

Determinants of Rural Household Savings in Ethiopia: The Case of East Hararghe Zone, Oromia Regional State

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The study was sponsored by Swedish International Development Cooperation Agency (SIDA) in collaboration with Haramaya University.

ABSTRACT

Saving is undeniably considered as a strategic variable in the theory of economic growth determining both individual and national wellbeing. However, saving level in Ethiopia particularly in rural areas is very low and little is known empirically about its patterns and determinants. Therefore, this study tries to assess the saving behaviors among rural household in East Hararghe Zone, Oromia Regional State, Ethiopia using survey data generated from 700 sample households. The results of this study show that 79.2% of the entire sample households had savings during the survey time. From the tobit model used for analysis, nine variables, namely household head education level, livestock holdings, access to credit service, income, investment, training participation, contact with extension contacts, forms of savings and saving motives were found to have significant influence on the amount of households savings. The results of the study shows that rural households do save irrespective of their low income mainly in informal saving institutions showing high request for accessibility potential for formal saving institutions.

Key words: Rural household savings, Patterns of savings, Oromia, East Hararghe Zone

1. INTRODUCTION

Saving is among important variables for economic growth of any country. Saving is about income that is not consumed by immediately buying goods and services (Prinsloo, 2000; Manyama, 2007). Saving constitutes the basis for capital formation, investment and growth of a country (Nga, 2007; Nwachukwu and Odigie, 2009).

According to Deaton (2005) and Rogg (2006) serious problem confronting poor countries including Ethiopia is the savings and investment gap. Because of this gap, these countries find it difficult to finance investments needed for growth from domestic saving. It is also common to see these countries to finance their investment in the short run partly through domestic government borrowings and/or foreign loan and grants but this would significantly increase the country's debt burden and would not be a solution in the long run.

However, both economic variables are not emphasized as a major variable for interventions for overall development in Africa in general and Ethiopia in Particular. This is the case mainly because of, first, most of the studies carried out in the field have focused on developed economies and unable to show the ground reality in poor developing countries. Second, most of these studies adopted a macroeconomic approach yet the behavior of economic units on the aggregate level may not necessarily be the same as on an individual or household level. And third, even the existing limited empirical research results in Africa related to rural household savings and investment are varied and inconclusive (Zhu, 2004; Nga, 2007).

The saving level in Ethiopia particularly in rural areas is very low and little is known empirically about its patterns and determinants. Savings in rural Ethiopia is mainly made out of the income from agricultural activities. It is also characterized as seasonal and irregular as the cash flow through sale of agricultural produce and availability of work is seasonal. This reduces their financial capacity to save or poorly respond to incentives that promote savings in the country (Dejene, 2003; EEA, 2009; EEA, 2009). However, rural households do indeed save in the form of tangible assets and/or in financial forms which can be potentially utilized by savings institutions and for investments which is very essential for both households and national wellbeing (Dimova and Sen, 2010; Karlan and Morduch, 2010).

Therefore, this study tries to analyze major determinants of savings behavior of rural households which has been less addressed in Ethiopia, with particular reference to East Hararghe Zone using microeconomic evidences.

2. REVIEW OF LITERATURE

Household savings is defined as that part of current income, after the payment of direct taxes, which is not consumed or transferred for future consumptions. Saving includes current disbursements made in the form of a reduction in household liabilities, such as repayment of loans. By contrast, any portion of the current expenditure of households not financed by current income but rather by the use of credit represents an increase in the financial liabilities of individuals and is treated as negative saving. In addition, household saving includes regular and recurring employer and employee contributions to pension and insurance funds and the interest earned on those funds. Saving is also defined in terms of flows in the current account and excludes any capital gains and losses (Schultz, 2005; Nga, 2007; Cronje, 2009).

There are some theoretical models in the literature which explains different determinants of savings and asset accumulations (Schultz, 2005; Nga, 2007; Rijckeghem and Ucer, 2009). Keynesian model explains that the motive behind savings is the desire to bequeath an estate. Disposable income is taken as the major determinant of individual savings in which People with a low income considered to be unable to save (Schultz, 2004; Nga, 2007; Rijckeghem and Ucer, 2009). In neoclassical economic theory, individuals are assumed to be rational beings who can respond in predictable ways to changes in incentives. Individual utility is usually assumed to be a function of consumption, and savings are often treated by residual of resources that remain after consumption (Beverly *et al.*, 2003; Cashell, 2009; Rijckeghem and Ucer, 2009).

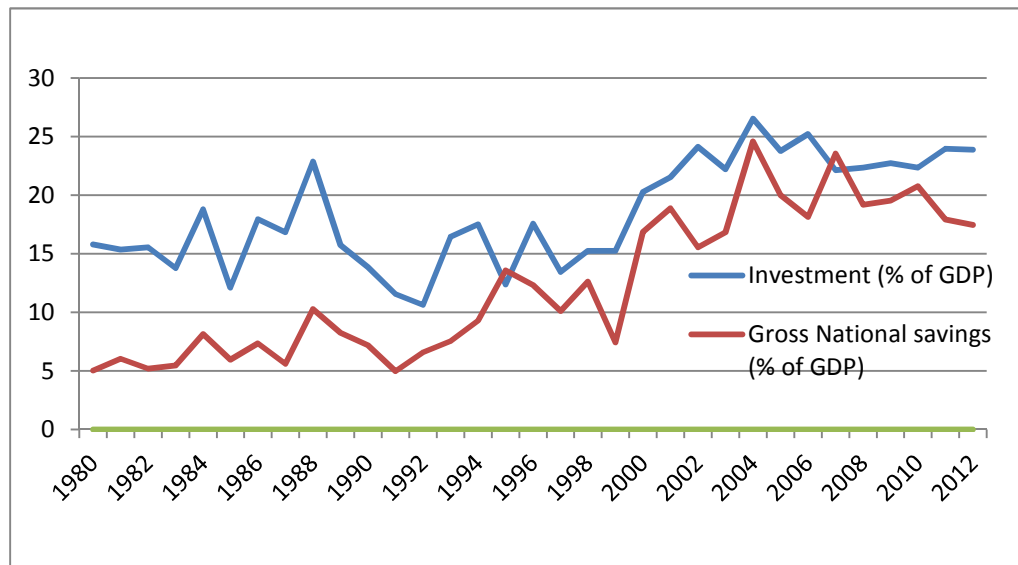
However, these theories were initially developed for developed economies and unable to explain the economy and the feature of households in developing countries as they have different characteristics (Schultz, 2005; Nga, 2007). According to Zhu (2004), some of the peculiar features of household's savings in developing countries in general and their rural areas in particular are; large household size, agriculture as a major source of income and most households live in abject poverty.

Many researchers indicate that many rural households in developing countries, particularly in Africa, are too poor to save (Rutherford, 2000; Robinson, 2001; Devaney *et al.*, 2007). However, as Coleman and Williams (2006) stated, the poor do save even though they do not have complete access to savings facilities in formal financial institutions. Instead, they use informal institutions for their savings. These include livestock, crop products, housing materials, farm equipments, and some other precious metals like jewelry.

Low saving has been a dominant feature of the Ethiopian Economy. As shown in figure 1, the average share of gross domestic savings and investment from GDP was 12.4 and 18.5 percent which is very low even to the standard of developing countries, respectively. At household level, irrespective of small size, rural households in Ethiopia do save in many ways, as

individuals or in a group. They usually save in kind mainly in food-grains or in livestock (Dejene, 2003).

Figure 1: Gross national savings and investment trends in Ethiopia



Source: EconomyWatch.com's Econ Stats database.

Generally, this brief review of the empirical literature revealed that there are different factors that affect household savings. Most of these empirical studies focus on aggregate national savings and urban centered using macro data. Thus, this study attempted to identify major micro level determinants of household savings in rural areas to fill the existing research gap.

3. RESEARCH METHODOLOGIES

3.1. Background and sampling methods

The study was carried out in East Hararghe zone of Oromia regional state of Ethiopia. The zone is geographically located between $7^{\circ}32'$ - $9^{\circ}44'$ North latitude and $41^{\circ}10'$ - $43^{\circ}16'$ East longitudes characterized by Plateaus, rugged dissected mountains, deep valleys and plains. It has a total population of 2,723,850 of whom 50.8 per cent are men and 49.2 per cent are women with population density of 151.87 persons per km^2 and unevenly distributed. Of the total population of the zone 87.4 per cent, 12.6 per cent, and 1.11 per cent are residents of urban, rural and pastoralists, respectively (CSA, 2010).

700 sample respondent households were used which was determined based on the simplified formula developed by Yamane (1967) at 95 per cent confidence level, 0.5 degree of variability and 95 per cent level of precision. A multistage sampling technique and probability proportional to size (PPS)¹³ random sampling technique was used to select respondent households.

¹³ The PPS is used to determine proportional allocation under which the sizes of the samples from the different cluster are kept proportional to the sizes of the cluster (Kothari, 2004)

3.2. Model Specification

Descriptive statistics were used to describe, compare, and contrast various data collected from the households with respect to the desired characteristics (Kothari, 2004). To analyze major determinants of household savings, Tobit Model (Tobin 1958) was used (Equation 1). This model was chosen because amount of household savings tend to be censored at the lower limit of zero (Gujarati, 2007).

The tobit model specification is given as follows

$$Y_i^* = X_i\beta + \mu_i, \quad i = 1, 2, \dots, n \quad (\text{Equ. 1})$$

$$\begin{aligned} Y_i &= Y_i^* \quad \text{if } Y_i^* > 0 \\ &= 0 \quad \text{if } Y_i^* \leq 0 \end{aligned} \quad (\text{Equ. 2})$$

Where:

Y_i : the observed amount of household savings
 Y_i^* is the latent variable which is not observed
 β is Vector of unknown parameters
 X_i is vector of independent variable affecting household savings. These were Sex of household head, age of household head, education level of household head, dependency ratio, land holdings, livestock ownership, credit access, income source of households, annual income, annual expenditure, annual investment, distance to the nearest formal financial institutions, training participation, contacts with development agents, media access, saving institutions, and saving motives.

The threshold value in the above model is zero. The model parameters are estimated by maximizing the tobit likelihood function of the following form (Maddala, 2005; Gujarati, 2007).

$$L = \prod_{Y_i^* > 0} \frac{1}{\sigma} f\left(\frac{Y_i - \beta_i X_i}{\sigma}\right) \prod_{Y_i^* \leq 0} F\left(\frac{\beta_i X_i}{\sigma}\right) \quad (\text{Equ. 3})$$

Where f and F are the density probability function and cumulative distribution function of Y_i^* , respectively. $\prod_{Y_i^* \leq 0}$ Means the product over I for which $Y_i^* \leq 0$, and $\prod_{Y_i^* > 0}$ means the product over those I for which $Y_i^* > 0$.

Decomposition techniques were used to analyze the effects of explanatory variables on the probability of household savings.

1. Change in the probability of gain in independent variable X_i changes is

$$\frac{\partial F(z)}{\partial X_i} = f(z) \frac{\beta_i}{\sigma} \quad (\text{Equ. 4})$$

2. The marginal effect of an explanatory variable on the expected value of the dependent variable is:

$$\frac{\partial E(Y_i)}{\partial X_i} = f(z) \beta_i \quad (\text{Equ. 5})$$

Where, $Z = \frac{\beta_i X_i}{\sigma}$ (Equ. 6)

3. The change in intensity of dependent variable with respect to a change in an explanatory variable among the saving category:

$$\frac{\partial E(Y_i / Y_i^* > 0)}{\partial X_i} = \beta_i \left[1 - Z \frac{f(z)}{F(z)} - \left(\frac{f(z)}{F(z)} \right)^2 \right] \quad (\text{Equ. 7})$$

$F(z)$ is a cumulative normal distribution of z , $f(z)$ is the value of the derivative of the normal curve at a given point (i.e. unit normal density), Z is the zero score for the area under the normal curve, β is a vector of tobit maximum likelihood estimate and σ is the standard deviation of the error term.

Prior to running the above specified models, all dependent variables were checked for the existence of data problems mainly multicollinearity problem, heteroscedasticity problem, and endogeneity problem.

4. RESULTS AND DISCUSSION

4.1. Saving performances of households

House hold savings is value deposited at the time of survey by households. Farmers usually save from their proceeds for consumption smoothing purposes throughout the year, accumulation of wealth, and for contingency purposes in case of bad harvest or accident. According to the survey data, results revealed that 79.2% of them had savings and the rest not. Among surveyed households, the average amount of household savings was 11365.3 Birr with standard deviation of birr 19900.5. The lowest saving level among the savers was 100 Birr and the highest reaches 236000 Birr.

4.2. Household characteristics of the sampled respondents

The average age of household heads was 38.76 years with the minimum and maximum ages of 19 and 80 years with standard deviation of 11.528 years, respectively. The survey result showed adult household heads were better in savings performance as compared to young and old household heads. On the other hand, the average family size of the sample households was 6.46 which was higher than the national average of 5 persons (CSA, 2010). The largest family size was 13 and the smallest was 1.

Among the total sampled household, the proportion of male-headed and female-headed households with savings was 509 (74.7%) and 20 (95.2%) respectively. This indicates that female headed households were relatively better in their saving status than male headed households. The chi-square test ($\chi^2=4.608$, $p\text{-value} = 0.032$) revealed that there is statistically significant difference between male-headed and female-headed households in their saving.

The educational status of households in the study area was considerably low. Most of these household heads had no formal education and are illiterate. From the total sample household heads about 349 (49.7%) of the household heads were illiterate i.e., they do not have both writing and reading ability either in their mother tongue or any other language. The average educational attainment of household head was less than one years of schooling.

The result indicated that household heads with primary education (grade 1-4) category are relatively better (about 81.5 % of households has saving) in their saving performance as compared to household heads with no any formal education.

4.3. Asset ownership of households

Accordingly, the land holding of the sampled households in the study area ranged from 0.13 to 3.25 hectare (ha) with an average of 0.46 hec. The survey results also showed that households with greater than 0.46 hec of land holding size are better in their savings performances as compared to households with less than 0.46 hec of land holding size

Next to land, livestock is the most important asset among rural communities in Ethiopia. The livestock ownership in the study area was one of the lowest in the country; because of lack of grazing land with an average of 2.245 TLU¹⁴ ranging between 0 to 10.77 TLU per household with standard deviation of 1.584. The average livestock holding of households with savings was 2.441 while that of the non-savers was 1.638 TLU with statistical significant difference at a 1% level ($\chi^2=45.076$, p-value =0.000). This indicates that livestock ownership has a direct relationship with saving performances of households.

4.4. Household income and expenditure patterns

This survey result shows the mean on-farm income of households with savings was birr 20682.8 with standard deviation of birr 20390.5, while the mean on-farm income of the non-savers was birr 11855.4 with standard deviation of birr 12521.8. The result of independent sample t-test revealed that there was statistically significant mean difference of 8827.5 between households with savings and with no savings at less than 1% significance level (t-value=5.326, P-value= 0.000). The average off/non-farm income of households with savings was birr 7636.2 with standard deviation of birr 14899.2, while the mean off/non-farm income of the non-savers was birr 2200.8 with standard deviation of birr 3450.9. The mean difference between the two groups was significant at less than 1% significance level (t-value=2.614, P-value= 0.006). Savers have higher on-farm as compared to their counterparts.

The total yearly consumption expenditure of sample households ranged from Birr 205.44 to 43853.0, and the mean expenditure was 18393.08. From all the expenditures of sample households, expenditure for food items, farming inputs, non-food items and ceremonial purposes accounts for 53.94%, 15.6%, 20.0% and 10.5%, respectively. The mean households' total expenditure with savings and with no savings was birr 19419.9 and 15253.2 with standard deviation of birr 20196.4 and 37508.3, respectively. The t-test statistics did not show significant mean difference between the two household groups with respect to their expenditure level.

4.5. Access to public services and economic infrastructures

In the study area, the average distance of households with savings and households without savings from the nearest all weather road was 8.5 km and 7.8 km with standard deviation of 7.7 km and 6.2 km, respectively. The mean difference between the two groups (0.74013) was statistically significance (t-value=0.020, P-value= 1.165).

About 78.9% and 21.1% of saver households and non saver households have received credit during the last cropping season (2011/12) in the study area, respectively. The result of the chi-square test ($\chi^2=5.754$ and P = .016) revealed that there is a significance percentage

¹⁴ Tropical Livestock Unit

difference between savers and non- saver households in relation to access to credit. Out of the total respondents who have received credit in the year, 8.1 %, 43.3 % and 4.8 % of them were received from formal financial institutions only, informal sectors only and from both sectors, respectively.

The survey result indicated that market places are located at minimum 0.5 and maximum 40 kilometers with an average of 9.08 km distance from sample household home with standard deviation of 5.2 km. On average savers were located about 9.44 km distances with standard deviation of 5.36 km whereas non- savers were about 8 km far away from the nearest market with standard deviation of 4.55 km.

4.6. Results of the Tobit Model

The VIF values of contingency coefficients for continuous variables in the model are much more less than the critical values¹⁵ showing that there is no problem of multicollinearity.

A total of 17 explanatory variables were considered in the econometric model out of which 9 variables were found to be significantly influence the saving performance of the sample households. These variables include; household head education level, livestock holdings, access to credit service, income, investment, training participation, contact with extension contacts, forms of savings and saving motives were found to have significant influence on the amount savings for the whole respondents.

Table 1: Tobit model estimates for the determinants of household savings

Explanatory variables	Coef.	Robust Std. Err.	t	P> t
Sex of household head	-2157.491	3619.238	-0.60	0.551
Age of household head	2.736214	70.06213	0.04	0.969
Education level of household head	595.8353	218.5234	2.73	0.007
Dependency ratio	77.91499	955.8422	0.08	0.935
Land holdings in hectare	12.98975	248.6477	0.05	0.958

Table 1 Continued....

Explanatory variables	Coef.	Robust Std. Err.	t	P> t
Livestock holdings in TLU	2256.931	557.4179	4.05	0.000
Access to credit service	5685.91	1556.263	3.65	0.000
Income sources	-3649.004	1776.009	-2.05	0.040
Annual income in Birr	.2952575	.0858055	3.44	0.001
Annual expenditure in Birr	-.0010067	.0526006	-0.02	0.985
Annual investment in Birr	.4342901	.1709847	2.54	0.011

¹⁵ Value of VIF greater than 10 is often taken as signals for the existence of multicollinearity problem in the model.

Nearest distance to formal financial institution in km	62.46376	148.0537	0.42	0.673
Training participations	3001.042	646.3787	4.64	0.000
Contacts with extension agents	236.1658	58.99121	4.00	0.000
Media access	1238.734	2784.976	0.44	0.657
Forms of savings	5166.918	2400.842	2.15	0.032
Saving motives	9645.302	1871.474	5.15	0.000
_cons	-29505.56	6343.411	-4.65	0.000

Obs. summary: 146 left-censored observations at SAVEHH<=0

554 uncensored observations 0 right-censored observations

Source: own computation from survey data

Tobit model output can be also used to assess the effects of changes in the explanatory variables on the intensity of household savings (Table 2). The effect of change in the education level of sample households increases the intensity of savings by 275.74 Birr among the saver households. In the same manner, the change in livestock holdings in TLU, access to credit, training participation, contact with extension agents, choosing saving institution and saving motives increases the level of household savings by 1044.47, 2631.3, 1388.83, 109.29, 2538.88, and 4463.67 Birr among the savers household, respectively.

Table 2: Marginal effect of explanatory variables on household savings

Explanatory Variable	Change in the probability of being a saver household $\frac{\partial F(Z)}{\partial X_i} = f(Z) \frac{\beta_1}{\sigma}$	Change among savers households	Change among the whole respondents
		$\frac{\partial E(Y_1)}{\partial X_i}$	$\frac{\partial E(Y_1/Y_1^*)}{\partial X_i} > 0$
Sex of household head	-.0413489	-998.4465	-1423.878
Age of household head	.0000524	1.266269	1.805817
Education level of household head	.0114194	275.7414	393.2329
Dependency ratio	.0014933	36.0576	51.42149
Land holdings in hectare	.000249	6.011414	8.572836
Livestock holdings in TLU	.0432547	1044.465	1489.505
Access to credit service	.1089721	2631.333	3752.525
Income sources *	-.0701099	-1680.355	-2394.992

Annual income in Birr	5.66e-06	.1366396	.1948608
Annual expenditure in Birr	-1.93e-08	-.0004659	-.0006644
Annual investment in Birr	8.32e-06	.2009814	.2866181
Nearest distance to formal financial institution in km	.0011971	28.90706	41.22416
Training participations	.0575158	1388.826	1980.595
Contacts with extension agents	.0045262	109.2931	155.8621
Media access *	.0234705	581.9753	829.4821
Forms of savings *	.0940602	2538.884	3602.783
Saving motives	.184855	4463.666	6365.602

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: own computation from survey data

5. CONCLUSION

The results of the descriptive and economic analyses of the determinants of household savings shows that 79.2% of sample households practiced saving with the average amount of 11365.3 Birr. The significant determinant explanatory variables of rural household savings in the study area were household head education level, livestock holdings, access to credit service, income, investment, training participation, contact with extension contacts, forms of savings and saving motives. This study shows rural farm households indeed save in respective of their low economic status. However, as these households mainly use the informal saving institutions, their savings is hardly traced in the national account. Policy-wise, efforts should be made to encourage the rural households to save through trainings and using the formal channel.

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