EFFECT OF TENURE SECURITY AND FARMERS' SOCIO-ECONOMIC CHARACTERISTICS ON FARM INVESTMENT OF ARRABLE CROP FARMERS IN IMO STATE, NIGERIA

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ABSTRACT

This study analyzed the effect of tenure security and farmers socio-economic characteristics on farm investment of arable crop farmers in Imo State, Nigeria. Multi-stage, purposive and simple random sampling techniques were used in selecting 80 respondents used for the study. Primary data were collected using structured questionnaire administered to the respondents. Data were analyzed using frequency counts, percentages, mean, and multiple regression analysis. Result showed that about 64 percent of the respondents were between 30-49 years of age, with a mean age of 42.63 years. Majority of the farmers were men and were married, with a mean household size of 5 persons per household. All the farmers had one form of formal education or other ranging from primary to tertiary education. The mean hectarage cultivated by the farmers was 1.9

hectares and on the average, the farmers had spent 18.02 years in arable crop farming. Only 30 percent and 17 of the farmers had contact with extension agents and were members of farmers' cooperative societies respectively. The major socio-economic factors influencing land tenure/tenure security were age and sex; cultural factor was norms/belief; tradition/religious factors were tribe and position in the family; and institutional factors were the state of the economy and credit. The significant determinants of farm investment were tenancy status of the farmers (P = 0.001), education (P = 0.001), farming experience (P = 0.005), farm size (P = 0.005), credit (P = 0.001) and income (P = 0.001). Education and training of the farmers was recommended as well as policies that will grant farmers increased access to land and secured tenure should be put implemented. These will increase investment and farm productivity.

KeyWords: Tenure Security, Investment and Arable Crop

INTRODUCTION

Land is often referred to as "real property" which, in very basic terms, means property which is fixed and immovable – as distinct from personal property which, again in basic terms, means property (as in goods and chattels) which is not fixed and can be moved (Donnelly, 2014). According to Eze *et al.* (2011), land is the basic resource which supports the production of all agricultural commodities including livestock which depend on land to produce the forage and grain they consume.

Tenure security according to Odoemelam *et al*. (2013) is the perception of having secured rights to land and property on a continual basis, free from un-reasonable interference from outsiders, as well as the ability to reap the benefits of labour and capital invested either in use or rented to another. Land access and tenure security influence decisions on the nature of crops grown whether for subsistence or commercial purposes. They influence the extent to which farmers are prepared to invest to improve in production, sustainable management, and adoption of new technologies and promising innovations (IFAD, 2008).

Land tenure and property rights affect the application of technologies for agricultural and natural resource management (Shimelles *et al.,* 2009). They stated that secured property rights give

sufficient incentives to the farmers to increase their efficiencies in terms of productivity and ensure environmental sustainability. It is natural that without secured property rights farmers do not feel emotional attachment to the land they cultivate, do not invest in land development and will not use inputs efficiently (Onyeneke, 2017). Iheke and Echebiri (2010) stated that tenancy status of a farmer is another important factor affecting farmers' productivity. Insecurity of tenure associated with leasehold or renting of land serves as disincentive to farmers from investing meaningfully on the land since the land goes back to the owner after the cropping season.

Deininger *et al.* (2004) noted that property rights to land that are secure and easily transferable have long been identified as a key element to bring about higher levels of investment and access to credit, facilitate reallocation of production factors to maximize allocative efficiency in resource use, and allow the development of an off-farm economy.

Debate on tenure security – farm investment relationship abound in Africa with argument on each side on the divide. For instance, Migot-Adholla *et al.* (1994) noted that tenure security with possession of formal title has little impact on either credit access or investment. However, there is evidence suggesting that investment may be undertaken to enhance tenure security rather than as a response to higher levels of tenure security (Besley 1995; Sjaastad and Bromley 1997). Brasselle *et al.* (2002) reported that in Burkina Faso, land-related investment appears to be undertaken primarily to increase tenure security rather than as a consequence of more secure rights.

Tenure security has a marked effect on expectations of return on investment of both labour and capital. Many development thinkers have attributed the low incentives to invest in smallholder agriculture to the absence of security of tenure to land ownership (Bruce *et al.,* 1994 and Rukuni, 2000). Rukuni (2000), argued that the inability of smallholder farmers to use "their" land as collateral to borrow the much needed short and long term credit for investment in agriculture denies most of them access to technology (hybrid seed, fertilizer, equipment etc.). This in turn can lead to low productivity and unsustainable practices. Tenure security is also considered as an important precondition for increasing land-based economic development and environmentally sustainable natural resource use (Bruce and Migot-Adholla1994).

A number of studies have also shown that farmers will be more likely to make medium- to long-term land improvement and in turn improve efficiency if their tenure is secured because they will be more likely to benefit from investment. Assuming that farmers have access to viable technologies, inputs and extension advice, and adequate household labour and financial resources, then enhanced tenure security will often lead to higher investment and higher agricultural production which in turn leads to sustainable agricultural development. Maxwell and Wiebe (1998) also noted that there is widespread evidence linking secured property rights to a higher propensity to invest in tree planting, manuring, soil and water conservation and other permanent improvements. Aside tenure security, the socioeconomic characteristics of the farmer affects investment. Kwanmuang (2014) noted that formal training, the presence of irrigation, and relatively large farm size will also positively influence plans to increase farm investment.

From the foregoing and given that few studies has actually been conducted on the subject matter in Nigeria, albeit none in the study area, it has become pertinent and indeed imperative to examines the effect of tenure security on farm investment by arable crop farmers in Imo State, Nigeria.

METHODOLOGY

The study was conducted in Imo State of Nigeria. Imo State is one of the 5 South Eastern States. Its capital is Owerri, which is also the largest city in the state. The State lies within latitudes 4° 45^1 N and 7° 15^1N, and longitudes 6^o50^1E and 7^o25^1E and covers a land area of $7,480km^2$ with a population of 3,939,899 persons (NPC, 2006). It is bounded on the east, west, north and south by Abia, Anambra, Delta, and Rivers States respectively. Imo State is divided into three agricultural zones which include Owerri, Orlu, and Okigwe zones respectively. The area is in a humid climate with annual rainfall range of between 1,500 mm to 2,200 mm with an average annual temperature above 20° C (68.0^o F) which creates an annual relative humidity reaching 90% in the rainy season. This makes the area ideal for the growing of arable crops such as cassava, maize, yam, melon, cocoyam, etc.

Multi-stage, purposive and random sampling techniques were used in selecting the respondents used for the study. In the first stage, two Agricultural Zones namely; Owerri and Orlu were purposively selected from the three Agricultural Zones due to their high involvement in

agricultural activities. The second stage also involved the purposive selection of two Local Government Areas (LGAs) from each from the two selected Agricultural Zones namely: Ngor Okpala and Owerri North LGAs in Owerri Agricultural Zone, and in Orlu Agricultural Zone, Ohaji Egbema and Oguta LGAs. The selection was done based on existence of arable crop farming in these areas. The third stage involved random selection of two autonomous communities from each of the two selected LGAs drawn from the two purposively selected agricultural zones. The fourth stage involved a random selection of two villages from each of the autonomous communities that gave a total number of sixteen villages that were involved in the study. The finally stage also involved a random selection of five farmers from each of the selected villages that gave a total sample of eighty arable crop farmers that formed the sample size for the study. The study employed Primary data. Data were collected with the use of well-structured questionnaire which were administered to the respondents and by oral interview.

Primary data were used for the study. Data were collected with the use of well-structured questionnaire which were administered to the respondents and by oral interview. Data analysis was by the use of frequency counts, percentages, mean, and regression analysis, following the ordinary least squares estimation technique. The models is implicitly written as:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10})$ (1)

Where: Y = amount of farm investment by the arable crop farmers (₦), X_1 = tenure status (dummy: secured i.e. when owned = 1, otherwise = 0), X_2 = educational attainment (years), X_3 = farming experience (years), X_4 = farm size (hectare), X_5 = household size (number of persons living in a household), X_6 = crop diversification (number of arable crops grown), X_7 = extension contact (dummy: farming = 1; otherwise = 0), X_8 = gender (dummy: male = 1, female = 0), X_9 = amount of credit (₦), and X_{10} = household income (₦).

RESULTS AND DISCUSSIONS

Socio-economic characteristics of the farmers

The socio-economic characteristics of the arable crop farmers is presented in Table 1. The analysis of the socioeconomic characteristics stems from the major roles they play in agricultural production, investment and enhancing the interpretation of the functional analysis.

Table 1: Socio-economic characteristics of the arable crop farmers

Age range	Frequency	Percentage	Mean
20-29	11	13.75	42.63
30-39	26	32.50	
40-49	25	31.25	
50-59	10	12.50	
60-69	5	6.25	
70-79	3	3.75	
Sex			
Male	51	63.75	
Female	29	36.25	
Marital status			
Single	23	28.75	
Married	48	60.00	
Widowed	9	11.25	
Household size			
1-3	27	33.75	5
4-6	42	52.50	
7-9	7	8.75	
10-12	4	5.00	
Level of education			
No formal education	0	0.00	
Primary	3	3.75	
Secondary	53	66.25	
Tertiary	24	30.00	
Farm size			

0.01-1.00	43	53.75	1.9
1.01-2.00	15	18.75	
2.01-3.00	12	15.00	
3.01-4.00	4	5.00	
4.01-5.00	6	7.50	
Farming experience			
1-10	30	37.50	18.02
11-20	27	33.75	
21-30	13	16.25	
31-40	4	5.00	
41-50	1	1.25	
51-60	4	5.00	
61-70	1	1.25	
Extension contact			
Contact	24	30.00	
No contact	56	70.00	
Member of association			
Member cooperative association	31	17	
Not member	49	83	

Source: Survey data 2016; n = 80

According to Table 1, about 64 percent of the respondents were between 30-49 years of age. The mean age of the farmers was 42.63 years. This result shows that the majority of the farmers are still reasonably young and energetic, and this should impact positively on their investment and productivity. Iheke and Nwaru (2014) stated that the risk bearing abilities and innovativeness of a farmer, his mental capacity to cope with the daily challenges and demands of farm production activities and his ability to do manual work decreases with advancing age. Also, old farmers are more risk averse than their younger counterparts.

About 63.75 percent of the farmers were men. This implies that land tenure system favours men and arable crop production in the study area are dominated by male farmers and they have the right to take decision concerning land use. This result is in line with the findings of Nkanta (2004), Iheke (2010), Akintayo (2011), Luka and Yahaya (2012) and Ehirim *et al.* (2013). They reported the dominance of male farmers in Nigeria agriculture. Iheke (2010) noted that land is rarely owned by women in the study area, except by allocation by their husband takes major decisions concerning the farm production except where he is no longer alive.

The marital status showed that 60 percent of the respondent farmers were married. The result implies that majority of the farm households are stable. Nwaru (2004) and Iheke (2010) noted that this stability should create conducive environment for good citizenship training, development of personal integrity and entrepreneurship, which are very important for efficient use of resources.

The household size distribution depicts that 52.50 farmers, had a household size of between 3-6 persons and the mean household size of about 5 persons per household. This is consistent, desirable and of great importance in farm production as rural households rely more on members of their households than hired workers for labour on their farms.

Table 1 shows that all the farmers had one form of formal education or other ranging from primary to tertiary education. The is desirable because according to Akinbile and Ndagha (2000), education has an important role particularly for farm management, participation in economic activities, dissemination and adoption of new technology and practice.

The mean hectarage cultivated by the farmers was 1.9 hectares. Iheke (2010) noted that these farms are usually small-sized, fragmented and scattered and not contiguous land holdings, posing serious challenge to the much desired agricultural modernization/mechanization and commercialization in Nigeria.

On the average, the farmers had spent 18.02 years in arable crop farming. This result implies that the farmers are reasonably experienced. This is in line with the findings of Onyenweaku *et al.* (2010) and Ukoha *et al.* (2010). They noted that years of farming experience of a farmer increases his production efficiency and helps to overcome certain inherent farm production constraints. Similarly, Ekanem *et al.* (2015) stated that the years of farming experience of a farmer enables him to acquire practical and relevant farming knowledge which drives his ability to efficiently utilize available resources with discretion.

Table 1 showed that only 30 percent of the farmers had contact with extension agents during the cropping season. This implies that the farmers were not substantially exposed to technical innovation; a measure if reversed would increase their productivity. Iheke (2006) noted that change agents, extension workers serve as channels for diffusion of technical innovations.

Only 17 percent of the farmers belonged to cooperative societies. Cooperative societies/ farmers' associations are sources of good quality inputs, labour, credit, information and organized marketing of products. They are expected to help members to receive and synthesize new information and innovations his locality and beyond.

Factors affecting land tenure / tenure security

The factors influencing land tenure/tenure security in the study area were summarized and presented in Table 2. The Table showed that the socioeconomic factors affecting land tenure / tenure security include age (76.25%), household size (70.0%), marital status (70%), sex (63.75%) and income (63.75). The Table equally revealed that the traditional/religious factors that majorly influence land tenure/ tenure security were tribe (68 percent) and position of the farmer in the family (68 percent).

Table 2: Distribution of the respondents based on factors influencing land   tenure / tenure security

Factors	Frequency	Percentage	Ranking
Socioeconomic			
Age	61	76.25	1st
Sex	51	63.75	3rd
Household size	56	70.0	2nd
Marital status	56	70.0	2nd
Income	51	63.75	3rd
Cultural factors			
Norms and belief	33	41.25	1st
Values	32	40.0	2nd
Tradition/Religious Factors			
Tribe	54	67.5	1st

Position in the family	54	67.5	1st
Denomination	35	43.75	3rd
Religious doctrine	36	45.0	2nd
Institutional factors			
Volume of credit	37	46.25	2nd
Distribution of Credit	37	46.25	2nd
Economy	39	48.75	1st
Inflation	36	45.0	3rd

Source: Field Survey, 2016.

Large household sizes encourage fragmentation of land and reduce the chance of securing the land for long term investment especially family land. Singles are not given equal opportunities with married persons especially tenure acquired through inheritance. Income encourages tenure security and more acquisition of land by purchase. Position of the farmers in the family equally determines the portion and the quantity of land tenure/tenure security. Also, lesser percentages of cultural and institutional factors fairly influence the farmers' tenure/tenure security.

Determinants of Farm Investment

The regression estimates of the determinants of farm investment is presented in Table 3.

Table 3:   Estimated Determinants of Farm Investment

Variables	Linear	Exponential +	Double log	Semi log
Intercept	58613.64	10.296	10.247	5044.449
	(5.13)***	(6.10)***	(3.27)***	(2.08)**
Tenancy Status (X_1)	2576.071	0.182	0.268	9.403
	(2.53)**	(3.66)***	(2.60)***	(3.20)
Education (X_2)	2426.2	0.042	0.458	3576.042
	(2.03)**	(3.56)***	(0.52)	(3.51***)
Farming experience (X_3)	1553.763	0.035	0.216	33181.33
	(1.77) *	(2.69)**	(0.95)	(1.89)*

Farm size (X_4)	1268.443	0.087	0.361	33040.81
	(0.13)	(2.55)**	(2.95)***	(1.58)
Household size (X_5)	-885.4508	-0.008	0.010	-28098.16
	(-0.44)	(0.28)	(0.04)	(-1.39)
Crop diversification (X_6)	952.7846	0.002	-0.181	5494.48
	(0.47)	(0.08)	(-0.70)	(0.26)
Major occupation (X_7)	-22736.73	-0.284	-0.300	-27875.55
	(-1.08)	(-0.91)	(-0.96)	(-1.16)
Gender (X_8)	-34378.7	-0.218	-0.042	-25419.17
	(-1.65)*	(-0.71)	(-0.14)	(-1.07)
Credit (X_9)	0.050	9.17e-06	0.392	8393.398
	(0.71)	(4.50)***	(3.75)***	(1.04)
Income (X_10)	0.564	5.01e-06	0.312	21510.72
	(4.90)***	(2.95)***	(1.95)*	(1.74)
R^2	0.619	0.793	0.682	0.579
R^{-2}	0.569	0.739	-0.621	0.510
F- ratio	4.21***	6.38***	5.72***	3.64***

Source: Computed from survey data, 2016

Note: *** = significant at 1%, ** = significant at 5%, * = significant at 10% + = Lead equation (…) = t- ratios.

From the table, the Exponential functional form gave the best fit and was therefore, chosen as the lead equation. This was based on the magnitude of the coefficient of multiple determination (R^2), the number of significant variables and the conformity of the signs borne by the coefficients of the variables to *a priori* expectations, as well as the significance of the F– ratio. The coefficient of multiple determination was 0.793. This implies that 79.3 percent of the variations in investment is accounted for, by the variables in the model. The F-ratio was significant at 1 percent which attests to the overall significance of the regression model. The significant variables influencing farm investment of the farmers were tenancy status of the farmers, education, farming experience, farm size, credit and income.

The coefficient of tenancy status was significant at 1% level of significance and positively related to amount of farm investment in arable crop production. This implies that the amount of farm investment increases as the farmer's tenure becomes more secure. This result is in line with the findings of Macours *et al.* (2004) and Iheke (2010) who noted that insecure property rights over land reduce sharply the level of activity on the land as it serves as disincentive to farmers from investing meaningfully on the land since the land goes back to the owner after the cropping season. Also, Tsue *et al.* (2014) noted that insecurity of tenure among arable farmers is a disincentive to conservation of resources. This is so because farmers are not willing to make necessary investments from which they may be unable to reap future benefits. Farmers' fear of expropriation over land on which an investment would have been made deters investments in fixed assets (Goldstein and Udry, 2008)

The coefficient of years of educational attainment of farmers was significant at 1 percent level and positively related to amount of farm investment in arable crop production. This implies that education increases the ability of farmers to engage and increase their farm investment. Kausar (2011) reported that education is positively related to the types of product that increase farm income. The level of farmers education have a greater effect on investment and this effect could be related to the fact that educated farmers adhere to instructions and positive changes in farming operations. This finding is in line with the finding of Obasi *et al.* (1991) who stated that it is expected that productivity will increase if more experienced and educated farmers cultivate greater hectares of farm land. Therefore, to increase farmers' knowledge of agricultural techniques and thereby improve both the sustainability of farming and returns on farm investment, farmer training is necessary.

The coefficient of farming experience was significant at 5% level of significance and positively related to amount of farm investment in arable crop production. This implies that the higher the years of farming experience, the higher the farmer's investment, this conforms to *a priori* expectation. According to Iheke (2010) and Iheke and Nwaru (2014), the years of experience may give a practical indication of the knowledge the farmer has acquired on how best to overcome certain inherent problems associated with agricultural production.

The coefficient of farm size was significant at 5% level of significance and positively related to amount of farm investment in arable crop production. This implies that an increase in farm size of

arable crop farmers leads to a corresponding increase in farm investment. In addition, Ofuoku *et al.* (2008) stated that the farmers' decision to adopt a new technology is majorly determined by the size of the farm.

The coefficient of credit was also found to be significant at 1 percent level and also positively related to amount of farm investment in arable crop production. Krause et al. (1990), Immink and Alarcon (1993) and Iheke (2006) noted that lack of fund and access to credit prohibits smallholder farmers from assuming risks of financial leverage associated with the adoption of new technology; limiting their investment capacity.

The coefficient of income was significant at 1percent level and positively related to amount of farm investment in arable crop production. This indicates that an increase in income leads to an increase in farm investment. Farmers who have many farm investments are farmers whose income is high. Nwaru (2004) and Olaoye and Odebiyi (2010) reported that increase in net farm income enable farmers to participate more in the input market that is farmers are in better position to acquire the necessary farm implements, inputs and other productive resources required to improve productivity.

CONCLUSION

This study showed that tenure security is key to increasing farm investment as farmers are more willing to make necessary investments in land improvement and conservation, irrigation and improvement inputs and technologies in a secured land so as to have the opportunity to reap the associated benefits. In addition, education, farming experience, farm size, credit and income have significant and positive effect on farm investment. Therefore, policies that will grant farmers increased access to land and secured tenure should be put in place. Education/training increase farmers' knowledge of agricultural techniques and thereby improve both the sustainability of farming and returns on farm investment training is necessary.

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