INNOVATIONS

Determinants of Household Saving Behavior in Rural Ethiopia: Evidence from Southwest Shoa zone

Obsa Urgessa*
Bekele Alemayehu**
Lecturer at Ambo University (Principal Investigator)
Lecturer at Ambo University (Co-investigator)

Abstract : Saving as a percent of GDP is very low relative to investment needs in Ethiopia. To fully mobilize rural household saving, identifying the constraining factors responsible for its underperformance is a priority issue. The main objective of this study, therefore, was to identify and estimate the main determinants of household saving behavior in rural Ethiopia.To achieve this objective, we collected primary data from 389 householdsusing structured questionnaire. To analyze these data, we relied on Tobit model. Our findingssuggest that household disposable income, education of household head, number of income earner in the family and livestock ownership influence household saving positively and significantly. Similarly;family size, participation in off-farm activities and distance from woreda center influence household saving negatively and significantly in the study area. To encourage more saving in the study area, measures that reduce fertility rate, income inequality and encourage women resource empowerment and provision of rural infrastructure are necessary.

Keyword: 1. Rural **2** Household **3.** Saving **4.** Tobit

Introduction

Empirical studies extensively shows that there is strong relationship between saving and economic growth (Attanasio *et al*., 2000; Banerjee & Esther, 2005). The ability of a country to raise productivity depends on its capability to mobilize saving (Lin, 1992). For households and individuals, saving provides caution against uncertain events in the future and for nation, it is the sources of funds for investment.Saving has been considered asa source of funds for capital accumulation. Therefore, by influencing investment, saving determines the direction of economic growth at least in the short-run(Solow, 1956). For example, Touny(2008) suggest that low saving level is the main reason for low level of economic growth scored by developing countries.Domestic saving not only helps to support capital formation, but also reduce dependency on unreliable foreign source of finance. Developing countries are highly dependent on foreign aid and grants. This in turn tends to increase their level of

indebtedness. IMF report in 2018 shows that Ethiopia's outstanding public debt is around 56 % of GDP in 2017/18 fiscal year.

Even though saving level is thought to be the main driving factor of economic growth; in Africa, it accounts the smallest percentage of GDP. Specially, in sub-Saharan Africa it is less than any part of the world. The average saving rate in this region is less than 15 percent of their national income(Loayzaet al, 2000). While it showed some significant improvement in East Asian countries, historically it remained stagnant in Caribbean and sub-Saharan Africa.Many factors like financial illiteracy, lack of information, financial advice and retirement plan have contributed to low level of saving in these regions(Lusardi, 2008). The saving rate in Ethiopia is less than the investment requirement and little is empirically known for itspatternsin rural areas. According to the National Bank of Ethiopia (NBE) report in 2016/17, the ratio of domestic saving to domestic gross product was 18.4 percent while the share of gross domestic investment to GDP was 39 %. Even though majority of rural household saves their income either in cash or in kind, per capita level of saving is very low in rural Ethiopia.

Empirical studies conducted so far in developing countries in general and in Ethiopia in particular mainly focused on macroeconomic determinants of domestic saving. However, ''these macroeconomic studies cannot deal with ''real-world'' features that reflect the diversity of saving behavior (Abdelkhaleket al, 2010). Thus, little is empirically known about factors determining household's saving at micro level in rural Ethiopia. Thus, this study attempts to reveal the main factors explaining the patterns of saving in rural Ethiopia. Specifically, the study attempts to address the following research questions:

- What are the determinants of household saving behavior in rural Ethiopia?
- Which type of saving motive is dominant among rural households?
- Which form of saving do rural household dominantly practice in rural Ethiopia?

Objective of the Study

The general objective of this study is to investigate the determinants of rural household saving behavior in rural Ethiopia. The specific objectives of this study include:

- ☞ To identify and estimate the determinants of household saving behavior in rural Ethiopia
- ☞ To identify the most prevalent type of household's saving motive among rural households.
- ☞ To identify the dominant form of saving practice by rural household.

Material and Methods

Types, data source and sampling technique

The main type of data used for this study is primary data. It was collected from individual sample household through semi- structured questionnaires. Secondary data werecollected from both published and unpublished sources. Multi-stage sampling techniques is employed to reach at the

final sampling unit. In the first stage, 6 woreda were randomly selected out of 11 woreda. In the second stage, 106 sample peasant associations/kebeles[1] from the sample woreda were randomly selected. In the third stage, sample household were selected from each sample kebele. The total sample was allocated to each sample kebele in proportion to their population size.

Individual sample households formed the sampling unit/ element of this study. Hence, **398** sample household were selected based on the simplified formula developed by Yamane (1967) at 95 percent confidence level, 0.5 percent of degree of variability and 5 % percent of level of precision for this study. The formula is:

$$n = \frac{N}{1 + N(e^2)} = \frac{95{,}167}{1 + 95{,}167(0.05)\text{^}2} \cong 389$$

Methods of data Analysis

To achieve the overall objective of this study, descriptive and econometric method of analysis are employed. Descriptive statistics like percentage, frequency distribution, standard deviation and graphs were used where necessary. To estimate the determinants of household saving behavior, a censored Tobit model was employed. A censored Tobit model is used to map all negative values of saving to zero. The rationale behind selecting this model is that saving in the sample household contains negative, zero and positive values. Hence, saving below zero is censored at zero. When observations are either censored or truncated, Tobit model will be used to obtain consistent estimates (Amemiya, 1985; Madala, 2005). If there is some sort of censoring/truncation, OLS estimators will be inconsistent. Thus, Tobit model is specified as:

$$Y_i^* = X_i\beta + u_i \text{.....1}$$
$$Y_i^* = Y_i \ if \ Y_i > 0 \text{ .....2}$$
$$= 0 \ if Y_i \leq 0$$

Where Y_i is the observed amount of saving, Y_i^* is the latent variable which is not observed,β is the vector of unknown parameters and X_i is the vector of explanatory variables (income of the household, household head's education, gender of household head, family size, dependency ratio, access to credit, land size holding, possession of irrigable land, participation in off-farm activities, number. of income earner in family, livestock ownership, location from woreda center, age of household head and square of household head's age). Four marginal effects were estimated using STATA.Estimation of the marginal effects were conducted by maximum likelihood method.

Result and Discussion

Descriptive Analysis

Demographic characteristics of the Respondents

The average age of household heads in the sample respondent is 46 years with 10 years standard deviation. The implication is that, on average, the respondents are in the productive age category.The mean value of family size in the sample respondent is around 7 members. The largeness of family size can influence the amount of saving decision of household negatively as large family size may be associated with large dependency ratio. Education is another variable that have viable theoretical effect on household saving. The average year of education for sample household head is found to 5 years. From the sample data, around 20% of the respondent/household heads did

[1] Kebele is the lowest administrative unit

not attend any formal education, whereas 26% and 38% of them attended first and second cycle respectively. Only 16% of them attended secondary education and above. As far as gender is concerned, 10% of the respondents are female headed while 90% of them are male headed. Another demographic factor that has negative theoretical impact on household saving is the dependency ratio. The mean value of dependency ratio in the sample household is around 0.64. This value indicates the presence of high dependency ratio in the sample population. High dependency ratio implies that larger fraction of family members consumes and absorb what has been produced by productive fraction of family members and hence, it leads to a reduction in income left after consumption.

Table 1: Household's Demographic characteristics

Variable	**Obs**	**Mean**	**Std. Dev.**
Age of household head	389	46.46	9.93
Household head education level	389	4.8	3.50
Family size	389	7.03	2.49
Dependency Ratio	389	.64	.53
Household heads' gender	**Freq.**	**Percent**	
• Female	40	10.28	
• Male	349	89.72	
Total |	**389**	**100.00**	

Source: Survey data, 2020

Socio-Economic Characteristics of the Respondents

Theoretically and empirically, income is the prime determinant of household saving. Income in this paper is measured as the sum of money received from agricultural production, sale of livestock and livestock products, wage and self- employment, remittance and sale of assets. In the study area, income from crop production takes the lion share followed by sale of livestock and livestock products. The average annual income per sample household is estimated to be 34,743.94 birr with standard deviation of 31,923.82. The distribution of income in the study area is shown by decile on table 2. All the sample household were divided in to ten equal deciles. The fifth column shows the cumulative percentage of income earned by the cumulative fractions of sample household (shown by 3rd column).

Table 2: Cumulative Income distribution by deciles

Group	Percentage of population (%)	Cumulative percentage of population (%)	Income share (%)	Cumulative income share (%)
D_1	10	10	0.012582	0.012582
D_2	10	20	0.023483	0.036065
D_3	10	30	0.035251	0.071316
D_4	10	40	0.047171	0.118487
D_5	10	50	0.059435	0.177921
D_6	10	60	0.077582	0.255503
D_7	10	70	0.109675	0.365178
D_8	10	80	0.141498	0.506676
D_9	10	90	0.179649	0.686325
D_{10}	10	100	0.313675	1.000000

From table 2, the poorest 10% of the sample population earns 1.3% of the total income while the bottom 20% of population receives only 3.6% of total income. In addition, the bottom 50% of the total population receives only 17.8% of total income while the top 10% and 20% of the total population receives 68.6% and 50.7% of total income. Therefore, the result shows the presence of moderate-income inequality in the study area.

Characteristics of household saving in the study area

Theoretically, saving is defined as the amount of income left after consumption expenditures are deducted from disposable income.In this study too, saving is measured as the amount of money deposited in cash and physical assetsafter consumption expenditure is deducted. In the study area; householdsare practicing saving through bank deposits, cash holding at home, lending to others and purchase of livestock. From the sample data, 74.04 percent of household are net savers while the remaining are either a borrower or none of the two during a survey year. The per capita saving is estimated to be 13,979.92 ETB while the average saving rate is found to be 0.44.

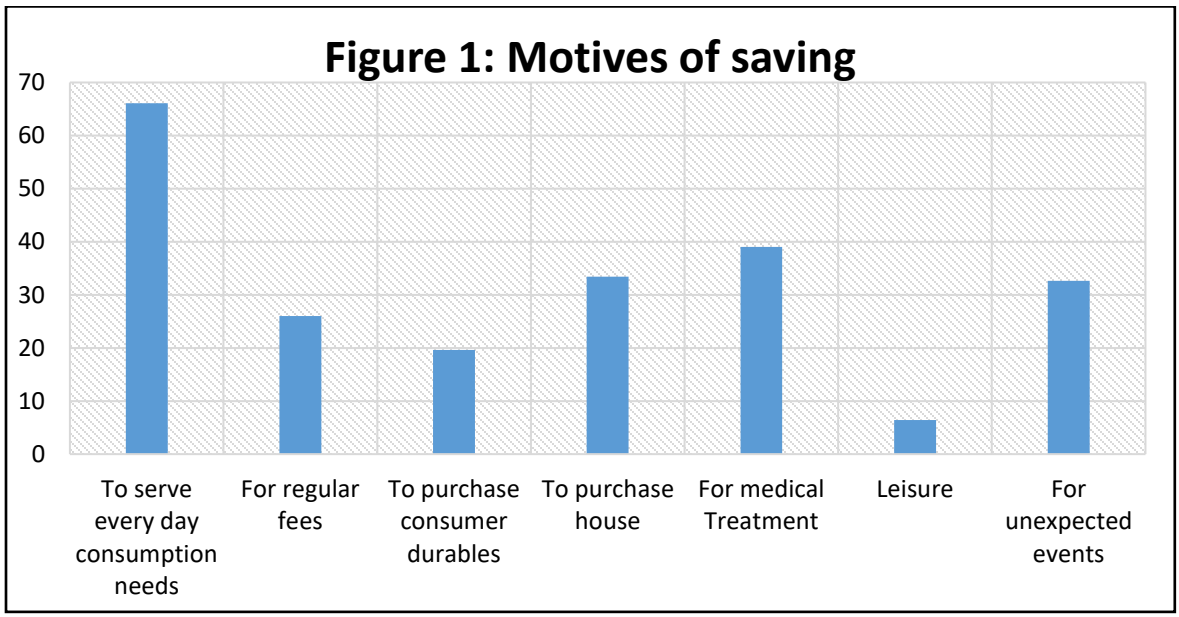
Table 3: Average values of continuous variables for net savers& non-savers

S.no	Variables	Average values for savers	Average values for non-savers
1	Disposable Income	74.04	25.97
2	Age of household head	46.68	45.81
3	Education of Household head	5.23	3.47
4	Land Size Owned	2.65	1.6
5	Family Size	6.8	7.1
6	Dependency Ratio	0.64	0.67
7	Distance from Woreda Center	7.76	8.39

Source: own survey, 2020.

From table 3, it is easy to observe that the average value of income, age, education and land size for net savers is greater than that of non-savers. The mean age for net savers is 46.68 years while for non-savers is 45.81 years. Similarly, net savers possess better education and land size than those of non-savers and hence, on average, they do have better saving practices. The mean values of family size and dependency ratio for non-savers is greater than the mean values of net savers.

Motives of Saving



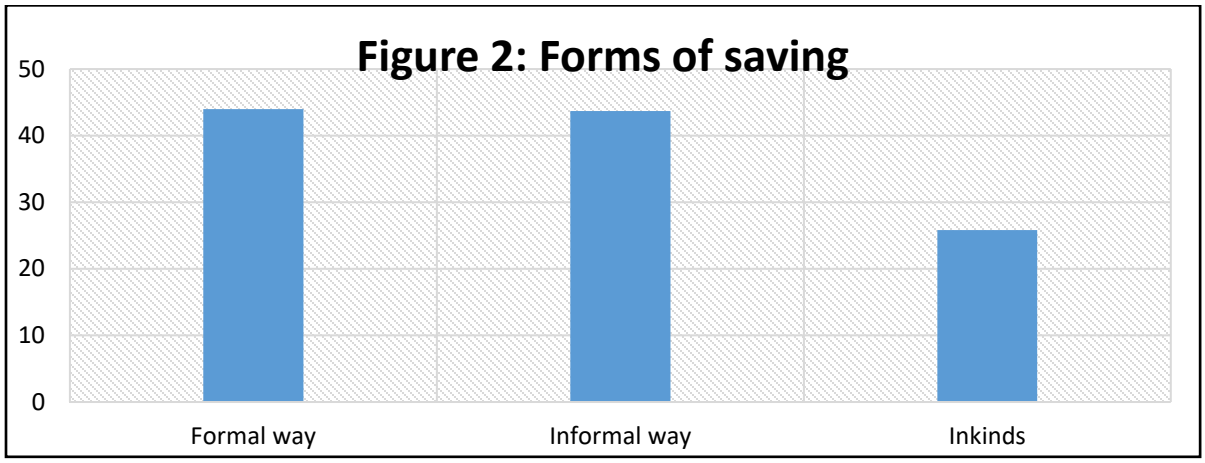
Source: Own survey, 2020

From figure 1, the dominant motive of saving is to smooth the consumption needs of household. This is so because, in the study area, production is carried once a year. Hence, to smooth consumption throughout the year, they put aside some fraction of their income/output. The next main motive is for medical treatment during sudden illness. The percent of household that rank 1st saving to finance consumption need of household comprises 66.7 percent while 39.02% of sample household saves for medical treatment. The third main motive of saving in the study area is to finance unexpected events. Around 32.65% of household saves for this purpose. Saving for leisure is found to be the least motive of saving among the sample household.

Forms of saving in the study area

Empirical evidence shows that rural household practices saving both in cash and non-cash forms (Issahaku H, 2011; Nayak S, 2013; Egwu P &Nwibo S, 2014). Examinations of sample data describes

that sample household are practicing saving in cash, bank deposit, contributions to equb and idir, loan to relatives and non-financial forms.



Source: Own survey, 2020.

From figure 2, we observe that 44% of sample household are saving their income in formal financial institutions. Similarly, 43.7 % are saving in the informal way (through ekub[2]&Idir[3]) while 25.8 % of them are saving in non-financial forms (like livestock and other assets).

Regression Result Analysis

Based on economic theory and empirical researches, 14 explanatory variables have been identified in this study. The description of these variables is provided below:

Descriptions of variables:

Disposable income: The natural logarithm of household's annual total disposable income
Age: Age of household head measured in years.
Squared age: The Square of the age of household head to describe the marginal return of age on saving
Education: Education level of household head measured in years
Gender: Sex of household head (entered as dummy=1 for male & =0 for women)
Family size: Adult equivalent household family size measured using the OCED adult equivalent size
Dependency ratio: Ratio of family members below age 14 and above age 60 to age from 15-60
Access to credit: Households' access to credit (entered as dummy=1 if taken credit & 0 otherwise)
Land size: Household land size owned in hectare
Income from large land size owned: It is an interaction variable showing more income generated due large land size owned.
Off-farm activity: It is a dummy variable assigned 1 if household is participating in off-farm activity and 0 otherwise.
Number of income earner: Number of family members earning income

[2]& 3Ekub and Idir are the traditional saving practices in Ethiopia.

Location: Distance from the district center in kilometer.
Livestock owned: It is a dummy variable assigned 1 if household is owning livestock and 0 otherwise.The tobit regression result and their marginal effect is displayed in table 5 below.

Table 4: Regression result and marginal effects

Variable	Marginal effects on:	
	Latent variable $E(y^*\|x))$	Total saving $[E(y\|x)]$
Disposable income	0.5448* (0.0483)	0.4892* (0.0441)
Age of household head	119.3786 (390.6)	107.1993 (350.22)
Square of head's age	-1.4473 (4.2938)	-1.2997 (3.8483)
Education	553.875* (138.4)	497.367* (123.56)
Gender	-2779.317 (1880.7)	-2554.551 (1764.3)
Family size	-510.036** (224.21)	-458.0005** (199.78)
Dependency ratio	-241.7489 (812.72)	-217.0849 (729.2)
Access to credit	-1432.786 (948.37)	-1282.523 (843.54)
Land size owned	837.6693 (725.77)	752.2076 (644.52)
Income due to large land size	-0.0002 (0.0135)	-0.00019 (0.0121)
Off-farm activity	-2517.138** (1094.3)	-2226.039** (946.36)
Number of income earner	4515.452* (1661.7)	4054.772* (1477.9)
Location	-159.4982** (76.23)	-143.2257** (67.932)
Livestock owned	2189.394*** (1159.8)	1938.622*** (1002.4)
Note: * shows significant at 1% *** shows significance at 10% ** shows significant at 5% Values in bracket are standard errors		
Log pseudolikelihood = -2935.381 Number of obs = 374 F (14, 360) = 59.50 Σ= 8086.713 Prob > F = 0.0000 $R^2 = 0.8381$		

From the regression result, most of the included explanatory variables significantly influence household saving in the study area. For example,household disposable income influence positively and significantly household saving for the sample household. On average, extra unit of disposable income increase household saving by 0.49 ETB for the average household. This result aligns with the microeconomic theory of household income allocation decision. Education of household head is also found to influence saving positively and significantly in the sample household. On average, additional

year of education increase the level of household saving by 497.5 ETB for the average household. The implication of this result is that the influence of additional education on household saving is magnificent in the study area. Off-farm activity participation and distance from the district center is also found to influence household saving negatively and significantly. Participation in off-farm activity is also found to influence saving negatively. This might be due the fact that those household participated in the off-farm activity were poor household whose income and hence, saving is low. Distance from the district center acted to reduce household saving since distant household would have low business opportunities than households closer to the district center.

Family size and dependency ratio are also found to influence household saving negatively. Family size decreases household saving significantly at 5% level of significance. Extra family member reduce household saving by 458 ETB for the average household. Household ownership of livestock also found to affect positively and significantly for the sample household. Each additional livestock owned increased household saving by 1939 ETB for the average household. In general, disposable income, education and livestock ownership are found to influence household saving positively and significantly. Family size, location and off-farm participation are found to influence rural household saving negatively and significantly for the average household.

Conclusion and Recommendation

Saving plays an important role in the development process of every country as a source of investment funds. However, in Ethiopia, its share in national GDP is very low relative to investment requirement. In the study area too, majority of household income goes to family consumption. This trend hinders the future consumption of household and the growth trend of national economy. Therefore, to encourage and promote saving in the study area in particular and country in general, the following policy intervention were recommended based on the findings of this paper:

- Reducing income inequality through intervention strategies like livelihood diversification, adoption of improved inputs, provision of rural infrastructure to link rural products to urban markets and provision of rural financing.
- Family size also acts to reduce household saving in the study area. Large family size and dependency ratio is due to high fertility rate in the study area. Hence to reduce fertility rate in the sample household, awareness creation strategies should be persuaded by government bodies and family planning strategies should also be practiced by the population in the study area.
- Saving among male headed household is less than those of female headed household. However, in rural household, females are discriminated in the possession and administration of economic resources. Hence, to encourage saving more among female headed household, Empowering and training, women in economic decision-makingalso needs special emphasis.
- Majority of Participant in off-farm activities are poor households. To encourage saving among this group of households, there should be fair payment for them.
- Location is also another variable that acts to reduce saving in the study area. This might be due to the fact that household living far away from woreda center has low access to information than households near woreda center. Therefore, to encourage saving in remote areas, provision of rural infrastructure and rural financealso need special attention.

References

1. *Abdelkhalek, T., Arestoff, F., El Mekkaoui de Freitas, N. & Mage, S. (2010). A Micro econometric Analysis of Household Savings Determinants in Morocco.African Reviewof Money Finance andBanking.*
2. *Attanasio, O., Lucio , P., & Antonello , S. (2000). Saving, Growth and Investment: A Macroeconomic Analysis Using a Panel of Countries. The Review of Economics and Statistics., 182-211.*
3. *Banerjee, A., & Esther, D. (2005). Growth Theory Through the Lens of Development Economics. Handbook of Economic Growth.*
4. *Egwu P. N. and Nwibo S. U. (2014).Determinants of Saving Capacity of Rural Women Farmers in Ebonyi State.Global Journal of Agricultural Research Vol.2, No.1, pp.1-10.*
5. *Issahaku, H. (2011). Determinants of Saving and Investment in Deprived District Capitals in Ghana: Continental Journal of Social Science, 4(1) ISSN: 2141 – 4265.*
6. *Lin, S. (1992). Malaysia: saving-investment gap, financing needs and capital market development. Malaysia Management Review., 26-53.*
7. *Loayza, N., K. Schmidt-Hebbel, and L. Servén (2000). "What Drives Private Saving across the World?" Review of Economics and Statistics, 82(2) 165-181.*
8. *Lusardi, A. (2008). Household Saving Behavior: The Role of Financial Literacy, Information, and Financial Education Programs (NBER Working Paper 13824).*
9. *Maddala, G.S. (1992). Introduction to Econometrics. New York: Macmillan, Chicago.*
10. *Nayak, S. (2013). Determinants and Pattern of Saving Behavior in Rural Households of Western Odisha. Master of Art degree (Development Studies) thesis.*
11. *Solow , R. (1956). A Contribution to the Theory of Economic Growth. Quarterly Journal of Economics., 65-94.*
12. *Touny, M.A. (2008), Determinants of Domestic Saving Performance in Egypt: An Empirical Study, Journal of Commercial Studies and Researches, Faculty of Commerce, Benha University, No. 1, 2008.*
14. *Yamane, T. (1976). Statistics, An Introductory Analysis, 2nd Ed., New York: Harper & Row.*