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Divergent Cooperative Memberships. Exploring the Determinants. A Case Study of Poultry Farming Households in Southwest Nigeria

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Abstract

This study examines the determinants of differential cooperative membership among poultry farming households in Oyo State. A multistage sampling technique was employed to randomly select 210 poultry farmers; 101 Cooperators and 109 Non-cooperators, using well-structured questionnaires. Descriptive statistics, T-test, Variance inflation factor, and stepwise multivariate regression are employed in data analysis. The study reveals that an ample proportion of the farmers are still within their productive age. Also, Farmers age, credit access, output level, and household non-food expenditure positively determines cooperative membership but negatively determined by paid labour, and marriage. Regarding differential cooperative memberships; formal education, age, and farm expenditure positively influences multipurpose cooperative membership but negatively influenced by gender and output level. Primary occupation, food expenditure, and paid labour, positively determined producer cooperative

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membership but negatively determined by farm expenditure, formal education, age, and household size while, primary occupation, and non-food expenditure positively determines marketing cooperative membership but negatively determined by paid labour, and farm expenditure. Farmers age, primary occupation, Non-food, and farming expenditure negatively determines consumer cooperative membership but positively determined by household size. Finding based policy options are inferred.

Keywords: Cooperatives, Differential Membership, Determinants, Southwest Nigeria, Poultry farming, Stepwise Regression.

1.0 Introduction

1.1 Background to the study

There are about 7.6 billion people in the world wherein about 900 million are economically disadvantaged, and about half of them wholly or partly depend on livestock for their livelihoods (UN, 2017; World Bank, 2016; Robinson, 2011). The necessity of securing the food supply in terms of quality and quantity for the increasing population, as well as the need for animal proteins, health problems due to nutrition, and consumers' awareness and tendency to maintain a healthy and balanced diet, have all made the Poultry sector a significant industry throughout the world (Yilmaz *et al*,. 2013). Livestock production, under which poultry production falls constitutes an important component of the agricultural economy in developing countries and it is an instrument of socioeconomic change, improved income and improved quality of rural life in Nigeria (Okumadewa, 1999), where about 70% of the 160 million population are poor and over 80% are rural dwellers, directly or indirectly subsisting on agriculture (NBS, 2012; NBS, 2014).

Regarding production performance, it is estimated that the developing world produced 50% of the world's beef, 41% of the milk, 59% of the pork and 53% of the poultry

(Steinfield *et al*., 2006; Herrero *et al*., 2009 and Rosegrant *et al*., 2009), while the Nigeria livestock resources was estimated to consist of 16.3 million Cattle; 40.8 million Goat; 27 million Sheep; 3.7 million Pigs and 151 million poultry Nasiru *et. al*, (2012). However, the contributions of the livestock sub sector to gross domestic product (GDP) over the years have decreased from 5.61% in 1960 to about 2.64% in 2010 and 1.77% in 2015 (NBS; 2015, 2016), indicating a falling trend.

In spite of the importation ban on poultry products in order to foster home based production, the performance of the poultry sub-sector in the Nigerian Agricultural industry has not been optimal owing to reasons ranging from lack of sufficient support, manifesting in form of policy misspecification, policy inadequacy, delay in policy implementation etc., while the formal credit institutions are usually not readily accessible by small holder farmer due to high interest rates. The relatively accessible non-formal credit institutions are usually limited in the volume of capital disbursed to farmers, all resulting to undercapitalization, low productivity, and reduction in farmers' income.

Farmers at various levels are usually encouraged by the government to form and or join cooperatives where they can pool resources together, so as to increase their productivity, production efficiency, bargaining power and earn higher income from output sales. However, their decision to join, and or form cooperatives is usually based on individual's or collective interest, needs and aspirations, which may vary from one farmer to another. Cooperatives has been defined as "an autonomous association of persons united voluntarily to meet their common; economic, social, and cultural needs and aspirations via a jointly-owned and democratically-controlled enterprise" (ILO; ICA, 2015).

The way cooperatives help reduce poverty is important. They identify economic opportunities for their members; empower the disadvantaged to protect their interests; providing security to the poor by allowing them to convert individual risks into collective risks; and mediate members access to assets that they utilize to earn a living (ILO, ICA 2015). A cooperative is an inclusive business model, suited to meeting the needs of her

members via farm input supply, farm mechanization, low interest funding, extension services, members' education, marketing services, amongst other agricultural and socio economic services to its members (Flannery, 1994; Liu & Sumelius, 2010).

It is important to remark that, capital is an important resource in Agricultural production which to a large extent determines production; capacity, scale, output and overall efficiency of the production unit which invariably determines farmers wellbeing hence, People cooperate because they cannot meet their needs aloof. With Poultry production been a capital intensive sub sector in the livestock sector, the need for farmers to meet this relatively huge capital based production demand is a key rationale for forming, and or belonging to Agricultural cooperative societies in addition to some other economic and social purposes i.e., farmers join various kind of cooperatives based on their individual interest, needs and aspirations which this study sets to investigate.

Cooperative societies in Nigeria

In Nigeria, before the era of modern cooperatives, there existed cooperative societies that were indigenous to the local people. These includes the labour clubs, the contribution clubs, and the indigenous and traditional farmers' societies which functioned at nearly all villages and community levels (Obasse, 2012; Crowder, 1973). The modern cooperative movement in Nigeria started when C. F. Strickland was appointed in 1933 to look into the possibility of introducing cooperative societies into the country. Strickland's report came out in 1934, and reported that cooperatives be established in Nigeria.

Cooperative societies are of various types, depending on their objectives and functionalities. Some of these important types of cooperatives are; Producer's cooperatives, which is usually established by small scale producers who pool their resources together in order to operate a larger production scale. The members of the society may produce goods in different locations or localized. The output is collected by the society and sold. Profits from investment is proportionately distributed among the member. On the other hand, Consumer cooperatives, they are established to purchase at

favorable price by reducing middlemen exploitative tendencies. These societies purchase foods at the wholesale prices and sell these goods to the members at cheaper rates than the market prices. The profit, if any, is distributed among the members proportionately. For marketing cooperatives, they are formed for promotion of trade. The two main objectives of these societies are to operate a larger share of their product market and to establish a favorable market price. These types of societies are formed by the small-medium scale agriculturalists and artisans. They collect the products of their members, grade and store for a profitable and organized sales. Another type is the insurance cooperatives which make contract with insurance companies for the purchase of different insurance policies for its member at lower premium. This society may take a group insurance policy for its members. The main object of the society is to minimize the risk of its member.

There are also in existence the Multipurpose Cooperative Societies. These are organized by people who pool their resources together in order to combine different activities hence offering multiple services such as marketing of members product, Provision of inputs e.g., credit and loans, advising, training, insuring, Bulk purchases etc. Multi-Purpose cooperatives allows the society to render any type of service that is profitable in the interest of the society and its members.

Numerous predicaments beyond farmers individual-direct control characterizes the poultry sector in Nigeria while Cooperatives seeks to provides a safety net to farmer members however, a significant proportion of players are Noncooperators hence, this study sets to determine the determinants of cooperative membership as influenced by economic, production, and socioeconomic-demographic features of the poultry farming households and how these variables determine differential cooperative membership among the Cooperator poultry farmers.

Also, the bulk of existing literatures on determinants of cooperative membership focuses mainly on determinants of membership or non membership without going further to

investigates the determinants of differential cooperative membership either among crop or livestock farming households wherein this study focuses on Poultry (Livestock) farmers in the study area.

2.0 Theoretical framework

When we say a choice is "rational" it implies that an agent's, firm's or an individual's (farmer's) choice reflects the most preferred available alternative (s). A "rational" choice is that which is based on logical reasoning. Reasoning can be defined as the domain or process of drawing logical inferences resulting to a logical conclusion/outcome that maximises utility as opposed to an irrational choice which on the other hand does not maximise utility. The basic idea behind rational choice theory is that people choose, or make their best decision under prevailing conditions and this invariably results to a rational or irrational outcome (Steven, L. G, 2002).

Individuals are generally assumed to make choices with the aim of maximizing utility e.g. a consumer selecting a bundle which maximises her utility from the available similar or dissimilar goods, a farmer choosing to plant a particular crop (out of other available plantable crops) that maximises her utility at a given season. The rational choice theory of consumer (farmer) behaviour is based on the following axioms, which also explain consumer preferences: (1) Availability of a set of alternative choices (2) For any pair or set of alternatives say; A and B, the consumer will either prefer any of A or B, or is indifferent. (3) Consumers' preference is *transitive*. That is, if a consumer prefers A to B and B to C, then she necessarily prefers A to C. If she is indifferent between A and B, and indifferent between B and C, then she is necessarily indifferent between A and C. (4) A consumer will choose the alternative She prefers the most.

The basic rational choice model assumes all outcomes are known with certainty with an extension model which provides for uncertainty by assuming that the farmer maximizes utility. Uncertainty is expressed with a probability distribution that attributes a likelihood

to each possible outcome. Suppose there are two (dichotomous) possible outcomes when considering the state of any poultry farmer say; Cooperator or Noncooperator. Let P(A) denote the probability of cooperative membership while P(*B*) denote otherwise (i.e. Noncooperator).

If a i^{th} poultry farmer under a given set of conditions decides to join a cooperative due to some economic conditions/variables e.g, Farm size, Age etc., denoted as A or did not join any cooperative, denoted as B, the farmer reveals her preference hence, her utility (U) function for cooperative membership if she decides to join a cooperative can be expressed as U_i = f(AnB') and U_i = f(A'nB) if otherwise i.e. Not a Cooperator, where "*f*" is a function that assigns a given value (utility) to the chosen option. With these as the only possible outcomes, it is clear that P(A) + P(B) = 1, implying a 100% nonadditive occurrence chance for *A* or *B* and are mutually exclusive. A multiple regression model which considers a set of explanatory variables (independent variables) and its relationship with the specified dependent variables (cooperative membership status) is employed in this study.

3.0. Materials and methods

3.1. **Study area**

This study was carried out in Oyo State, South west region of Nigeria. The State has 33 local Government areas with an estimated population of 5.6 million inhabitants (NPC, 2006). The land area is 35,743 km^2 located within latitude 3 and 5°N; between longitude 7°E and 9.3°E. The average temperatures are between 24°C and 25°C. Major food crops found in the state includes yam, cassava, maize, rice, vegetables and cash crops like cocoa, kolanut and citrus while the rural households rear Sheeps, Goats, Chickens and Pigs. Also, there is widespread production of exotic breeds of cockerels, layers and broiler poultry in the study areas. A good number of international and federal agricultural institutions are located in the state owing to the prominent agricultural activities inherent in the state. The State is characterized with widespread poultry production activities and has the highest number of registered poultry farmers in Nigeria (PAN, FDLPCS, 2007).

3.2. **Sources of data**

Primary data sourced vial questionnaire schedules was employed in this study. Information related to socioeconomic characteristics (e.g. household food expenditures, household size, gender etc.) and demographic characteristics (e.g. age, gender, marital status etc.) in addition to farmers production characteristics (e.g. farm size, years of farming experience, primary labour source, etc.) were collected from the poultry farmers in the study area in three months (June- August, 2017) with the aid of volunteered Enumerators.

3.3. **Sampling technique**

A multistage sampling technique was employed for this study. The first stage involved a purposive selection of Oyo state out of the 6 geopolitical zones in southwest Nigeria (Southwest consists of Ondo, Lagos, Ogun, Ekiti, Oyo and Osun States), followed by a random selection of two agricultural zones (Ibadan/Ibarapa and Oyo) from the four Agricultural Zones in the state (Ibadan/Ibarapa, Oyo, Ogbomoso and Saki). The third stage involved a random selection of three local government areas under the Oyo agricultural zone and one local government in Ibadan/Ibarapa Zone (due to the relatively larger poultry production activities being carried out in Oyo agricultural zone relative to Ibadan/Ibarapa). The fourth stage involved a random selection of ten villages under Ido Local government area and three villages per Afijio, Oyo central, and Oyo west local government areas, from which 240 poultry farmers were randomly selected in the final stage. From a total of 250 questionnaires administered, only 210 samples were useful due to non-response and non-return of questionnaires.

3.4. **Analytical techniques**

3.4.1. **Test of significance**

Mean difference test was used to test for the significance of the differences between the parameters of the hypothesized quantitative variables.

3.4.2. **Stepwise regression analysis**

The Ordinary least square (OLS) multiple regression model was employed to analyse the various determinant factors of cooperative membership. The model is preferred to the binary probit or binary logit model because it gives an unbiased likelihood estimates of cooperative membership as the marginal effect (MPC) of a given explanatory variable over the explained variable expressed as the coefficient. OLS regression model considers the relationship between a continuous or discrete explained variable (regressand) and its relationship with the set of some specified explanatory variables (regressor). The model is specified as follow;

$$Y_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + \mu_i \quad \text{.....(1)}$$

Explicit model specification;

$$Y_i = \beta_0 + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 \text{.....} + \beta_n \chi_n + \mu_i \quad \text{.....(2)}$$

Where; $\mu \sim N(0, \sigma^2)$, β = Parameter estimates (β_1 = Intercept, β_2 = Coefficient), Y_i = Binary dependent variable. Assigned a value of "1" if a poultry farmer is a Cooperator and "0" if otherwise. For determinants of differential cooperative membership, the Y_i dependent variable in each stepwise regression assumes a value of "1" if a Cooperator poultry farmer belongs to a i^{th} Cooperative society and "0" if otherwise. Following the multiple regression analysis on determinants of membership of cooperatives (stage 1), a stepwise regression algorithm analysis on the determinants of differential cooperatives was ran for the respective cooperatives vis-à-vis; Multipurpose, Marketing, Producers and Consumer cooperatives.

X_i = Vector of the explanatory variables. i =1, 2, 3,….. 13.

X_1 = Household size, X_2 = Marital status (dummy; Married=1, Nonmarried=0), X_3= Farmers age in years, X_4 = Gender of household head (dummy; Male=1, Female=0), X_5= Level of education (years), X_6= Average non-farm expenditure (₦), X_7= Average monthly food expenditure (₦), X_8= Average monthly non-food expenditure (₦), X_9= Primary occupation

(dummy; Farming=1; Otherwise=0), X_{10}= Access to credit (dummy; Yes= 1; No=0), X_{11}= Primary source of labour (Dummy; Paid labor=1, Family labor=0), X_{12} = Access to extension agent (dummy; Yes= 1; No=0), X_{13} = Output level (Daily Egg crates), μ_i= Error term.

3.4.3. **Multicolinearity**

Multicolinearity is a common problem usually encountered in multiple regression model and it is characterized with correlation of two or more variables in the regression model. It is usually more of a problem of intensity and less of occurrence. In the presence of perfect multicollinearity, regression coefficients of the X_j variables becomes indeterminable hence omitted, as the standard errors becomes infinite (perfect collinearity). In situations of a near perfect multicollinearity, the regression coefficients will have a large standard error, implying a low precision hence, making it difficult or impossible to associate the effect of such regressor(s) on the regressand in policymaking, irrespective of their relative importance.

Multicollinearity is essentially a sample phenomenon, arising from nonexperimental data with no single unique method of detecting it or measuring its strength. There are however, some rules of thumb (Gujarati, 2003). The Coefficient of determination (R^2) usually provide a general overview of multicollinearity of a regression model without indication of causality variable, hence this study employed the variance inflation factor (VIF) analysis.

3.4.3. **Variance inflation factor (VIF)**

In the presence of Multicollinearity, the best linear unbiased estimator of the multiple regression will have large variance and covariance hence, wide confidence intervals, insignificant t-statistics, and outrageous coefficient of determination. The rate at which the variances and the covariances of the estimator increases (collinearity) can be reflected vial the VIF multicollinearity indicator. The VIF can be specified as follows;

$$VIF = \frac{1}{(1-R_j^2)} \quad \text{.....(3)}$$

Where: $1-R_j^2$ = Tolerance.....(4)

j= Set of explanatory variables, R_j^2 = Coefficient of determination of a regression of "j^{th}" explanator on all the other explanators. The larger the VIFj, the more problematic variable Xj is. As a rule of thumb, if 5≤VIF, such variable is said to be highly collinear (Kleinbaum *et al.* 1988, Gujarati, 2003 and Brien, 2007) hence, dropped.

4.0 RESULTS AND DISCUSSIONS

4.1. Socioeconomic characteristics

A summary of the socioeconomic characteristics is presented in Table 1, where the mean age of the Cooperator and Noncooperator poultry farmers was found to be 49 and 44.67 years respectively, indicating that most of them are still within the economic productive age. There exists a significant difference between the mean ages of Cooperator and Noncooperator poultry farmers, significant at 1% level, implying that older farmers are more likely to join cooperatives e.g, in order to gain control and maintain a sustained support system via cooperatives compared to younger farmers who might count it not necessary.

Table 1. Socioeconomic characteristics of the respondents

Variables	**Cooperators**		**Non-Cooperators**		**Pooled**	
Gender	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Male	88	87.05	92	84.40	180	85.71
Female	13	12.87	17	15.60	30	14.29
Total	139	100	10	100	210	100
Marital Status	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Married	75	74.26	84	77.06	159	75.71
Single	26	25.74	25	22.94	51	24.29
Total	101	100.00	109	100.00	210	100

Age	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
<31	3	2.96	25	13.76	18	8.57
31-40	26	25.74	15	22.94	51	24.29
41-50	33	32.67	40	36.70	73	34.76
51-60	24	23.76	20	18.35	44	20.96
>60	15	14.85	9	8.26	24	11.43
Total	101	100.00	109	100.00	210	100
Min.	30		20		22	
Max.	76		80		80	
Mean	49.14		44.67		46.82	
Std.dev	11.67(1.16)		12.19(1.18)		12.13(0.84)	P=0.0036[a]
Household Size	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
1-2	16	15.84	22	20.18	38	18.10
3-4	32	31.68	34	31.19	66	31.43
5-6	33	32.67	40	36.70	73	34.76
7-8	16	15.84	12	11.01	28	13.33
>8	4	3.96	1	0.92	5	2.38
Total	101	100.00	109	100.00	210	100.00
Minimum	1		1		1	
Max	12		14		14	
Mean	4.69		4.28		4.49	0.41
Stddev	2.22(0.22)		7.22(0.21)		2.15(0.33)	P= 0.2216
Education (years)	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
<1	2	1.98	9	8.26	11	5.24
1-6	4	3.96	4	3.67	8	3.81
7-9	15	14.85	14	12.84	29	13.81
10-12	12	11.88	12	11.01	24	11.43
13-16	55	54.46	49	44.95	104	49.52
>16	13	12.87	21	19.27	34	16.19
Total	101	100	109	100	210	100
Minimum	1		0		0	

Max	25		27		27	
Mean	18.27 (0.39)		17.45 (0.57)		17.45(0.36)	
Stddev	3.93		6.12		5.18	P=0.47
Extension Agents' Access	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Yes	30	29.70	20	18.35	50	23.81
No	71	70.30	89	81.65	160	76.19
Total	101	100.00	109	100.00	210	100.00
Electricity	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Yes	23	22.77	15	13.76	38	18.10
No	77	77.23	94	86.24	172	81.90
Total	**101**	**100.00**	**109**	**100.00**	**210**	**100.00**
Farm Insurance	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Yes	7	6.93	5	4.59	12	5.71
No	94	93.07	104	95.41	198	94.29
Total	101	100.00	109	100.00	210	100.00
Primary Occupation	**Freq.**	**Percentage**	**Freq.**	**Percentage**	**Freq.**	**Percentage**
Agriculture	48	47.52	47	43.12	95	45.24
Employee	18	17.82	29	26.61	47	22.38
Trader	8	7.92	13	11.93	31	10.00
Handicraft	16	15.84	7	6.42	23	10.95
Others	11	10.89	13	11.93	24	11.43
Total	101	100.00	109	100.00	210	100
Paid Labor Usage						
Yes	74	73.17	63	66.97	147	70
No	27	26.73	36	33.03	63	30.00
Total	**101**	**100.00**	**109**	**100.00**	**210**	**100**

Source: Field Survey data, 2017. Robust standard errors Parenthesized. [a]Sig at 1%.

4.2. **Determinants of Cooperative membership**

The result of the ordinary least square multiple regression on the determinants of cooperative membership among the poultry farmers in the study area is presented in table 2. The chi-square was found to be significant at 1% level showing that the outcome is well predicted by the regression model. Of the thirteen variables postulated to determine cooperative membership, only six variables was significant.

Marital status negatively determined cooperative membership, and significant at 10% level. This is likely due to the fact that couples combine their resources together to foster farm needs and household expenses hence, reducing dependence on external supports unlike non-married poultry farmers. Also, farmers age positively determined cooperative membership, and significant at 5% level. This might be due to the possibility that as farmer grow older, their dependency level tends to increase hence they join cooperatives in order to gain necessary supports compared to younger farmers, while access to credit was found to increase the likelihood of cooperative membership, significant at 10% level. This might be due to the fact that farmer who have access to credit (e.g. formal credit sources) tend to seek for alternative credit sources (e.g. Cooperatives) which provides credit to farmers at lower cost.

Furthermore, usage of paid labour negatively determined cooperative membership, and significant at 10% level, with sole family labour serving as reference. This implies that employment of paid labour has a likelihood of reducing cooperative membership by about -18%. Furthermore, output level positively influences cooperative membership with a positive, and significant at 5% level. This is likely due to the possibility that as farm output increases farmers are faced with the need to increase their market access and get up to date market information which are more readily available/ accessible in cooperatives. Consequently, household non-food expenditure positively influences cooperative membership, and significant at 1% level. This is likely due to the possibility that as farmer's expenditure rises, the need for; more capital, or augmenting-alternative capital sources arises hence farmer decides to join cooperatives so as to find relief (being part of the reasons why cooperatives are formed).

Table 2. **Results of the likelihood estimate on the determinants of cooperative membership among the Cooperator poultry farming households in the study area.**

Variables	Cooperator/Noncooperator				
	Coeff.	**Std.Err.**	**T-value**	**VIF**	**1/VIF**
Gender	-0.0336	0.1078	-0.31	1.30	0.7706
M. Status	-0.1425	0.0893	-1.59[c]	1.36	0.7375
Education	0.0061	0.0075	0.81	1.41	0.7112
Age	0.0068	0.0032	2.10[b]	1.43	0.7005
HHSize	0.0043	0.0189	0.23	1.53	0.6516
Occupation	-0.0906	0.0748	-1.21	1.30	0.7717
Credit	0.1401	0.0987	1.42[c]	1.30	0.7711
Labour	-0.1769	0.0721	-2.45[c]	1.21	0.8268
Output	0.0006	0.0002	2.35[b]	1.13	0.8840
Extension service	-0.1035	0.0827	-1.25	1.15	0.8729
Nfood exp	9.14e-08	3.72e-08	2.46[a]	1.08	0.9220
Food exp	5.29e-08	8.38e-09	0.63	1.45	0.6904
Farm exp	-3.90e-09	1.31e-09	-0.30	1.12	0.8944
Constant	0.3435	0.2545	1.35[c]		(1.3)
Prob>F=	0.0006				
R^2 =	0.1651				
Adj R^2 =	0.1092				

Source: Field Survey data, 2017. [a]Sig at 1%, [b]Sig at 5%, [c]Sig at 10%. Mean VIF parenthesized

4.2.1 **Determinants of differential cooperative membership**

The least square estimates on the determinants of differential cooperative membership among the four major cooperative societies in the study area (vis-à-vis Multipurpose, Marketing, Consumer and Producer cooperatives) is shown in table 3.

Gender of household head reduces membership of multipurpose cooperatives, and significant at 10% level. This might be due to the possibility that male headed farming households are usually economically well-off compared to female headed farming households. Also, a yearly increase in

formal education of poultry farmer increases her likelihood of multipurpose cooperative membership, while decreasing her likelihood of producer cooperative membership, and significant at 1% level. This is likely due to the fact that literate/educated farmers makes more informed decisions to benefits by joining multipurpose cooperatives as opposed to single purpose producer cooperatives with reduced membership tendencies as formal education level increases. Also, a yearly increase in age of farmer increases the propensity to join multipurpose cooperatives, but decreases that of producer and consumer cooperatives respectively. This is likely due to the same reason with formal education where farmers in this respect are able to garner more experience with time hence, makes more informed decisions. This was found to be significant at 10%, 5%, and 10% levels respectively.

Besides, household size reduces producer cooperatives membership, but increases consumer cooperatives membership wherein a per head increase in household size reduces producer cooperatives membership while increasing the likelihood of consumer cooperatives membership. This is likely due to the fact that larger farming households tend to have a more diversified needs which are relatively more accessible in multipurpose cooperatives, compared to single purpose cooperatives. This was found to be significant at 1%, and 5% levels respectively.

Farming as primary occupation positively determine membership of marketing, and producer cooperatives, but negatively determined membership of consumer cooperatives. This is likely due to the possibility that those primarily engaged in poultry farming are usually concerned with attaining an efficient production, and favourable market access which is the sole concern of these two respective cooperatives. This was found to be significant at 5%, 1% and 5% levels respectively.

Furthermore, paid labour usage positively influences membership of producer cooperatives, but negative determined membership of marketing cooperatives, but reducing that of marketing cooperatives. This was found to be significant at 5% and 1% levels respectively. Also, output level was found to negatively determine membership of multipurpose cooperatives, this is likely due to the possibility that as output increases, farmers join specialized/specific cooperatives in order to stay informed about efficient production practices

and enhanced market access for their increasing output in order to avoid glut. This was found to be significant at 10% level.

Besides, non-food expenditure increases membership of marketing cooperatives, but negatively determined consumer cooperatives membership. Both was significant at 1%, and 10% level. Also, farm expenditure increases multipurpose cooperatives membership, while reducing marketing and producer cooperatives membership. This is likely due to the non-specificity nature of multipurpose cooperatives unlike marketing and producer cooperatives (specific cooperatives) where members are informed about specific poultry farming practices, resulting to reduction in farm expenditure, significant at 10%, 10% and 5% respectively.

Table 3. **Results of the least square estimate on the determinants of differential cooperative membership among the Cooperator poultry farming households in the study area.**

Variables	**Marketing Cooperatives**					**Multipurpose Cooperatives**				
	Coef.	Std.Err.	T-value	VIF	1/VIF	Coef.	Std.Err.	T-value	VIF	1/VIF
Gender	0.1269	0.1619	0.78	1.47	0.6798	-0.6941	0.5029	-1.38[c]	1.47	0.6798
M. Status	-0.0085	0.1329	-0.06	1.69	0.5919	0.0161	0.4129	0.04	1.69	0.5919
Education	-0.0119	0.0146	-0.81	1.63	0.6128	0.1459	0.0454	3.22[a]	1.63	0.6128
Age	0.0056	0.0051	1.10	1.72	0.5820	0.0241	0.0157	1.54[c]	1.72	0.5820
HHSize	-0.0025	0.0292	-0.09	2.09	0.4781	-0.0492	0.0909	-0.54	2.09	0.4781
Occupation	0.1945	0.1118	1.74[b]	1.53	0.6536	-0.1210	0.3474	-0.35	1.53	0.6536
Credit	0.0388	0.1216	0.32	1.34	0.7459	0.1303	0.3778	0.34	1.34	0.7459
Labour	-0.1107	0.1066	-1.04[a]	1.39	0.7192	0.0119	0.3312	0.04	1.39	0.7191
Output	0.0009	0.0002	3.49	1.21	0.8238	-0.0011	0.0008	-1.42[c]	1.21	0.8238
Extension	0.1059	0.1055	1.00	1.16	0.8593	-0.1224	0.3279	-0.37	1.16	0.8593
Nfood exp	1.40e-08	3.97e-08	3.53[a]	1.13	0.8875	-2.25e-08	1.23e-1	-0.18	1.13	0.8875
Food exp	7.40e-09	9.36e-08	0.79	1.42	0.709	1.44e-09	2.91e-09	0.50	1.42	0.7029
Farm exp	-3.78e-08	2.28e-09	-1.66[c]	1.31	0.7635	1.52e-09	7.08e-09	2.15[c]	1.31	0.7635
Constant	-0.4287	0.3579	-1.20			-1.2279	1.1122	-1.10	(1.47)	
Prob>F=	0.0005					**Prob>F=**	0.0334			
R^2 =	0.3264					**R^2 =**	0.2269			
Adj R^2 =	0.2257					**Adj R^2 =**	0.1114			

Source: Field Survey data, 2017. [a]Sig at 1%, [b]Sig at 5%, [c]Sig at 10%. Mean VIF parenthesized.

Table. 3 **cont'd.**

Variables	Producer Cooperatives					Consumer Cooperatives				
	Coeff.	Std.Err.	T-value	VIF	1/VIF	Coeff.	Std.Err.	T-value	VIF	1/VIF
Gender	0.0947	0.0749	1.26	1.47	0.6798	0.2929	0.6050	0.48	1.47	0.6798
M. Status	0.0271	0.0615	0.44	1.69	0.5919	-0.1129	0.4967	-0.23	1.69	0.5919
Education	-0.0327	0.0068	-4.85[a]	1.63	0.6128	-0.0398	0.0546	-0.73	1.63	0.6128
Age	-0.0040	0.0023	-1.72[b]	1.72	0.5820	-0.0272	0.0189	-1.45[c]	1.72	0.5820
HHSize	-0.0349	0.0135	-2.58[a]	2.09	0.4781	0.2105	0.1093	1.93[b]	2.09	0.4781
Occupation	0.1687	0.0517	3.26[a]	1.53	0.6536	-0.9023	0.4178	-2.16[b]	1.53	0.6536
Credit	-0.0215	0.0563	-0.38	1.34	0.7459	-0.1654	0.4545	-0.36	1.34	0.7459
Labour	0.0977	0.0493	1.98[b]	1.39	0.7193	-0.1851	0.3984	-0.46	1.39	0.7191
Output	-0.0001	0.0001	-0.91	1.21	0.8232	0.0001	0.0009	0.15	1.21	0.8238
Extension	-0.0199	0.0489	-0.41	1.16	0.8593	0.0308	0.3944	0.08	1.16	0.8592
Nfood exp	-8.58e-08	1.84e-09	-0.47	1.13	0.8875	-2.16e-09	1.48e-09	-1.45[c]	1.13	0.8875
Food exp	1.33e-06	4.33e-07	3.07[a]	1.42	0.7029	-8.72e-06	3.50e-06	-2.49[a]	1.42	0.7029
Farm exp	-1.99e-08	1.05e-08	-1.89[b]	1.31	0.7635	-4.76e-08	8.51e-08	-0.56	1.31	0.7635
Constant	0.7693	0.1656	4.65[a]			3.4173	1.3379	2.55[a]	(1.47)	
Prob>F=	0.0000					**Prob>F=**	0.0354			
R^2 =	0.4234					**R^2 =**	0.2253			
Adj R^2 =	0.3372					**Adj R^2 =**	0.1095			

Source: Field Survey data, 2017. [a]Sig at 1%, [b]Sig at 5%, [c]Sig at 10%. Mean VIF parenthesized.

5.0 Conclusion and Recommendations

This study analysed the determinants of cooperative membership and determinants of differential cooperative membership among poultry farming households in Southwest Nigeria. Empirical findings from the study reveals that the ages of Cooperators and Noncooperator poultry farmers varies significantly. Regarding the determinants of cooperative membership, farmers age, access to credit, output level, and household non-food expenditure, positively influences Cooperative membership while, usage of paid labour, and marital status negatively influences cooperative membership.

On the determinants of differential cooperatives membership i.e., Multipurpose, Marketing and Consumers' cooperatives; formal education, Age, and Farming experience positively influences membership of multipurpose cooperatives but negatively influenced by gender and output level. Also, marketing cooperatives is positively influenced by Primary occupation, and Non food expenditures but negatively influenced by labor, and Farm expenditure. Producer cooperative membership is positively influenced by primary occupation, labor and food expenditure but negatively influenced by, Education, Age, Household size, and farm expenditure. Consumer cooperative membership is negatively influenced by Food, and Non food expenditure, Age, and Primary occupation, but positively influenced by Household Size.

Considering its positive influence in promoting cooperative membership, Poultry farming should be encouraged among young farmers, while enhancing access to credit. Policy making should favour promotion of Farmers' formal education so as to enhance informed decision making. Farm inputs should be made available to farmers in order to boost production output level.

Finally, timely information should be made available so as to help farmers make more informed decision on joining cooperatives that will best meet their needs and interests.

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