SAVINGS, INCOME AND INVESTMENT PATTERNS AND ITS DETERMINANTS AMONG SMALL HOLDER ARABLE CROP FARMERS IN UMUAHIA CAPITAL TERRITORY, ABIA STATE NIGERIA.

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ABSTRACT: *The study was conducted in Umuahia Capital Territory of Abia state, Nigeria. A multi-stage random sampling technique was used to select 120 small holder arable crop farmers. Primary data was collected with the use of semi structured questionnaire. Data was analyzed with the aid of descriptive statistics and multiple regression model. Findings showed that farmers who participated in crop production and self-employed activities received the largest total farm (₦41157.26) and total off farm (₦5487.39) monthly income respectively. The preferred forms of savings outlets for these farmers were the informal savings outlets largely the self-help groups which accounted for 24.17% of the farmers that made savings with an annual average savings of about ₦85, 660.89. Result also showed that 28.33% of the farmers practiced arable crop production and invested an average amount of ₦654, 345.09. The result of the multiple regression analysis showed that age, educational level, primary occupation, farm size, access to credit and household size had significant positive influence on the small holder farmers' income at varied risk levels while, income, household size, education level, age, and access to credit had significant positive influence on the farmers volume of savings at varied risk levels, it was also revealed that age, farming experience, farm income and educational level had significant positive influence exception of farm size which had a significant negative influence on farm investment by small holder farmers at varied risk levels. The main constraints to the small holder farmers' inability to save are inadequacy of income (74.17%) and fear of loss of their income (55.83%). It was recommended that incentives such as improved technologies, appropriate farm support services, short and medium term loans should be provided by the government and other actors to farmers in order to boost their income level.*

KEYWORDS: *capital accumulation, income, investment, small holder farmers.*

INTRODUCTION

Agriculture in Nigeria is practiced at subsistent level and is characterized by numerous farmers operating several scattered small and fragmented plots of land using traditional methods such as land rotation, bush burning and crude implements (Odoemenem *et al*, 2013). According to Oluwepo, (2010), majority of the rural populace in Nigeria either depend entirely on farming and farming activities for survival and generation of income, or depend on other non-farming activities to supplement their main sources of income. The validity of this statement becomes evident when it is realized that over 90.0% of the country's local food production comes from small farms which are usually not more than 10 hectares in size, while at least 60.0% of the population earn their living from these small farms. It could then be seen that most farmers

have limited resources, a factor that limits their production output, income, savings and investment.

Savings is a common word used by individuals on daily basis. It simply means putting something aside for future use or what will be considered as deferred expenditure (Amu and Amu, 2012). Savings are very imperative for supporting and developing rural enterprises, improving well-being, insuring against times of shocks, and providing a buffer to help people cope in times of crisis (Rutherford, 1999; Zeller and Sharma, 2000). Households' savings play an important role in the economic development of both developed and developing nations, due to its significant influence on the circular flow of income in the economy (Iyoha *et al.,* 2003).

Savings may be made in kind such as jewelry, land or livestock. It may be in the form of currency notes deposited in banks or more often hoarded. Savings provide several benefits for farm households. The sustenance of household savings increases the possibility of future investment both at the micro and macro- levels in the economy. Directly, savings could be used for investment. Indirectly, savings indicates repayment ability, also increase credit rating and as collateral in a credit market (Brata, 1999). Savings is both a risk management strategy and determinant of magnitude of investment. Investments are being made in agriculture to improve the quality of rural assets and enhance productivity. The ability, willingness and opportunity of households to save and invest over time can therefore significantly influence the rate and sustainability of capital accumulation and economic growth in developing countries (Oluwakemi, 2012).

According to Ajayi (1998) investment could be considered as an act of laying out money now in return for a future financial reward or the sacrifice of something now for the prospect of later benefits. The reward in this context may be received in the form of an income flow or by the receipt of a single capital sum or a combination of both. Over the years, many farmers in Nigeria have increasingly not been able to invest adequately on their farming activities. They have as such resulted to forming cooperative movements to achieve a common goal through democratically controlled business organizations. The most important economic obligation of members of the cooperative society is savings. Farmers save a specified amount of money daily, weekly, monthly or quarterly as it is convenient for the group and the individuals. This type of savings is important for agricultural production, because it allows farmers or members' access to credit at the onset of the farming season which could boost farm production and income of the farmers. Odoemenem *et al.,* (2013) were of the view that small scale farmers invest their savings in two major areas. These are the agricultural and non-agricultural sectors. Investment in the agricultural sector or farm activity includes the purchase of fertilizer and chemicals, hired labour and buying more land for farming. While investment in non-agricultural sector are mainly centered on education, trade expansion, building houses, dowry obligation, and purchase of durable assets.

One of the basic problems confronting the development of agricultural sector in Nigeria could be attributed to inadequate savings, income and investment by the small scale farmers. Despite this problem, policy makers have not really drawn up adequate and comprehensive rural savings scheme that will motivate the farmers to invest their capital productively (Odoemenem *et al.*, 2013; Sunday *et al.*, 2011). According to Shitu (2012) capital accumulation is a major prerequisite of economic development and if the volume of savings are inadequate to meet investment requirements, major bottlenecks are likely to develop in the process of capital formation and the drive for development. The volume of investment has been found to depend

on income, cost of procuring investible funds and entrepreneur's expectations on the trend of the business in future. In the light of the foregoing, the study seeks to: (i) describe socio-economic characteristics of small holder arable crop farmers in the study area; (ii) examine various income, savings and investment patterns of small holder arable crop farmers in the study area; (iii) determine factors influencing savings, income and investment of small holder arable crop farmers in the study area; (iv) identify constraints that militate against savings, income and investment of small holder arable crop farmers in the study area.

RESEARCH METHODOLOGY

Study Area

The study was carried out in Umuahia capital territory. Umuahia is the capital of Abia state located in the South East geo-political zone of Nigeria. Umuahia capital territory which comprise Umuahia North and Umuahia South has a population of 426,803 (NPC, 2006) with a land mass of 423462 square kilometer. Umuahia capital territory is bounded in the North by Isiukwato L.G.A, South by Isialangwa North L.G.A and to the east by Ikwuano L.G.A and to the west by Obowo L.G.A in Imo state.

Umuahia Capital Territory has five notable clans, which are Ibeku, Ohuhu, Olokoro, Umuokpara and Ubakala, 84 autonomous communities and 33 political wards (Unleeds and Unsleeds, 2007). It lays between latitudes 5^030^1 and 5^040^1 North of the Equator and longitudes 7^025^1 and 7^032^1 East of the Greenwich meridian. It belongs to the rain forest zone with its attendant dry and rainy seasons. Umuahia Capital territory has distinct wet and dry seasons, which characterize its humid tropical climate, with the dry season extending from November to March. The state has an annual mean temperature of about 27^0 C -30^0C and a relative humidity ranging from 70% to 80%, with January to march as the hottest months (ASEPA, 1996). Crops grown include Cassava, Maize, Melon, Okra, Garden egg, Oil Palm, Cocoa etc and animals reared are Sheep, Goats, Cattle, Pigs and Poultry.

Sampling Technique

Multi-stage random sampling technique was used in the selection of samples. First, 5 autonomous communities were randomly selected from the two local government areas, giving a total of 10 autonomous communities. Secondly, 4 villages were randomly selected from each of the 10 autonomous communities. This gave a total of 40 villages. The sample frame of the small holder farmers was formulated with the help of the Agricultural Extension agents in charge of the circles. Finally, 3 arable crop farmers were randomly selected from each village giving a total sample size of 120 small holder arable crop farmers.

METHOD OF DATA COLLECTION

The study employed primary data for its analysis. Data were elicited for the purpose of this study by use of pre-tested and structured questionnaires personally administered on the small holder arable crop farmers. The data of interest includes personal and household/dwelling characteristics, household income, savings and investment amount, household consumption/expenditure details. Information was collected from secondary sources such as textbooks, journals, learned publications, bulletins and the internet.

Method of Data Analysis

In order to realize the purpose of this study, a number of statistical tools were employed in analyzing data that was obtained for the study. Descriptive statistics such as frequencies, means, tables and percentages were used to analyze the socioeconomic profiles of the small holder farmers (objective i), examine various income, savings and investment patterns of small holder farmers (objective ii) and constraints that militate against savings, income and investment of small holder farmers (objective iv) .Multiple regression model was employed to analyze the factors influencing savings, income and investment of the small holder farmers (objective iii).

Model Specification
The multiple regression model of the determinants of farmers' income, savings and investment is explicitly stated as follows;

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + ei \qquad ... (I)$$

For income model
Where;
Y = farm income of the respondents (Naira)
X_1 = Age of the respondents (years)
X_2 = Household size (number)
X_3 = Education level (number of years spent in school)
X_4 = Primary occupation (Farming =1, 0 = otherwise)
X_5 = Farm size (hectare)
X_6 = Farming experience (years)
X_7 = Membership of farmers association (Yes = 1, No = 0)
X_8 = Access to credit (Naira)
X_9 = Savings (Naira)
X_{10} = Disposable income/Expenditure patterns (Naira)
ei = Error term
b_0 = intercept (or constant)
$b_1, b_2 \dots b_{10}$ = ith coefficient corresponding to $x_1, x_2 \dots x_{10}$

Savings model:
Where;
Y = Amount Saved (Naira)
X_1 = Age of the respondents (years)
X_2 = Household size (number)
X_3 = Education level (number of years spent in school)
X_4 = Primary occupation (Farming =1, 0 = otherwise)
X_5 = Farm size (hectare)
X_6 = Farming experience (years)
X_7 = Membership of farmers association (Yes = 1, No = 0)
X_8 = Access to credit (Naira)
X_9 = Disposable income/Expenditure patterns (Naira)
ei = Error term
b_0 = Intercept,
$b_1 - b_9$ = Regression parameters to be estimated.

Investment model:
Where;
Y = Amount Invested by the respondents in farm productions (Naira)
X_1 = Age of the respondents (years)
X_2 = Household size (number)

X_3= Education level (number of years spent in school)
X_4= Primary occupation (Farming =1, 0= otherwise)
X_5= Farm size (hectare)
X_6= Farming experience (years)
X_7= Membership of farmers association (Yes = 1, No = 0)
X_8= Access to credit (Naira)
X_9= Savings (Naira)
X_{10}= Disposable income/Expenditure patterns (Naira)
ei = Error term
b_0= Intercept,
$b_1 - b_{10}$= Regression parameters to be estimated.

Four functional forms (Linear, Exponential, Semi-log and Double-log function) of the specified model were fitted to the data. The lead equation was selected based on the values of R^2 coefficient, the magnitude of the F-ratio as well as the conformity of signs of coefficient to *a priori* expectations and the number of significant parameters. The four functional forms of the regression model that were used are specified as follows;

Linear Form:
$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + \ldots \ldots b_nx_n + ei$

Semi − log form:
$Y = b_o + b_1logx_1 + b_2logx_2 + b_3logx_3 + b_4logx_4 + b_5logx_5 + b_6logx_6 + b_7logx_7 + b_8logx_8 + \ldots b_nlogx_n + ei$

Double log form:
$Log\ Y = b_o + b_1logx_1 + b_2logx_2 + b_3logx_3 + b_4logx_4 + b_5logx_5 + b_6logx_6 + b_7logx_7 + b_8logx_8 + \ldots b_nlogx_n + ei$

Exponential form:
$Log\ Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + \ldots \ldots b_nx_n + ei$

RESULTS AND DISCUSSIONS

Socio Economic Characteristics of small holder arable crop farmers
The distribution of the respondents according to gender is shown in Table 1. The table reveals a greater proportion of small holder farmers (60.0%) in the study area were females while 40.0% were males. This may be due to the fact that females generally make greater responsibilities for agricultural production and enhanced economic contributions to family needs as the males abandon farming and migrate to seek for white collar jobs in the cities (Osondu and Ibezim, 2013).

The table shows that 28.33% of the farmers were within the age range of 41 to 40 years, while 24.18% were between 41 to 50 years. The mean age of the farmers was 47 years. This is an indication that the small holder farmers in the study area were mostly middle aged and still active. This has implication on agricultural production because of the ability of this segment of the population to effectively withstand the rigours, strain and stress involved in agricultural production (Onyenucheya and Ukoha, 2007).

The table also shows that a good proportion (67.50%) of the small holder farmers in the study area was married while 11.67% of them were single. Also, 19.17% and 1.67% of them were widowed and divorced respectively. This therefore implies that the married classes were more

involved in farming because of the need to supplement the family's means of livelihood (Adegboye *et al.*, 2008).

The table reveals that a good proportion (59.17%) of the small holder farmers had household sizes of between 1 to 4 persons, while 33.33.0% and 7.5% of them had 5 to 8 and 9 to 12 persons respectively. The mean household size was 4.12 persons. This result indicates that the small holder farmers in the study area had moderate family sizes. This is expected because the present economic crises and deepening poverty levels have forced rural households to embark on family planning measures to reduce their number of children. It has been shown in the past that rural farm women had large household sizes to be able to provide enough labour for agricultural production. This scenario is responsible for the high rate of malnutrition, mortality, illiteracy, unemployment especially in the rural economy hence leading to a change in family emphasis (Okorji, 1999).

The table revealed that 51.67% of the farmers had secondary school education while 11.67% of them had no formal education. However, 88.33% of the farmers in the study area were literate with divers' formal educational levels ranging from primary school education to tertiary education. Possession of literacy (ability to read and write) would enable the farmers to better utilize effectively and efficiently whatever available resources in the area. As expected, higher education would enhance improved technology adoption hence increased farm income (Ezeh, 2007).

Table 1 further shows that 72.50% of the respondents were primarily engaged in farming while 14.17% of them were petty traders. Also, 5.0% and 8.83% of the respondents were civil service and artisans respectively. The predominance of farming in the rural areas explains why over 90% of the food produced in the country comes from the rural sector.

The distribution of the rural women farmers according to farm size is shown in Table 1. The table showed that 27.50% of the small holder farmers had farm size of less than 1 hectare, while a good proportion (56.67%) of them had farm land of between 1 and 2 hectares. The mean farm size of the respondents is 1.47 hectares. This is a clear indication that the farmers in the area operate mostly on small scale farm land. This result is in agreement with the observation of Onumadu (2009) that most farmers in the rural area generally have small holdings.

Table 1: Socio-economics of Small Holder Arable Crop Farmers

Variables	Frequency	Percentage
Gender		
Male	48	40.0
Female	72	60.0
Age		
21-30	13	10.83
31-40	34	28.33
41-50	29	24.18
51-60	25	20.83
61 and above	19	15.83
Mean	47.31	
Marital Status		
Single	14	11.67
Married	81	67.50

Widowed	23	19.17
Divorced	2	1.67
Household Size		
1-4	71	59.17
5-8	40	33.33
9-12	9	7.5
Mean	4.12	
Educational Level		
No formal Education	14	11.67
Primary Education	23	19.17
Secondary Education	62	51.67
Tertiary Education	21	17.5
Primary Occupation		
Farming	87	72.50
Petty trading	17	14.17
Civil Service	6	5.0
Artisan	10	8..83
Farm size		
<1	33	27.50
1-2	68	56.67
3-4	19	15.83
Mean	1.47	
Total	120	100.00

Source: field survey, 2014

Composition of Income pattern of small holder arable crop farmers

Table 2 shows the income pattern and how much different income sources contribute to total farmers' income in the sample. The analysis provides background information on the amount and sources of income earned by an average small holder farmer. The results indicate that all small holder farmers derive income from farming, which however, only accounts for more than half (74.58%) of total income on average. The other income (25.42%) is derived from different off-farm sources. Crop farming, which is mainly subsistence in nature, is by far the most important single source of income for the farm households, providing about 49.87% of total income. Despite the growing skepticism on the role of agriculture for reducing poverty among rural household, this result shows that, it remains the major source of rural household income.

A low proportion of the farmers derive income from livestock enterprises, income from this source is only 24.69% of total income. This suggests that the type of livestock activities is small-scale, mostly extensive free range backyard type. Also, a good number of the small holder farmers in the study area receive income from off-farm sources, and self-employed income is the most important, accounting for 6.62% of total income and 26.17% of off-farm income. Self-employed income is mainly derived from handicrafts, food processing, shop-keeping and other local services, as well as trade in agricultural and non-agricultural goods.

However, 24.40% of the farmers participated in non-agricultural wage activities, but this source only contributes 6.20% to total income. The non-agricultural wage employment includes formal and informal jobs in construction, manufacturing, education, health, commerce,

administration, and other services. The smaller contribution of non-agricultural wage income to total income could be because of the little educational and professional qualification of the farmers, which reduce their earning from available non-agricultural activities.

Even though more than half of the respondents have land, only about 12.18% receive income from supplying agricultural wage labour, which accounts for about 3.10 % of total income. The phenomenon by which landed farmers – as oppose to landless farmers, participate in supplying wage labour is not common in the study area. The reasons for this include the need to earn cash income to meet urgent financial need, reduce income risks and finance farm expansion (Reardon, 1997). Another important income source comprises capital earnings and pensions, contributing 8.45% to total income. Meanwhile, 4.01% of the households receive remittances from local and international sources, but it contributes only 1.02% to total income. Given that a smaller proportion of the households receive remittance income, which contribute a smaller share of total income, it is the least important income sources for the farmers in the study area. It would be risky for poor farmers to rely on this income source. Moreover, it depends more on the economic situation of the givers.

Considering the total income of households participating in the various income activities, the results show that the farmers participating in crop production and other income activities (such as capital earnings and pensions) receive the largest total farm (₦41151.26) and total off farm (₦ 6970.59) monthly income respectively per adult equivalent. This indicates that crop production and other income sources activity is the most remunerative activities in the area. However, because establishing self-employed business require initial investment, rural farm households that are disadvantage in terms of financial capital, will be constraint from reaping the potential benefit of self-employed activities.

Table 2: Income pattern of small holder arable crop farmers

Income pattern	Mean income per capita (₦)	Share of total Income (%)	Participation rate (%)
Total household income	82497.59	100	-
Total farm income	61527.01	74.58	-
Crop income	41157.26	49.89	66.89
Livestock income	20369.75	24.69	33.12
Total off farm income	20970.58	25.42	-
Agric wage income	2554.62	3.10	12.18
Non-Agric wage income	5117.65	6.20	24.40
Remittance	840.34	1.02	4.01
Self employed	5487.39	6.62	26.18
Other income (capital earnings and pension)	6970.58	8.45	33.24

Source: field survey, 2014

Composition of Savings Avenue of Small Holder arable crop Farmers
Table 3 shows various avenues in which farmers in the study area made their savings. From the result it was discovered that majority of the farmers made their savings in their self help group which is the case of most women farmers and accounted for 24.17% of the entire farmers

that made savings with an annual average savings of about ₦85660.89.Also a good proportion (20.83%) of the respondents saved their money with Isusu collectors which accounted for an annual average savings of ₦34264.36. However, 12.6% of the farmers made their savings in the bank with an average savings of ₦42830.45.meanwhile, 11.67%, 9.17%, 8.3% and 13.33% others made their savings in their respective homes, Cooperative thrift and credit society, through Relative/Friend/Neighbour and in Rotating savings and credit association (ROSCAs) respectively. This is a clear indication that majority of the farmers made their savings in informal financial sector. This is in line with the view of Odoemenem, *et al.,* (2013) that farmers make use of informal financial sectors to mobilize savings and develop their rural communities because it gives them access to loans that they cannot get from formal financial institutions due to lack of collateral.

Table 3: Savings Avenue of small holder arable crop farmers

Avenue	Frequency[+]	Percentage[+]	Average savings
Bank	15	12.6	42830.45
Home	14	11.67	36711.81
Cooperative thrift and credit society	11	9.17	30233.26
Self help group	29	24.17	85660.89
Relative/Friend/Neighbour	10	8.3	34264.36
Isusu collectors	25	20.83	64254.68
Rotating savings and credit association (ROSCAs)	16	13.33	51396.53

Source: field survey, 2014
[+] *Multiple responses*

Disposable income and volume of savings

Table 4 shows the disposable income and volume of savings made by the farmers in the study area. 33.33% have a disposable income level of between ₦40,000 to ₦59,000 while 10.83% have disposable income level of ₦80,000 and above. Also According to the result presented in the Table, 30.0% of the respondents had savings volume of less than ₦20,000, and 24.17% of them had saving volume of between ₦40,000 to ₦59,000 while the a few (15.83 %) had saving volume between ₦60,000 and above. The rest 10.8% did not save at all, due to insufficient income.

Table 4:   Annual disposable income and volume of savings of small holder arable crop farmers according

Category (₦)	Disposable Income Frequency	Percentage	Category(₦)	Volume of Savings Frequency	percentages
< 20,000	18	15.0	No savings	13	10.83
20,000-39,000	31	25.83	< 20,000	36	30.0

40,000-59,000	40	33.33	20,000-39,000	23	19.17
60,000-79,000	16	13.33	40,000-59,000	29	24.17
80,000 and above	13	10.83	60,000&above	19	15.83
Total	120	100.00			
Minimum income ₦	15000		Minimum savings		9700
Maximum income	150000		Maximum savings		115000
Mean	36357.35		mean	293671	
Standard deviation	120448.1		Standard deviation	987667.3	

Source: field Survey, 2014

Enterprise Dimension and amount invested

The enterprise dimension of the farmers and the average amount invested is shown in Table 5. The result indicates that 28.33% of the respondents were into arable crop production while 15.83% of the farmers diversified into other dimensions like establishment of other farm enterprises such as: heliculture, bee keeping, and tree cropping. 16.67% and 26.67% of the farmers were into poultry and livestock farming respectively. According to the result presented in the Table 4.11, the highest average amount invested in crop production by the farmers was ₦654, 345.09. Similarly, ₦497,098.65, ₦340,223.15 and ₦411,907.34 were invested in poultry, livestock farming and fisheries respectively by the farmers while other farm enterprise such as bee keeping, heliculture among others attracted an average investment amount of ₦299.445.88. This means that most of the farmers applied the fund saved in crop and livestock production which were mostly sheep, goat and pig because of high productivity and income.

Table 5: Distribution of Respondents on Type of Farm Enterprise and average amount invested

Enterprise	Frequency	Percentage	Average Amount invested (₦)
Crop production only	34	28.33	654,345.09
Poultry	20	16.67	497,098.65
Livestock	32	26.67	340,223.15
Fisheries	15	12.5	411,907.34
Others (apiculture, heliculture etc)	19	15.83	299.445.88
Total	120	100	

Source: field Survey, 2014

Determinants of income of small holder arable crop farmers

The multiple regression model results of the factors influencing the income of rural women farmers in Abia State, Nigeria is presented in Table 6. All the functional forms were significant at given levels implying that any of the functional forms can be used for predictive purposes. However, the farm income of the small holder farmers was best estimated using the Exponential functional form, which explained 98.28% of the total variation in the income level

of the farmers in the study area at 1.0% risk level. The F-ratio (801.70) was significant at 1.0% which attests to the overall significance of the regression result.

Specifically, the coefficient (0.0978664) of age was positive and highly significant at 1.0% probability level. This shows that an increase in age of the small holder farmers would stir up increase in farm income. The magnitude of the increase in income level as a result of a unit change in the age of farm households is 0.10%. This is contrary to a priori expectation. It is likely that the older farm households in the study are still economically active with high income earning opportunities and have made several income generating investments which accounted for the posture of this result. Meanwhile, this result is contrary to Omonona (2009) who opined that at the early stage of life, earnings rise before gradually declining in later years. He further noted that this is usually the case for households who are into energy-sapping occupations like farming. The ability to work large farms with crude implements declines with age. So as age increases, income shrinks, which automatically reduces per capita expenditure.

The coefficient (0.660254) of educational level made positive contribution to the equation and is statistically significant at 99.0% confidence level. The implication is that as the educational level of the small holder farmers increases, income likewise increases. This is in consonance with *a priori* expectation. The level of literacy would enable the farmer to be able to adopt modern method of better farming. This agrees with Ezeh (2007) that the ability to read and write would enable farmers to utilize effectively and efficiently available farm resources. Good farm management (proxy of educational level) will result in high yield which in turn results to increased income (Onyebinama, 2004).

In terms of primary occupational dichotomy (farming/non-farming), as an individual primarily engages in farming, the income also increases. The validity of this statement is evident from its positive coefficient (0.7504221) which was statistically significant at 1.0% alpha level. This result is not in conformity with *a priori* expectation and with Olawuyi and Adetunji *(2013)* that income of households that engage primarily in farming is lower than those that involve primarily in non-farming. However the posture of this result may be attributed to the increasing return to labour in farming compared to what non-farm work offers in the study area

The coefficient of farm size (0.5361972) was positive and statistically significant at 1.0% α level (P< 0.01). This indicates that an increase in farm size leads to an increase in income of the small holder farmers. The sign of the coefficient conforms to *a priori* expectation. This result is in tandem with Onwuka (2005) and Oputa (2005) that the larger the farm, the more quantities of inputs that would be needed in the farm, hence greater investment expenditures and income. This result is expected because large farm size leads to gains known as economic of scale (Onyebinama, 2004). Meanwhile, this finding contradict Anyiro and Oriaku (2011) that suggest efficiency in the use of land rather than expansion of cultivated areas as a necessary requisite that could increase farmers income.

Small holder farmers' access to farm credit gave a positive coefficient (1.382555) and was highly significant at 1.0% alpha level, indicating that an increase in farmers' access to farm credit would increase farm income. The sign identity of this variable makes sense for this study and conforms to *a priori* expectation. Access to credit have been identified as an important factor in farm business and useful in funding transaction cost for farm wage activities (Ibrahim and Srinivasan, 2013). It also regarded as one of the key elements in raising productivity and income (DBSA, 2005).

An Increase in the adult equivalent household size would increase the total farm income of small holder farmers. This was made possible by the statistical significant (1.0% alpha level) and positive (0.1452402) coefficient of household size. This is in agreement with *a priori* expectation. Increase in household size has implication on farm labour supply which minimizes the amount spent on hired labour and as well maximizes profit.

Table 6: Multiple Regression Estimates of Factors influencing the income of small holder farmers in Umuahia Capital Territory of Abia State, Nigeria

Variable	Linear	Functional Exponential+	Forms Semi-Log	Double-log
Constant	-38133.25 (-1.02)	7.942327*** (13.22)	46285.22 (0.40)	6.885725*** (4.59)
Age	-143.6695 (-0.21)	0.0978664*** (7.01)	-2088.397 (-0.10)	0.7758773** (2.23)
Education	3964.413 (0.67)	0.660254*** (5.33)	18329* (1.74)	0.1291195 (0.61)
Farming Experience	-1294.469 (-1.46)	-0.0229304 (1.04)	-8046.671* (-1.77)	-0.1393655 (-1.39)
Household size	2586.816 (1.25)	0.1452402*** (2.88)	23020.01* (1.84)	0.1895723 (0.73)
Access to credit	16363.13* (1.50)	1.382555*** (5.84)	19124.71 (0.74)	0.1380492 (0.57)
Farm size	21758.97*** (5.88)	.5361972*** (5.89)	35268.19*** (5.21)	0.8744072*** (8.58)
Occupation	19672.35*** (2.83)	0.7504221*** (4.68)	51818.26 (1.36)	0.4578355** (2.12)
Membership of cooperative society	-14252.72 (-1.34)	.0197044 (0.12)	-23051.07 (-1.15)	-0.0305913 (-0.13)
Amount invested	.000862 (0.04)	3.02e-07 (0.53)	389.9551 (0.07)	0.0232259 (0.33)
R^2	0.2788	0.9828	0.5544	0.5306
Adjusted R^2	0.2198	0.9816	0.5083	0.4814
F-value	4.72***	801.70***	12.03***	10.80***

Source: field Survey, 2014.
***, **,*: variables statistically significant at 1.0%, 5.0% and 10.0% risk levels respectively.
Figures in parenthesis are t-ratio.; + = lead Equation

Determinants of savings of small holder arable crop farmers

The estimated savings function is shown in Table 7. The Exponential function was chosen as the lead equation because it exhibited better diagnostic test statistics than other models. The R^2 of the lead equation indicates that, about 95.26 percent of variability of farmers' saving is attributed to the specified explanatory variables in the model. This shows that, the specified explanatory variables were important determinants of household saving among respondents. The F-statistic value of 207.08 is statistically significant at 1 percent probability level, suggesting that the R^2 is significant and the estimated linear regression equation has goodness of fit.

The empirical results show that farmers' income has a significant positive effect (at 1.0% significance level) on the amount saved. This is in agreement with Keynesian postulates that relate income positively to savings and the Friedman permanent income hypothesis. This implies that as the farmers income increases, the tendency to save increase too. The hypothesis asserted that household will spend their permanent income while the transitory income is channeled into saving with marginal propensity to save approaching unity. The result indicates that, a naira increase in monthly income of the farmers will result to 1.0308 naira increase in saving. Similar result has also been obtained by Adeyemo and Bamire, (2005); Ayanwale and Bamire, (2000); Harris *et al*., (1999) in Australia; Horioka and Junmin (2007) in China; Abdelkhalek *et al.*, (2009) in Morocco and Kibet *et al.,*(2009) in Kenya.

Household size has a significant positive coefficient (0.2230169) (at 10.0% significant level) on savings of small scale farmers. This implies that, a farmer with a large household will likely save more of his income. This is contrary to a priori expectation. It may be likely that the farm households in the study area have adult and economically active household members. A farmer with large economically active household members will likely save more of his income, since he will not solely provide for the household. This also implies a lower well-being for a farmer with a larger household size.

Education had a significant positive effect (0.7451883)) on saving of small holder farmers in the study area at 5.0% significant level. This means that saving is predominant among farmers who have some form of formal education. About 75.0% of our respondents have some levels of formal education: this suggests that they can access financial facilities, adopt improved technology in their farming activities including easy movement from one job to another to increase their aggregate monthly income. These have the tendency to increase savings, since income is positively related to saving. The result indicates that, educated farmers will likely save 0.75% of their income every month from his total or aggregate monthly income. Orebiyi, (2005) had reported similar result. However, Rehman *et al.,* (2010) in a study conducted in Pakistan reported a contrary result.

The coefficient (0.085175) of Age was positive and statistically significant at 1.0% risk level, implying that the amount saved by small scale farmers increases with increasing age. This consolidates the findings of Attanasio and Szekely, (2000) who found that savings capacity is enhanced as age tends to rise. Old people tend to be more frugal and thrifty.

The coefficient (1.535702) of farmers' access to credit made a positive contribution to the equation and was significant at 1.0% alpha level. This implies that farmers with access to farm credit had increased savings. This conforms to a priori expectation because credit is regarded as one of the key elements in raising productivity and income (DBSA, 2005) which in-turn enhances savings.

Table 7: Multiple Regression Estimates of Factors influencing the amount saved by small holder   farmers in Umuahia Capital Territory of Abia State, Nigeria

Variable	Linear	Functional Exponential+	Forms Semi-Log	Double-log
Constant	367087.8	11.85038***	-62795.45	-1.78e-14*
	(1.02)	(10.58)	(-0.15)	(-1.70)
Age	1995.186	0.085175***	56849.59	0.6806051
	(0.96)	(3.72)	(0.81)	(0.98)
Education	11648.19	0.7451883***	24772.23	-0.0240553
	(0.69)	(3.64)	(0.51)	(-0.05)
Farming Experience	-489.889	0.0108392	2362.279	0.0348408
	(-0.19)	(0.30)	(0.10)	(0.15)
Household size	6587.315	0.2230169***	61985.87	0.6952989
	(1.06)	(2.68)	(1.03)	(1.22)
Access to credit	-20740.87	1.535702***	-55142.1	-0.1940062
	(-0.64)	(3.86)	(-0.95)	(-0.35)
Farm size	-5779.112	0.0969901	10983.79	-0.3398725
	(-0.45)	(0.58)	(0.35)	(-1.10)
Occupation	-13900.82	0.0155195	-38225.05	-0.4193066
	(-0.67)	(0.07)	(-0.73)	(-0.85)
Membership of cooperative society	-1747.91	0.2844927	-15290.25	-0.6138536
	(-0.05)	(0.66)	(-0.27)	(-1.16)
Annual farm income	-0.0335963	1.030856***	-34376.86	0.205384
	(-0.11)	(7.07)	(-1.45)	(0.91)
Expenditure	0.1804892	5.51e-06	11607.68	0.3550777**
	(0.45)	(1.00)	(0.71)	(2.24)
R^2	0.1350	0.9526	0.1675	0.9745
Adjusted R^2	0.0418	0.9480	0.0635	0.9710
F-value	0.1634	207.08***	1.61	274.49***

Source: field survey, 2014.
***, **,*: variables statistically significant at 1.0%, 5.0% and 10.0% risk levels respectively.
Figures in parenthesis are t-ratio.
+ = lead Equation

Determinants of Farm Investment of small holder arable crop farmers
The estimated determinants of farm investment by small scale farmers in Abia State were summarized and presented in Table 8. Based on statistical and econometric considerations, the

double-log functional form was chosen as the lead equation. The coefficient of determination (R^2) is 0.9889, implying that the explanatory variables accounted for about 98.89% of the change in the amount invested in farming. The overall significance of the model was measured using F-test, which has a value of 803.15 which is significant at 1.0% risk level.

Specifically, the coefficient (1.359314) of age was positive and statistically significant at 99.0% confidence level. This implies that age has direct influence on the farm investment, as increase in age of farmer increases the amount invested in farming. Ibrahim and Srinivasan (2013) supported this assertion that rural households' likelihood to invest in farm activities increases as they grow older. This outcome may be due to the farming experience gathered over the years. Due to the risk and uncertainty associated in farming younger people with less farming experience invested much fund in non-farming enterprise.

The coefficient (0.2577418) of years of experience in farming had a statistically significant and positive effect on the amount invested in farming. This implies that investment amount in farming increases among farmers within some range of years of farming experience. This could be explained by the fact that small holder farmers who are highly experienced in farming and most likely older farmers are not very active economically to invest on non-farm enterprise investment opportunities. They therefore prefer to depend and invest on farming only. Thus implying that as individuals increases his farming experience through training and learning, his investment in farming likewise increases. This affirms the earlier finding of Bosma, *et al.* (2009) who deduced that having had experience in farming increases investment amount in such enterprise. The marginal effect value for years of experience in farming was statistically significant at 5.0% significance level.

The coefficient (0.2559074) of farm income per capita was significant and positive. The marginal effect value for farm income per capita was statistically significant at the 10.0% level. This implies that an increase in farm income of the small holder farmers will stir up increased amount invested in farming. Small holder farmers with higher levels of income have a higher tolerance for risk. Hence, they are most likely to invest more funds in farming. Limited financial resources at the disposal of farmers act as barriers to entry in farm enterprise investments. This outcome contradicts the findings of Oseni and Winters (2009) who reported in their studies in Nigeria that households with increased farm income are more likely to diversify and invest more fund in off-farm income generating activities, hence undertake off-farm work.

The coefficient of farm size (-0.499369) is negative and statistically significant at 5.0% α level. This indicates that an increase in farm size leads to decrease in the amount invested in farming. Although the negative coefficient of farm size is at variance with *a priori* expectation, it suggests efficiency in the use of land rather than expansion of cultivated areas as a necessary requisite that could increase the capital invested in farming. This result is expected considering the small scale nature of the farmers in the study area. This result disagrees with Onwuka (2005) and Oputa (2005) that the larger the farm, the more quantities of inputs that would be needed in the farm, hence greater investment expenditures and income.

Table 8: Multiple Regression Estimates of determinants of farm investment by small holder   farmers in Umuahia Capital Territory of Abia State, Nigeria

	Functional	Forms

Variable	Linear	Exponential	Semi-Log	Double-log+
Constant	40646.85 (0.27)	10.91232*** (16.41)	-138546 (-0.21)	10.39314*** (3.64)
Age	3265.926 (1.41)	0.1386549*** (7.22)	52789.12 (0.52)	1.359314*** (2.79)
Education	17899.93 (0.89)	1.170292*** (6.31)	-5408.229 (-0.08)	0.4839591 (1.44)
Farming Experience	-3812.515 (-1.00)	-0.0040525 (-0.12)	-17574.2 (0.50)	-0.0101653 (-0.06)
Household size	1275.721 (0.15)	0.1286213** (2.38)	-61309.2 (-0.69)	0.2513563 (0.60)
Access to credit	24543.54 (0.60)	1.803796*** (6.16)	25311.57 (0.31)	0.2065713 (0.53)
Farm size	-17052.68 (-0.96)	0.0521208 (0.31)	-60170.08 (-1.30)	-0.499369** (-2.27)
Savings	-0.0151787 (-0.10)	1.62e-07 (0.05)	-25018.18 (-1.46)	0.044764 (0.55)
Annual farm income	-0.0521564 (-0.53)	2.45e-07 (0.05)	12442.17 (0.37)	0.2559074* (1.60)
Expenditure	.1946495 (0.33)	7.39e-06 (0.99)	22809.55 (0.93)	.2577418** (2.20)
R^2	0.2859	0.9696	0.3193	0.9889
Adjusted R^2	0.2241	0.9669	0.2437	0.9877
F-value	4.63***	7767.71***	4.22***	803.15***

Source: field survey data, 2014.
***, **,*: variables statistically significant at 1.0%, 5.0% and 10.0% risk levels respectively.
Figures in parenthesis are t-ratio.
+ = lead Equation

Challenges of Saving and Investment
The constraints identified by the respondents that inhibit their attempt to save and invest as small holder farmers are shown in Table 9. The respondents identified several constraints to their inability to put part of what they earn aside for use in the future. The main constraint to the small holder farmers' inability to save is inadequacy of income which was identified by 74.17% of the respondents. According to this category of respondents, their incomes are not able to meet their needs let alone some being left for savings. They conceded that though they always try and wish to save, they are unable to do so due to their limited incomes. Remoteness of banks (50.83%) was also found to hinder the small holder farmers saving abilities. Another hindrance to the small holder farmers' ability to save also has to do with the fear that their monies will not be safe if they save it in both formal and informal forms. Some of them

(55.83%) mentioned that people may abscond with their savings or thieves may enter their homes and make away with their savings. Pressure from the extended family as well as members of the society at large were also identified by another 45.0% of the respondent as constraining their ability to save money. A significant number (36.67%) of the respondents also identified their own inability to manage their financial resources very well as a constraint to their savings abilities. Factors such as high bank charges (30.83%), delays and congestions at the banks (20.83%), another 25.83% of the respondents also mentioned sickness as a hindrance to their ability to save money. According to these people, constant illness depletes any money that they may have and may want to put aside for future use.

Table 9: Constraints of savings and investment by small holder farmers in Umuahia Capital   Territory of Abia State, Nigeria.

Constraints	Frequency*	percentages
Inadequate income	89	74.17
Sickness	31	25.83
Fear of safety of their income	67	55.83
Family and societal demand	54	45.0
Misuse of money	44	36.67
Remoteness of bank	61	50.83
High bank charges	37	30.83
Delay and congestions at banks	25	20.83

Source: field survey, 2014
* Multiple responses recorded

CONCLUSION AND RECOMMENDATION

The research has shown that farmers participating in crop production and self-employed activities receive the largest total farm and total off farm monthly income. The most preferred savings outlets of small holder farmers in the study area were the informal savings outlets mainly the mutual help groups with an annual average savings of about ₦85660.89. Meanwhile, a good proportion of the farmers had a disposable income level of between ₦40, 000 and ₦ 59, 000 and had savings volume of less than ₦20, 000. It was evident from the research that respondents invested more fund in arable crop production and invested an average amount of ₦654, 345.09. There is the propensity to save and invest among farmers in Umuahia capital territory of Abia State, Nigeria, in spite of low income.

There are factors that have positive influence on saving and investment behaviour of small holder arable crop farmers surveyed such as level of income, household size, education, age, and access to credit, farming experience, farm, educational level, farm size. Meanwhile, the OLS results of the estimated determinants of farm income with double-log functional form as the lead equation shows that age, educational level, occupation, farm size, access to credit and household size had significant positive influence on small holder farmers' income at varied risk levels. The main constraints to the small holder farmers' inability to save are inadequacy of income, sickness and fear of safety of their income.

Given the significance of the income factor in terms of both savings and investment, incentives such as improved technology, appropriate farm support services, medium and long term loans should be provided by the government and other bodies to farmers in order to boost their

income level. Only then can the savings being accumulated in the rural economy be transformed into productive investment that will enhance or uplift their present standard of living.

Worker depended also on off-job (farm or non-farm) income, as such farm level policies which remove agricultural production constraints will increase the workers income and encourage saving among workers.

To improve saving among small holder farmers in Nigeria, policies on tax rate reduction and free or subsidized education are strongly advocated. These will reduce their expenditure and subsequently increase their aggregate monthly income, which is positively related to saving. Policies that reduce household size will improve savings of agro-based workers in the region.

Finally, small holder farmers should be encouraged to form cooperative societies to enable them access credits from banks as this will encourage the accumulation of social capital in form of savings.

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