Determinants of Financial Inclusion among Rural Farming Households in Akinyele Local Government, Oyo State, Nigeria

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Abstract:- **Financial exclusion remains a significant challenge in Nigeria, as much of the economy's wealth remains outside the banking system. Addressing this issue is crucial for the country's overall economic development. However, quantifying progress in financial inclusion has proven difficult due to the lack of a universally accepted standard measure, and finding ways to measure progress towards greater financial inclusion for all Nigerians is necessary. In Akinyele Local Government, Oyo State, Nigeria, this study examined the factors influencing financial inclusion among rural farming households. A multistage sampling technique was used to gather primary data from rural agricultural households. Descriptive statistics and the Multivariate Probit model were used to examine the gathered data. According to the descriptive statistics, the average household size was 4, and the majority (64%) of the population was male. With 56% of rural farming households consisting of single people, 57.33% having access to extension services, and 58.67% having access to credit facilities, the average distance to the closest financial institution is 5.4 km. The Multivariate probit regression shows that the determinants of financial inclusion among households using having a bank account as the dependent variable are religion, access to credit facilities, and cooperative association membership, while sex, income, credit facilities, access to agricultural training, and scale of production are the variables influence using internet among the rural farming households while using debit or credit cards was influence by income and animal asset index. The study proposed increasing credit provision among rural farming households to enhance their income.**

Keywords:- *Rural Households, Financial Inclusion, Farming Households, Akinyele, Nigeria.*

I. INTRODUCTION

Financial inclusion has been identified as an important factor contributing to a country's overall economic development. It creates consumption smoothing opportunities through building resilience against shocks for low-income people (Mulungu & Kilimani, 2023), and helps in accessing other basic needs, such as health services, education and is crucial for investment opportunities for businesspeople (Bruhn & Love, 2009). The most important beneficiaries of financial inclusion are the poor and sidelined or marginalized individuals lacking this benefit in the first place (World Bank, 2019). Notwithstanding, financial inclusion has continued to receive attention in developing and developed countries. The World Bank (2015) defined *financial inclusion* as "individuals and businesses having access to useful and affordable financial products and services that meet their needs, such as transactions, payments, savings, credit, and insurance, delivered responsibly and sustainably." Access to an individual's or household's financial instrument, such as a transaction account, is used to measure financial inclusion at the micro level. The goal of financial inclusion is to make sure that all adult members of society have easy access to a variety of financial products that are affordable and tailored to their needs. Financial exclusion is a direct cause of both extreme and non-extreme poverty (Onaolapo, 2015). Nigeria has overtaken other nations in terms of the percentage of its population that lives in abject poverty. According to data on poverty, 87 million Nigerians, or almost 50% of the nation's population, subsist on less than $1.90 per day (Adebayo, 2018). Lack of assets and insufficient income are the leading causes of poverty. Because they can increase an economy's investment efficiency and manage risky economic circumstances, savings and credit, which are components of financial inclusion, are vital for lowering the vulnerability of rural households to poverty (Kumra et al., 2018). Although financial inclusion is a top priority worldwide objective, no benchmark is acknowledged (Tita, 2017). Accurate measurements are required to track progress and identify opportunities for policy interventions because the absence of uniformity has made assessing financial inclusion progress challenging. According to Shahul-Hameedu (2014), the difficulties in assessing financial inclusion may be ascribed to the emergence of numerous conceptions and policies which continuously modify metrics. Besides such developments, the challenges may be due to inadequate integration consumers' perspectives into measurement methods. This latter aspect is crucial if financial inclusion focuses on specific target groups more likely to be marginalized than on emphasizing aggregates.

Similar to this, ongoing discussions about financial inclusion point to the necessity of moving away from gauging financial inclusion based on headline indicators,

like access or formal account ownership, and toward indicators that take consumer goals and sustainable development outcomes into account (World Economic Forum (WEF), 2018). Although there are many indicators of financial inclusion, access and consumption indicators have been highlighted in most studies (Demirgüç-Kunt et al., 2018; Migap et al., 2015; Okpara, 2013). The report points out that measurements depending on these indicators are equally important and may even shed light on the preliminary stages toward integration into a regulated financial system. However, they omit other crucial measurements and only account for a portion of the financial involvement dimension of financial inclusion (Hall, 2014).

Additionally, focusing on such measurements only provides limited coverage of financial inclusion, reducing their usefulness for advising policy decisions. In contrast to credit, which differs according to term, interest, required collateral, and other factors, account ownership is often comparable across national borders. Making payments and saving money is made possible by having a bank deposit account, which is probably more widely desired than credit (Allen, 2012). This study makes an important methodological advance by establishing a connection between financial inclusion and rural household poverty in Oyo State, Nigeria. A few studies in Nigeria, like Okpara's (2013), have computed a financial inclusion index using an average ratio index. Even though the index was calculated spanning three decades (1985, 1988, and 2003), it used bank indicators because it exclusively used bank data. In order to determine how effectively formal financial institutions have been able to address the loan demands of farmers, Kalu et al. (2018) computed adequacy and timeliness gap indexes. The difference between the amount of credit granted and the amount requested served as the basis for the sufficiency gap index. These studies undermine the idea of financial inclusion by identifying only one sort of financial inclusion mode—access to credit—and their generalization to various financial products may require revision. This is similar to how neither bank financial services nor credit availability alone equates to financial inclusion. In order to conceptualize the determinants of financial inclusion among rural households, this study will take into account multiple forms of financial inclusion, such as access to credit, access to a telephone, and bank account ownership. This supports the use of multivariate probit regression in this study. As a result, this study identifies the determinants of financial inclusion among rural farming households in Oyo State, Nigeria's Akinyele Local Government.

II. THEORETICAL AND LITERATURE REVIEW

The foundation of this work is the collaborative intervention theory of financial inclusion and classical economic theory. Adam Smith, a well-known economist, first discussed the earliest proponents of the theory of the free-market economy in 1776. According to Adam Smith's (1776) theory, the economy runs autonomously, and supply and demand combine to bring the economy to equilibrium without government intervention (O'Brien, 1975).

According to Adam Smith (1776), the classical economic theory is predicated on the idea of a free market economy (Skinner & Wilson, 1975). The laissez-faire or free-market philosophy calls for little to no intervention by the government in the workings of the market. The laissez-faire philosophy also permits people to act in ways that serve their economic interests (Skinner & Wilson, 1975). As a result, economic resources can be distributed to the market preferences of people and businesses (Skinner & Wilson, 1975). Bagehot (1873) emphasized the role of the banking system in economic development and identified circumstances in which the bank may promote innovation and growth by founding and backing productive investments. Banks offer essential financial services that are necessary for both economic growth and the eradication of poverty, according to Bagehot (1873). Mobilizing savings, assessing various initiatives, controlling risks, and simplifying transactions are just a few of the services that can be offered (Bagehot, 1873). These various services were argued to be instrumental in encouraging innovation, economic growth, and development. According to the collaborative intervention theory of financial inclusion, the excluded population should receive formal financial services through collaborative intervention from many stakeholders. According to the hypothesis, it will take a coordinated effort from numerous stakeholders to include the excluded population in the legal financial system. There are certain advantages to the collaborative intervention idea of financial inclusion. One is that it promotes a multi-stakeholder approach while offering official financial services. Second, the stakeholders working together are pleased with their important contribution to the financial inclusion initiative. The drawback to the collaborative intervention idea of financial inclusion is that deciding on the ideal number of partners required to provide formal financial services to the excluded population is challenging; some collaborators can stop working, leaving only a few active ones to complete the assignment, and having a higher number of collaborators does not guarantee a higher probability of success in delivering formal financial services to the excluded population (Ozili, 2020)

➢ Literature Review

The factors that affect financial inclusion among rural households have been the subject of numerous empirical investigations. Park and Mercado Jr. (2018) looked at how income inequality and poverty reduction in various economies were affected by inclusive banking sectors. According to the study, poverty will decrease when financial inclusion significantly increases in high- and middle-income economies. They also concluded that poverty rates are low in high- and middle-income nations with high levels of financial inclusion. In contrast, there was no correlation between the two in middle- to low-income countries. Park and Mercado Jr. (2018) contend that successful growth, development, and poverty reduction outcomes depend equally on selecting the appropriate financial inclusion policies. In this way, financial inclusion has shown evidence of reducing poverty in high- and middle-income economies. Allen et al. (2016) also examined the impact of individual and national variables on financial institutions' access and

usage dimensions. They evaluated three features using a probit regression method: the factors determining formal account ownership, the variables impacting the usage of formal accounts to save, and the frequency of use. They discovered that proximity to financial institutions, fewer transaction costs associated with owning an account, and stable national policies all favoured financial inclusion. Being rich, educated, older, residing in an urban region, employed, and married were all found to boost the likelihood of having a formal account and funds with a financial institution. Similarly, using the probit regression model, Zins and Weill (2016) examined the Global Findex (2014), which covered 37 African nations. They discovered that the primary determinants of financial inclusion were individual variables. The ownership of accounts, deposits, and borrowing in formal financial institutions increased by 44%, 32%, and 10%, respectively, when tertiary education was present. In their study, Soumare et al. (2016) utilized a logit regression model to examine the factors influencing four variables in West and Central Africa: account ownership, savings, borrowing, and frequency of financial inclusion. They discovered that access to formal financial services is influenced by age, gender, education, marital status, occupation, location, family size, and trust in official institutions. In addition, Abdu et al. (2015) employed the probit model to examine the factors that influence financial inclusion using the four indicators of owning an account, saving money, borrowing money, and holding a personal insurance policy. They claimed that having a formal account was more likely for men, young people, and those with secondary and postsecondary education. A tertiary degree was the single important factor in determining whether someone could borrow money from a financial organization. A tertiary degree generally increased the possibility of having a formal account by 54.10 percent, savings by 57.50 percent, and borrowing by 13.30 percent, although having the highest income level increased the likelihood of having an insurance policy by 5.51 percent. Casadas (2015) investigated how mobile money deployments affected financial intermediation and the elimination of poverty. According to the study, mobile phones increase financial inclusion in underdeveloped nations. According to another research, mobile phones influence how many people use mobile money to transition from the informal economy to the formal one. The study also discovered that the availability of mobile money had a favourable impact on poverty reduction in many developing nations. At the national level, Mercado (2015) investigated the connection between financial inclusion, poverty, and income inequality. According to the study, financial inclusion in developing Asian nations dramatically lowers poverty and inequality. Financial inclusion in developing Asian nations is highly influenced by per capita income, the rule of law, and demographic characteristics. Nyasetia et al. (2012) investigated the impact of financial deepening on Kenyan investors' and savers' behaviour. The study concluded that financial deepening enhanced investments and savings in Kenya. According to other findings, increasing household savings will ultimately increase investment in the nation. Therefore, financial depth is essential.

III. METHODOLOGY

> *Study Area*

The study was conducted in Oyo state's Akinyele local government area. Southwest Nigeria's Oyo State is an interior state. With a predicted population of 7,840,864 in 2016, Oyo State would be the fifth most populated state in the nation. Its capital is Ibadan, which was once the second-most populous city in Africa. The state's 35,743km2 land area is located between latitudes 3°N and 5°N and longitudes 7°E and 9.3°E. With a relative humidity of 74.55%, the mean maximum and lowest temperatures are 26.460°C and 21.420°C, respectively. Yorubas comprise most of Oyo State's population, and the language is still widely spoken. Thirty-three (33) Local Government Areas make up Oyo State. The State is 28,454 square kilometers and is bordered by Ogun State to the south, Kwara State to the north, the Republic of Benin to the west, and Osun State to the east. Old hard rocks and dome-shaped hills make up the environment, which rises gently from 500 meters above sea level in the south to 1,219 meters in the north. As an agrarian state, Oyo State primarily cultivates food crops, including rice, vegetable yam, cassava, and corn and cash crops like cocoa, rubber, kolanut, and citrus. Four (4) Agricultural Development Project (ADP) zones exist in the state as categorized by the Oyo State Agricultural Development Project (OYSADEP): Ibadan/Ibarapa zone, Oyo zone, Ogbomoso zone, and Saki zone.

A well-structured questionnaire was used to gather primary data. Information was gathered on socioeconomic traits, food and non-food spending, and financial inclusion variables. Age, gender, household size, education level, primary occupation, agricultural experience, marital status, monthly income, proximity to the closest bank, and membership in a cooperative organization are just a few of the socioeconomic factors gathered from the respondents. Additionally, information on sources of financial inclusion was gathered, including access to credit cards, remittances, banking services, and telephone service. A Multistage stage sampling technique was used to select the sample for this study. Five wards were selected from the 12 wards in Akinyele local government in the first stage. The selected local government was based on the distribution of rural villages in the LGA and geographical proximity in the wards. The second stage involved the selection of two villages from the five wards, making 10 villages selected for this study. In the last stage, proportionate sampling will be used to select 150 farming households for this study.

The Cochran (1977) sampling method will be applied in selecting the sample. It is given as:

$$n_0 = \frac{Z^2}{e^2}Pq = \frac{(1.96)^2(0.5)(0.5)}{(0.048)^2} = 150$$

n_0 is the sample size, $z = 1.96$ (95%) is the selected confidence interval level, P is the estimated proportion of an attribute that is present in the population (expectation of 50%), $q = 1 - p$, e is the desired level of precision (5%).

The formula that was used to select the proportionate to-size selection is

$$n_h = \frac{N_h}{N} n,$$

Where n_h =Number of elements in each of the strata,

N_h =Number of elements in each of the strata,

N =Total population and

n = Sample size

Table 1 Sample Size Selection

Selected Wards	Total estimated farmers (N_h)	Proportionate to size selection of farmers (n_h)
Ward 1	117	35
Ward 2	78	25
Ward 3	95	26
Ward 4	110	37
Ward 5	85	27
Total	485	150

➢ *Methods of Data Analysis*
This study adopted descriptive statistics and multivariate probit regression to determine the objective of this study. The descriptive statistics

Multivariate probit was used to examine the determinants of financial inclusion among the rural households. Empirically, the model can be specified as follows:

$$Y_{i1} = X'_{ij1}\beta1 + e_{i1} \tag{1}$$

$$Y_{i2} = X'_{ij2}\beta2 + e_{i2} \tag{2}$$

$$Y_{i3} = X'_{ij3}\beta3 + e_{i3} \tag{3}$$

Where i = farmer id, Y_{i1} = 1, if the farmer has a bank account (0 otherwise), Y_{i2} = 1 if the farmer accesses the internet 'Other Farmers' (0 otherwise), Y_{i3} = 1 if the farmer accesses credit card sources (0 otherwise), X'_i = Vector of factors affecting access to financial inclusion, β_j = Vector of unknown parameters (j = 1, 2, 3), and ε =, is the error term.

The following independent variables were used in the analysis.

Before estimating the model parameters, a multicollinearity test among the explanatory variables was first conducted.

The following independent variables were used in the analysis.

Y_1 = Owned Bank account (Yes=1, No=0)

Y_2 = Using internet Banking (Yes=1, No=0)

Y_3 = Using credit/debit cards (Yes=1, No=0)

X_1= Marital Status (Married=0, otherwise)

X_2= Years of formal education (years)

X_3= Household size (number)

X_4= Age (Years)

X_5= Income (Naira)

X_6= Total size of the farmland (hectares)

X_7= Cooperative member (Yes=1, No=0)

X_8= Sex (1 = male. 0 = female)

X_9= Access to credit (Yes=1, No=0)

X_{10} = Access to extension (Yes=1, No=0)

X_{11} = Distance to input service (km)

X_{12}= Primary occupation (Farming=0, otherwise)

X_{13}= Scale of production (Small-scale=0, otherwise)

X_{14}= Animal Index

X_{15}= Asset Index

X_{16}= Agricultural training (Yes=1, No=0)

ε_0 = Error term

The hypothesis can be tested by running three independent binary probit or logit models, assuming that error terms are mutually exclusive. However, the decision to access different financial inclusion may be correlated. Thus, the elements of error terms might experience stochastic dependence. A multivariate probit model of the following form is used to test the hypothesis in this situation.

$$Y_{ij} = X'_{ij}\beta_j + \varepsilon_{ij} \tag{4}$$

Where Y_{ij} (j =1, …,4) represents the three different access sources for financial inclusion by the ith farmer (i = 1, …, 1,200), X'_{ij} is a 1 × k vector of observed variables that

affect the choice decision of farmer β_j is a $k \times 1$ vector of unknown parameters (to be estimated), and ε_{ij} is the unobserved error term. Assuming the error terms (across j = 1, …, m alternatives) are multivariate and are normally distributed with a mean vector equal to zero, the unknown, assumed parameters in Equation (4) are estimated using simulated maximum likelihood. The method uses the Geweke-Hajivassiliour-Keane smooth recursive conditioning simulator procedure to evaluate the multivariate normal distribution.

IV. RESULTS AND DISCUSSIONS

➢ *Socio-economic Characteristics of the Rural Farming Households.*

Table 3 shows the socioeconomic characteristics of the rural farming households in Akinyele Local Government Area of Oyo State. The distribution of respondents by age revealed that (44%) of the respondents are within the age range of 41–50 years, (29.33%) are within the age range of 31–40 years, (12%) are within the age range of 51–60 years and 60 years, respectively, and only 2.67% are within the age range of 21–30 years. The mean age of the rural farming households was 29 years, while the minimum and maximum ages were 22 years and 65 years, respectively. The finding indicates that most respondents are still within their economically productive age for farming. This agrees with Ike (2012), who opined that farmers' average age is between 30 and 59 years and are still within a productive and active age. The sex distribution indicates that most (64%) respondents were male, while a few (36%) were female. This agrees with Mhlanga (2021), who opined that male-headed households were more dominant in the study area. The distribution of the households by marital status shows that the majority (56%) were single, 17.33% were married, 15.33% were widows, 6.67% were separated, and 4.67% were divorced. It indicates that most of the respondents are still single. This finding contradicts the study of Arowolo *et al*. (2022), who found that married people were more prevalent in the study area. The result from the study further indicates that most of the respondent's years of education fall within the range of 0–6 years, followed by 20% of the respondent's years of education falling within the range of 7–12 years, while a few (2%) of the respondent's years of education fall within the range of 13 years. It inferred that all the respondents had one form of formal education; in essence, it would assist in adopting innovation or new technology about new varieties of crops. The mean years of education were six, while the minimum and maximum years were 1 and 18, respectively.

The finding indicates that the majority (74%) of the respondents had a household size within the range of (10–12), followed by (12%) of the respondents who had a household size within the range of (7-9), 10.67% of the respondents had a household size within the range of (4-6), and a few 3.33% of the respondents had a household size within the range of (1-3). The mean household size is four members, while the minimum and maximum household members are 2 and 9, respectively. It agrees with Arowolo et al. (2022). Also, the majority (72% of the respondents) had

their primary occupation as Livestock farming; 38% of the respondents had their primary occupation as poultry farming; and 26.67% of the respondents had their primary occupation as petty traders (12%) of the respondents had their primary occupation as crop farming, (10.67%) of the respondents had their primary occupation as Civil servants, and a few (2.67%) of the respondents had their primary occupation as Artisans. This implies that most farmers are into livestock production as their core occupation. It agrees with Arowolo, *et al.,* (2022). Most (60%) of the respondents had their secondary occupation as livestock farming, followed by 13.33 percent of the respondents who had their secondary occupation as petty traders, 12 percent of the respondents had their secondary occupation as crop farming, 9.33 percent of the respondents had their secondary occupation as artisans and 5.33% of the respondents had their secondary occupation as Civil servants. The majority (66%) of the respondents had years of experience in secondary occupations between 1-5 years, while a few (34%) had years of experience in secondary occupations between 6-10 years. The mean years of farming experience by the rural farming households is 1.3 years, while the minimum and maximum are 1 and 2 years, respectively. It implies that most of the farmer's years of experience in their secondary occupation are still at a minimum level. A large percentage of the rural farming households (56.67%) had a total income from a primary occupation within $\leq$ ₦50,000, followed by (35.33%) of the respondents who had a total income from a primary occupation falling within the range of (₦60,000–100,000), 5.33% of the respondents had a total income from the primary occupation that fell within the range of (₦110,000-150,000) and a few 2.67% of the respondents had a total income from a primary occupation falling within the range of (160,000–200,000). The mean income from primary occupation was ₦11217.00, while the minimum and maximum income were ₦6800.00 and ₦17000.00, respectively. The finding further indicates that the majority (58.67%) of the respondents had access to credit facilities, while a few (41.33%) had no access. It implies that most respondents had credit access, positively affecting their production. This is consistent with the submission of Arowolo et al. (2022). The finding also shows that the majority (38%) of the respondents source their land through land purchased/bought, followed by (25.33%) of the respondents who own their land, (16.67%) of the respondents who inherited their land, and (11.33%) of the respondents who source their land through renting or leasing. It indicates that most farmers had access to land through land purchases. As such, it gives the farmers confidence in land ownership; equally, planting varieties of crops that have increased productivity invariably increases the farmers' income. Also, the majority (53.33%) of the respondents were not members of any cooperative association, while a few (46.67%) were members of a cooperative society. Most respondents (57.33%) had access to extension services, while a few (42.67%) had no access to extension services in the study area. It implies that farmers would have access to innovative practices, which might positively impact their productivity and income. The majority (96%) of the respondents had a distance to the input market at 1–10 km, while a few (4%) had a distance to

the input market at 11–20 km. It was inferred that most farmers had closer access to the input market, which would motivate them to engage in farming production. The mean distance was 6.6km, while the minimum and maximum years of distance to the input market were 1 and 18 km, respectively. Most of the rural farming households (77.33%) owned a bank account, while a few (22.67%) did not own a

bank account. This implies that most farmers own a bank, which invariably means they can save their income in various accounts. This agrees with Arowolo et al. (2022). The study also indicates that the majority (76%) of the respondents had access to the internet to check their balance and make transfers, while a few (24%) didn't have access to the internet to check their balance and make transfers.

Table 2 Socioeconomic Characteristics of Rural Farming Households in Akinyele LGA

Variables	Frequency	Percentage	Mean, Min, Max
Age of the Respondents			
21-30	04	2.67	
31-40	44	29.33	Mean =29
41-50	66	44	Min =22
51-60	18	12	Max =65
≥60	18	12	
Sex			
Male	96	64	
Female	54	36	
Marital status of respondents			
Married	26	17.33	
Single	84	56	
Divorced	07	4.67	
Separated	10	6.67	
Widow	23	15.33	
Year of education			
0-6	117	78	Mean =06
7-12	30	20	Min =01
≥13	03	2	Max =18
Household Size			
1-3	05	3.33	Mean =04
4-6	16	10.67	Min =02
7-9	18	12	Max =09
10-12	111	74	
Primary Occupation			
Crop Farming	18	12	
Civil Servant	16	10.67	
Artisans	04	2.67	
Livestock Farming	72	48	
Petty Trader	40	26.67	
Secondary Occupation			
Crop Farming	18	12	
Civil Servant	08	5.33	
Artisans	14	9.33	
Livestock Farming	90	60	
Petty Trader	20	13.33	
Income from Primary Occupation (₦)			
≤ 50,000	85	56.67	
60,000 -100,000	53	35.33	Mean =11217
110,000 -150,000	08	5.33	Min =6800
160,000 – 200,000	04	2.67	Max =17000
Access to Credit Facility			
Yes	88	58.67	
No	62	41.33	
Source of Land for Farming			
Personal Land	51	34.00	
Inherited	25	16.67	
Rented / Leased	17	11.33	
Bought	57	38	

Membership of Cooperative Society			
Yes	70	46.67	
No	80	53.33	
Access to Extension Services			
Yes	86	57.33	
No	64	42.67	
Distance to Input Market			
1-10	144	96	Mean= 6.6
11-20	006	4	Min=1, Max=20
Owned a Bank Account			
Yes	116	77.33	
No	034	22.67	
Internet usage Banking			
Yes	114	76	
No	036	24	
Use Credit/Debit Cards			
Yes	89	59.33	
No	61	40.67	

Source: Field Survey, 2022

➢ *Determinants of Financial Inclusion among the Rural Farming Households*

The determinants of financial inclusion among the rural farming households in Akinyele Local Government were examined using multivariate probit regression. In Table 3, the dependent variables used in this study were owning a bank account, using the Internet, and using a credit card. A probability Chi2(10) 94.0235 of 0.000 indicates that the model is statistically fit and can be used for econometric prediction. A multivariate probit specification effectively fits the data, as shown by the very significant (p-value=0.000) results of the rho () likelihood ratio test. Rho is the abbreviation for the correlation coefficient among the exposure routes' error words. For instance, the correlation coefficient between the error terms of routes (1) and (2) is Rho21. Another crucial finding is that the correlation coefficients between the error terms are significant and show that the exposure routes are interdependent. The relatively substantial off-diagonal values of the error covariance matrix (/atrhoij) also supported the simultaneous modelling. A similar result was reported by (Fasakin *et al*., 2023, and Tsegaye *et al.*, 2017)

• *Having a Bank Account:*

Religion was significant at 5% and negatively related to having a bank account. This implies that the religion of the rural farming household is negatively related to having a bank account. This disagrees with Evans (2016), where religion positively correlated with financial inclusion. The study opined that Islamic banking services and activity significantly and positively affect financial inclusion. Countries with Islamic banking, presence, and activity have higher financial inclusion than those without such services. There is no presence of an Islamic bank in the study area. Rural farming households in Nigeria are characterized by the credit distribution scheme where some government agencies distribute credit (cash) to rural dwellers publicly without sensitization on the essence of having a bank account based on poverty eradication. Access to credit was significant at 1% and negatively related to having a bank account among rural farming households. This implies that microcredit access negatively influences the possibility of rural farming households operating bank accounts. Cooperative association membership was significant at 10% and positively related to having a bank account. This means that belonging to membership in a cooperative association influences the likelihood of using a bank account as a mode of financial inclusion.

➢ *Using Internet Banking*

Sex was significant at 10% with a positive coefficient. The positive significance of gender could be attributed to the fact that being male, the smallholder farmers in Nigeria have greater control of resources and faceless institutional discrimination than females do, which enables them to gain greater access to internet usage in assessing financial services. This present finding agrees with (Adegbite, 2022), who heard similar results. Income was significant at 1% with a negative coefficient. This implies that the income of rural farming households negatively influences internet usage as a mode of financial inclusion. Internet access has been classified as inclusive digital finance. Hence, its impact on rural households must be considered. This disagrees with (Zins & Weill, 2016). Insufficient income is one of the main reasons why individuals do not have bank accounts (Finscope, 2008). The study by Yang et al. (2022) opined that the income growth effect occurs with the development of digital internet finance, and this promotes rural farming households' income. Access to credit negatively and significantly affects farmers' Internet usage decisions. It indicates that access to credit reduces the likelihood of using the Internet for financial transactions among rural farming households. Credit facility availability helps purchase inputs and hire labour and machines, which helps keep the crop cycle going even after harvesting (Arowolo, 2020). The availability of finance leads to increased agricultural productivity and higher incomes for the farmer. Cooperative associations positively and significantly influence the decision of the farmers to use the Internet. This showed that cooperative association increases the likelihood of using the

Internet for financial transactions. The scale of the operation was significant at 5% with a negative coefficient. It indicates that the scale of production reduces the likelihood of using the Internet for financial transactions. This finding is plausible, considering the level of development of infrastructural amenities in the study area. Rural households need more basic amenities, which might affect their access to internet usage for their basic transactions. Agricultural training was significant at 10% with a negative coefficient. This implies that agricultural training influences Internet use negatively among rural farming households. It shows that agricultural training decreases the likelihood of using the Internet for financial transactions.

- *Using Credit/Debit Card:*

Income was significant at 10% with a negative coefficient. This implies that as the income of households increases, the possibility of using credit cards decreases. This is so because most of the residents in the rural areas of Nigeria have their financial institutions located long distances from the residential places, hence the difficulty in using debit or credit cards for financial transactions. Koomson, *et al.* (2023) highlight the effects of financial literacy among rural households. The high level of illiteracy in rural areas in Nigeria, coupled with poor infrastructure development, impedes financial inclusion among rural households. Ibekwe (2021) submits that financial inclusion positively affects income and entrepreneurial development and has helped improve Nigeria's living standards. The asset index was significant at 1% with a negative coefficient. This implies that asset accumulation negatively influences the usage of debit cards for financial inclusion.

Table 3 Multivariate Probit Model for the Determinants of Financial Inclusion among Rural Farming Households

Variable	Bank account		Internet		Credit Card	
	Coef	St. Err.	Coef	St. Err.	Coef	St. Err.
Age	0.001	0.012	0.023	0.014	0.001	0.014
Sex	0.708	0.729	1.643	0.960*	-0.235	0.798
Marital Status	-0.463	0.938	-0.746	0.993	0.002	0.000
Education level	-0.303	0.362	-0.199	0.338	-7.930	0.316
Religion	-0.316	0.164**	0.009	0.179	-0.093	0.173
Household size	-0.097	0.098	-0.065	0.107	-0.029	0.116
Income	-0.000	0.000	-0.000	0.000**	-0.000	0.000*
Access to credit	-5.783	0.562***	-5.808	0.680***	0.392	0.729
Coop association	1.715	0.877*	1.649	0.875**	1.383	0.632
Extension Access	5.909	0.000	4.837	0.000	0.158	0.925
Scale of prod	-0.182	0.445	-1.268	0.633**	0.676	0.519
Animal Index	-0.161	0.676	-0.544	0.707	-2.648	0.901***
Asset index	-1.603	1.928	-1.997	1.852	1.067	3.320
Pry occupation	-0.629	0.678	-0.957	0.698	-0.887	0.863
Agric training	-0.736	0.504	1.007	0.560*	0.278	0.538
Constant	3.322	1.963	1.540	2.071	0.049	1.322
Wald chi2(42)	83.05					
Prob > chi2	0.0002					
Log likelihood	-215.11805					
Number of obs.	150					
/atrho21	-0.040	0.152	-0.260	0.791	-0.338	0.257
/atrho31	0.111	0.166	0.670	0.502	-0.213	0.436
/atrho32	-0.147	0.175	-0.840	0.400	-0.491	0.196
rho21	-0.040	0.152	-0.260	0.791	-0.325	0.252
rho31	0.111	0.164	0.680	0.499	-0.210	0.410
rho32	-0.146	0.172	-0.850	0.394	-0.455	0.194

Source: Field survey, 2023 Note: *, ** and *** rep10%, 5% and 1% levels of significant

V. CONCLUSION AND RECOMMENDATIONS

This study empirically conceptualized financial inclusion among rural households in Akinyele Local Government Area on three variables: owning a bank account, using internet banking, and using credit cards. It was concluded that various factors determining the financial inclusion among the rural farming households are belonging to cooperative association, religion, sex, agricultural training, income, access to credit, scale of production, and assets owned. In conclusion, the study proposed prioritizing increasing credit provision among rural farming households to enhance their income level.

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