

# Understanding the Determinants of Rural Credit Accessibility: The Case of Ehiaminchini, Fanteakwa District, Ghana

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## Abstract

Rural areas in developing countries are known to lack access to credit facilities. Lack of credit limits production activities and stifles agricultural productivity. The objective of this study is to identify the determinants of credit accessibility to more effectively aid alleviate poverty using Ehiaminchini, a village in the Fanteakwa District of Eastern Ghana as a case study. The study utilizes cross-sectional data collected with the use of structured questionnaires from 109 farm households. Interviews and focus group discussions were also conducted to supplement the data. A probit model was used to analyze the factors that determine households' access to credit. The results show that livelihood diversification, household productivity, savings accounts and household size are factors that have a significant influence on households' ability to access credit. Furthermore, the marginal effect of household productivity indicates that the predicted probability of accessing credit increases as productivity increases. We argue that improving household productivity and diversifying livelihoods in rural households will, to a large extent, address the problem of credit constraint.

**Keywords:** rural credit, credit accessibility, diversification of livelihood, agricultural, Ghana

## 1. Introduction

Poverty has long been regarded as a major challenge in developing countries, especially in Sub-Saharan Africa and south Asia (FAO 2001). It has also been long established that more than 75% of the world's poor reside in rural areas and will continue to do so well into the 21<sup>st</sup> century. The challenges of rural people in rural areas are innumerable. People in rural areas lack not only economic opportunities; they also have less access to social services such as health, information, water, sanitation and education (Carney 1999, FAO 2001). The net result being difficulty in breaking the vicious cycle (FAO 2001). Rural communities will continue to exist. This presupposes that measures that can make rural life sustainable must be given priority in development policies and plans by national governments, especially in developing countries. Agriculture has long been identified as a sector with the much-needed potential to spark rural growth and economic development. In fact, agriculture continues to be the backbone of rural economies across the globe and is key to rural poverty alleviation (World Bank 2008). Improving agricultural productivity could be critical in reducing rural poverty. In addition, diversifying into other areas such as non-farm activities is also critical in improving household living standards (Baffoe et al. 2014). The agricultural sector, however, especially in sub-Saharan Africa, is bedevilled with endemic constraints that make improving living standards challenging. One constraint, which also has the potential to accelerate rural growth and reduce poverty, is the issue of credit accessibility. Limited access to credit is a major challenge to improving productive activities that can raise living standards in rural areas. It is estimated that 2.5 billion people in the world lack access to financial services (credit). The majority of them live in rural areas and depend on agriculture either directly or indirectly for their livelihood (World Bank, 2008; 2013). Fletschner and Guirkingner (2010) show that credit constraints significantly affect farm profit. They report an average adjusted profit-loss of \$1,477 for financially inefficient households. Similarly, Baffoe et al. (2014) demonstrate that access to credit enhances agricultural productivity. These results imply that farmers find it difficult to improve productivity without access to credit as it limits their ability to purchase much-needed inputs such as fertilizer, improved seeds, or land for their farming activities.

Credit is deemed indispensable in production activities in that it is key to acquiring requisite inputs for them (Feder et al., 1990). Bashir et al., (2010) contend that extensive and appropriate use of inputs is determined by access to credit. There is, therefore potential to improve agricultural productivity through access to credit. A recent work in Tanzania found that people with credit are more productive than those without credit. The reason is that the former invest the money in inputs such as seeds, fertilizer and pesticides for their production activities (Girabi and Mwakaje 2013). A similar finding is reported by Asaolu et al., (2011). The argument is that credit allows producers to have access to inputs and new production technologies that can help increase overall agricultural productivity (Feder et al., 1990; Asaolu et al., 2011). However, Baffoe et al. (2014) highlight how critical knowledge is as an integral part of the credit package and as a prerequisite for using credit effectively. They added that access to credit also allows households to diversify their livelihoods. The authors, however, emphasized that an initial increase in the diversification of household income generating activities is a precondition to credit access.

Financial institutions are reluctant to lend to the agriculture sector, particularly to small-scale farmers because of perceived adverse risks (Akosa, 2011), default history, land tenure issues and information asymmetries endemic in rural areas (AGRIFIN, 2012). Small-scale farmers barely benefit from existing credit sources, especially formal credit (IFAD, 2000). A recent assessment of eleven rural and community banks (RCB's) in Ghana indicates that only 9% of their lending portfolio goes to the agriculture sector (AGRIFIN 2012). Also, a study on credit accessibility shows that 95% of maize farmers lack access to credit (Kuwornu et al., 2013). Large-scale farmers who possess collateral in the form of land and other assets like livestock and cocoa farms are the main beneficiaries of credit. They constitute only 20% of the farming population. The implication here is that small-scale farmers are constrained in adopting improved inputs and modern technologies (Owusu-Antwi and Antwi, 2010). The net result being difficulty in improving productivity.

There are two streams of previous studies on the determinants of credit; supply and demand dimensions of accessibility. Akudugu (2012) estimates the determinants of credit in his study using Logit and Tobit models. On one hand, the logit results for credit demand show that age, literacy, cash crop growing, farm size, gender (male), political affiliation and social group membership have significant positive effects on credit demand. On the other hand, the Tobit results show that having a savings account is the only significant positive factor that influences credit supply. In order to understand whether there are other possible factors that account for access to credit supply, Akudugu (2012) introduced the Inverse Mills Ratio (IMR) to capture selectivity bias. Their IMR results were statistically significant, indicating that rural banks are biased when it comes to supplying credit to farmers. The explanation they gave was that political interference and poor interpersonal relationships determine whether rural banks advance credit to farmers, meaning that one has to have strong social connections in order to have access to credit. These results are consistent with the findings of Dzadze et al., (2012) and Kuwornu, Ohene-Ntow and Asuming-Brempong (2012), also in Ghana, and Onyeneke and Iruo (2012) in Nigeria. However, Onyeneke and Iruo (2012) also identified farm experience, family size and the possession of bird stock while Dzadze et al. reported having contact with agricultural extension services as a factor of credit accessibility. In addition, Kuwornu et al., (2012) showed household size and annual income to be factors that determine access to credit. Okpukpara (2010) reported collateral demands by formal credit institutions as a prerequisite to credit accessibility.

Until now, no study has investigated improved household productivity and livelihood diversification as determinants of credit. We believe that improving productivity and engaging in multiple livelihood activities can entice lending institutions to advance credit to a household. This is because such households are likely to be less vulnerable since diversification aims to reduce vulnerability (Ellis, 1998; Baffoe et al. 2014). Following Ellis (1998), livelihood diversification here is defined as 'the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living'. Diversification serves as a safety net for the poor (Zoomers and Kleinpening, 1996) and a means of accumulating wealth among the rural better-off (Hart, 1994). It also enhances rural households' ability to access credit (Baffoe et al. 2014). According to Carter (1997), diversification further enhances farm investment and productivity. Clearly, livelihood diversification could be an effective strategy to reduce poverty. But we should note here that improved productivity and diversification reinforce each other. Diversifying activities can help a household improve its agricultural productivity while improved agricultural productivity may, conversely, offer resources with which to diversify the household's activities. However, we do not argue that this nexus is always true, since diversifying activities does not necessarily connote improved agricultural productivity. By being cognizant of established determinants, this study will build on the empirical findings of Baffoe et al., (2014) by modelling agricultural productivity and livelihood diversification as potential

determinants of credit accessibility. Baffoe et al., (2014) found that households with credit are more productive in agriculture than households without credit, with the distinguishing factor being livelihood diversification.

Credit constraint is a major challenge in Ghana. Credit inadequacy limits households' productive capacities and stifles agricultural productivity (MoFA, 2011). This phenomenon is reflected in national agricultural output as a recent analysis by sector indicates that the contribution of the agricultural sector's growth rate to Ghana GDP has decreased from 7.4% in 2008 to 1.8% in 2011 (MoFA, 2011). The observation is that in spite of the potential of the agricultural sector, the country is still not self-sufficient in terms of food production as it does not yet match demand (Dzadze et al., 2012). This is partly because farmers lack incentive to produce on a commercial basis, so subsistence production dominates (MoFA, 2007).

The objective of this study is to empirically identify the determinants of access to rural credit in order to more effectively alleviate poverty using Ehiaminchini, a farming community in the Fanteakwa District of eastern Ghana as a case study.

## 2. Methodology

### 2.1 Study Area

Figure 1 shows a map of the study area. The study was undertaken in Ehiaminchini, a village in the Fanteakwa District of Eastern Ghana. The community is approximately 20 km away from the district capital, Begoro. It has a total population of approximately 2000 people with an average of 6 people per household. Farming is the major occupation in the community and major crops include, but are not limited to cassava, yams, maize, cocoyams, plantains and vegetables (e.g. peppers, tomatoes, cabbage) (Fanteakwa District Assembly 2013).

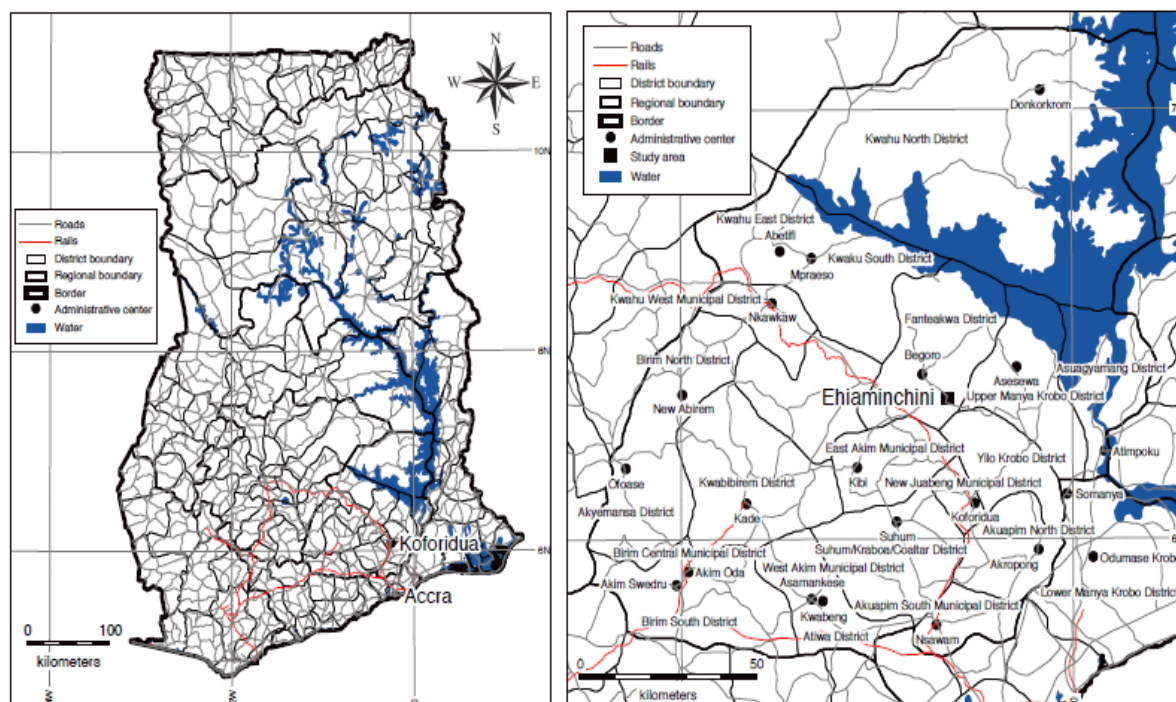


Figure 1. Administrative regions in Ghana (left) and the study community (right)

Source: The GIS data for the map is from DIVA. The database had no third-level administrative boundary data.

Aside from raising major crops, households in the community are also actively engaged in other diverse means of increasing their livelihoods. Households do other activities such as petty trading, brewing, Gari processing, and palm oil production, among other pursuits; in addition to their primary economic activity (farming). Crop farming in the community is heavily dependent on the weather (rain-fed agriculture), which makes the activity very vulnerable. Because of this, financial institutions in the district are very cautious when it comes to giving credit to farmers in their catchment areas. Institutions aiming to make a profit and avoid risky lending portfolios prefer giving credit to diversified households. Such households are considered less vulnerable relative to less- or undiversified households.

The households in the community were categorized into two groups: borrower households (with credit) and non-borrower households (without credit). Out of 109 households, 37 (34%) had access to credit whilst 72, (66%) did not. This is a clear indication that many households in the community have limited access to credit. Figure 2 shows the amount of credit (in Ghana Cedi) received. It should be noted that the requested and received amounts are the same. Rationality did not apply to the borrowers. The majority (19) borrowed within the range of GHS0 to GHS500. Likewise, the smallest number (2) of borrower households borrowed amounts in the ranges of GHS1001 to GHS1500 and GHS2501 to GHS3000. None of the households borrowed between GHS2001 and GHS2500. The reason the majority borrowed within the range of 0-500GHS is the fear of default and subsequent indebtedness. This was made known during an official interview. Similarly, the fewest number of households borrowed from GHS1001 to GHS3000 due to high interest rates, which range from 25% to 32%.

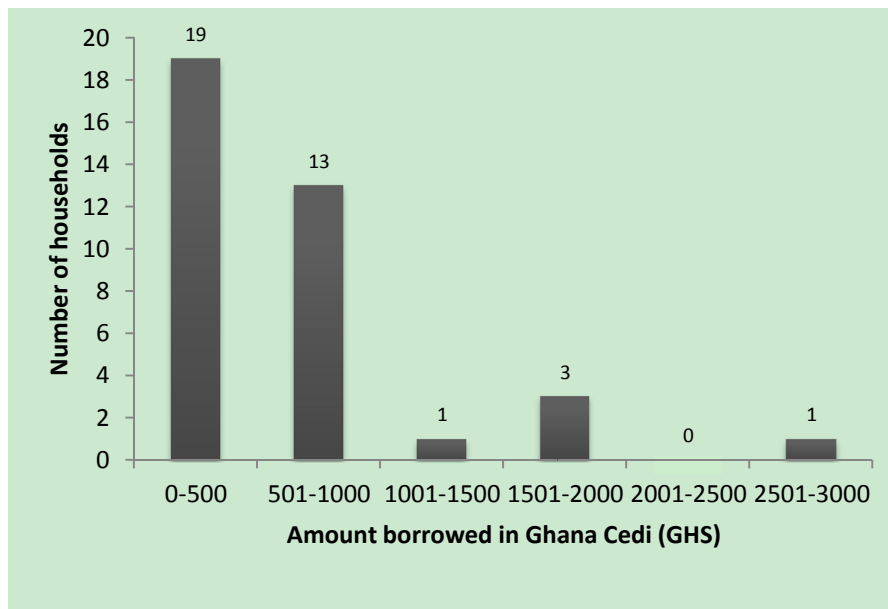


Figure 2. Credit granted in Ghana Cedi (GHS)

Source: Field survey 2013

Note: Rural banks are the major source of credit among borrowers. Requested and received amounts are equal.

Again, households engaged in three or more activities were classified as diversified households, while those involved in two or less were classified as less diversified households. Table 1 shows the livelihood diversification situation among the households. The table shows that 95% of the borrowers are engaged in livelihood diversification compared to only 10% of non-borrower households. Diversified activity implies that risk is spread, which is critical in reducing vulnerability, improving productivity and enhancing household resilience (Baffoe et al., 2014). Table 2 also shows the yield productivity of major crops among the households. From the table, it can be seen that borrowers' major crop yields are higher and statistically different from those of non-borrower households.

Table 1. Livelihood diversification among households

Group	Activity categories					Total
	Petty trading	Manufacturing	Service	Other	Non-diversified	
Borrowers	18 (49)	8 (22)	-	9 (24)	2 (5)	37 (100)
Non-borrowers	3 (4)	-	-	4 (6)	65 (90)	72 (100)
Total	21	8	-	13	67	109

Adapted from Baffoe et al. 2014

Table 2. Yield productivity of major crops among households

Crop	Borrowers (N=37)				Non-borrowers (N=72)				t-value
	Avg. yield (mt/ha)	Min	Max	Std. Dev	Avg. yield (mt/ha)	Min	Max	Std. Dev	
Cassava	8.540	3	10	5.582	6.305	1	23	4.405	0.040**
Maize	4.333	2	10	1.795	3.569	1	10	1.991	0.050**
Yams	7.030	1	26	5.947	4.682	1	17	3.421	0.045**

Note:\*\* indicates statistical significance at the 5% confidence level

Source: Adapted from Baffoe et al. 2014

## 2.2 Sampling Technique

One hundred and twenty households in the community were selected for the study. The community was divided into twelve areas and ten households were picked from each area, paying close attention to spatial distribution and randomness. The results of the study are based on valid data from 109 households.

## 2.3 Data Collection

Formal interviews were conducted with the officials of lending institutions in the study district to better understand the supply side of credit. Managers and credit officers of four financial institutions were interviewed. The inquiries included but were not limited to questions about credit supply requirements, interest rates, credit amounts granted to small holders, repayment strategies and default rates. Interviews were recorded then later transcribed and segmented into meaningful pieces to support the argument.

Structured questionnaires were then used to collect data on the socioeconomic characteristics we considered could affect households' decisions to access credit or not. Factors captured by the questionnaire included households' diversification status, years of education the household head had attained, years of farming experience, age, agricultural production amount, input expenditures and household size, among others. The questionnaires were administered randomly to the one hundred and nine selected households.

We also conducted focus group discussions. This was the last data collection exercise undertaken. The main objective was to triangulate the data as much as possible. Three separate interviews of groups of 5 people each were conducted to validate the data. No household was allowed to participate in more than one group. This was to obtain as many diverse views as possible and to ensure fair representation. Households were invited to attend a session through a 'Gongo beater' (village town crier based in the palace) in the community.

## 3. Empirical Estimation Method

### 3.1 Probit Model

We used a probit model to estimate the determinants of credit accessibility because of its efficiency in estimating dichotomous variables. According to Nagler (2002), the probit model constrains the estimated probabilities to be 0 and 1 and relaxes the constraint that the effect of the independent variables is constant across different predicted values of the dependent variable. The model assumes that values of 1 and 0 are observed for variable (Y). However, there is an unobserved latent continuous variable ( $Y^*$ ) that determines the (Y) value (Long 2006; Kuwornu et al., 2012). Y is the observed binary variable (Okpukpara, 2010) and for this study, it is credit access (whether or not a household borrows).

The advantages of the model lie in the use of maximum likelihood estimation to efficiently estimate coefficients with asymptotic error distribution (Nagler, 1994). In other words, the error term distribution is believable and the probabilities are realistic. The error term is assumed to be normally distributed and the probability that the event (access to credit or not) will occur is the cumulative density function (cdf) of the error evaluated at each given value of the independent variables (Long 2006). Hence, in identifying the determinants of credit accessibility for this study, the probit model is a good choice.

We assume that ( $Y^*$ ) can be specified as follows:

$$Y^*_i = \beta_0 + \sum_{j=1}^{10} \beta_j X_j + \varepsilon_i \quad (1)$$

And that

$$Y_i = 1 \text{ if } Y^*_i > 0$$

$$Y_i = 0 \text{ if } Y^*_i \leq 0$$

Positive values of  $Y^*$  are observed as  $Y = 1$  while negative or zero values of  $Y^*$  are observed as  $Y = 0$ .

While  $Y = 1$  if a household head has access to credit and 0 if otherwise,  $X_1$  represents the household head's technical efficiency;  $X_2$  represents the household's livelihood diversification;  $X_3$  represents the household's savings account;  $X_4$  represents its collateral;  $X_5$  represents household size;  $X_6$  represents the gender of the household head;  $X_7$  represents the household head's age;  $X_8$  represents the household head's years of education;  $X_9$  represents the household head's years of farming experience; and  $X_{10}$  represents the household's group membership;  $X_{11}$  represents the household's connection with the lender.  $\beta_i$  represents unknown parameters to be estimated respectively (Nagler, 2002). The description and measurements of these variables are summarized in Table 3.

Table 3. Description and measurement of variables used in the probit model

Variable	Description	Measurement	A priori sign
Credit access (Dependent variable)	Whether or not a household head has access to credit	Dummy: 1 if yes, 0 otherwise	
Technical efficiency	Household productivity	Technological Efficiency	+
Diversification	Whether a household is engaged in multiple livelihood activities or not	Dummy: 1 if yes, 0 otherwise	+
Savings account	Whether or not a farmer has an account with a financial institution	Dummy: 1 if yes, 0 otherwise	+
Collateral	Whether or not a household has assets that can allow them to borrow	Dummy: 1 if yes, 0 otherwise	+/-
Household size	Total number of people in a household	Head count	+
Gender	Sex of household head	Dummy: 1 if Male, 0 otherwise	+
Age	Age of household head	Years	-
School years	Years of formal education of household head	Years	+/-
Farm experience	Experience in farming activities	Years	+/-
Group membership	Whether or not a farmer is a member of any social group, i.e. a proxy for social capital	Dummy: 1 if yes, 0 otherwise	+
Connection	Whether or not a household head has relationship with a lender	Dummy: 1 if yes, 0 otherwise	+

The dependent variable in the probit model is a binary (dichotomous) variable representing households' credit constraint condition. Following Kuwornu et al., (2012), this dependent variable  $Y_i = 1$  for farmers who have access to credit and  $Y_i = 0$  otherwise.

The independent variables are selected based on a review of empirical and theoretical literature on credit constraint factors. Here, we included livelihood diversification and household productivity as potential factors in the model.

#### *Household size*

Household size is the total number of people living and eating together in a house. It is measured as a continuous variable. A previous study (Kuwornu et al., 2012) found this variable to be a credit constraint factor. However the opposite is expected in this study. Large family size is assumed to influence a household's decision to access credit for productive activities such as farming. The reason is that such households are likely to do effective farming as they have readily abundant labor. The coefficient is therefore expected to be positive.

#### *Age*

This variable is continuous and measured in years. It is assumed that as a household head grows older, the ability to access credit decreases. This is due to the fact that they may not be strong enough to work efficiently or invest in farming activities. However, the opposite is true for younger households. The sign of the coefficient associated with this variable is therefore expected to be negative.

#### *Schooling years*

This is also a continuous variable measuring the number of years of formal education the household head has attained. Its coefficient could be either positive or negative. Although previous studies have reported negative coefficients (e.g. Akudugu 2012; Kuwornu et al., 2012; Ahmed et al 2011), we believe it is difficult to predict. Having more education, can enhance one's knowledge of credit availability, so we think this coefficient could have either sign.

#### *Farming experience*

We assumed that as a household head continues to farm, he or she gains valuable experience on the best farming practices, resource allocation and credit acquisition, which enhance their chances to access credit. It is also possible that lending institutions will care little about the experience of the household if they meet all other necessary criteria. This explanation is based on field experience, so either sign is expected for the "farming experience" variable, which is continuous and counts the number of years the household head has farmed.

#### *Technical efficiency*

This variable represents the productivity of the household. We assumed that households who exhibit high productivity are likely to have access to credit since high productivity can connote repayment ability. Baffoe et al (2014) empirically demonstrated in their study that improving productivity is critical as far as credit accessibility is concerned. Technical Efficiency (TE) is estimated to capture the agricultural productivity of the household. TE is estimated using a Data Envelopment Analysis (DEA) approach (Coelli et al. 2005). It is a continuous variable and is measured as an index. A positive coefficient is expected for this variable. Figure 3 shows the technical efficiency distribution score among the households.

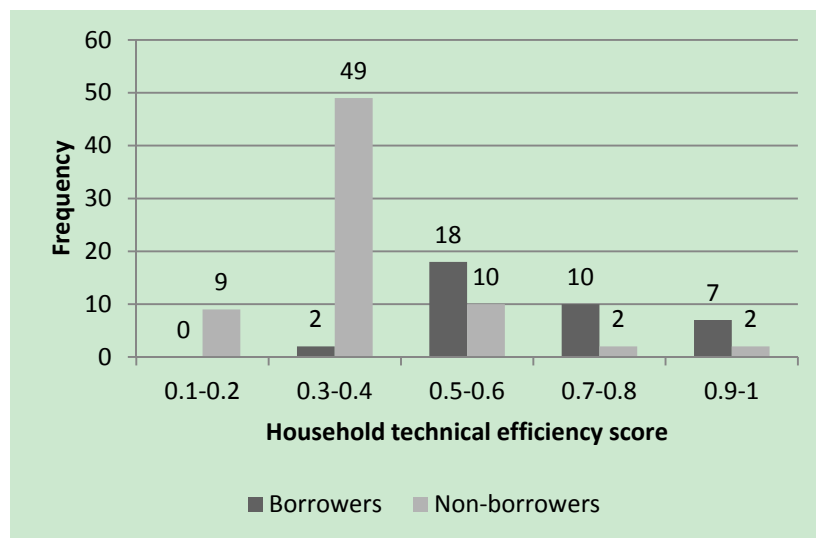


Figure 3. Household technical efficiency distribution

### *Livelihood diversification*

This variable explains whether a household is engaging in multiple livelihood activities or not. It is assumed that diversified households will stand a better chance of accessing credit due to their ability to spread risk among a number of income-generating pursuits (Baffoe et al. 2014). It is a dummy variable taking the value “1” for households with diversified activities and “0” otherwise. The sign is expected to be positive.

### *Savings account*

This variable is used as a proxy for the monetary worth of a household (Akudugu 2012). It is assumed that a household with a bank account is likely to access credit from a lending institution since their savings can serve as collateral. It is measured as a dummy taking the value “1” for a household with a savings account and “0” otherwise. It is therefore expected that the coefficient of this variable will be positive.

### *Gender*

This variable is given the value “1” if the household head is male and “0” otherwise. Households with male heads are known to be highly mobile and to be exposed to information (Kuwornu et al., 2012). They are also likely to invest the credit they access in farming activities compared to their female counterparts. We therefore expect that male-headed households will likely access credit for farming, so we expect this variable to have a positive sign.

### *Group membership*

This variable is used as a proxy for social capital. It has the value “1” for households who are members of a social group and “0” otherwise. It is expected that households in a social group will more likely access credit. This is because the group can serve as social collateral. Akudugu (2012) found the coefficient of this variable to be positive. A positive coefficient sign is therefore expected for this variable.

### *Connection*

This refers to the relationship between a household and a lender. It is assumed that households who have some sort of relationship (either formal or informal) can capitalize on that familiarity to access credit, irrespective of laid down rules. On the contrary, others may be impeded due to strict institutional criteria. This was observed during interactions with households. Predicting this variable is difficult. It is dummied “1” for households with “connections” and “0” otherwise. We do not have a prior expectation for the sign of the coefficient for this variable.

### *Collateral*

This comprises all the durable assets of a household. It is assumed that households with valuable assets are likely to have access to credit since assets can be liquidated to redeem default. However, this does not mean that households without collateral cannot access credit. Households without collateral can also access credit provided they can prove their credit worthiness. This was also made known during interviews with lending institutions. We have no preconceived expectation for the sign of this variable. It is dummied “1” for households with collateral and “0” otherwise.

## **4. Results**

Table 4 depicts the socioeconomic characteristics of the households. It can be seen that borrowers are younger than non-borrowers. The average age of borrowers is 46 years compared to 53 year of non-borrowers and 50 years for all households. In terms of education level, though it is low for both groups, borrowers have more schooling on average (10 years) than non-borrowers (8 years) and all households (8 years). This is an indication that borrowers are likely to know how to read and write, which is crucial when applying for a loan with a formal financial institution. Borrowers are more likely to be willing and able to deal with the complex application process due to their ability to read and write.

There are no apparent differences with regard to household size. Borrowers have one extra household member making their households the largest (7 persons) as compared to averages of 6 persons over all households and in non-borrower households. Farm size (6 acres) is the same across the board. It is clear that the average profit for borrowers (GHS652.6) is larger than that of non-borrowers (GHS468.14) and for the average over all households (GH366.0). This may be attributed to the fact that borrowers are able to invest credit profitably.



Table 4. Mean socioeconomic characteristics of households

Variable	All households (N=109) (mean)	Borrowers (N=37) (mean)	Non-borrowers (mean)
Age (years)	50	46	53
Farm size (acres)	6	6	6
Household size (persons)	6	7	6
Farm experience (years)	28	24	30
Education (years)	8	10	8
Profit (new Ghana cedi (GHS))	366.0	652.6	468.14

Source: Survey 2013

Table 5 shows the maximum likelihood estimates of the probit model. It shows that the coefficients of five variables are statistically significantly different from 0 ( $\beta_1, \beta_2, \beta_3, \beta_5$  and  $\beta_6$ ). These are the factors that influence households' access to credit. The coefficients of the livelihood diversification and savings account variables are significantly different from 0 at 1 the per cent confidence level while those of household size and gender are significant at the 5 per cent confidence level. Similarly, the coefficient of technical efficiency is significantly different from 0 at the 10 per cent level. It should be noted that the significance of gender is characterized by a negative coefficient. The coefficients of schooling years and group membership are positive, but not significantly different from 0. Likewise, the coefficients of age, farm experience, connection and collateral are also not significantly different from 0 and even have negative signs. The coefficients of gender, schooling years, collateral and group membership are contrary to our expectations.

Table 5. Determinants of credit accessibility

Constant	-2.303 (1.612)
$\beta_1$	0.344* (0.141)
$\beta_2$	1.458*** (0.005)
$\beta_3$	1.652*** (0.481)
$\beta_4$	-0.164 (0.399)
$\beta_5$	0.269** (0.107)
$\beta_6$	-0.918** (0.494)
$\beta_7$	-0.018 (0.029)
$\beta_8$	0.059 (0.075)
$\beta_9$	-0.021 (0.036)
$\beta_{10}$	0.095 (0.390)
$\beta_{11}$	-0.164 (0.399)
Prob > Chi square	0.0002
Log likelihood	-33.74
Pseudo R Squared	0.33

Note: The dependent variable is Credit Access (with or without credit). \*\*\*, \*\* and \* indicate statistical significance at the 1, 5, and 10% levels respectively. Standard errors are in parentheses.

## 5. Discussion

The household size result suggests that large rural households are more likely to have access to credit. This result meets our a priori expectation. What it means is that holding other variables constant, a change in household size increases the probability of a household accessing credit by 0.24% (Table 5). This finding contrasts with previous work (Kuwornu et al. 2012) that reported that large family size constrains households' ability to access credit because their high demand for credit may result in default. Our finding can be explained by the fact that such households have abundant labor, which helps them pursue productive activities, particularly farming.

The result for livelihood diversification is positive. What this result means is that holding other variables constant, a change in livelihood diversification of a household increases the probability of that household accessing credit by 1.45%. Closely linked to diversification is household technical efficiency. A change in household productivity increases the probability of accessing credit by 0.34%. The result for having a savings account is not surprising. It also meets the a priori expectation. It confirms that having an account can enhance a household's ability to access credit by portraying the household as credit worthy. This is consistent with the findings in Dzadze et al. (2012) and Akudugu (2012) that savings accounts play a critical role in accessing credit. The gender result is contrary to a priori expectation. Our result indicates that male-headed households' probability of accessing credit is 1.14% lower than that of female-headed households. Thus, male-headed households are less likely to have access to credit. We attribute this to the fact that men are not seen as credit worthy. The result is not surprising as the men themselves admitted as much during a focus group discussion. One man remarked;

*"We are too stubborn and that is why the banks prefer to give credit to the women. We show off when we get good money tending to forget that the money is not for us. We use it to do all sorts of things and are unable to repay when the time is due. We are to blame ourselves"* Focus Group Discussion, 2013.

Even though this result is contrary to our expectation, it turned out that women are better managers when it comes to using a loan. While women use credit productively for fear of debt and shame, the same cannot be said of the men. There was general consensus that men usually allow themselves to be controlled by money. Financial institutions in the study area prefer dealing with female-headed diversified households because of their ability to carry on small-scale businesses. The implication here is that any effort to make credit accessible to rural households must give particular attention to female-headed households. This result is supported by the findings of Findeis et al., (2009) in Malawi. The authors reported that access to credit by women enhances their participation in off-farm self-employed activities, thereby helping to improve their status. However, it contrasts with the findings of Sebopetji and Belete (2009) in South Africa. The latter study found that male-headed households are likely to have more access to credit than their female counterparts due to the fact that men are more mobile and have access to information.

### 5.1 Improvement in Productivity and Diversification

The results for household productivity and diversification meet study expectations. Improving productivity, which could result from diversification, is critical in accessing credit. The marginal effects and probability of accessing credit increases as productivity increases. Figure 4 illustrates the marginal effect on predicted probability of productivity. From the figure, it can be seen that holding other factors constant, the predicted probability of accessing credit increases as household productivity increases. We argue that improving productivity is indeed critical in accessing credit. This lends support to the finding of Baffoe et al. (2014) that improving productivity at the first stage of development is crucial to accessing financial support.

Households engaged in more than one income-generating activity stand a better chance of accessing credit. Interviews with financial institutions in the study area indicate that diversified households are preferred because of their ability to do multiple activities, which helps avert risk. This makes them less vulnerable than undiversified households. Advancing credit to small scale-farmers is generally seen as a risky venture and financial institutions usually hesitate to do so for the fear of increasing the risk of their lending portfolio (World Bank 2008). Farming is characterized by uncertainties such as climate variability; and farmers' vulnerability was reported to be high in the study area. Lending institution officials offered the following remarks:

*"In an event of unfavorable weather such as drought or flood, a farmer may not be able to repay the loan, which may go a long way to affect the lending portfolio of the bank"*.

*Personal interview with Mumuadu Rural Bank, 2013.*

*"Farming in this area is unpredictable because of the weather. We are very careful when giving loans to farmers"*

here. We give to people with potential to repay on the due date”.

Personal interview with Atiwa Rural Bank, 2013.

“Not that we don't want to help farmers, we are here to help everyone financially. We want farmers who cultivate promising crops such as vegetables. We cannot give them a long-term loan, no. They should diversify from the traditional crops which take longer to mature”. Personal interview with Advans Investment Limited, 2013.

In essence, diversification puts households in a strategic position to attract financial support. The results clearly underscore the importance of diversification as a path to improve household credit accessibility and improve productivity.

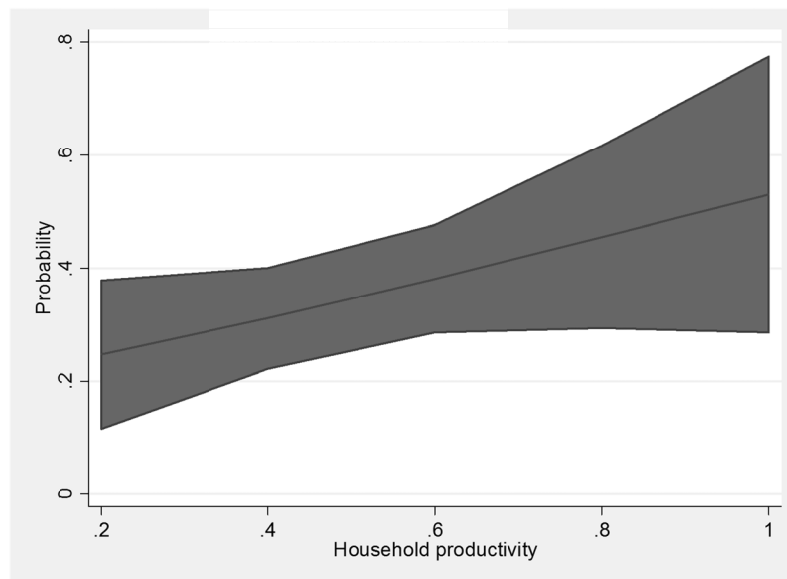


Figure 3. Marginal effect of household productivity on probability of accessing credit

## 6. Conclusion

This study empirically identified the factors that influence rural households' decision to access credit. We found that households in the study area have limited access to credit. Of particular importance are the results for improved household productivity and livelihood diversification, reinforce each other. Our findings suggest that a productive and diversified household stands a better chance of accessing credit. Clearly, improving productivity and diversifying economic activity could be critical in alleviating rural poverty.

This study recommends policy support for livelihood diversification in rural areas as diversification can help improve household productivity.

For further research, we recommend in-depth analysis of the interconnections between diversification, credit accessibility and household productivity from a larger data source. Further research must also scale up the investigation to cover more areas, either at the local or regional level. It will be interesting to know from a larger data source how the nexus contributes to household welfare.

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