Actual)								
Age Squared								
Age1: 15-24	1.067*	0.077	191.293	2.906	1.213*	0.078	240.429	3.364
Age2:25-54	2.410*	0.072	1131.741	11.136	2.528*	0.073	1212.98	12.531
Age3: 55-64	2.848*	0.097	856.111	17.248	2.918*	0.099	877.204	18.531
Age4: 65+	r				r			
Educ (year)								
Educ1: None	1.041*	0.049	444.035	2.831	1.121*	0.050	508.944	3.067
Educ2: Primary	-0.579*	0.050	136.459	0.560	-0.580*	0.050	137.027	0.567
Educ3: Secondary	-0.596*	0.045	171.744	0.551	-0.599*	0.045	174.384	0.549
Educ4: Tertiary	r				r			
Marital status: Never married	-1.784*	0.077	533.311	0.168	-1.297*	0.082	249.673	0.273
Married	-0.565*	0.071	63.884	0.568	-0.012	0.078	0.025	0.875
Divorced/Separated/Widow	r				r			
Stratum: Urban	-0.224*	0.035	42.002	0.799	-0.198*	0.035	32.706	0.821
Region: Southern Nigeria	0.496*	0.030	264.810	1.642	0.545*	0.031	316.981	1.725
Gender: Male	0.489*	0.034	208.218	1.631	0.539*	0.034	249.886	1.715
Household size (Actual)								
HH size1: 1-3	0.464*	0.043	117.103	1.591	0.408*	0.043	89.027	1.504
HH size2: 4-6	0.288*	0.030	95.333	1.334	0.281*	0.030	89.850	1.325
HH size3: 7+	r				r			
HH Status: Head					1.851*	0.112	272.332	6.366
HH Status: Head*Male	1.477*	0.070	448.73	4.379	0.233**	0.105	4.899	1.262
Head*Urban	0.314*	0.092	11.743	1.368	0.123	0.092	1.800	1.131
Head*South	0.119	0.073	2.685	1.127	-0.468*	0.082	32.488	0.626
Head*Literate	0.084	0.074	1.296	1.368	-0.320*	0.082	15.282	0.726
-2 Log Likelihood	34817.368				34518.847			
Chi-Square: Value	13768.901				14067.423			
d.f.	17				18			
Sig.	0.000				0.000			
Pseudo R-Squared:								
Cox & Snell	0.321				0.326			
Negalkerke	0.431				0.438			

Dependent Variable: Labor Force Participation Rate r = Referenced categories.

* =: Significant at 1% critical level

** =: Significant at 5% critical level