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ANALYSING THE EFFECT OF MICROENTERPRISE DEVELOPMENT ON RURAL HOUSEHOLDS' SAVINGS IN THE TOLON DISTRICT OF GHANA: A SWITCHING REGRESSION APPROACH

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Abstract

This paper examined the effect of microenterprise development on rural household saving in the Tolon district of Northern region of Ghana. It involved 105 farm households selected through a two-stage sampling approach. A switching regression model was fitted to correct selectivity bias problem. From the result, males; non-household heads; farmers who had access to credit; farmers with high income and farmers further from micro institution had the higher probability of engaging in microenterprise activities. Among other factors, female dependent, income level and interest rate significantly influenced the amount of money saved by the households. The study demonstrated that microenterprise development is not only necessary for safeguarding the future of rural households but also for the sustainability of financial institutions. Policy makers are encouraged to take the opportunity to enhance the existing microenterprises in the district and also introduce new lucrative ones while rural households also give microenterprise businesses the much attention. Credit facilities should be made available to the households to boost their microenterprises.

1. INTRODUCTION

Savings and economic development have been part of human life since prehistoric time. It is a means of accumulating assets to perform specific functions for the saver at a later period (Ike

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& Idoge, 2006).It is also the setting aside of some items for future use (Shipton, 1990). In their part, it is a foregone consumption Miller and VanHoose (2001). In economics texts, savings is equal to investment. The implication is that, whatever money is saved is equally invested. Meanwhile, the driver of growth and development is investment since this have a higher rate of multiplier effect. Obayelu (2012) noted that savings is imperative for supporting and developing rural industries. Saving over time can significantly influence the rate and sustainability of capital accumulation and economic growth especially in the developing countries like Ghana (Bautista & Lamberte, 1990). Romeo *et al.* (1990) also noted that savings increases capital formation that leads to greater output and unemployment reduction. Similarly in Brata (1999), savings provides the means for investment, risk management and collateral for credit in the financial market.

However, this does not suggest that every individual saves towards the future. In Amu (2012), every individual have personal attitude towards saving. While others are so desperate towards savings, others believe in spending whatever money they receive each day. After all, a common biblical prayer is 'give us this day our daily bread'. This attitude is influenced by the income level, placement towards money, future goals and aspirations. Kraay (2000) finds that average saving rates rise as household income progresses beyond a minimum required for survival.

In Ghana, only few households have savings accounts (Quartey, 2002). This Amu (2012) mentioned low income as well as inadequate financial mediators as the potential reasons for the low savings rate. Ziorklui and Barbee (2003) also attributed the low savings to political as well as microeconomic factors. Ghanaian for that matter will prefer to save in the form of tangible asset like buying properties rather than putting the money into savings account.

One way of improving or at least stabilizing the income levels of households is through microenterprise development or through diversification. In a USAID report, vulnerable households tend to allocate their scarce resources to maintain consumption levels and reduce risk rather than to maximize profit or income (Wolfe, 2009). USAID (2008) defined microenterprises as 'tiny, informally organized business activities'. This means that the number of people involved in these activities is small (less than five) and included the micro entrepreneur and usually family workers. The report further noted that this is simply a reflection of a low level of economic development. Therefore as development progresses, some microenterprises will grow and move into larger size categories, while many others will collapse. According to World Bank (2004), several people in developing countries earn their living through small-scale business. Many of these entrepreneurs do not have access to even the most basic of financial services, such as a simple bank account in which they can save money.

According to Dunn (1997), one reason for slow growth of microenterprise activities is the fact that households are pursuing diversification strategy. Microenterprise development in the rural areas is mostly a form of diversification since most of these people are engaged in agriculture as a major occupation. However, diversification requires that the household does not focus all of its productive resources into the single (main) enterprise. This usually implies that the target enterprise does not grow as rapidly as it would under a specialization strategy (Dunn, 1997). The fact that diversification refers to the presence of multiple income generating activities within the household economic portfolio means that the potential to save is harnessed through microenterprise development. But could this be a guess conclusion? This study therefore examined the role of micro enterprise development on rural household savings.

2. MATERIALS AND METHODS

2.1. Study location

Tolon District came into existence in 2011 by LI. 2142 with Tolon as the district capital. Hitherto, the district was known as the Tolon/Kumbungu District. Geographically, the District lies between

latitudes 9^0 15` and $10^0$ 02` N and Longitudes 0^0 53`and$1^0$ 25` Wt. It shares boundaries to the North with Kumbungu, North Gonja to the West, Central Gonja to the South, and Sagnarigu Districts to the East. In terms of locality, the district is general rural (92.5%) (GSS, 2012). Like other districts, poverty is relative high with the major occupation been farming. This culminated into most of the youth travelling to the South for non-existing jobs. Therefore, deliberate policies and programmes that can promote general socio-economic and infrastructural development of the area are necessary.

2.2. Sampling technique and data

The study involved 105 farmers. This was selected through a two-stage. In the first stage, four communities were randomly selected in the Tolon district. In the second stage, the respondents were put into two groups: microenterprise developers (those who engaged in microenterprise activity) and non-microenterprise developers (those who did not). Simple random was then used to select the final respondents (56 microenterprise developers and 47 non-microenterprise developers). The data gathered was on the socioeconomic and economic characteristics; income and savings information of the respondents. This involved the use of well-structured questionnaire.

2.3. Analytical framework

The study estimated a switching regression to determine the effect of micro enterprise development on savings. In decision-impact evaluations, the actual gains of the decision are unknown or unobservable. For instance, we cannot observe the saving values for micro enterprise households had they not gone into microenterprise development. Traditionally, this estimation would require that a probit/logit model is estimated for the microenterprise development and an ordinary least square for the savings, but this is a deceit since we would be unable to measure the actual effect of microenterprise development on savings (this would overestimate the effect).

This is because microenterprise development as a 'decision' is not randomly distributed between the microenterprise developers and non-developers. Instead, the individuals compared the gains and costs of microenterprise development and make a decision (self-selection; to engage or not to engage in a microenterprise). Thus individuals who engaged in a microenterprise may have some inherent characteristics that influenced their decisions and savings. For instance, if those who engaged in microenterprise are the hardworking farmers and we failed to control for hardworking [which of course is not measured], then the result would be skewed towards those who engaged in microenterprise (biasness). Therefore, microenterprise development is an endogenous variable and not exogenous. This is resolved by estimating simultaneous equations for the microenterprise development and savings (Hausman, 1978). What remained unresolved is selectivity bias. This is because; microenterprise development has influence on savings. Thus farmers who engaged in microenterprise may not operate on the same savings frontier as those who did not. Therefore estimating a pooled sample would mean that the effect of microenterprise development is the same for both samples and any difference is through a shift in the intercept. To resolve this also, we estimated separate equations for both farmers who engaged in microenterprise and those who did not. Others who used the switching regression were Alene and Manyong (2007); Lokshin and Sajaia (2004) and Assa (2012).

Mathematically,

$$D^* = \gamma Z_i + u_i$$

Where D^* is the latent value for microenterprise development. The criterion functions for D^* are

$$
\begin{aligned}
D = 1 \quad & iff \quad D^* = \gamma Z_i + u_i > 0 \text{ and} \\
D = 0 \quad & iff \quad D^* = \gamma Z_i + u_i \leq 0
\end{aligned}
$$

The saving regime for the two groups (microenterprise developers and non-developers) is also given as:

$$Regime\ 1: \qquad S_{1i} = \delta x_{1i} + e_{1i} \qquad\qquad iff \qquad D_i = 1$$
$$Regime\ 2: \qquad S_{2i} = \delta x_{2i} + e_{2i} \qquad\qquad iff \qquad D_i = 0$$

Where Z_i, x_{1i} and x_{2i} are exogenous variables. From Lokshin and Sajaia (2004), the error components u_i, e_{1i} and e_{2i} assumed a trivariate distribution, zero mean and a covariance matrix that is given as:

$$Cov\ (u_i, e_{1i}, e_{2i}) = \begin{bmatrix} \sigma_u^2 & \sigma_{1u} & \sigma_{2u} \\ \sigma_{1u} & \sigma_1^2 & . \\ \sigma_{2u} & . & \sigma_2^2 \end{bmatrix}$$

Where σ_u^2 is the selection equation error term variance, σ_1^2 and σ_2^2 are the variance of the error terms in the two regimes, σ_{1u} is the covariance of u_i and e_{1i}, σ_{2u} is the covariance of u_i and e_{2i}. The covariance between e_{1i} and e_{2i} is not defined since S_{1i} and S_{2i} do not exist concurrently.

The two regime equations are estimated by two stage estimation (Lee, 1978). To correct for selectivity bias, e_{1i} and e_{2i} are extrapolated and a new additional variable generated as:

$$E(e_{1i}/u_i \leq \gamma Z_i) = E\left(\sigma_{1uu_i}/u_i \leq \gamma Z_i\right) = \sigma_{1u} \frac{\emptyset(\gamma Z_i)}{\Phi(\gamma Z_i)}\ and$$

$$E(e_{2i}/u_i \leq \gamma Z_i) = E\left(\sigma_{2uu_i}/u_i \leq \gamma Z_i\right) = \sigma_{2u} \frac{\emptyset(\gamma Z_i)}{1 - \Phi(\gamma Z_i)}$$

Where $\emptyset$ is the probability density function, Φ is the cumulative distribution function. $\frac{\emptyset}{\Phi}$ is the Inverse Mills Ratio (IMR) which is defined as:

$$\lambda_{1i} = \frac{\emptyset(\gamma Z_i)}{\Phi(\gamma Z_i)}\ and\ \lambda_{2i} = \frac{\emptyset(\gamma Z_i)}{1 - \Phi(\gamma Z_i)}$$

Therefore, the two regime equations become:

$$Regime\ 1: \qquad S_{1i} = \delta x_{1i} + \sigma_{1u}\lambda_{1i} + e_{1i} \qquad iff \qquad D_i = 1$$
$$Regime\ 2: \qquad S_{2i} = \delta x_{2i} + \sigma_{2u}\lambda_{2i} + e_{2i} \qquad iff \qquad D_i = 0$$

2.4. Empirical models
The theoretical model discussed suggests that we formulate three empirical equations. But since the variables included in the saving equations are the same for the two regimes, we formulate one equation for microenterprise development and another for savings.

Thus in stage one;
$Microenterpris = \delta_0 + \delta_1 Age + \delta_2 Age\ squared + \delta_3 Sex + \delta_4 Household\ size + \delta_5 Education + \delta_6 Household\ position + \delta_7 Credit + \delta_8 Income + \delta_9 Distance + e$

In the second stage;
$Savings = \beta_0 + \beta_1 Age + \beta_2 Age\ squared + \beta_3 Sex + \beta_4 Education + \beta_5 Household\ position + \beta_6 Female\ dependant + \beta_7 Male\ dependant + \beta_8 Income + \beta_9 Interest\ rate + \beta_{10} Distance + u$

Where age is the number of years from birth (years), sex is a dummy (1 if male, 0 if female), education is number of years of formal education, household size is the total number of people in a household, household position is a dummy (1 if a household head and 0 if otherwise), female dependent is the total number of female depending on a respondent, male dependent is the total number of male depending on a respondent, credit is a dummy (1 if a farmer received a credit and 0 if

otherwise), income is the total monthly income of a respondent, distance is the distance from home to microenterprise or savings institution (kilometers).

3. RESULTS AND DISCUSSION

3.1. Descriptive statistics of respondents
Table 1 below shows the descriptive statistics of the continuous variables used in the study. The average farmer in the study was 43 years old with very level of education (1 years of formal education; an equivalent of primary one). The estimated average household size was 15. This is farm above the Northern region's average household size of 7.7 (GSS, 2012). The level of dependency in the district was quite high considering the fact that about 6 and 5 male and females respectively depends on the average farmer. The monthly income level of the respondents was between GH₵45.00 and GH₵900.00; with an average of GH₵301.24. Similarly, the mean monthly savings was GH₵35.95. The distance from the respondents' home to their respective saving institutions and to the micro enterprise is 0.64 km and 3.83 km respectively.

Table 1: Descriptive statistics of households

Variable	Minimum	Maximum	Mean	Standard deviation
Age	20	78	43.37	13.10
Level of education	0	12	1.43	3.17
Household size	4	34	14.92	6.86
No. of male dependent	0	12	5.64	3.33
No. of female dependent	1	16	4.88	2.95
Income	45	900	301.24	197.95
Saving amounts	2	300	35.95	51.06
Distance to saving institution	1	4	0.64	1.12
Distance to micro institution	0.5	17	3.83	5.23

3.2. Determinants of households' decision into microenterprise development
Table 2 below shows the first stage result of the switching regression model. The result shows that sex, household position, access to credit, income level and distance to micro institution had a significant influence on the decision to engage in a micro activity. Specifically, the males; non-household heads; farmers who accessed credit; households with high income and households farther from micro institution or enterprise had a higher probability of engaging in a micro enterprise. The estimated chi square of the model was also significant indicating the goodness of fit or the appropriateness of the model assumed in the study.

Microenterprise development in the district is a minor or supplementary economic activity. This means that households should be able to combine these activities with the major economic activity, farming. This could be the reason for the estimated positive effect of sex on microenterprise engagement. Asmah (2011) also found non-farm diversification was high for male household heads. From Aterido et al. (2011) also, females are less likely to run sole proprietor businesses than their male counterparts. However, this was contrary to the apriori expectation of the research since women are mostly found in these micro activities. One can say that farming is no longer lucrative for the men to solely commit all their resources into, hence this diversification. Non-household head farmers in the study also have a higher probability of engaging in a microenterprise due to the availability of resources for committing into these activities. Although household size was not significant, it maintained its expected negative sign. The amount of income available to the household is very much important in influencing farmer's decision into diversification. It is therefore not surprise that the sign of income in the model was positive. Income is an essential resource that has command over other resources; thus the higher the income the higher the ability to get other needed resources. The engagement into a microenterprise requires an additional capital. This means that it is only when the income is high that the household can commit a share into a microenterprise. Similar to income is

credit since it also provides an additional resource to the household. Considering this part of the country where poverty is still high, the only way to encourage participation in these micro activities is through the provision of credit facilities to the farmers. Contrary to the expectation was the positive sign of distance which suggests that the farther the household is from a micro enterprise, the higher the probability of engaging in it. Perhaps, the microenterprises are located farm away from the vicinity of the households.

Table 2: Determinants of microenterprise engagement

Variable	Coefficient	Std. error	Z-Value	P-Value
Constant	-1.859	1.872	-0.99	0.321
Age	-0.023	0.083	-0.36	0.719
Age squared	0.001	0.001	0.56	0.575
Sex	1.050**	0.500	2.10	0.035
Household size	-0.024	0.033	-0.72	0.469
Education	-0.023	0.059	-0.38	0.703
Household position	-1.214**	0.600	-2.03	0.043
Access to credit	1.542***	0.467	3.30	0.001
Income	0.002**	0.001	2.35	0.019
Distance to micro institution	0.222***	0.047	4.75	0.000
Wald chi square		47.430***		0.000

Note: ** and *** indicates significance at 5% and 1% respectively

3.3. Factors influencing rural households' savings

One of the objectives of this paper is to examine the factors influencing rural households' savings in the Tolon district. This involved a switching regression and the result is shown in table 3. Thus in the table, there are separate results for households who engaged in microenterprise and those who did not. The significance of lambda in the microenterprise model suggests the presence of selectivity bias in the model and the estimation of the switching regression is adequate. However, in the case of the non-microenterprise households, lambda was insignificant. An estimated Wald test was also significant at 1% (see table 2). From Asmah (2011), the significance of this test implied that the coefficients in the two savings equations are different from one another. In the microenterprise model, age, age squared, sex, household position, number of female dependent, income level and interest rate significantly influenced the amount a microenterprise household saves. In the case of non-microenterprise model, only age, age squared number of female dependent, income and distance to savings institution significantly influenced saving amounts in non-microenterprise households.

The positive and negative significance of age and age squared respectively in the two models means the younger farmers made a higher savings than their older counterparts. However, this would be resolved in the long run, where the older farmers would also save higher amounts. The plausibility lies in the innovativeness and ability to adopt recent technologies/innovations by the youths. Male farmers in the study also had a higher saving potential than the females. This is contrary to the research expectation as one would expect that the male farmer would have more expenditure to make than the female farmer. However in the study area especially, the male farmers have control over resources than the females. This means that their ability to mobilize resources for saving is also higher. It is important to recall that the male farmers had a higher probability of engaging in microenterprise activity than the females. Non-household head farmers had a higher savings potential than the household head farmers. In other words, the non-households saved higher amounts than the household heads. The reason had been that there is less household responsibility of these non-household farmers. Similarly it is the household heads that represents the household in social activities, which means that there are extra expenditures that would be made by the household head other than savings. Dependency is one important factor that influences savings. With higher dependency, more daily expenditures are made and the ability to save higher amounts decreases. This is worsened if the female dependents are even many. The demands and needs of female dependent are

not the same as a male dependent. This could be the reason for the estimated negative effect of the number of female dependent on savings; many females dependent lead to lesser savings. In both models, income was positive and significant. Loayza *et al.* (2000), Turner *et al.* (1998) and Salotti (2010) also found a negative effect of dependency on rural household savings. This implies that the higher the income, the higher the amount saved in a month. Recall (in table 2) that the probability of engaging in microenterprise was higher for higher income farmers than those with lower income. These demonstrate the importance of income in household and rural economies development and also confirmed the findings of Issahaku (2011). Interest rate is the perception of the farmer on the interest rate on savings; whether the interest rate is high or low. The result shows that farmers who perceived the interest rates on savings to be high save higher amounts in each month than those who perceived it low. This could mean that farmers in the region save for more cash returns and perhaps not mainly to safeguard their money for later use. Contrary to Loayza *et al.* (2000) who found a negative relationship between interest rate and savings, Dirschmid and Glatzer (2004) also found interest rate to have a positive effect on saving. Although distance was positive in both models, it is only significant in the non-microenterprise model. This means that among the non-microenterprise households, famers who are far from the saving institutions had a higher saving rate than those who are closer. This was contrary to the research expectation.

Table 3: Second stage result of switching regression showing the factors influencing rural households' savings potential

Variable	Microenterprise				No Microenterprise			
	Coeff.	Std. error	Z-Value	P-Value	Coeff.	Std. error	Z-Value	P-Value
Age	9.627**	3.940	2.44	0.015	2.604**	1.273	2.05	0.041
Age squared	-0.085**	0.040	-2.13	0.033	-0.023*	0.014	-1.68	0.094
Sex	73.808***	23.263	3.17	0.002	0.033	6.081	0.05	0.957
Education	-2.653	2.956	-0.9	0.370	-0.568	0.638	-0.89	0.374
Household position	-74.263***	24.146	-3.08	0.002	3.787	6.505	0.58	0.560
No. of male dependent	4.601	3.109	1.48	0.139	1.153	0.947	1.22	0.223
No. of female dependent	-5.585*	3.138	-1.78	0.075	-3.012***	1.029	-2.93	0.003
Income	0.181***	0.042	4.33	0.000	0.041***	0.013	3.28	0.001
Interest rate	35.705**	16.438	2.17	0.030	4.913	5.524	0.89	0.374
Distance to savings unit	3.470	6.645	0.52	0.602	4.895*	2.531	1.93	0.053
Constant	-284.878	97.537	-2.92	0.003	-47.450	27.212	-1.74	0.081
Lambda	31.269*	18.617	1.68	0.093	-2.212	4.597	-0.48	0.630

Note: *, ** and *** indicates significance at 10%, 5% and 1% respectively

3.4. Savings-Income ratio of farmers

From table 3, higher income farmers save higher amounts than lower income farmers. Therefore, it is important to estimate the proportions of the incomes used in saving. This is shown in table 4. The highest saving-income ratio was recorded for farmers with 70-79 years (0.25), although they recorded the least income. This was followed by those within 40-49 years; meanwhile, the least ratio was recorded for farmers between 20 and 29 years. In terms of sex, the male farmers saved a higher proportion of their income (0.14) compared with that of the female farmers (0.08). While the lowest ratio (0.09) was recorded for farmers with household between 17-24, the highest was recorded for those with 25-32 household members (0.24). Contrary to Issahaku (2011), the saving-income ratio of the farmers declined with the level of education. Not only do farmers who engaged in micro enterprise have a higher income than those who did not but also, they had a higher saving-income

ratio (0.14) than their counterparts who did not have any microenterprise (0.09).This demonstrates the potential gains from microenterprises. Thus in other to improve the income and savings of the farmers for current and future usage, microenterprise development is necessary.

Table 4: Savings-Income ratio of farmers

Variable grouping	Average income	Average savings	Savings-Income ratio
Age			
20-29	304.29	14.71	0.05
30-39	276.25	32.70	0.12
40-49	279.31	48.72	0.17
50-59	466.67	64.33	0.14
60-69	340.00	30.11	0.09
70-79	133.33	33.33	0.25
Sex			
Female	273.84	22.72	0.08
Male	320.24	45.13	0.14
Household size			
1-8	318.95	37.26	0.12
9-16	221.59	26.73	0.12
17-24	348.24	29.89	0.09
24-32	450.00	108.13	0.24
Level of education			
No formal	297.27	37.35	0.13
Primary	353.89	45.00	0.13
JHS	310.00	18.50	0.06
SHS	200.00	5.00	0.03
Category of respondent			
Non-Microenterprise farmer	267.80	23.96	0.09
Microenterprise farmer	331.64	46.85	0.14

3.5. Reasons and challenges of rural household savings

Savings mean keeping money away from present usage. In this study, the respondents who saved their monies equally have reasons for saving. The major reason for saving was to keep the money safe, prevent the money from being lost through fire outbreak, to earn interest on income, to minimize borrowing from other family members and to avoid unnecessary spending. Low accessibility to banking institutions, low income levels in the first place, fear of losing money especially with the 'susu' institutions, difficulty and bureaucracy in opening bank accounts, and extra transportation cost to get to the banks were identified as challenges facing rural household savings in the district.

4. CONCLUSION

Microenterprise development is one of the strategic measures to ensure income stability. There are several strategies available to the farmers to supplement their farm activities. However, the probability of engaging in a microenterprise is higher for the males, non-household heads, credit receivers, high income farmers and those far from a microenterprise. There is demonstrable gain in saving from microenterprise development as microenterprise farmers saved higher amounts of their incomes. Not only is this laudable for resource management by the farmer, but also good for the development of the country. This is because; it would increase the financial status of the financial institutions who are essential for given out loans necessary for development. It is therefore important that policy makers take the opportunity to enhance the existing microenterprises in the district and perhaps introduce new lucrative ones. Notwithstanding, more credit facilities should be made available to the farmers to boost their microenterprises. Savings was also higher for the younger

farmers, the male farmers, farmers with less female dependent and farmers who perceived the interests on savings as high. It would be appropriate therefore that policies targeting younger females, would not be out-of place. Generally, rural households are encouraged to give microenterprise business the seriousness it deserves.

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