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Factors Influencing Smallholder Farmers' Participation in Cooperative Organization in Rural Nigeria

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Abstract
This study investigates the factors that influences smallholder rice farmers' participation in cooperative organisations. it seek to provide answers to the reason why some rice farmers join cooperatives while others are reluctant to join or drop out, in spite of the benefits associate with being a member. The 341 farming households was selected through multistage random sampling procedure. The data was collected and analysed using well-structured questionnaire and probit model, respectively. The results reveal among many others that cooperative members have higher income per hectare than the non-cooperative members. Younger and male farmers are more likely to participate in cooperative organization. Farmers with small farm size have the highest probability of participation than those with large farm size. Contact with extension agents and education positively influence the probability of participation. In order to improve participation in cooperative organization, this study therefore, recommends that female headed households should be the focus of attention of any program aim to increase cooperative membership in rural Nigeria. Contact with extension agents and years of education of the household head should be improved. Programs, strategies and policies that are targeted at the achievement of increase agricultural productivity should be intensified.
Keyword: Rice, farmer, cooperative, Nigeria
JEL Classification: D02, J54, O12, P13

1.0.   Introduction
Nigeria's economy can be described as purely agrarian, in view of the fact that 75% of the population depend on agriculture for survival. Hence, boosting agricultural production is not only important as source of food, and employment, it is also very relevant in the fight against the high prevalence of poverty in rural Nigeria with about 60.9% of the population living below the poverty line. Consequently, all efforts are therefore geared toward achieving agricultural growth and development. Institutional innovations are believed to play a crucial role in this as they can help farmers to overcome market failures (Hazell *et al.,* 2010; World Bank, 2008). Therefore, there is a renewed interest in producer organizations such as cooperatives as an institutional tool to improve market participation of smallholder farmers, increase farm incomes and reduce rural poverty (Bernard and Spielman, 2009; Bernard and Taffesse, 2012; Fisher and Qaim, 2012a, 2012b; Markelova *et al.,* 2009; Shiferaw *et al.,* 2009).

According to Francesconi and Ruben, (2007), the original reasons for the establishment of cooperatives are related to local self-help initiatives for addressing common rural challenges, such as poverty and food security. Cooperatives are often associated with collective action and social capital, and are therefore often thought to be more inclusive than other types of institutional innovations such as contract-farming (Verhofstadt and Maertens, 2014). Cooperatives in developing countries are institutional arrangements, involved in the organization of often small farmers with the advantages of reducing transaction costs of accessing input and output markets (Bijman, 2007), as well as improving the negotiating power of smaller farmers vis-à-vis large transaction partners (Kherallah and Kirsten, 2001). Co-operative organization is defined as an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise (ICA, 2007).

According to Hermida (2008), cooperatives have contributed greatly to the development of modern national and systematized agricultural production-base, helped enhance self-sufficiency of major staple foods, and strengthened farmers' household economy by facilitating market access and competitiveness, adapting their operations to agricultural technological innovations and encouraging democratic decision-making processes, leadership development and education. Cooperative organizations has been viewed as a necessary condition for coordinating rural farmers and also passing cogent information of relevance to agricultural productivity growth to the rural farmers. It is relatively easier, efficient and cost effective to deal with a group of farmers than dealing with individual farmers. In addition it is easy to provide organized farmers with modern farm technologies (Tadesse, 2002) and training on the best-bet production practices.

Farmer in cooperative organization are better organized and organized farmers have common interest rather than individual interest so that they can undertake the giant project through pooling resources and efforts (Fitsum , 2003a, b). Cooperative can also help to gain collective bargaining power and vertical integration (Fulton, 2000), reduce transaction costs in the production process (Smith, 1979), mitigate risks and uncertainties for smallholders (Zeuli, 2002) and ensure food security (Veerakumaran, 2003). The support can enable them to

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be competitive and powerful economically and managerially, and actively participate in the development process of the region (Zheng et al., 2011). There is evidence of the marketing performance of collective action (Kaganzi *et al.,* 2009; Okello and Swinton, 2007). Farmer cooperatives have been promoted as an efficient mechanism for increasing market access and reducing poverty (Birchall, 2003; Poulton *et al.*, 2006). Clearly, cooperative institutions, if well-developed have the potential to address many of the development challenges experienced by many rural dwellers in many parts of the world. According to United Nations (2009) cooperatives ―play a meaningful role in uplifting the socio-economic conditions of their members and local communities.

Seven notable principles are reported in the literature (Majawamariya, 2013) to guide the activities and operations of the cooperative organizations. These are: *voluntary and open membership* to all persons able to use their services and willing to accept the responsibilities of membership without any discrimination; *democratic administration* implying accountability and equal voting rights; members' *equitable participation to* the capital of their cooperative; *autonomy and independence*; *provision of information, education and training* to members, elected representatives, managers and employees so they can contribute effectively to the development of their cooperatives; *cooperation among cooperatives* in order to strengthen the cooperative movement by working together through local, national, regional and international structures and last but not the least and finally, *concern for community* since cooperatives also work for the sustainable development of their communities through policies accepted by their members (ICA, 2007; Gray and Kraenzle, 1998).

Against this background, the federal government of Nigeria provided the cooperative organisations a legal supportive framework, in 1935. To sustain, promote and create an enabling environment for the cooperative societies to operate, a department of agricultural cooperatives was created within the Federal Ministry of Agriculture, Water Resources and Rural Development in 1979. It was created solely for the actualization of the policy that was aimed at encouraging the formation of cooperative societies (Daniel and Ihechituru, 2002). The Nigerian Cooperative Societies Act of 1993 was also enacted in line with the international best practices (Federal Republic of Nigeria, 1993) to show government's interest in cooperative societies. For many decades, different group of people such as small-scale entrepreneurs, artisans and rural farmers have been encouraged by the national international organizations and Non-Governmental Organizations (NGO) to organize themselves into groups and establish cooperatives societies. The legal support associated with the technical, material and financial incentives has dramatically increased the number of and type of cooperative organizations in Nigeria. Such that about 50, 000 registered cooperative societies exist in Nigeria (Tar, 2008). However, among the many cooperative organizations that are in existence in Nigeria, the most relevant ones are the agricultural producers' organizations. The major responsibility of these producer organizations include input distribution (Nweze, 2002), provision of functional education to members in the areas of production, processing and marketing of agricultural produce (Hermida, 2008), mobilization and distribution of credit to the farmers (Bhuyan,2007)

Observably, in spite of the aforementioned incentives and benefits associated with being a member of any cooperative organization in Nigeria, not all rural smallholder farmers are member. Since the benefits of collective action emerge primarily through the exploitation of economies of scale, low participation rates in joint activities may put a serious threat to the success and viability of farmer groups (Fischer and Qaim, 2011). Thus, this raise a fundamental question of what are the factors that hinder or influence the farmers to join the cooperative organizations. No study in Nigeria has been carried to provide answer to this question. Thus, creating a gap in the literature that this study intends to fill. Therefore, the main objective of this study is to investigate empirically the major factors that influence rural smallholder farmers to join cooperative organisations using a recently collected data (2014) and probit model. We tested the hypothesis stated that the socio-economic characteristics of the farmers are not significant in influencing their participation in any cooperative organizations.

The remainder of the paper is structured as follows. Section 2 provides the analytical framework and estimation techniques. Section 3 contains the empirical model. Section 4 provides a description of the data used for the analysis. Finally, section 5 contains the summary, conclusions and policy recommendations.

2.0.   Analytical Framework and Estimation Techniques

According to rational farmer viewpoint of Schultz, farmers' decision to participate in cooperative organisation is based on the assumption of expected utility maximization. When confronted with a choice between two alternative technologies, farmers compare the expected utility of participation in cooperative organization with non-participation. The farmers' decision to participate is influenced by a set of households' socioeconomic and demographic variables.

Thus, famer J's expected utility of participation and non-participation in the cooperative organization can be expressed as follows:

$$EU_{kj} = \beta_k Z_j + \tau_{kj} \qquad\qquad (1)$$

$$EU_{mj} = \beta_m Z_j + \tau_{mj} \qquad (2)$$

Where EU_{kj} and EU_{mj} denote the expected utility with the non-participation and participation in the cooperative organization, respectively and Z represents a set of farmer J's socioeconomic and demographic variables listed in Table 1 with their expected signs according to the literature. τ is a random disturbance and assumed to be independently and identically distributed with mean zero. Then the difference in expected utility may be written as:

$$EU_{mj} - EU_{kj} = (\beta_{mj}Z_j + \tau_{mj}) - (\beta_{kj}Z_j - \tau_{kj})$$
$$= (\beta_m - \beta_j)Z_j + (\tau_{mj} - \tau_{kj}) = \beta Z_j + \tau_j \qquad (3)$$

If $EU_{mj} - EU_{kj} > 0$, farmer will prefer to participate in the cooperative organization. Thus, the difference of the expected utility between participation and non-participation is the potential factor that influences farmers' decision. The dependent variable is participation in cooperative organizations. Accordingly, participation model is used to identify the major factors that affect rural farmers' decision to join any cooperative organization. The model is expressed as follows:

$$G_i = \beta_0 + \sum_{j=1}^{n} \beta_j Z_j + \tau_j \quad \text{Where,} \quad \tau_j = N(0, \delta^2) \text{ j=1,2…,n} \qquad (4)$$

Since the dependent variable has two option, the study assigned one for those farmers that are members of any cooperative organization and zero for those who did not join any cooperative organization. The OLS model does not guarantee a good result for such study, because it suffers from non-normality and heteroscedasticity (Maria-pia, 2007). Rather, the binary choice analysis (Probit or Logit) is a good tool (Green, 2002). The distribution of the study fulfils it by the central limit theorem and residual normality assumption. Equation (4) is revised as follows:

$$E\left(G_j = \frac{1}{Z_j}\right) = \beta_0 + \sum_{j=1}^{n} \beta_j Z_j = \int_{-\infty}^{z_j} \Phi(Z)dZ = \frac{1}{\sqrt{2\Pi}} \int_{-\infty}^{\infty} e^{-(1/2)Z^2 dX} \qquad (5)$$

Where $\Phi(.)$ is the cumulative distribution function of the standard normal distribution. The coefficient of equation (5) uses to interpret only the direction. For instance, the probability of the household to join cooperative increases with β_j exceeding zero. The coefficient of the probit model does not use for analysis and interpretation purposes

$$\frac{\partial P(G_j = 1/Z_j)}{\partial Z_j} = \frac{\partial(G_j / Z_j \beta_j)}{\partial Z_j} = \frac{\partial\left(\beta_0 + \sum_{j=1}^{n} \beta_j Z_j\right)}{\partial Z_j} \qquad (6)$$

The study uses the marginal probit model to capture the magnitude of the coefficient. Equation (6) is the partial (elasticity) response of the model. It shows by how many units the response variable increases or decreases with a unit change, from the baseline, in one explanatory variable, keeping other independent variable constant.

3.0.   The Empirical Model of Farmers' Participation in Cooperative Organization

For this study, the dependent variable (*PARTFAR*) is participation in any cooperative organization and it is equal to one if the farmer is a member of any cooperative organization and zero otherwise. To identify the independent (explanatory) variables, we draw on the existing literature and we selected the relevant farmers' socio-economic and demographic characteristics. For instance, we include in our analysis the AGE and years of formal education of the household head(*EDUC*) both as proxies for human capital, thus is based on the hypothesis that human capital increases "the ability to perceive, interpret, and respond to new events "(Schultz, 1982). In addition, AGE is expected to be negatively associated with the participation in cooperative organization variable. Therefore, younger farmers will be more likely to participate in cooperative organization than the older farmers. This is due to the fact that the risk aversion of the farmers tends to increase as they grow in age. This implies that young farmers are usually associated with a higher risk-taking behaviour than the elderly as stated by Simtowe *et al*. (2007). We also expect openness to innovations to decrease with old age, we also include the square term of

age (*AGE2*).

The *GENDER* of the household head is hypothesised to be positive which implies that we expect the male headed households to participate more in cooperative organizations than the female counterpart. This is mainly due to the unequal gender norms and relations, women have a lower socio-economic status, compared to their male counterparts, which limits their opportunities to access and participate in formal groups (Woldu, Tadesse and Waller, 2013). Women restricted access to, control over, and ownership of land, credit, and information, as compared to men, disadvantage them from meeting conditions of formal group membership and leadership (FAO 2011; World Bank 2009). Furthermore, Women may have different opportunities, motivation, and capabilities than men to engage in collective action (Pandolfelli, Meinzen-Dick, and Dohrn, 2007). In addition, in view of the women reproductive responsibilities in addition to farming, women may also have higher opportunity costs of time, which may reduce their incentives for group membership (Meinzen-Dick and Zwarteveen, 1998). Household size (*HHSIZE*) is used to measure labour availability.

The other dependent variables also hypothesised to have positive relationship with participation in cooperative organization include the total land available for farming (*FARLA*), contact with extension agents (*EXTCON*), total farm income (*FARINC*), total farm output (*OUTPUT*), distance to the nearest output market (*DISTMAK*), access to credit (*CREDIT*), savings (*SAV*), and agricultural expenditure per hectare (*EXP/HA*). The estimated probit model is explicitly presented below:

$$G_j = \beta_0 + \beta_j AGE_j + \beta_j AGE2_j + \beta_j GENDER_j + \beta_j FARLA_j + \beta_j OUTPUT_j +$$

$$\beta_j DISTMAK_j + \beta_j CREDIT_j + \beta_j SAV_j + \beta_j EXPHA_j^{-1} + \beta_j EDUC_j + \beta_j EXTCO_j +$$

$$\beta_j HHSIZE_j + \beta_j FARINC_j$$

4.0. Data and Descriptive Statistics

This study utilised a primary data collected in 2014 through multistage random sampling technique. In the first stage, six prominent rice producing States were purposively selected, thus Niger, Osun, Ekiti, Ebonyi, Benue and Ogun were selected. Two major rice producing Local Government Areas (LGAs) were also selected from the six selected States. The next stage was the selection of two villages from each of the LGAs selected. In the final stage, farmers were selected proportional to the size of the farmers in each of the village. Overall, this selection design generated about 350 farmers. However, after data management, only 341 respondents were used for the analysis due to inconsistencies and faulty data records.

The result of the descriptive statistics as presented in Table 1 shows about 59% of the total sampled farmers are male. However, 251 (76.61%) of the sampled farmers are members of any cooperative organization, while 90 (26.39%) of the farmers are non-members. Among those that belong to any cooperative organization, 154 (61.35%) of them are males, while only 97 (38.65%) are female. This implies that a predominant number of the cooperative organisations are males. This is also similar to the findings from the study conducted in Ethiopia by Woldu et al. (2013) where it was discovered that only 20% of cooperative membership are women and even fewer are found in management positions. Men dominate in agricultural cooperative membership and management (Mogues *et al*. 2009).

The average age of the respondents is 43years. The average years of education is 5 years. This the farmers are not illiterates and thus capable of making appropriate decisions towards cooperative organization membership. The average farmland was 2.91ha, with an average output of 2356kg**.** The average distance to the nearest market was 14km. This long distance coupled with the high transportation cost and the poor rural access roads are disincentives to agricultural marketing in rural Nigeria and tends to discourage large scale production and commercialised agriculture. However, it is believed that with the help of the cooperative organizations, farmers will not only be able to produce more, they are more likely to have good and profitable markets for their outputs thus, increasing households' income and ultimately serve as route out of poverty.

Table 1: Variable definitions and descriptive statistics

Variables	Type	Definition of variable	Mean	Standard deviation
Dependent *PARTFAR*	Dummy	1 if farmer participate in any cooperative organization, 0 otherwise	0.74	0.44
Socio-economic and Demographic				
AGE	Continuous	Age of household head (Year)	43.00	12.13
AGE2	Continuous	Square of the age of household head	2014.36	1099.39
EDUC	Continuous	Years of formal education	5.59	4.93
GENDER	Dummy	1 if the household head is male, 0 otherwise	0.59	0.49
HHSIZE	Continuous	Household size (Number)	8.32	4.70
FARLA	Continuous	Total land available for farming(ha)	2.91	1.59
CREDIT	Dummy	1 if farmer has access to credit, 0 otherwise	0.29	0.45
FARINC	Continuous	Total farm income (₦)	229553.40	172293.70
OUTPUT	Continuous	Total farm output(Kg)	2356.04	1621.13
SAV	Dummy	1 if farmer saved, 0 otherwise	0.28	0.45
EXTCON	Dummy	1 if farmer has contact with extension agents, 0 otherwise	0.85	0.35
DISTMAK	Continuous	Distance to the nearest market(km)	14.28	10.78
EXP/HA	Continuous	Agricultural expenditure per hectare (₦)	45640.25	79956.85
TOTEXP	Continuous	Total Agricultural Expenditure	94465.10	79964.33
AMTSAV	Continuous	Total amount saved	36341.09	46280.65
CREAMT	Continuous	Total amount of credit obtained	48186.92	41682.34

Source: Field survey, 2014

4.1. Socio-Economic Characteristics of cooperative member and non-member households

The test of mean difference in some selected socio-economic characteristics between the cooperative members and non-members is presented in Table 2. Most importantly, the result shows that members and non-members of cooperative organizations differ in farm size, output and income. This is in tandem with the study conducted by Ibezim, Okoroigwe and Ijioma (2010) which also indicated that there was significant difference in the output, income and farm size of cooperative and non-cooperative farmers in Abia State, Nigeria.

The non-members of cooperative organizations have statistically significant higher farm size that the cooperative members. This shows that cooperative organization in rural Nigeria is essentially a group of smallholder farmers who team up together in order to overcome the challenges of smallness. The non-cooperative members have statistically significant higher amount of credit obtained and money saved compared with the cooperative members. This revealed that non-members are basically wealthy and might not see any good reason to join any of the cooperative organization, which has basically input supply and credit provision to the members as the main aim of formation. Most smallholder farmers therefore join cooperative in order to benefit from these services.

The cooperative members have statistically significant higher expenditure per hectare than the non-members. This shows that the cooperative members spend more on agricultural production this could be in terms of more fertilizer application, use of good quality seed e.t.c, and this translates into the observed higher yield of about 236.36kg/ha than the non-cooperative members and also reflected in their significant higher income per hectare of about ₦84589.52 than the non-cooperative members. This is similar to the findings of Bamire, Adejobi, Akinola, and Olagbaju (2007) which reported that a 10 percent increase in cooperative membership increased maize farmers' net earnings by 10.4 percent in Oyo State, Nigeria. Thus, being a member of any cooperative organization obviously has a positive effect on the farmers' quantity of input use, yield and income per hectare.

Table 2: Selected Socio-Economic Characteristics of Cooperative Member and Non- member Households

Characteristics	Total sample (N=341)	Non-member (N=90)	Member (N=251)	Mean difference	t-test
GENDER Male Female	202(59.24%) 139(40.76%)	48(53.33%) 42(46.67%)	154(62.35%) 97 (38.65%)	106.00 55.00	1.32
AGE	43.21(0.66)	42.73(1.09)	43.39(0.80)	0.66(1.49)	0.44
EDUC	5.89(0.27)	5.9(0.57)	5.5(0.29)	0.44(0.61)	0.73
HHSIZE	8.32(0.25)	8.5(0.52)	8.2(0.29)	0.26(0.57)	0.44
FARLA	2.91(0.09)	3.20(0.18)	2.79(0.09)	0.40(0.19)**	2.07
FARINC	229553.40 (9330.33)	228111.10 (18524.88)	230070.50 (10818.23)	1959.41 (21199.36)	0.09
OUTPUT	2356.04 (87.79)	2397.11 (180.24)	2341.32 (100.45)	55.79 (199.45)	0.28
DISTMAK	14.28(0.58)	13.96(1.23)	14.39(0.66)	0.44(1.32)	0.33
EXP/HA	45,640.25 (5772.74)	28,743.69 (2438.54)	51,698.77 (5772.74)	22,955.08** (9758.85)	2.35
TOTEXP	94,465.10 (4330.31)	91,979.44 (9317.81)	95,356.37 (4853.00)	3376.73 (9837.38)	0.34
AMTSAV	36,341.09 (4074.78)	55,100 (9290.53)	27,910.11 (3899.78)	27,189.89*** (8509.04)	3.19
CREAMT	48,186.92 (4029.58)	60,576.92 (11067.37)	44,209.88 (3914.15)	16367.05* (9303.91)	1.76
YIELD	1055.92 (68.62)	881.94 (100.59)	1118.29 (85.73)	236.36 (155.39)	1.52
INCOME/HA	151,598.30 (21353.13)	89,334.46 (8927.76)	173,924.00 (28717.92)	84589.52* (48299.38)	1.75

Source: Field survey, 2014
Note: Figure in parentheses are the standard errors.

4.2. Variable cost of Production by Participation in Cooperative Status
This section presents the difference in the variable cost of production between the members and non-members of cooperative organization. The significant of the mean difference is tested using the t-test. The result is presented in Table 3 and it reveals that the most important variable cost in rice production are: fertilizer, herbicide, ploughing, planting, weeding, harvesting, threshing, bagging and transportation. In all of these, farmers that are member of any cooperative organization spend higher on weeding and harvesting than the non-members., while the non-members spend higher on fertilizer, herbicide, ploughing, planting, threshing and bagging compared with the members. However, the non-members have statistically significant higher cost on fertilizer, ploughing, planting and bagging compared with the members. This suggests that the cooperative members could be getting some inputs such as fertilizer, herbicides and improved seeds at subsidized rate or benefiting from bulk purchase, which lead to a reduction in cost. In the same vein they could also be getting moral supports from the other members in terms of planting and ploughing, thus constituting a reduction in cost.

Table 3: Variable cost of Production by Participation in Cooperative Status

Activities	Total sample (N=341)	Non-member (N=90)	Member (N=251)	Mean difference	t-test
Fertilizer	32480.00 (3366.60)	45973.68 (10924.28)	27901.76 (2380.67)	18071.90 (7501.06)	2.41**
Herbicide	24566.28 (3475.01)	34084.21 (8634.57)	21867.16 (3700.88)	12217.05 (8319.67)	1.49
Ploughing	36685.71 (8211.42)	86200.00 (35600.00)	28433.33 (6297.26)	57766.67 (20099.97)	2.89***
Planting	28828.95 (3792.21)	47250.00 (17866.99)	25375.00 (2946.15)	21875.00 (10156.33)	2.15**
Weeding	18734.69 (2160.74)	15000.00 (4183.30)	19159.09 (2361.76)	4159.09 (7188.17)	0.58
Harvesting	29218.13 (3014.10)	21458.82 (3298.25)	31311.90 (3689.06)	9853.08 (7330.74)	1.34
Threshing	8897.14 (1019.27)	11200.00 (2738.37)	8214.82 (1042.14)	2985.19 (2418.18)	1.23
Bagging	4714.63 (2311.69)	10057.14 (3706.99)	3614.71 (750.91)	6442.44 (2311.69)	2.79**
Transportation	10884.27 (418.36)	10833.75 (720.15)	10902.64 (507.75)	68.89 (947.62)	0.07

Source: Field survey, 2014. Note: Figure in parentheses are the standard errors.

5.0. Empirical Results and Discussion

The empirical results discussed in this section is based on the bivariate probit model specifications as described in section 3. The STATA statistical software was used for the analysis. For each of the estimated regression, we also report estimates for the parameters and marginal effects. That is, we provided additional information using the marginal effects after probit. The log-likelihood of -177.94, the Pseudo R^2 of 0.088 and the LR (Chi2) of 33.72 (significant at 1% level), implies that the overall model is fitted and the independent variables included in the model are collectively able to explain the farmers' decision regarding the participation in cooperative organization in Nigeria. The low R^2 is attributed to the dummy dependent variable. Gujarati (2004) argues that R^2 in the dichotomous response model is much lower compared to the linear model because of dummy or binary dependent variable.

The negative and statistically significant at 5% of the coefficient of *AGE* suggests that younger farmers are more likely to participate in cooperative organizations than the older farmers. This is due to the fact that younger one are believed to be more risk neutral and ready to embrace change than the older farmers. The result of the marginal effect shows that a one year increase in age of the farmer will significantly reduce the probability of participation in cooperative organization by 2.8%. However, Fischer and Qaim (2012a) find that age exibits a positive effect on participation in cooperative in among Banana farmers in Kenya.

However, the coefficient of *AGE2* is positive and statistically significant at 5%. This explains the life cycle hypothesis of age in relation to farmers' participation in cooperative organizations and it is a reflection of the non-linearity of the relationship between age and participation in cooperative organization. Essentially, it suggests that the farmers' age will reduce to a certain level and thereafter participation will start to increase.

The coefficient of *GENDER* is positive and statistically significant. This suggests that the men are more likely to participate in cooperative organizations that the women. One of the vital explanations to this is the fact that women face, more often than not, major obstacles to joining and being active members of typically male-dominated cooperatives. Due to unequal gender norms and relations, women have a lower socio-economic status, compared to their male counterparts, which limits their opportunities to access and participate in formal groups Woldu *et al.* (2013).

The coefficient of *EDUC* is negative and statistically significant at 5%. This implies that as the farmers' increases in years of formal education the probability of participating in cooperative organization will decrease. The result of marginal effect also provide an additional information and it shows that an additional year of education, significantly reduces the probability of participation in cooperative organization by 1.2%. This is however, contrary to expectation. Since it is expected that education should be positively related to the probability of participation in cooperative organization as an educated farmers is knowledgeable and better adapted to new innovations.

The coefficient of *FARLA* is also negative and statistically significant at 5%. This reveals that farmers with small farm size are more likely to participate in cooperative organizations than their counterparts with large

farm size and an additional increase in farm size will significantly reduce the probability of participation by 4.6%. This is however an indication that cooperative organization is essentially a union of smallholder farmers and large farm size is not an essential a condition or requirement for participation in any cooperative organization in the study area and particularly among the rice farmers. This result is however contrary to the findings of Fischer and Qaim (2012a) in their study of the determinants participation in cooperative organization in Kenya. The study discovered that the size of the land holding has a positive and significant effect on the probability of membership; each additional acre of land owned increases the probability by almost 4.3 percentage points.

The coefficient of *OUTPUT* is positive and statistically significant in influencing farmers' participation in cooperative organization. This suggests that as farmers get higher output, the probability of participation in cooperative organization increases. This could be due to the fact that being a member of some cooperative organizations create more access to output market. Some cooperative organizations practice collective commercialization, while some carry out collective transportation of bulky or large quantity output from remote rural areas to the output markets, in order to generate a reduction in the total cost of transportation.

The negative and statistically significant coefficient of *SAV* implies that farmers that saved more are less likely to participate in cooperative organization. This suggests that the farmers that saved more might always have enough cash both during production and off-season farming period and hence, might not need to ask for credit; which seems to be one of the vital roles of most rural cooperative organizations and many farmers could have joined the organization simply because of the need to have access to credit. This is buttressed by the positive although, insignificant coefficient of access to credit.

The negative and statistically significant of the coefficient of *EXTCON* reveals that the farmers that have no contact with extension agents are more likely to participate in cooperative organizations than those that have adequate contact. This shows that participation in cooperative organization is another way of coping with the shortcoming of extension contact in Nigeria. Information not readily available to farmers due to the lack of contact with the extension agents could be made available by the cooperative organization.

EXP/HA is positive and statistically significant at 10% in influencing the farmers participation in cooperative organizations. This reveals that as the cost of agricultural production per hectare increases, the probability of participating in any cooperative organization also increases. The high cost of assessing inputs represents one of the disincentives to agricultural production in Nigeria. Important inputs such as improved seed, fertilizer and agro-chemicals although subsidised by the Government in order to guarantee the supply in adequate quantity and at the right time to the farmers are still the much sorted out for and quite very expensive at the time of planting. Therefore, most cooperative organizations are responsible for the supply of these inputs to their members at reduced costs and hence, encourages farmers' participation in these cooperative organizations.

Table: Original Parameter and Marginal Effect Estimates of the Binary Probit Model

Variables	Original Parameter Estimates		Marginal Effects Estimates	
	Coefficient	z-value	Coefficient	z-value
AGE	-0.089** (0.043)	-2.08	-0.028** (0.013)	-2.09
AGE2	0.001** (0.000)	2.16	0.000** (0.000)	2.18
EDUC	-0.038** (0.017)	-2.21	-0.012** (0.005)	-2.21
GENDER	0.364 **(0.174)	2.09	0.116 ** (0.056)	2.06
HHSIZE	-0.005 (0.017)	-0.31	-0.002 (0.005)	-0.31
FARLA	-0.148 **(0.058)	-2.55	-0.046** (0.018)	-2.54
CREDIT	0.028 (0.190)	0.15	0.009 (0.059)	0.15
FARINC	-0.129 (0.165)	-0.79	-0.041 (0.051)	-0.79
OUTPUT	0.000** (0.000)	2.30	0.000** (0.000)	2.31
SAV	-0.373 **(0.179)	-2.09	-0.123** (0.061)	-2.01
EXTCON	-0.448 (0.229)	-1.95	-0.123** (0.054)	-2.26
DISTMAK	0.001 (0.007)	0.20	0.000 (0.002)	0.20
EXP/PHA	0.181* (0.109)	1.66	0.057* (0.034)	1.67
CONSTANT	2.678 (1.822)	1.47	-	-
Log likelihood	-177.94			
Number of observation	339.00			
LR chi2(13)	33.72***			
Pseudo R^2	0.088			

Note: **, and * implies significant at 5% and 10%, respectively. Figure in parentheses are the standard errors.

Source: Field survey, 2014

5.0.   Summary, Conclusion and Policy Recommendations

The roles and relevance of cooperative organization in shaping the growth and development of agricultural production has been the focus of many development oriented bodies for many decades. However, not too many information is available to explain why up till now many farmers are still not members of any cooperative organization. This study adopted the binary probit model to assess the major factors that influence smallholders rice farmers' participation in cooperative organization in rural Nigeria. The results show that the cooperative organizations are dominated by males. The non-members of cooperative organizations have significantly higher farm size, amount of credit obtained and money saved than the members.

In terms of variable costs of production, the results show that the cooperative members have statistically significant higher expenditure and income per hectare than the non-members. Members of cooperative organizations spend higher on weeding and harvesting than the non-members, while the non-members spend higher on fertilizer, herbicide, ploughing, planting, threshing and bagging compared with the members. The result of the probit model shows that younger farmers are more likely to participate in cooperative organizations than the older farmers. In addition, the male farmers are more likely to participate in cooperative organizations that the female. In the same vein, as the farmers' increase in years of formal education the probability of participating in cooperative organization will decrease. Farmers with small farm size are more likely to participate in cooperative organizations than their counterparts with large farm size and an additional increase in farm size will significantly reduce the probability of participation by 4.6%. As the farm output increases, the probability of participation in cooperative organization also increases. Savings and contact with extension agents have a negative effect on the probability of participation. Finally, the expenditure per hectare is also one of the factors that exert positive effect on the probability of participation.

The study reveals that, cooperative organization is essentially a union of smallholder farmers with small farm size, and it is basically organized to overcome the challenges associated with smallness. In order to improve participation this study therefore, recommends that female headed households should be the focus of attention of any program aim to increase cooperative membership in rural Nigeria. Contact with extension agents and years of education of the household head should be improved. Programs, strategies and policies that are targeted at the achievement of increase agricultural productivity should be intensified.

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