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Microfinance and Micro-Small-Medium Scale Enterprises (MSME's) in Kasoa Municipality, Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Author GDA designed the study, performed the statistical analysis, and wrote the first draft of the manuscript. Author IGKA was in charge of the collection and management of the data as well as the editing of the manuscript. Author DSE managed the literature search and streamlined the analysis of the study. All authors read and approved the final manuscript.

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ABSTRACT

Limited access to credit is one of the key factors inhibiting the growth of micro-small-medium scale enterprises (MSME's) in developing countries like Ghana. Hence, this study sought to identify determinants of access to credit and the factors influencing the volume of credit disbursed to MSME's in Kasoa municipality of Ghana. The study used primary data collected from 140 randomly sampled MSME's who applied for loan from Progressive Microfinance Company limited. The paired sample t-test was used to test whether there is significant difference between the amount demanded and the amount of credit received. The study used Probit model to analyze factors influencing the probability of access to credit while the Tobit model was used to analyze the determinants of amount of credit disbursed to the MSME's. The paired-sample t-test revealed that the amount of credit received was significantly lower than the amount of credit demanded by the MSME's. Empirical results from the Probit regression model indicated that educational level, provision of a personal guarantor, duration in business, permanent place of business and household size are the variables that significantly influence the probability of MSME's accessing credit from the MFI's. Moreover, empirical results from Tobit

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regression model show that sales level, availability of collateral security, business income, stock level and availability of bank statement have significant influence on the amount of credit disbursed to MSME's. The study therefore recommends that MSME's should be granted the required loan amount to enable them achieve their investment plans, and MSME's should be encouraged to operate bank account since it would increase their chances of accessing larger loan size.

Keywords: Credit; micro-small-medium enterprises; probit regression; tobit regression; Kasa; Ghana.

1. INTRODUCTION

Small and Medium scale Enterprises (SME's) have been identified as channels for economic growth especially in most developing countries in the World. They are major sources of income and employment representing the fuel for national economic engine of every developing country. According to Ahiawodzi and Adade [1], SME's represents about 90% of business and are responsible for about 50 to 60% of employment in most African countries. In the analysis of issues concerning SME's in Ghana, Abor and Quartey [2] reported that SME's are competent and abounds in job creation, providing about 85% of employment in the Ghanaian manufacturing sector. Ahiawodzi and Adade [1] further noted that SME's represent about 70% of Ghana's GDP and accounts for roughly 92% of businesses in Ghana. Apart from helping to reduce unemployment (one of the serious problems in the Ghanaian economy), SME's also help to strengthen the industrial linkages and integration by the production of intermediate products as raw materials for large scale companies as well as selling of final goods produced by large scale manufacturing companies. These significant contributions of SME's coupled with the fact that SME's can be a catalyst for economic advancement motivated the Government of Ghana to establish the National Board for Small Scale Industries (NBSSI) in 1985 to facilitate the promotion and development of SME's through loan scheme. It has been documented by many researchers, economists as well as policymakers that access to credit play a significant role in the growth and survival of small-to-medium enterprises including microenterprises. Thus to achieve sustainable economic growth especially in developing countries, one of the strategies is for policy makers to pursue financial sector policies that aim at extending more credit to SME's.

However, limited access to credit has been identified as one of the main obstacles to the growth and development of SME's in both the developing and advanced economies. Even the SME's that get financial assistance normally have low approval rate. In Ghana, a survey by the Association of Ghana Industries (AGI) in 2010 indicated that access to credit is one of the main factors limiting the growth of small businesses, (AGI's Business Barometer Report, December 2010). This observation might be attributed to the fact that regular banks often focus on highly collateralized investments with low credit risk, which are rarely found in the micro, small and medium enterprises (MSME's) sector of the economy. Also, most regular banks are not focusing on the informal operations of the MSME's of which most are either unregistered or have no proper accounting records which are the basis for client assessment. As a result, many MSME's do not access credit from the regular banks. Rather, they turn to informal financial services such as microfinance institutions and savings and loans companies.

These situations have well been argued in the financial repression hypotheses and credit rationing theory by [3,4,5]. In the financial repression hypotheses, McKinnon [3] and Shaw

[4] maintained that financial market distortions arise as a result of policies such as impositions of deposits and lending rates and directed policies which led to artificial low interest rates, direct credit controls and high reserve requirements. The activities of these formal financial services lead to a fragmented financial market which in turn crowds out the financial needs of the MSME's. The end result is that these high risk borrowers (MSME's) do not have access to credit from the formal financial sector but resort to the informal sector which in most times, are woefully inadequate. However, Stieglitz and Weiss [5] asserted that malfunctioning in the financial market is caused by information asymmetry. This compels the financial institutions to adopt non-price strategies such as credit rationing in their credit disbursement in the imperfect market. Again, high risk borrowers (MSME's) may not access credit as they are considered to be the worse defaulters due to their willingness to pay high interest rate.

Although numerous attempts have been made to address challenges of MSME's access to credit in literature, the problem still persist in most developing countries including Ghana. The original purposes and the premises as well as the modus operandi by which the informal financial institutions were established appear to be fading out and being progressively replaced by the tenets of the regular banking sector. What is even worsening the situation is that the informal financial institutions such as the savings and loans companies and the microfinance institutions are adopting the strategies of the regular banks to disburse inadequate loans to MSME's. With these kinds of emerging trends, one could argue that with the passage of time, accessing credit by the MSME's who are the main targets of informal sector would be adversely affected. Moreover, productivity of SME's might naturally dwindle due to limited access to credit. In this light, we therefore pose the following separate research questions:

- (1) What are the determinants of loan accessibility and
- (2) What factors influence the actual amount that could be disbursed to a client (MSME's)?

Many empirical studies have investigated the determinants of credit access. However, these studies are limited to human capital theory or household characteristics such as gender, age, household size, marital status and household income levels. These do not give the perfect picture of the determinants of credit access from banks. Few other studies have concentrated on firm characteristics such as firm's age and financial characteristics such as stock level, stock turnover and firm's profits. According to the current knowledge of the authors, there is paucity of empirical evidence in which all three characteristics (i.e. entrepreneur characteristics, firm characteristics and financial characteristics) have been considered together to examine the determinants of access to credit as well as the factors that influence the volume of credit received by the clients (in our case MSME's). Thus, the contribution of this paper is twofold. Based on data sets from microfinance institution in Kasoa Metropolis, we first examine whether MSME's have different probabilities to access credit. Secondly, we investigate whether the loan amount they receive is explained by certain determinants. For instance, why does firm A receive greater amount of loan than firm B even though firm B applied for a higher amount than firm A, given that both firms have similar size and capacity. This simultaneous investigation of access to credit and the determinants of loan amount disbursed to MSME's are limited in the field of credit literature, hence, the study hopes to contribute in filling this gap.

The findings from the study will be of great importance to the Ghanaian policy makers in their quest to strengthen the activities of MSME's in their effort to eliminate constraints

inhibiting the growth of enterprises. The study will also offer insight into the factors inhibiting credit access as well as factors contributing to credit rationing so as to help government and other stakeholders know where to target their efforts in their quest to providing easy access and cheap credit to entrepreneurs. Other significant variables that this paper throws light upon are the volume of sales and incomes from business operations since microeconomic and macroeconomic indicators have bearings on the sales levels of enterprises which in turn influence the volume of credit disbursed by MFI's. Again, the paper will help entrepreneurs by exposing them to some of the critical issues banks consider in their credit disbursement processes.

The remainder of this paper is organized into four sections. Section two provides both theoretical and empirical literature review. In section three, we provide the methodology that was used in carrying out this work and includes the sampling frame and techniques, data collection procedures as well as analytical techniques. Section four presents the empirical results and discussions. After the discussion of the results, the study ends with conclusions and recommendations for policy and future studies.

1.1 Literature Review

According to Nwaru [6], credit is defined as an instrument whose effectiveness is a function of finance and economics that goes with it. Credit is an input factor and so its demand is a derived demand, that is, borrowers will only demand for credit to help the production of goods and services or for business expansion. Credit can be in kind or in cash. However, this study considers credit in cash. Credit access refers to the absence of price and non-price barriers in the use of financial services. In literature, there are many supporting arguments that appreciate the difficulty of credit access by MSME's. This can partly be attributed to the fact that most MSME's lack proper accounting documentation and procedures and most often firm owner's mix their personal finances with that of the business finances, so financial institutions cannot rely on the business financial statement for assessment.

The financial institutions in Ghana are grouped into three main categories namely, formal, semi-formal and informal. While the formal sector of Ghana's financial institution is predominantly made up of commercial banks and rural community banks, the semi-formal financial institutions consist of mainly savings and loans companies and microfinance institutions (MFI). The informal financial sector consists of money lenders, family members, friends and the traditional susu system of credit. Most of the formal financial sector (commercial banks) targets the urban middle-income and high income clients (medium and large scale enterprises). However, microfinance institutions concentrate on the micro, small and medium scale enterprises. These semi-formal financial institutions have become the main source of financial resources for MSME's in Ghana. Hence, they are the main focus of this study.

In Ghana, the most commonly used definitions of MSME's are based on the number of employees of the enterprise (employment criteria) as defined by [7]. They classified SME's into four main categories; (i) micro-enterprise – employing less than 6 employees, (ii) very small enterprise – employing between 6 – 9 employees, (iii) small enterprises – employing between 10 and 29 and (iv) medium enterprises – employing 29 – 50 workers. On the other hand, the Ghana Statistical Service (GSS) also defines small enterprises as those with less than 10 employees while those with more than 10 are classified as medium and large enterprises. The study adopts the definition by Osei et al. [7], and therefore defines Micro-

Small-Medium enterprises as firms with 1 – 50 workers. This gives a fair representation of the MSME's employment level in Ghana and ensures that adequate numbers of firms are included in the sample.

In Ghana, most MSME's are mainly sole proprietorship and partnership form of business where ownership cannot be separated from firm control. This makes it relatively difficult to distinguish household characteristics from business characteristics. Studies on entrepreneurial skills and credit access had focus on household characteristics such as educational level, years of experience, age and gender. Thus, there is a correlation between household characteristics and credit access.

Roslan and Abd Karim [8] asserts that educational level fosters entrepreneurial competency enabling owners to keep proper book records, analyzing business cash flow and make the right decisions. Thus, MSME's owners with higher level of education are more likely to manage their businesses effectively and efficiently than their counterparts with low level of education. Furthermore, Irwin and Scoth [9] in their study of the barriers faced by SME's in raising banking finance; found that experienced graduates access credit relatively easier than their counterparts with low level of education.

Entrepreneurial experience plays a vital role in accessing credit from financial institutions. It has been documented that firms with longer years of experience are more likely to have access to credit than those with few years in business. This is because entrepreneurs with longer years in operation are in better positions to repay their loan than beginners. A recent study by Abunyuwah and Blay [10] in assessing the credit constraint conditions of small scale fish farmers in Ghana observed among other things that entrepreneurs with longer years of experience have higher probability of accessing credit from formal financial institutions than their counterparts with relatively few years of experience in the fishing industry.

Literature on gender and access to credit are quite interesting but have mixed findings. While researchers like Pearson and Greeg [11] contends that financial institutions are inclined to lend to women because of their ability to manage tighter budgets and turn to repay their debt obligations better than men, others like Bennett and Golberg [12] argue that low-income women in developing countries suffer societal suppression and abuse, and their counterparts in developed economies suffer lending discrimination.

Ajagbe et al. [13] in assessing the determinants of small scale enterprise credit demand in Nigeria employed Tobit regression model to identify the factors that influenced credit demand of small scale enterprises in Oyo state, Nigeria. The Tobit regression analysis indicated among other things that age of the entrepreneur has a negative relationship with credit demand. The argument is that as individuals advance in age the less productive they become in economic activities and therefore MFI's rate such individuals low in terms of repayment capacity which reduces their chances of accessing credit.

Obo and Ekpebu [14] recently examined the determinants of agricultural credit access and allocation among arable crop farmers in Benue state of Nigeria. Using multiple regression analysis, they identified household size, among other socioeconomic and firm-specific variables to be significant factors influencing the amount of credit received by farmers. Kuwornu et al. [15] also observed household size to be a significant determinant of farmer's access to credit when analyzing the determinants of access to agricultural credit among maize farmers in Ghana.

Atieno [16] identified household income level as one of the significant variables explaining access to formal credits. Furthermore, Oyedele et al. [17] employed Probit model to analyze the determinants of credit constraint conditions in Nigeria and indicated that household size, household expenditure among other variables were significant in explaining credit constraint conditions of farm households.

Firm's operational characteristics such as firm's age, volume of sales, level of firm's stock, stock turnover, collateral security as well as firm's income have the capacity to influence the volume of credit disbursed. Firm's duration in business is defined as the absolute number of years of existence since start-ups. A number of studies have documented a relationship between firm's age and access to credit. A survey conducted on 133 firms by Aryeeteh et al. [18] reveals that only about 10% of start-up firms in Ghana could obtain loans from the banks. Again, Levy et al. [19] indicated that about 80% of firms in Tanzania and Sri-Lanka with at least six years in operation are able to access loan from banks and other financial institutions.

The value of stock constitutes the accumulation of SME's wealth and security against emergencies. The value of firm's stock is an important factor influencing the decisions of credit institutions on how much loan to disburse to SME's. In the absence of fixed collateral such as land, vehicle or other immovable properties; banks use firm's capital stock as collateral against any loan amount. Also, firms with high level of capital stock are rated high by banks in terms of repayment capacity than firms with low capital stock value. Sales level is also one of the key indicators financial institutions use to measure the performance of firms. A firm's level of sales determines how the products of the MSME's are patronized which in turn determine their repayment capacity. According to Buyinza and Bbaale [20], volume of sales and capital stock are functions of access to and the amount of credit supplied to enterprises. They used Probit and Tobit models to estimate firm's access to credit and volume of credit disbursed to firms respectively in the Eastern African countries, where they observed a positive significant influence of firm's sales and capital stock on credit demand and supply.

In the absence of sufficient and accurate financial information probably due to information asymmetry, MFI's generally rely on high valued collateral security which, according to the MFI's reduces the probability of default. Thus, collateral security has become a key determinant of access to and amount of credit supplied. For instance, a study by Azende [21] showed that stringent collateral requirements by MFI's limit MSME's access to credit. Voordeckers and Steijvers [22] in studying the credit rationing for SME's in the Belgian economy indicated that about 50% of Belgium enterprises are credit rationed due to lack of collateral.

In developing countries like Ghana, SME's lack the ability to provide audited financial statements and accounting reports in accordance with prescribed accounting standards. This could partially be attributed to lack of adequate business experience and financial illiteracy level of entrepreneurs. Often, banks tend to rely on bank statements to study the movement of cash in and out of the business. Firms that are able to provide bank statements have higher probability of obtaining bigger loans than firms with no bank statement. Sometimes, financial institutions require that firms issue cheques against their monthly repayment amount. Ghimire and Abo [23], in analyzing the factors inhibiting the demand for credit by Ivorian SME's observed that, firms with no financial statements were denied access to loans. Kinditi et al. [24] also noted that loan applicants with no financial documentations

were rejected by their banks as there were nothing to show about their future and current performance.

Income from firm's operations is a key determinant of firm's access to credit as well as the loan size supplied. Firms with high income level are predicted by financial institutions to have a greater repayment capacity than firms with low income levels. Ibrahim and Alleiro [25] in assessing the determinants of formal credit among farmers in rural areas of Nigeria using Probit regression model noted that increase in the income levels of farmers in Nigeria increases the probability of accessing loans from credit institutions. Similarly, Dainelli et al. [26] reported an increasing function of firm's income on credit accessibility as well as the size of loan supplied by formal financial institutions.

2. METHODOLOGY

2.1 The Study Area

Kasoa, formerly known as Odupongkpehe, is a peri-urban city in Ghana situated outside the Ghana's capital city, Accra. Kasoa has territory in three of the twenty Metropolitan, Municipalities and District Assemblies (MMADs) in the central region of Ghana: Awutu Senya district, Ewutu Municipal district and Awutu senya East Municipal Assembly (ASEMA). It is the second largest town in these districts, second only to Winneba. The town is situated along the Accra-Cape Coast road, approximately 36 kilometers, by road, west of Ghana's Kotoka international Airport. The average elevation of Kasoa is about 75 kilometers above sea level with coordinates: 05 31 12N, 00 28 48W (Latitude: 5.5200; Longitude: 0.4800). Kasoa experiences a seven-month rainy season that lasts from April through to October. During the rainy season, the South West Monsoon winds are very prominent. The rainy season is followed by dry season that last from November to March. The North East Trade winds are very common in the period of the dry season.

Ghana has experienced rapid population growth in the last three decades. This population growth has directly affected Kasoa and its peri-urban areas. Kasoa is reported to be one of the fastest growing communities in West Africa with its estimated population increasing from 34,719 in 2000 to 69,384. Thus, from 2000 – 2010, the population increased by 34,665.

Agriculture and related businesses is one of the leading economic activities for Kasoa's working population. Crop farming and fishing are very popular economic activities in the lowlands near the coast. Kasoa's market is the main regional market with traders coming from other communities to trade especially on market days (every Tuesday and Friday). The market is consistently packed and is often difficult for new traders to sell their products because all the stalls in the market become occupied. Agro-processed products are popular commodities at these markets. Some of these products are processed cassava foods popularly known as 'gari' and 'agbelima'. The vibrant economic activities in the Municipality have resulted in the establishments of Microfinance institutions to support the financial capital of these business enterprises which are mainly micro-small-medium scale enterprises.

2.2 Sampling Procedure and Data Collection

The Data used for this empirical study were provided by Progressive Microfinance Co. Ltd, a microfinance institution (MFI) with special focus on MSME's. The institution operates in

Ghana as a fully-fledged microfinance company and it has its head-office in Kwashieman-Accra. The first two of its operations have been very successful and currently run four branch offices in Accra (Kwashieman, Kaneshie, Taifa and Accra central) and a branch office in central region (Kasoa) of Ghana.

All the five branch offices follow the same disbursement procedures. First, the loan request come either directly from the applicant through a loan application form or stimulated by credit officer who may contact the entrepreneur for his eligibility to apply for a loan. The credit officer will then perform a diligent rapid appraisal on the age (the minimum age for eligibility is 18 years), whether the applicant has a running business, type and location of business, residential status of the applicant and how far the business is from the nearest branch of the company. On the average, about 20% of the loan applicants are rejected through the rapid appraisal.

After the loan officer is satisfied with the minimum criteria, the loan officer then continues with a detailed client business assessment. During the assessment of the client business, detailed information regarding the client's private and business income and expenditures is collected. Moreover, data on business cash flow such as weekly or monthly purchase, sales level, mark-up, stock turnover and the value of stock at the time of visit. All these information are gathered in order to help the credit officer calculate the client's repayment ability. The third step in the loan disbursement process is for the client to provide an asset to secure the loan. This is called collateral. The collateral can be in the form of vehicle, house or land. Sometimes, the institution may accept client's business stock as collateral depending on the nature of the stock. The role of the collateral in the credit disbursement process is to serve as a disincentive for borrowers to default. The final step in the disbursement process is the loan amount decision at the credit committee usually made up of a minimum of three members. In the credit committee assessment the credit officer in charge is made to present his assessment on the client and recommend the loan amount and the maturity period based on the assessment. Following a unanimous decision of the credit committee, the loan amount and the maturity may either be fully approved, partly approved (amount reduced) or rejected outright.

The dataset for this study comprises of randomly sampled microloans applications at the Kasoa branch office of the company that have been disbursed and rejected within the Kasoa municipality. Moreover, the study excludes all loans that were rejected by credit officers even before the rapid appraisal process as well as pending loan application yet to be decided on. In all, a total of 140 applicants with fully complete client and loan data were sampled.

2.3 Analytical Framework

In analyzing the sampled dataset, descriptive statistics was employed to summarize the demographic characteristics of the client's as well as the percentages of credit applied and amount received. The paired-sample t-test was used to test for any significant difference between the volume of credit applied by the MSME's and the volume of credit actually disbursed to them. The Probit regression model was used to analyze the difference in probability of MSME's access to credit. Finally, the Tobit regression model was used to analyze the difference in the volume of credit supplied to MSME's.

2.3.1 The paired-sample t-test

Generally, the paired-sample t-test looks at the significant differences between two samples. The study adopted the paired-sample t-test technique to find out the degree of association

between total amount of loan applied by the MSME's and the actual amount supplied to them. The paired t-test is calculated from the formula below:

$$t = \frac{\sum d}{\sqrt{\frac{n(\sum d^2) - (\sum d)^2}{n-1}}}$$

Where $\sum d^2$ represents the sum of squared differences, $(\sum d)^2$ represents the sum of the differences squared and n is the sample size. As the averages of the differences gets bigger, the t value gets bigger and the confidence interval enlarges. However, as the variation in the differences gets bigger, the t value diminishes.

2.3.2 The probit model

In many empirical studies in the field of credit access, a limited dependent variable model such as Logit or Probit is used (e.g. see [11,27,28,29]). Nagler [30] indicated that Probit model constraint the estimated probabilities of the dependent variable to lie between 0 and 1 and relaxes the independent variables as a constant across probability values of the dependent variable. The Probit model assumes that apart from the observed values of 0 and 1 for the dependent variable Y , there is a latent unobserved continuous variable Y^* that determines the value of the dependent variable Y . Nagler [30] again maintains that Probit model has the advantage of plausible error distribution as well as reasonable probabilities. Hence, the preferred and the commonly used model has been the binary probit. The dependent variable Y^* is a dichotomous which represent the credit access condition of the MSME's and take the values "1" for those who are able to access credit and "0" otherwise. We assume that Y^* can be specified as follows:

$$Y_i^* = \beta_0 + \sum_{j=1}^8 \beta_j X_{ji} + \varepsilon_i$$

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

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

Where Y_i denotes the observed dependent variable; Y^* is latent which is not observable, X_{ji} denotes the vector of factors influencing the amount of credit SME's received by entrepreneur i , β_j represent vector of unknown parameters and ε_i represent a random disturbance term [30].

The empirical Probit model specified to analyze the probability of loans to be approved is given as follows;

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i$$

Where $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$ and X_9 denotes the age of the entrepreneur, the squared of the age of the entrepreneur, gender, marital status, household size of the entrepreneur,

educational level, duration in place, permanent place of business, and personal guarantor respectively. The measurements and the *a priori* expectations of the variables used in the empirical Probit model are presented in Table 1.

Table 1. Description, measurement and a priori expectations of factors affecting MSME's access to credit

Variable description	Measurement	A priori expectation
Age of the entrepreneur	Years	+
Age squared of the entrepreneur	Years	-
Gender	Dummy: 1 if male, 0 otherwise	+/-
Marital status	Dummy: 1 if married, 0 otherwise	+/-
Educational level	Years of formal education	+
Household size	Number of people	-
Duration in business	Years	+
Personal guarantor	Dummy: 1 if applicant has personal guarantor, 0 otherwise	+
Permanent place of business	Dummy: 1 if permanent place of business; 0 otherwise	+

2.3.3 The tobit model

In order to investigate why an entrepreneur A may receive bigger volume of credit than entrepreneur B even though B may request for higher amount than A (that is, why different volumes of credit are disbursed to different entrepreneurs), we assume that there is no conditional dependency between credit approval and the volume of credit disbursed.

We therefore estimate the amount of credit disbursed to clients by Tobit model. The Tobit model can be defined as;

$$Y_i^* = \beta_0 + \sum_{j=1}^6 \beta_j X_j + \varepsilon_i$$

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

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

Where Y_i denotes the observed dependent variable; Y_i^* is latent, X_j denotes the vector of factors influencing the amount of credit SME's received by entrepreneur β_j denotes vector of unknown parameters, ε_i is a residual that are independently and normally distributed with zero mean and common variance σ^2 .

The empirical model for the Tobit model used to estimate the amount of credit disbursed is given by:

$$K_M = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i$$

Where X_1 , X_2 , X_3 , X_4 , X_5 , and X_6 denotes collateral security, duration in business, sales level, bank statement, business income, stock level and stock turnover respectively; and K_M denotes the amount of credit disbursed. The variable description, measurement and a priori expectations of factors influencing the amount of credit disbursed are presented in Table 2 below.

Table 2. Description, measurement and a priori expectation of factors affecting the volume of credit disbursed

Variable description	Measurement	A priori expectation
Collateral security	Dummy: 1 if applicant has collateral security, 0 otherwise	+
Sales level	Volume of sales/month in Ghana cedis	+
Bank statement	Dummy: 1 if applicant has bank statement, 0 otherwise	+
Business income	Difference between Revenue and cost of sales	+
Stock level	Value of stock in Ghana cedis at the time of visit	+
Stock turnover	Rate at which goods are sold/month in percentages	+

3. RESULTS AND DISCUSSION

3.1 Empirical Results

3.1.1 Demographic characteristics of respondents

Summary statistics on demographic characteristics of the respondents are reported in Table 3 below. From the descriptive statistics, majority (43.57%) of the respondents are within the age bracket 31 – 40 indicating that majority are in their active and productive age group with the mean age of 41 years. Female respondents constitute about 67.64% while male respondents constitute only 32.14%. 77% of the respondents are married while only 33% are not married. The mean household size is 3 per respondents household. On the average, respondents spend 10 years in formal education. The study also indicated that about 33.57% of the respondents had 6 – 10 years of experience in their respective businesses with the mean duration in business been 10.4 years.

Table 3. Demographic distributions of the respondents

Variable	Frequency	Percentage
Age		
20 - 30	21	15.00
31 - 40	61	43.57
41 - 50	36	25.71
51 - 60	12	8.57
> 60	10	7.14
Total	140	100.00
Gender		
Male	95	67.86

Table 3 Continued.....

Female	45	32.14
Total	140	100.00
Marital Status		
Married	108	77.14
Otherwise	32	22.86
Total	140	100.00
Educational Level		
No formal	16	11.43
Primary	16	11.43
Junior High	48	34.29
Senior High	53	37.86
Tertiary	7	5.00
Total	140	100.00
Household size		
3-Jan	70	50.00
6-Apr	65	46.43
> 6	5	3.57
Total	140	100.00
Duration in Business		
< 1	17	12.14
5-Jan	31	22.14
10-Jun	47	33.57
15-Nov	20	14.29
16 - 20	6	4.29
> 20	19	13.57
	140	100.00

Source: Survey data, 2013

3.2 Credit Constraint Conditions of the MSME's

Korwunor et al. [15] defined credit constraint as a gap between demand for and supply of credit by the lenders and therefore the wider the gap, the larger the credit constraint conditions. Thus, in this study, a respondent is said to be credit constrained if the volume of credit received is lower than the volume applied. However, if the volume of credit received is just equal to the volume applied, then the respondent is said not to be credit constrained. Table 4 indicates that 83 (91%) out of the 91 respondents whose loans were approved did receive amount less than what they applied for (credit constrained) while only 8 (9%) of the respondents had amount equal to the amount applied (credit unconstrained). This indicates that majority of MSME's in the study area are credit constrained and this can affect productivity and for that matter business income.

Table 4. Credit constraint conditions of respondents

Credit Conditions	Constrained	Unconstrained	Total
Frequency	83	8	91
Percentage	91.21	8.79	100

With regards to the credit constraint conditions, t-test analyses was used to determine whether there is a significance difference between the amount of credit applied and amount received. The results in Table 5 indicate that the mean value of credit applied (GH¢3,302) is

greater than the mean value of credit received (GH¢1,978) at 1% significant level. This means that MSME's in the study area received about 60% of the volume of credit applied. These amounts are inadequate to the MSME's and may hinder their investment plans and affect their productivity and income levels. This result is in agreement with the findings of Korwunor et al. [15] and Oboh and Ekpebu [14] who indicated the mean value of credit amount applied is greater than amount received at 1% significant level.

Table 5. Paired t-test results showing the significance difference between credits applied and credit received

Loans	Mean	t-value	DF	Significance (2-tailed)
Amount Applied	3302	10.3644	90	0.000***
Amount Received	1978			

*** Significance at 1%

3.3 Factors Influencing the Probability of Receiving Loan

Results for the estimation of the Probit model (Probability of respondent access to loan) are shown in Table 6 below. The maximum likelihood estimates of the Probit regression model indicates that respondents duration in business, household size, educational attainment and the provision of a personal guarantor are significant variables that influence probability of respondents receiving credit.

Coefficient of educational level was found to be positive and significant at 1%. This means that higher level of education is highly associated with probability of accessing loans. The result is in conformity with the earlier findings of Roslan and Karim [8] who reported that education enable entrepreneurs' to appreciate complex information, book keeping, perform simple cash flow analysis and make better decisions and hence, have higher probability of accessing loans from lenders than those with little or no formal education.

Table 6. Probit regression estimates of factors influencing credit access

Variable	Coefficient	Robust std error	P-value
Age	0.211	0.182	0.245
Age squared	-0.002	0.002	0.42
Duration in business	0.529	0.229	0.021**
Educational level	0.168	0.061	0.006***
Gender	0.134	0.513	0.794
Marital status	0.129	0.501	0.797
Personal guarantor	2.377	0.566	0.000***
Permanent place of Business	1.756	0.599	0.003***
Household size	-0.0479	0.026	0.063*
Constant	-4.675	3.841	0.223
Number of Observations	Wald chi ² (9) 32.93	Prob > chi ² 0.0001	Pseudo R ²
140			0.3631

***, **, and * at 1%, 5% and 10% significance level respectively

The finding is also in agreement with Briggeman et al. [31] who found positive relationship between education and the probability of accessing credit.

Entrepreneurs with longer time in business are expected to manage their business better. The results indicated a direct relationship between duration in business and credit access at 5% significance level. Thus, firm's absolute number of years of existence since start-ups has bearing on the probability of accessing credit from banks and MFI's. The finding is consistent with the previous study by Woldie et al. [32] in Tanzania who observed that firms at start-ups and less than five years find it difficult to access credit from formal institutions and therefore depend more on informal sources of finance.

Household size plays a significant role in the probability of accessing credit. The study reveals that household size is negatively signed and significant at 10% level of significance. Thus, the larger the household size, the lower the probability of getting the loan application approved. This is contrary to the findings of Weber and Mushoff [33] who found a positive significant influence of household size on credit access. However, our findings confirm the study by Akpan et al. [34] and Idowu et al. [35] who found household size to be a decreasing function of the probability to access credit at 10% and 1% significant levels respectively.

Respondents having a permanent place of business play a key role in accessing credit from both the formal and the informal credit lenders. Entrepreneurs with permanent place of business have greater chance of accessing credit than their counterparts without permanent place of business. Thus, hawkers have low probability of accessing credit. This is revealed by the study as the permanent place of business is positively signed and significant at 1% level of significance. Personal guarantor is positively and significantly related to the probability of credit access at 1% level of significance. This follows our a priori expectation since the guarantor in a way serves as collateral to the loan. Thus, entrepreneurs who provide credible guarantors have greater chance of having their loan approved than entrepreneurs without guarantors.

3.4 Factors Influencing the Amount of Credit Disbursed to Respondents

The results of the maximum-likelihood estimates of the Tobit model are presented in Table 7. The Tobit regression results revealed that the availability of collateral security, sales level, and availability of bank statement, level of business income and stock level are significant factors positively influencing the volume of credit disbursed to MSME's. Collateral has become a key determinant of the amount of credit disbursed to MSME's as banks and MFI's use as an insurance against the probability of default. The availability of collateral security is positively signed and significant at 1% level of significance. This implies that MSME's with tangible assets that could serve as collaterals have greater chances of receiving larger amount of credit. This result falls in line with a study by Kira [36] who reported a significant positive relationship between the amount of credit demanded and availability of collateral security among Tanzanian SME's. However, the result contradicts the findings of Akpan et al. [33] who found collateral to relate negatively to the amount of credit disbursed to poultry farmers in Nigeria.

Lenders demand bank statements to enable them determine the liquidity status of the business at every point in time. This is also to cross-check how cash from the business flows in and out as well as to determine the clients savings capacity which partly determines their repayment capacity. Bank statement has positive influence on the volume of credit disbursed and statistically significant at 1% significance level. The result is in agreement with a recent study by Ghimire and Abo [23] who observed that financial statement is a critical determinant of access to and the amount of credit disbursed to SME's in the Ivorian economy.

The results as shown in Table 7 reveal that firm's levels of sales have positive bearing on the amount of credit supplied by the lenders. It is statistically significant at 1% level of significance. The results go with the findings by Buyinza and Bbaale [20] who reported that an increase in the level of sales by one unit increases the volume of credit disbursed by 0.7 percentage points, all other things been equal. Thus, firms with larger sales volumes induce credit supply, and microfinance institutions are willing to supply more credit to firms with greater sales than firms with lower sales levels.

Income from business plays a key role in the credit evaluation process of MSME's. Entrepreneurs with high income from business are likely to have greater amount of loan than their counterparts with small income from business. This is because entrepreneurs with high income levels can sustain their family and are less likely to supplement their family expenditure with a proportion of the loan and hence, banks are more willing to disburse to them higher amount. The results somehow substantiate the works of Weber & Mushoff [32] and Abunyuwah and Blay [10] who indicated that income from business is a significant increasing function of the amount of loan received. This was also affirmed by Dainelli and Giunta [26] who indicated that an increase in firm's income (profitability) increases firm's ratings and hence, increases the amount of credit received.

Table 7. Tobit regression estimates of factors influencing the volume of credit disbursed

Variable	Coefficient	Standard Error	P - Value
Collateral Security	2612.613	392.455	0.000***
Duration in Business	26.294	22.720	0.250
Sales	0.024	0.008	0.005***
Bank Statement	937.682	444.899	0.006***
Business Income	0.101	0.052	0.056*
Stock level	0.169	0.010	0.095*
Stock turnover	0.119	0.650	0.855
Number of Observations	91	LR χ^2 (7)	Pseudo R ²
	74.54	Prob > χ^2	0.0532

***, **, and * represent 1%, 5% and 10% significance level

The value of stock constitutes the accumulation of SME's wealth and security against emergencies. Stocks can also be easily converted to cash if the need arises. Financial institutions also consider the firms level of stock as a substitute for collateral security. The higher the value of firm's stock level the greater the probability of getting a larger amount of loan. From the Tobit regression results, the firm's level of stock have positive influence on the amount of credit disbursed and is significant at 10% level of significance. The result is in line with the finding of Buyinza and Bbaale [20] who reported a positive relationship between firm's level of stock and supply of credit.

Finally, firm's duration in business defined as the absolute number of years of existence since start-ups as well as the firm's stock turnover have no statistical influence on the amount of credit disbursed to business enterprises in the Kasoa Municipality.

4. CONCLUSION AND RECOMMENDATIONS

The study sought to analyze the effects of the determinants of MSME's access to credit as well as the volume of credit disbursed to MSME's in the Kasoa municipality. The data for this

study was elicited from a sample of 140 MSME's receiving credit from Progressive Microfinance Company Limited, Kasoa branch. Descriptive statistics and the paired sample t-test were used to describe the demographic characteristics of the respondents and test for significant difference between amount applied and amount received respectively. The Probit regression model was used to analyze the quantitative effects of factors influencing the probability of MSME's accessing credit, while Tobit regression model was then used to analyze quantitatively the effects of factors influencing the amount of credit disbursed to the MSME's.

The results of the paired-sample t-test indicate that the mean value of credit received by the sampled MSME's was significantly lower than the mean value of credit applied at 1% significant level. The results further revealed that only 9% of the sampled MSME's were credit unconstrained while 91% were credit constrained. The Probit regression model established that educational level, availability of personal guarantor, permanent place of business, duration in business and household size exert significant influence on the probability of MSME's accessing loans from the institution. Moreover, estimation from Tobit regression model indicated that volume of sales, collateral security, business income; stock level and availability of bank statement are significant factors influencing the volume of credit disbursed to MSME's in the study area.

The study therefore recommends that banks and MFI's should grant MSME's the required amount of loans to enable them achieve their investment plans, increase productivity and enhance their livelihood, and MSME's should be encouraged to operate bank accounts since it influence significantly the amount of credit disbursed. Again, the study clearly articulates the significance of firm's level of sales to the credit market. Therefore, policy implementers should devise policy options that are intended to purge hindrances in both macroeconomic and microeconomic environments that hinder the sales of MSME's in the country. The study also recommends that credit policy for MSME's terms and conditions should be formulated to marshal savings and make best use of the availability of credit. The study provides some contributions to the existing literature on credit by enhancing our understanding on factors determining credit access as well as factors determining the size of loan disbursed to MSME's. The study was conducted in Kasoa municipality only, and the results may not be a representative of the whole country. We therefore suggest that future research could extend to the other parts of the country.

COMPETING INTEREST

Authors have declared that no competing interests exist.

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