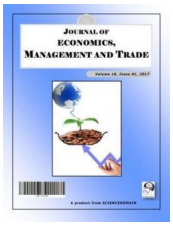

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Factors Influencing Access to Credits among Micro and Small Agro-based Enterprises in the Tamale Metropolis, Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Author SS designed the study, performed the statistical analysis and wrote the first draft of the manuscript. Authors SNA and DA did further analysis of the data, reviewed the manuscript and managed the literature review and referencing. All authors read and approved the final manuscript.

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ABSTRACT

Access to credits has been noted as a teething problem among agro-based micro and small enterprises (MSEs). The study examined and estimated the factors influencing access to credits using survey data of 155 micro and small enterprise operators selected through multistage sampling technique in the Tamale Metropolitan Assembly in the Northern Region of Ghana. The method of analysis involved the use of binary logit estimations. The study revealed that older entrepreneurs, males, level of education, income, distance from formal credit source, engagement in casual work significantly influenced the access to formal credit. Access to formal credit was however strongly and adversely influenced by number of paid employees, production sector, processing sector and engagement in other economic activities. The age of respondent, high number of years in business, high income, far distance to informal credit source and increased

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number of casual workers engaged positively influenced access to informal credits while increased expenses on child education and increased number of paid employees inversely affected access to informal credits. Overall access to credit (whether formal or informal), access was found to have influenced by older entrepreneurs, higher income and far distance but older Businesses and being in the service sectors were found to significantly affected access inversely. Government policies should aim at formulating programmes to promote and strengthen economic power of MSE operators to enhance their access to credits; by designing a sustainable and appropriate training programme for business skills development; provide technical assistant and advisory and consultation services.

Keywords: Access; credit; micro; small; agro-based; enterprises.

1. INTRODUCTION

Micro and Small agro-based enterprises (MSEs) played a vital and vibrant role in the economic growth and development of most developing economies [1]. MSEs play a significant role in development, especially in the third world countries and generate wide-spread economic benefits. The sector plays an important role in industrialization, promotion of rural urban balance, effective resource utilization and indigenous people's participation in economic development. To be effective in promotion of rural urban balance and indigenous people's participation in economic development and other industry areas, finance plays a key role. As far as MSEs are concerned as part of business enterprises, they need finance to start up, expand, diversify and for working capital of the business firms, without which no one business enterprise can achieve its objectives [1]. Micro, small, and medium-sized agricultural producers, processors, and traders need access to a variety of financial services in order to maintain and grow their businesses.

Micro and Small agro-based enterprises are labour intensive and perform useful roles in ensuring income stability, growth and employment participation for the bulk of low-income earners and as a result provides the poor a potential escape route from poverty [2,3]. The Food and Agricultural Sector in Ghana employs majority of people in the Ghanaian economy though its contribution to Gross Domestic Product (GDP) has been declining slowly over the years. Going beyond traditional agriculture dominated by production by farmers to include other value chain actors in agriculture is often considered a promising pathway out of poverty for poor rural economies, and there is a widespread belief that small enterprises may play an important role in especially the early stages of diversifying beyond agriculture [4,5,6].

The current agricultural policy framework under which Ghana operates is provided by the Food and Agriculture Sector Development Policy (FASDEP II) document which firmly recognizes the role that credit can play in productivity and livelihood improvements of its citizens.The definition of SMEs varies across disciplines and locations. The World Bank defines SMEs as having no more than 500 employees, but this varies from country to country. In Ghana SMEs are describe on the basis of capital requirements and employment size. The National Board for Small Scale Industries (NBSSI) defines small-scale enterprise as firms with not more than 9 workers with plant and machinery (excluding land, buildings and vehicles) not exceeding 10 million Ghana Cedis. Access to credit refers to the possibility that individuals or enterprises can access financial services, including credit, deposit, payment, insurance, and other risk management services [7].

The working and operational definition of MSEs for this study is adopted from [8] who classified small-scale enterprises into three categories, namely; micro enterprises which employs less than 6 people; very small enterprises employing 6 to 9 people; and small enterprises employing from 10 to 29 employees.

1.1 Access to Credits among MSEs

In Sub-Sahara Africa, most small businesses fail in the first year due to lack of funding from government and traditional banks [9]. In Ghana, the problems of financing small firms have meaningfully hindered the role that these Micro and Small Agro-based Enterprises play in the general macroeconomic performance of the Ghanaian economy. Government hard work to develop and advance funding to the MSEs have not yielded the desired results and the place of small and medium-sized enterprises in growing economies, especially Ghana as instruments of

economic growth is yet to be realized fully. Micro and Small Agro-based Enterprises in Ghana utilize their little capital that would not be sufficient to finance a large business to startup businesses and provide jobs and promote economic growth to the communities in which they are established. This helps to reduce rural, urban migration by ensuring even supply of economic activities. MSEs learn to utilize mainly local raw substance that would otherwise be neglected and have less foreign exchange, and to mobilize and utilize financial wealth like family savings that is otherwise dormant and by their activities promote local knowledge [8].

MSEs in Ghana are still challenged with a variety of limitations despite trade and industry improvement presented in Ghana since independence. Access to credit remains the most important and principal constraint of all. Small and Micro Enterprises (SMEs) in Ghana face a lot of difficulties in assessing credit which affects their working capital and their ability to utilize raw materials. [10] recounted that 38% of the SMEs mentioned finance as a main constraint; SMEs have inadequate access to capital markets locally and internationally, in part because of the perception of complex risk, serious management weaknesses, lack of information, and the advanced costs of intermediation for smaller firms. As an outcome, SMEs often cannot achieve long-term access to credit from financial institutions.

Several studies indicate that credit markets are characterized by information asymmetry and poor contract enforcement mechanisms resulting in a credit gap trapping those who cannot access formal sources of credit [11,12,13] and [14]. Another problem that SMEs face in accessing credit is due to inadequate or lack of legal mechanism to ensure repayment, especially in rural and urban sectors in developing countries where SMEs dominate. Moreover, the use of collateral as a solution for the information asymmetry problem is constrained by the limited available assets possessed by SMEs in developing countries [15].

Access to credit is an important instrument that enables MSEs overcome problems of liquidity, however MSEs in Ghana have received less attention. Though studies on small and medium enterprise sector has been researched in Ghana [16,17,18] emphasizing the factors influencing the micro and small enterprises at the household level with less attempts on analysis at the enterprise levels.

This paper examines the determinants of access to formal and informal credits at the enterprise levels specifically agro based MSEs. The main objective is to investigate factors influencing access to credits among MSEs in Tamale Metropolis. The study hypothesized that household and entrepreneur specific characteristics, socio-economic factors and market environment factors have an effect on access to credits among Micro and Small agro-based enterprises in the Tamale Metropolis.

2. THEORETICAL BACKGROUND

Given the objective of the study, which is to examine factors influencing access to credits among micro and small agro-based enterprises, we assume that micro and small agro-based enterprises have two choices; that is to be able to access credit or not able to access credit. Any MSEs may decide whether or not to apply for credit on the basis of their perceived utility of accessing credit relative to that of not accessing credit. Theoretical approaches in analyzing factors influencing access to credits among MSEs have their roots in the theory of consumer behaviour. The study adopts the theoretical frameworks of [19,20,21], it is assumed there are many micro and small agro based enterprises trading for profit maximization. MSEs are most likely to seek access to credit for expansion of businesses and to improve their operation, however viable collateral is vital for rapid credit approval. Thus, some of these firms may possess collateral while others do not. In the case of Tamale metropolis where the poverty incidence is high, it is logically prudent to generalize that collateral is almost lacking by most of the enterprises [22].

Based on the profit maximization goal of MSEs, these firms may seek formal or informal loans to initiate or expand businesses, given lending rates “r” and firms characteristics (X), MSEs decision to seek credit is considered as the demand for loan, which is the total number of firms that seek to borrow or access credit. In the credit market, this demand is contingent on the supply of loans, which is the number of loans, that a particular financial institution (formal or informal) is willing to provide.

According to [19] information asymmetry exists concerning various degree of borrower's riskiness. Assuming that firms (MSEs) are risk neutral, firms compare the expected utility of wealth from accessing credit denoted as U(πp) to that of not accessing credit, represented by U(πnp) with net returns (π) representing wealth. Participation then occurs if U(πp) > U(πnp). MSE's expected utility of accessing credit can be related to a set of explanatory variables (Z) as:

$$\pi = \alpha Z_i + u_{1i}$$

Where α is a vector of parameters to estimated and u1i is the error term distributed as N (0, σ2).

Zi is a vector of exogenous variables including the determinants of credit access. The utility MSEs derive from accessing credit is not observable but actions of the MSEs can be learned by either observing SMEs whose credit application were approved to access credit or non-credit approval and did not access credit.

The conceptual framework adopted assumes that a micro and small agro based operator who apply for credit from a formal or informal credit source and his/her request is approved to receive part or the full amount requested is influenced by certain key household and entrepreneur specific characteristics, socio-economic factors as well as market environment factors.

The operational framework of the study portrays that access to credits by MSEs may be influenced by household and entrepreneur specific characteristics such as age, gender, marital status, educational level, number of dependents, head of household and household size while socio-economic factors including business age, amount spent on child education and number of paid workers may have positive or negative influence on access to credits. Market environmental factors such as business sector (production, processing, service or trading sectors), net income and involvement in other economic activities may also have effect on access to credits.

3. METHODOLOGY

3.1 The Study Area

The study was carried out in the Tamale Metropolis and Sagnarigu district of the Northern region of Ghana respectively. The Metropolis is located in the central part of the Northern Region and is bounded by Sagnarigu district to the north, Mion district to the east, Tolon district to the west, Central Gonja to the south west and East Gonja to the south. Sagnarigu district shares boundaries with the metropolis. The Northern region is one of the poorest regions in Ghana, despite the heavy presence of NGOs. The region lacks most of the social amenities like schools, health facilities, roads and potable water supply necessary for economic development. Tamale metropolis and the Sagnarigu district has market potential for local goods from the agricultural and commercial sectors from the other districts in the region and the southern parts of Ghana; also stands to gain in trade from the neighboring countries e.g. Togo, Burkina Faso. Although the Tamale metropolis is seen as urban and Sagnarigu as peri-urban, several parts of the region are rural with most of the arable lands used for farming activities.

3.2 Sampling Procedure

A multi-stage stratified sampling technique was employed in selecting the respondents for the study, so as to ensure that the respondents were picked from urban (Tamale Metropolis), peri-urban and rural communities (Sagnarigu district). A four stage sampling techniques was used to select the sample population of the study. Stage 1: The Tamale Metropolitan and Sagnarigu district assemblies were purposively selected out of the 26 districts on the basis of high concentration of micro and small agro based enterprises. Stage 2: Four agricultural zones were selected randomly from each district (4 out of 4 for Sagnarigu and 4 out of 5 for Tamale metropolis) based on MoFA zoning criteria. Stage 3: Lists of Small Scale Agro-based enterprises were obtained and grouped into four sectors (production, services, trading and processing sectors). Stage 4: Twenty entrepreneurs (20) were selected randomly from the list of selected enterprises from each sector (4) across the agricultural zones making up 160 respondents for the study. A total of 155 questionnaires were properly answered representing 97% of the sample population.

3.3 Logistic Model

The logistic regression model was applied in estimating the probability of factors influencing access to credit by agro based MSEs. The study employed the logistic regression model for evaluating SMEs access to credit bearing in mind

the dichotomous nature of the dependent variable. To access credit can take one of the two values, either Y = 1 for enterprises whose credit application was approved to access credit, while Y = 0 for the non-credit approval and did not access credit. Since the dependent variable is not continuous, the application of linear regression models is not appropriate. This means that the use of probit or logit models which provide equally efficient parameters are more appropriate methods in analyzing dichotomous dependent variables [23].

Preceding literature on credit access [24,25,26] also adopted the use of the logit model in the analysis of their study in Nigeria and Ghana. Additionally, [27] also explained that a logit model is well-matched for explaining and testing the hypotheses about the relationship between a categorical outcome variable and one or more categorical or continuous variable, when a continuous dependent variables are included in the model.

The functional form of the logit model is presented as follows:

$$P_i = E\left(Y_i/X_i\right) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_1)}} \quad (1)$$

$$P_i = E\left(Y_i/X_i\right) = \frac{1}{1+e^{-(Z_i)}} \quad (2)$$

Where *Pi* is a probability of access to credit given i[th] MSE and ranges from 0 to 1. ; Z*i* is the set of unobserved continuous variable, called latent variable or the functional form of n explanatory variables ($\boldsymbol{X_i}$) including demographic attributes of entrepreneur and firm's Socio- economic attributes. The logit model also assumes that Z*i* is linearly related to the explanatory variables which is expressed as:

$$Z_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_i$$

Where;

i=1,2,3,4……n

β_0 is the intercept and β_i are the slope parameters.

If P_i is the probability of a firm accessing credit, then 1- P_i indicates the probability of not accessing, which can be given as;

$$1- P_i = \frac{1}{1+e^{(Z_i)}} \quad (3)$$

Dividing equation (1) by equation (3) and simplifying gives

$$\frac{P_i}{1-P_i} = \frac{1+e^{(Z_i)}}{1+e^{-(Z_i)}} = e^{Z_i} \quad (4)$$

Equation (4) gives the ratio of the probability that an MSE or a firm accessing credit when its credit application is approved or otherwise. Lastly, the logit model is obtained by taking the natural logarithm of equation (4) as follows:

$$Li= \ln\left[\frac{P_i}{1-P_i}\right] = \beta_o + \beta_1 X_1 + e$$

Where;

P_i is the probability (Y=1) that a firm will access credit,

$1 - P$ is the probability (Y=0) that a firm will not access credit,

β_o the intercept. It is the value of the log odd ratio, when the explanatory variables are zero.

β_1 the slope, which measures the change in L (logit) for a unit change in the explanatory variables (X);

e is the error term.

3.4 Methods of Data Collection

Data collection techniques consisted of key informant interview, individual (face-to-face) questionnaire administration and observation. The questionnaire and interview guide were pretested to ensure that they were good instruments for the purpose of the study.

3.4.1 Description and measurement of variables

The justification for the choice of variables used in this study was based on gaps revealed in the reviewed literature and focus of the study which motivated the choices. The variables considered include demographic (household and entrepreneur specific characteristics), socio-economic as well as market environment factors.

3.4.2 Dependent variables

The dependent variables for the study are the overall access to credit, formal access to credit and informal access to credit.

i. **The overall Access to Credit:** The overall access to credit takes the value of "1" for MSE operator's whose applications were approved and given a part or full amount requested from either the formal or informal credit source or from both sources in 2013/2014 for his business operations and "0" otherwise. The MSE operator had no access to credit, if his loan application was rejected, or did not borrow for particular reasons.
ii. **Formal access to credit:** Formal access to credit takes the value of "1" for MSEs operator whose loan application were approved and was given a portion of amount or the full amount requested from the formal credit institutions for business in 2013/2014 and "0" otherwise.
iii. **Informal access to credit:** Informal access to credit takes the value of "1" for MSEs operators whose loan applications were approved and was given a portion of amount or the full amount requested from the informal credit sources in 2013/2014 and "0" otherwise.

3.4.3 Independent variables

A summary of the list of explanatory variables, their measurement and hypothesized signs as used in the logit regression model are given below. The effect of the independent variables on access to credit (Over all, Formal and Informal) could be either negative (-) or positive (+). The expected sign for each independent variable on access to credit (Overall, Formal and Informal) is stated.

If the expected sign of an independent variable is negative (-) then we expect to have a negative relationship of that independent variable with access to credit which means that given the independent variable is continuous(count), an increase will make an MSE less likely to access credit and a decrease otherwise. Given the independent variable is dummy, a movement or change from zero (0) to one (1) will make an MSE less likely to access credit.

Also if If the expected sign of an independent variable is positive (+) then we expect to have a positive relationship of that independent variable with access to credit which means that given the independent variable is continuous(count), an increase in that independent variable will make an MSE more likely to access credit and a decrease otherwise. Given the independent variable is dummy, a movement or change from zero (0) to one (1) will make an MSE more likely to access credit.

Both the dependent and independent variables are summarized and described on Tables 1, 2 and 3.

4. RESULTS AND DISCUSSION

4.1 Demographic and Socio-economic Characteristics of Agro Based MSEs

The age distribution of the surveyed entrepreneurs ranges from 19 years to 65 years with an average age of 43 years. Those that fell within the age bracket of 41-50 years constitute majority (35.5%) of the respondents. Generally, 85.2% are within the economically active age group (19 – 50 years) which represents a potential agro based MSE sector in Tamale Metropolis and Sagnarigu Districts. According to [28] as the age of a household increases, so

Table 1. Variables definitions and unit of measurements

Dependent variables	Unit of measurement
Over all Access to credits	Dummy 1= MSEs applications were approved and received part or full amount requested from either the formal or informal credit source or from both sources between in 2013/2014 for business and 0=Otherwise.
Formal access to credit	Dummy 1=if MSE Operator whose credit applications were approved and received either part or full amount of the loan from a formal financial institution 0=Otherwise
Informal access to credit	Dummy 1= MSE Operator whose credit applications were approved and received either part or full amount of the loan from the informal sector 0=Otherwise

Table 2. Variables definitions, unit of measurements and hypothesized sign

Independent variables				
Definition	**Unit of measurement**	**Expected sign for Overall, Formal and informal access to credit**		
		Overall Access	**Formal Access**	**Informal Access**
Sex of respondent	Dummy 1=MSE Operator is a male 0=MSE Operator is Female	+	-	-/+
Age of entrepreneur	Continuous variable measured in Years	+	+	+
House hold size	A continuous variable- total number of people in the household.	+	+	-/+
Number of dependents	A continuous variable -Number of vulnerable people in MSE operator's household catered for by entrepreneur.	-/+	-	-/+
Marital status of entrepreneur	Dummy 1= MSE Operator is married 0=Otherwise	+	-/+	-/+
Entrepreneur's level of education	Continuous variable. Number of years of schooling	+	+	+
Income	A continuous variable which is sum of earnings from all business ventures by entrepreneur in Ghana cedes.	+	+	+
Production Sector	Dummy 1= MSE Operator is engaged in the production sector. 0= Otherwise	-	+	-/+
Processing Sector	Dummy 1=MSE Operator is engaged in the processing sector. 2= Otherwise	-	+	-/+
Service Sector	Dummy 1=MSE Operator is engaged in the service sector 0= otherwise	-	+	-/+
Trade Sector	Dummy 1=MSE Operator is engaged in the trading sector. 0=Otherwise.	-	+	-/+
Business Age	A continuous variable- number of years enterprise has being in operations	+	+	+
Amount Spent on child education	School fees paid on child education a continuous variable.	+	_	+
Head of Household	Dummy 1=MSE Operator is head of house hold. 0=Otherwise	+	-	+

does his business experience, practical, wisdom and his income generating capacity. Age is related to time and this means with time, commitment and perseverance one gains more experience and virtually succeeds in achieving his goals. Details of the socio-demographic characteristics are presented in Table 4.

The result further indicates that a fair distribution of both male (51.6%) and female (48.8%) SME owners exist though the women dominate especially in food processing and trading sector. Majority of MSEs are female-owned businesses, which are often home-based compared to those owned by males; and are mostly not considered in official statistics [9]. The level of education of respondents essentially helps him/her to observe good business management practices including credit management. Majority (58.1%) of the respondents had no formal education whereas 26.4% had basic level of education for an individual to read and write. These results reflect a general trend of low levels of education among people in the northern region, where the school

dropout rate is very high. [29] revealed that the probability of applying for credit significantly increases with the number of years of schooling, increased age and as well as income.

Mainstream SME owners are predominantly married (91.6 %) with a small proportion (8.4 %) either single or widowed. Additionally most (36.2 5) SME have a household size between 6 to 10 members and closely followed by 20 % of SME owners with household size between 1 to 5 members.

Table 3. Variables definitions, unit of measurements and hypothesized sign

Independent variables				
Definition	**Unit of measurement**	**Expected sign for Overall, Formal and informal access to credit**		
		Overall Access	**Formal Access**	**Informal Access**
Family Labour	Number of family labour used by entrepreneur	+	+	+
Number of employees or Paid Workers	A continuous variable - total number of employees who are on salaries or wages paid by the entrepreneur.	+	-/+	-/+
Distance to Source of Formal Credits	Distance travelled to formal credits source to obtain credits(Km)	-/+	-/+	-/+
Distance to Source of Informal Credits	Distance travelled to informal credits source to obtain credits(Km)	-/+	-/+	-/+
Distance to Source of Overall Credits	Distance travelled to either formal or informal credits source to obtain credits(Km)	-/+	-/+	-/+
Other Economic Activity	Dummy 1=MSE Operator is engaged in other economic activity 0=Otherwise	–	–	–
Casual worker	This is a continuous variable and defines the number of casual labour engaged MSE.	+	+	+

Table 4. Demographic characteristics of respondents

Characteristic	**Frequency**	**Percentage**	**Characteristic**	**Frequency**	**Percentage**
Education			**Age**		
No formal education	90	58.1	Below 31	26	16.8
Basic	41	26.4	31 – 40	51	32.9
Secondary	9	5.8	41 – 50	55	35.5
Tertiary	15	9.7	above 50	23	14.8
No of Dependents			**Sex**		
1 month – 6years	73	47.1	Male	80	51.6
Above 65 years	17	10.9	Female	75	48.4
House Hold Size			**Marital Status**		
1 – 5	31	20.0	Single	4	2.6
6 – 10	56	36.2	Married	141	91.6
11 – 15	30	19.3	Widow	9	5.8
16-25	26	16.8			
above 25	12	7.7			

4.2 Borrowing Status of MSEs Entrepreneurs

According to the results of the survey, majority (61.9%) of MSEs applied for formal credits and 88.5% of those who applied had their request honored, while 11.5% had their request rejected due to failure to meet the terms of lenders. The reasons for the high levels of amount of credits given were due to the different type of loan packages. Most of the MSEs, especially the Tractor service providers, received tractors while the agro inputs and chemical dealers also received very large amounts as a result of support by government to improve supplies of inputs and agro chemicals to food crop producers. Details are presented on Table 5.

The survey also revealed that 8.3% respondents of formal credit beneficiaries paid interest lower than 10% on their loans while 49% of respondents paid interests greater than 40%. These interest rates are far too high for any realistic profits to be made according to respondents. The lenders claim the interest rates were computed comprising of interest rates, insurance and processing fees. Majority of formal credit beneficiaries of the surveyed respondents (93.7%) were guaranteed to obtain access by virtue of their group or association solidarity.

4.3 Factors Influencing Access to Credits by Agro based MSEs

In Table 5, the estimation results of the logistic model of factors influencing access to credits by agro based MSEs in the Tamale Metropolis are presented. The table presents the marginal effects, standard errors and odds ratio of the independent variables, the p-value of the chi square and the Pseudo R^2. We observe that the p-values (0.0030, 0.0000 & 0.0000) and their corresponding chi square (46.27, 96.28 & 75.81) for Overall Access to Credits, Formal Access to Credits and Informal Access to Credits respectively are significant. This indicates that, overall, the model applied can statistically predict factors influencing access to credits (Overall Access, Formal Access & Informal Access) by agro based MSEs in the Tamale Metropolis. Thus, the independent variables jointly determine access to credits by agro based MSEs. The results of the logistic regression are presented on Table 6.

Overall access to credits was determined by distance (1%), age of entrepreneur (5%), age of business (5%), service Sector (5%) and income (10%). Distance, age of entrepreneur, service sector and income met the expectation of the research. However age of business had a negative effect on access to credit which did not correspond to the expectation of the research. Formal access to credits was determined by distance (1%), Income (1%), number of Employees (1%), Production Sector (1%), Processing Sector (1%), Casual Employee (5%), other economic activity (5%), age (5%), marital status (10%) and education (10%). All variables that determined formal access to credit met the expectation of the research. However Child Education and number of casual employees were negatively related to access to informal credit and did not meet the expectation of the study.

Entrepreneur's age positively influences MSEs overall access to credit, formal and informal access to credit at 5% significant level for overall and formal access to credit and 10% significance level for informal access to credit. This implies that old entrepreneurs are more likely to access credit and a year increase in an entrepreneur's age will increase the probability of an entrepreneur accessing credit by 0.0182. The effect of an entrepreneur's age in accessing credit is stronger in influencing access to formal credit compared with informal credit. Age of an entrepreneur influences the probability of accessing formal and informal credit by 0.0200 and 0.0128 respectively. According to [30] age of an individual is said to be positively related to the decision to apply for credit and the amount of credit applied. Generally it can be said that due to the capability of the older entrepreneurs to accumulate assets which are used as collaterals, formal financial institutions perceive them as creditworthy, therefore stand the likelihood of accessing formal credit from commercial banks than the younger entrepreneurs.

Distance to source of credit was another factor that was found to have a positive and significant influence on access to credit. Distance to credit source influenced both formal and informal credit at 1% significant level, with a very strong effect on access to informal (0.2341) credit compared with formal (0.0791) credit. The positive association suggest that the likelihood of accessing credit increases if the distance between the firm and source of credit increases. The possible explanation to these findings is that the enterprises are located within urban centers closer to the banking institutions and cost of

travelling is low and again most of the MSEs received their credits at their door mouths due to mobile banking. However [31] on the contrary showed that physical distance of farm households from formal lending institutions adversely influenced access to formal credit. Because transportation cost raised the effective cost of borrowing at otherwise relatively lowers interest rate in the sector. [30] indicated that there was no evidence on impact of distance from urban centers (remoteness) on demand for credit and showed that availability of different sources of credit have limited impact on demand for credit.

Table 5. Borrowing Status of Micro and small agro based entrepreneurs

Characteristic	Frequency	Percentage	Characteristic	Frequency	Percentage
Borrowing Status			**Interest Charges**		
Yes	96	61.9	Less than 10%	8	8.3
No	59	38.1	10% - 20%	6	6.3
Request Honored			21% - 30%	15	15.6
Yes	85	88.5	31% - 40%	20	20.8
No	11	11.5	Greater than 40%	47	49
Collateral types					
Land /building	6	6.3			
Guarantor	90	93.7			

Table 6. Logit Regression Estimates of factors affecting access to Credits by MSEs

Variable	Overall Access to Credits		Formal Access to Credits		Informal Access to Credits	
	Marginal effects	Std error	Marginal effects	Std error	Marginal effects	Std error
Age	.0182**	.0045	.0200**	.0097	.0128*	.0067
Sex	.1064	.1003	.0747	.2539	-.0118	.2014
Marital status	.0263	.0814	.3604*	.1856	.0111	.1962
Education	.0003	.0.0814	.0258*	.0134	-.0003	.0100
Dependant	-.0211	.0141	.0224	.0368	.02592	.0259
Age of business	-.0124**	.0014	.0070	.0113	.0166*	.0090
Income	.00001*	6.88	.0005***	.0001	.00001*	.00001
Child Education	.00004	.00005	.0001	.0001	-.0002**	.00009
Distance Overall Access	.1067***	.0341	-	-	-	-
Distance (Formal Access)	-	-	.0791***	.00001	-	-
Distance (Informal Access)	-	-	-	-	.2341***	.0487
Household Size	.0155	.0102	-.9199	.0216	-.0165	.0199
Employees	.0082	.0177	-.1632***	.0434	.0674*	.0199
Service Sector	-.2994**	.1408	-.2111	.2721	-.2209	.2543
Production Sector	-.0735	.0776	-.6638***	.1342	.1072	.1748
Processing Sector	-.0310	.0731	-.4951***	.1520	.1285	.1194
Family labour	-.0052	.0235	.0589	.0553	-.0083	.0395
Other economic activity	.0281	.0593	-.3351**	.1627	-.0561	.1349
Household Head	-.0224	.0670	-.0365	.1920	-.1467	.1542
Casual Employee	-.0168	.0193	.1237**	.0529	-.0615**	.0349
Number of Observations	155		155		155	
LR-Chi2(18)	46.27		96.28		75.81	
Prob >Chi2	0.0030		0.0000		0.0000	
Pseudo R2	0.5180		0.4511		0.3648	

**** Significant at 1%, ** Significant at 5% and * Significant at 10%*

Number of hired paid employees had a negative but significant effect on Access to formal credits and a positive effect on access to informal credit. However, number of hired paid employees had a positive effect on access to informal credit. Additionally number of hired paid employees was not significant in influencing overall access to credit. An increases in the number of hired employees reduces the probability of a firm to access formal credit by 0.16 times. This implies that as the number of hired labour increases in the firm it affects the business and raises operational cost thereby affecting profitability. The results from the study implies that most of these MSEs require intensive labour, however as a result of unavailability and high cost of labour prevailing in the study area, increases in hired labour may serve as a disincentive to access formal credits since this can affect profitability and ability to pay back credits. These results are in contrast with [32] who revealed that the decision to use hired labour increases the probability of demanding credit but consistent with the study of [32] who revealed that the decision to use hired labour increases the probability of demanding credit.

Business Age or enterprise age has a negative influence on access to overall credits but positively increases access to informal credit by small scale agro-based enterprises in the region, however enterprise age had no effect on access to formal credit. The negative association suggest that for every one year increase in the age of the enterprise there will be a decrease in the probability of accessing overall credit by 0.0124 and increase access to informal credit by 0.0166. This might be due to the peculiar characteristics of MSEs who are noted to retrogress or virtually collapse with time due to low productivity and inefficiency. The results are consistent with studies by [33] but in contrast with studies by [34] who revealed that firms age play a major role in access to credits since older firms are noted to have capital generated over time and also credit history that can be used by lenders to assess their credit worthiness.

Educational of entrepreneur's has a positively significantly influences on SMEs access to formal credits but did not have any effect on the overall access to credit and access to informal credit. An increase in an entrepreneur's years of education will increase the probability of accessing formal credit by 0.0258 times. The results are consistent with findings by [35] who revealed that educational background of the SME owner–manager is often positively related to the firm's usage of leverage. [36] also asserted that more educated entrepreneurs have the ability to present positive financial information and strong business plans, with better ability to maintain a good relationship with financial institutions compared to less educated entrepreneurs.

Marital status was significant and positively influenced access to formal credit but was not significant in determining overall access to credit and access to informal credit. Married entrepreneurs are 0.3604 more likely to access formal credit compared to non-married entrepreneurs. Married entrepreneurs are often viewed as responsible personalities and very stable and may be able to meet their loan obligations as compared to those not married. [30] from his probit estimations found out that married individuals who demand for credit are more likely to obtain credit from NGOs/cooperatives, government programmes though in the case of commercial banks and money lenders, marital status is not important for one to qualify for credit.

Engagement in other economic activities aside the main business is significant and negatively affects access to formal credits but was not significant in influencing Overall access to credit and access to informal credit. This means that entrepreneurs engaged in other economic activities apart from their main business are 0.3351 less likely to access formal credit. This may be attributed to the fact that as MSEs may earn additional incomes from their engagement in other economic activities and can easily plough back the extra incomes into the business. SMEs engagement in other economic activities may not have need for external credits. The high transaction cost associated with obtaining credit may prompt MSEs to switch profits from other income generating activities back to other business making them less likely to borrow from formal sources. These findings are consistent with investigations by [20] who found out that engagement in other economic activities had a significantly negative effect on the probability of demanding for credit. However, the findings of [37] were not consistent with these results as they realised a positive and significant relationship between demand for credit and engagement in other economic activities.

Engagement of casual workers or casual labour by entrepreneurs significantly influenced access to formal and informal credit but not access to

overall credit. Engagement of casual workers had a positive effect on access to formal credit but a negative effect on access to informal credit. Additional engagement of a casual worker increases the probability of accessing formal credits by 0.1237 (12.4%) whilst the engagement of an additional casual worker decreases the likelihood of accessing informal credit by 0.0615 (6.15%). These findings are consistent with research by [38] in analysing the performance of microenterprises in Ghana.

The estimates also showed that the income earned by an entrepreneur is statistically significant with a positive effect on overall access to credit, access to formal credit and access to informal credit respectively. The effect of income on access to formal credit (0.0005) is stronger compared to its effect of 0.00001 on both access to informal credit and overall access to credit. Additionally, an increase in the income earnings of an entrepreneur increases his/her likelihood of accessing formal credit by 0.0005 times (0.05%) and that of both informal and overall access to credit by 0.00001 times. These results are consistent with a study by [39] who found out that income positively affect demand for credit and subsequently promotes access to credit. With increases in the firm's income, ability to save and accumulate wealth increases and more assets are acquired which can be used as collaterals for accessing credits.

The Production sector was found to be statistically significant with a negative effect on formal credit. However SMEs involved in the production sector had no effect on overall access to credit and informal access to credit. SMEs involved in the production sector are 0.0363 times less likely to access credit from formal sources compared with SMEs in the trading sectors. In terms of access to formal credits, SMEs involved in the production sector were less competitive compared with those involved in the trading sectors. The possible explanations to these findings are that SMEs selected for the study were primary raw cereals legumes and yam producers who are characterized with low productivity, low incomes and rarely have collaterals to source formal credits.

The Processing sector was statistically significant with a negative effect on access to formal credits. Overall access to credit and informal access to credit were not determined by SMEs involved in processing. The results show that SMEs involved in the processing sector are 0.4951 less likely to access credit from formal sources compared with SMEs in the trading sectors. The respondents selected from the processing sector for this study were from the rice processors and groundnuts oil processors, majority of whom were females and noted to have less access to formal loans. According to [40], majority of MSEs in the processing sector are female-owned businesses, which are often home-based, compared to those owned by males; and mostly not considered in official statistics which affects their chances of gaining access to formal financial institutions.

5. CONCLUSION

The results of the study confirms the hypotheses that household and entrepreneur specific characteristics (*Age, Marital status and educational level*), Socio-economic factors (*Age of business, Distance to source of credit, Number of regular employees and Number of casual employees*) and Market environment factors (*Income, Service sector, Production sector, Processing sector and involvement in other economic activity*) have effect on access to credits among Micro and Small agro based enterprises in the Tamale Metropolis.

Majority of the MSEs operators were founds to be engaged in the production sector and their general educational level was low. Older entrepreneurs, males, higher level of education, higher income, far distance from formal credit source, engagement in casual works made it significantly possible to have access to formal credit whereas informal credits was positively influenced by increased age of respondent, high number of years in business, high income, far distance to informal credit source and increased number of casual workers engaged. Due to the positive impact of education on access to formal credits coupled with low levels of education, specific policies that will provide a sustainable and appropriate educational programme will be a major milestone towards improving and enhancing Micro and Small agro based enterprises growth, to drive the private sector and become the real engine of economic development. The study results portrays that income levels of MSEs facilitates and impact positively on their access to credits, government policies should therefore be geared towards creating a good micro environment for effective and efficient running of these enterprises in order to increase and obtain higher profit margins for sustainable growth and development of the small scale enterprises sector.

The analysis revealed that the production, processing and service sectors really lack access to credits in the study area. Efforts should be directed at addressing specific issues that confront these enterprise sub-sectors. Policies should aim at formulating programmes to strengthen economic power of MSE operators such that the sector players are perceived attractive by financiers. Facilitating and providing technical assistant as well as advisory and consultation services to MSEs will go a long way to promote and strengthened these enterprises. The Rural Enterprise Programme is in existence supporting micro and small enterprise development in the districts; efforts need to be intensified to secure funding to sustain this programme.

The study captured factors influencing the micro and small agro based enterprises with less detailed factors captured at the institutional (financial credit institutions) and prevailing national economic factors. It is therefore recommended that further studies should capture more institutional and economic factors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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