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DETERMINANTS OF SAVINGS AND INVESTMENT AMONG COCOA FARMERS IN BOKI LOCAL GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA

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ABSTRACT

This study examined the determinants of savings and investment among cocoa farmers in Boki Local Government Area, Cross River State, Nigeria. Specifically, the study identified the different forms of saving and investment, examined the socio-economic factors influencing savings, analysed the determinants of investment and identified the constraints affecting savings and investment decisions of cocoa farmers. A multi-stage sampling technique was employed to select 120 cocoa farmers and primary data was obtained through structured questionnaire. Data was analysed using descriptive and inferential statistics. Results showed that 70% of respondents were male, 70.8% married, and 49.2% within the economically active age group (40–59 years), reflecting a labour-intensive, experience-driven production system. About 68.3% used formal financial institutions for savings, while 62.5% invested in land and real estate due to perceived security and long-term value. Regression results indicated that income ($p < 0.01$), farm size ($p < 0.05$), and farming experience ($p < 0.05$) significantly influenced savings, while age, marital status, farming experience, and income significantly influenced investment decisions. These patterns reflect income capacity and life-cycle dynamics. However, price volatility, high input costs, and poor infrastructure constrained financial accumulation. The study concludes that savings and investment among cocoa farmers are primarily income-driven but structurally constrained. It recommends strengthening rural financial systems, stabilizing agricultural incomes, and improving infrastructure to enhance farmers' capacity for sustainable investment.

Keywords: Cocoa farmers, Savings, Investment, Socio-economic determinants, Nigeria, Rural development

INTRODUCTION

Agriculture remains central to economic development in sub-Saharan Africa, particularly in Nigeria where it provides employment and livelihood for a large proportion of the population (world bank, 2022). Cocoa (Theobroma cacao) is a small perennial tree crop, typically growing between 4 and 8 meters in height, belonging to the genus Theobroma. It is predominantly cultivated in tropical regions, particularly Southeast Asia, Latin America, and West Africa. Côte d'Ivoire remains the leading global producer, accounting for approximately 31% of total world cocoa output. Other major producing countries include Brazil, Cameroon, Ghana, Indonesia, and Nigeria (Amu and Amu, 2012, World bank 2020, FAO, 2020). Cocoa was introduced into West Africa in the early nineteenth century and later into Nigeria in 1874 (Ogunwolu *et al*., 2022). The crop serves as a vital source of income for rural households, with smallholder farmers responsible for about 95% of global production, typically cultivating between 2 and 5 hectares (Anga, 2016). Its production is especially significant as a major export commodity and income source for rural households, particularly in southern Nigeria (International Cocoa Organization, 2022). Despite this importance, cocoa farming is dominated by smallholder producers who face persistent constraints including low productivity, limited capital, and weak access to formal financial systems. Savings and investment are fundamental to agricultural transformation. At the micro level, savings enable households to smooth consumption, mitigate risks, and accumulate capital, while investment supports productivity-enhancing activities such as farm expansion and adoption of improved technologies. However, rural households often operate under liquidity constraints due to irregular income flows, underdeveloped financial markets, and infrastructural deficits (Dupas and Robinson, 2013; Demirgüç-Kunt *et al*., 2018). Theoretically, savings behaviour is explained by the Keynesian Consumption Function, which posits that savings increases with income, and the Life-Cycle Hypothesis, which suggests that individuals allocate savings and consumption over their lifetime based on expected income streams. These frameworks imply that socio-economic characteristics such as income, age, household size, and experience play critical roles in shaping financial behaviour. Empirical studies have shown that income, education, farm size, and access to financial institutions significantly influence savings and investment among rural households (Nwibo, 2013; Odoemenem *et al*., 2013). Muhammad *et al.* (2025) further reported that socio-economic factors such as age, household size, education level, and annual income significantly influenced farmers' livelihood outcomes and financial capacity in North-Western Nigeria, which directly affects their ability to save and invest. Similarly, Akinyemi *et al.* (2021) reported that access to credit, income level, age, and access to electricity significantly influenced livelihood income diversification among rural farming households in Osun State. In addition, Adamu *et al.* (2021) also observed that increased personal savings, diversification into commercial farming, and participation in non-farm activities were important strategies used by crop farmers in Kaduna State to reduce poverty and improve household welfare. These findings support the argument that improved income, financial inclusion, and livelihood diversification enhance farmers' capacity to save and make productive investments. Therefore, similar socio-economic variables are expected to significantly influence savings and investment decisions among cocoa farmers in Boki Local Government Area. Access to formal financial institutions and cooperative membership enhances savings mobilization and facilitates investment (Dupas and Robinson, 2013; Karlan *et al*., 2014). Conversely, constraints such as price instability, high input costs, and poor rural infrastructure limit the ability of farmers to accumulate and invest capital effectively. Despite this body of evidence, there is limited

context-specific research focusing on cocoa farmers in south-eastern Nigeria, particularly in Boki Local Government Area. Given the economic importance of cocoa production in this region, understanding the determinants of savings and investment is essential for designing targeted interventions that enhance financial inclusion, improve productivity, and strengthen rural livelihoods. The research is therefore aimed at examining the determinants of savings and investment among cocoa farmers in Boki Local Government Area, Cross River State, Nigeria.

MATERIALS AND METHODS

Study Area

Boki Local Government Area is located in Cross River State, Nigeria, bordering Cameroon. It is situated in the rainforest region of Cross River State, characterized by dense vegetation, rolling hills, and numerous rivers and streams. The area lies within the rainforest belt, with agricultural activities dominated by cocoa, oil palm, yam, and cassava cultivation. It lies on latitude 6^0N and longitude 9^0E with a population of approximately 186,611 according to the 2006 census and is projected to be about 284,200 in 2022 and 358,795 by 2026 based on official growth estimates (National Population Commission [NPC] and NBS, 2022; City Population, 2022, Xplorer.ng, 2025), across14 communities. The area is known for its rich biodiversity and natural resources. The people of Boki Local Government Area rely on various sources of income for their livelihoods such as; farming, fishing, trading and craftsmanship.

Sampling Technique and Sample Size

A multi-stage sampling technique was employed. A sampling frame of registered cocoa farmers was obtained, from which 120 respondents were randomly selected.

Data Collection

Primary data were collected using structured questionnaires covering socio-economic characteristics, savings patterns, investment behaviour, and constraints.

Analytical Techniques

Both descriptive and inferential statistics were used in the data analysis. Objective 1 and 4 was analysed using descriptive statistics which involved the use of mean, frequency tables and percentages. Objective 2 and 3 was analyzed using multiple regression analysis.

Model Specification

Multiple Regression Model

Y= f (AG, SEX, MST, EDU, FS, HHS, FEX, HAI, MFO) Implicit form

$Y= \beta_o + \beta_1 AGE + \beta_2 SEX + \beta_3 MST + \beta_4 EDU + \beta_5 FS + \beta_6 HHS + \beta_7 FEX + \beta_8 HAI + \beta_9 MFO + \mathscr{E}$ ... Explicit form

Where:

β_o = Constant

$\beta_1 – \beta_9$ = Coefficients of regression

Y= Rural Household Savings and Investments (Naira)

AG = Age (years)

SEX = Sex (Dummy)

MST = Marital status (Dummy)

EDU = Education level (No of years spent in formal school)

FS = Farm size (Hectares)

HHS = Household size (In number)

FEX = Farming Experience (Years)

HAI = Household Annual Income (Naira)

MFO = Membership of farmer's organization (Dummy)

$\mathscr{E}$ = error term

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Most respondents were male (70%) (due to intensive labour requirements and cultural barriers in land acquisition for farming), married (70.8%), and in the 40–59 age group (49.2%) with a mean age of 43 years, and with an average household size of five, indicating that majority of the farmers were middle aged and very active, and may have a positive effect on the availability of family labour which may lead to increase in level of production and higher income. Nearly all had formal education (96.7%), indicating potential for adoption of modern farming techniques. The study further showed that the mean farm size was 5 hectares with majority of the farmers (57.5%) having a farm size of 1-5 hectares, and the mean farming experiences was 14 years with a good number of respondents (48.0%) had a farming experience of 11-20 years, this shows that majority of the farmers have gathered enough experience in cocoa farming and are acquainted with the rudiments of cocoa production.

Table 1: Socio-economic Characteristics of Respondents

Variable	Frequency (n=120)	Percentage %	Mean
Age			
20-39	42	35.0	
40-59	59	49.2	43
60-79	17	14.2	
70-99	2	1.6	
Sex			
Male	84	70.0	
Female	36	30.0	
Marital Status			
Single	35	29.2	
Married	85	70.8	
Educational Level			
No Formal Education	4	3.3	
Primary Education	22	18.3	12
Secondary Education	57	47.6	
Tertiary Education	37	30.8	
Farming Experience			
1 – 10			
11 – 20	45	37.5	
21 – 30	58	48.0	14

Variable	Frequency (n=120)	Percentage %	Mean
31 and above	14	12.0	
	3	2.5	
Farm Size	69	57.5	
1 – 5	40	33.3	5
6 – 10	8	6.7	
11 – 16	3	2.5	
17 and above			
Household Size			
1 – 5	61	50.8	
6 – 10	47	39.2	2
11 – 16	12	10.0	

Source: Field Survey, 2025

Forms of Savings and Investment

The result in table 2 revealed formal banking as the predominant saving mechanism (68.3%), indicating that cocoa farmers are aware of the need to save their money with the banks, for safe keeping. while land and real estate constitute the main investment choices (62.5%). Informal savings mechanisms, including cooperatives and home savings, are secondary. This implies that majority of the coca farmers invest their money on non-farm ventures that yield quince which returns to some extent has hampered expansion, with the attendant effect on yield (output) and farm income.

Table 2: Forms of Savings and Investment among Cocoa Farmers

Earing/invest	Frequency (n=120)	Percentage
Savings		
Bank savings	82	68.3
Informal association	18	15.0
Cash home	20	16.7
Investment		
Land/real estate	75	62.5
Stock market	21	17.5
Agriculture	24	20.0

Source: Computed from field survey, 2025

Determinants of Savings

Table 3 presents the determinants of saving among the respondents. Four functional forms of linear, semi-logs, double-log and exponential were analysed and on the basis of the value of coefficient of multiple determination (R^2), the number of variables that are significant with the correct signs and majorities the f-statistics and the standard error values, the double log model was chosen as the lead equation. The adjusted R^2 value of .541(54%) and an f-statistics value of 16.611, implies that 54% of variation (variability) in the dependent variable (savings) is explained by the independent variables specified, while the remaining 46% was due to error term or uncontrollable factors in the model. The f-statistics value of 16.611 significant at 5%. This implies that the model has a better fit. Regression results also indicate that income, farm size, and farming experience are significant determinants of savings, corroborating previous findings (Nwibo, 2013; Odoemenem *et al*., 2013; Saleh *et al*., 2024).

Table 3: Multiple Regression Result on Determinants of Savings among Cocoa Farmers Lead in Boki Local Government Area

Variables	Linear	Semi-log	Double-log$^+$	Exponential
Constant	-2.56ε+6	-1.11ε+8	-4.210	14.1111
	(1399476)	(1.26ε+7)	(1.867)	(.220)
X_1 = Age	38369.43	1735599	.186	.004
	30010.34	(856727.8)	(.126)	(.005)
X_2 = Sex	-475978	-38671.0	-.019	-.087
	(335884.1)	(313925.2)	(.046)	(.053)
X_3 = Marital status	-204395	-199712	-.100	-.070
	(702525.8)	(685660.9)	(.101)	(.110)
X_4 = educational	53489.71	390080.0	.144	.013
	(83721.38)	(715367.9)	(.106)	(.013)
X_5 = farm size	100291.0	596077.7	.115	.018
	(77102.93)	(404045.2)	(.060)**	(.012)
X_6 = household size	61209.16	317396.6	.010	.003
	(108954.36)	(685608.8)	(.101)	(.017)
X_7 = farm experience	83664.43	977531.9	.189	.014
	(41379.36)	(536270.6)	(.079)*	(.006)
X_8 = income	.068	588243.7	1.003	1.117E-8
	(.008)*	(690617.4)	(.102)***	(.000)*
X_9 =		234261.2	.064	.108

Variables	Linear	Semi-log	Double-log+	Exponential
		(614393.6)	(.091)	(.101)
R^2	.488	.519	.576	.490
AdjR^2	.447	.480	.541	.488
F-Stat	11.667	13.193	16.611	11.734
SE	2946810	2856994	.42173	.4627

Source: computed from field survey, 2025.

Determinants of Investment

Table 4 presents determinants of investment among the respondents. On the basis of the value of coefficient of multiple determination (R^2), the number of significant variables that are correctly sign, the f-statistic value, the linear model was chosen as the lead equation. The lead equation has adjusted R^2 and f-calculated value of 0.51(56%) and 16.61 respectively. This implies that about 56% of the variation in the dependent variable (investment) is explained by the independent variables (age, sex, educational level, marital status, farm size, household size, farming experience, annual income and membership of farmer organization). The f-statistic value was 16.61 and was significant at 1%, this implies that the model has a better fit. Age, marital status, farming experience, and income significantly influence investment decisions. Older farmers tend to invest less, consistent with the Life-Cycle Hypothesis (Ike and Idoge, 2006).

Table 4: Regression Result on Determinant of Investment

Variables	Semi-log	Exponential	Double-log	Linear+
Constant	-1.61E+8	14.582	-5.201	-1.13E+6
	(1.62E+7)	(.219)	(1.964)	(1689800)
X_1 = Age	-870883	-.008	-.132	-61079.0
	(1094533)	(.005)	(.133)	(36236.04)
X_2 = Sex	227765.8	-.124	-.054	-472958
	(401062.7)	(.052)***	(.049)	(405564.0)
X_3 = educational	121583.8	.029	-.012	551586.5
	(875982.5)	(.110)	(.106)	(848266.2)
X_4 = Marital status	1411685	.031	.256	204216.9
	(913935.5)	(.031)***	(.111)***	(101089.5)**
X_5 = farm size	-1.32E+6	.003	.003	9073.564
	(875916.0)	(.012)	(.063)	(93098.09)
X_6 = household size	-25531.3	-.008	-.088	-125289
	(516197.6)	(.017)	(.106)	(131557.5)
X_7 = farm experience	1075497	.009	.079	87203.39
	(685125.3)	(.006)	(.083)	(49963.59)*
X_8 = income	9296814	1.305E+8	1.148	.112
	(882314.8)	(.000)***	(.107)***	(.019)***
X_9 = MOF	56720.03	.079	.039	371057.7
	(784933.3)	(.100)	(.095)	(774373.5)
R^2	.554	.520	.555	.576
AdjR^2	.517	.481	.518	.561
F-Stat	15.18	13.25	15.214	16.6
SE	3650021	.46034	.44362	.3558131

Source: computed from field survey, 2025

Constraints to Savings and Investment

As shown in table 5, major constraints include price fluctuations, family commitments, poor infrastructure, and high input costs, which limit the ability of farmers to save and invest.

Table 5: Constraints to Savings and Investments

Constraints	SA(5)	A(4)	SD(3)	D(2)	N(1)	Critical mean	Rank
High cost of farm inputs	80(400)	22(88)	10(30)	8(16)	-	4.45	3rd
Unexpected crop loses	65(325)	28(112)	7(21)	15(30)	5	4.10	4th
High cost of living	88(440)	20(80)	8(24)	4(8)	-	3.66	6th
Family commitment	86(430)	30(120)	4(12)	-	-	4.68	1st
Unstable government policies	70(350)	21(84)	17(51)	3(6)	1	3.10	7th
Unclear tenure rights	55(275)	30(120)	20(60)	11(22)	4	4.00	5th
Price fluctuation	96(480)	15(60)	6(18)	2(4)	-	4.68	1st
Poor infrastructure	79(395)	20(80)	18(54)	3(6)		4.46	2nd
Inadequate capital							

Source: Computed from field survey, 2025

SA = strongly Agree, A = Agree, SD = Strongly Disagree, D = Disagree

N = neutral

CONCLUSION

The study concludes that cocoa farmers' savings and investment behaviour are significantly influenced by income, farm size, age, and farming experience, while structural and institutional constraints limit optimal financial accumulation and investment. To enhance investment in cocoa production, farmers should be encouraged to reinvest more of their income into farm expansion, commercial banks should establish more branches in rural cocoa-producing communities to improve financial inclusion, and government alongside community stakeholders should strengthen rural infrastructure, especially road networks, to support agricultural activities and improve access to markets and financial services.

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