# Determinants of Access to Credit and Credit Source Choice by Micro, Small and Medium Enterprises in Nekemte, Ethiopia

Fikadu Goshu Fufa (MBA, MSc)

Nile Insurance Company and Visiting lecture at Wollega University, P-O-Box 675, Nekemte Ethiopia

**Abstract**

Now days, in almost all economies of the world, Micro and  small enterprises (SMEs) are recognized as engines of growth by their main contributions to national income, poverty reduction, export promotion and contribute to employment in developing countries and become the second largest employment generating sector for the poor households following the agriculture sector. The main objective of the study is to assess determinants of access to credit and credit source choice by SME entrepreneurs in the study area. Data was collected by using structured questionnaire from 173 entrepreneurs and the analyses of binary logistic regression and multinomial logit model is conducted by STATA version 10. The study shows that the major source of finance for SME is own source finance. The results of binary logistic regression reveals that there is statistically significant relationship between firms' access to credit and firm size, firms owing of  business plan, firm location, risk taking propensity of the firm head, firm age, and prevalence of corruption problem. Also, the result of multinomial logit model shows that firm size, access to work premises, firm location, access to business information, firm age, firm capital and prevalence of corruption in loan processing have statistical significant relationship with credit source choice decision by MSE entrepreneurs. The study result reveals that firm size, firm age, corruption problem and firm locations are statistically significantly determine both access to credit and credit source choice of the SME entrepreneurs in the study area. Based on the finding of this study, it is  recommends that government should formulate policies that will make sources of financing such as commercial banks, micro finance institutions and other sources to relax their credit regulations and operations which encourage borrowing and offer more credit facilities for firms especially which are found at micro and small sized level. Also, the government should establish stringent rule that curbs the corruption problem that prevail in accessing credit sources. Moreover, the government through its SME support institution has to facilitate the construction and arrangement of favorable business location for SME entrepreneurs in the study area.

**Keywords**: SME, Determinant, logistic regression, multinomial logit, access to credit, credit choice, Nekemte

## 1. INTRODUCTION

Now days, in almost all economies of the world, Small and Medium sized Enterprises (SMEs) are recognized as engines of growth and development and poverty reduction (Balogun, Agumba, & Ansary, 2016; Menike, 2015; Munyori & Ngugi, 2014; Zemenu & Mohammed, 2014). SMEs are a key vehicle leading to higher jobs and sustainable economic growth (Legas, 2015) and become the lifeblood of most economies (Brhane, 2014).The MSEs are important for their potential contribution in addressing socio economic problem such as unemployment, income inequalities, political stability and economic growth among others (Musara & Gwaindepi, 2014; Asah & Fatoki, 2011; Okpara & Wynn, 2007).

The SMEs sector is also perceived to be the backbone of any economies worldwide by their main contributions to national income, poverty reduction and export promotion (Nguyen & Luu, 2013). They are important sources of income not only for those people who could not find employment in other sectors but also provide cushion to falling incomes of low wage earners (Kefale & Chinnan, 2012). They make significant contribution towards the provision of low cost goods and services (Reddy, 2007). In most of the industrialized countries, over 96% of all construction and manufacturing sector firms originate from the SMEs sector (Balogun, Agumba, & Ansary, 2016). They also contribute 45% to employment and 33% to annual GDP in developing countries (Nguyen & Luu, 2013).

In Ethiopia, since the issuance of proclamation No 33/1998 to establish the Federal MSE Development Agency (FMSEDA), the SMEs are flourishing across the country and the sector becomes the second largest employment generating sector for the poor households following the agriculture sector (Mohammed, Habtamu, & Dessalegn, 2014). Almost 50% jobs created are attributable to small business enterprises which provided employment opportunity for 1,006,539 citizens (CSA, 2003). From 2010 to 2014, the SMEs sector created an employment opportunity for about 4 million citizens (FDRE-NPC, 2015; UNDP, 2015). Since the issuance of proclamation, the SMEs sector contribution to employment creation was increasing from time to time reaching to 5,186 entrepreneurs in 2015/16 fiscal year in the study area.

However, in spite of their major contributions, SMEs are facing a number of challenges limiting the sector to contribute fully among which financing is an important one (Nguyen & Luu, 2013; Kira & He, 2012). Access to finance is the most important obstacle to SMEs entry and growth (Monitor Group, 2014; Reddy, 2007). In Ethiopia, despite the government has been supporting town administrations in facilitating loan services, securing

land for manufacturing and marketing, and providing technical and vocational training for SMEs, access to finance and access to land are the greatest constraints than for the average Sub-Saharan SME firm in which 86% of them use internal finance for their investment as compared with 79% for other Sub-Saharan countries and 69% worldwide (Monitor Group, 2014). Similarly, the World Bank global competitiveness ranking place Ethiopia among the lowest ranked countries in the world with the cost of and access to financial services and loans (UNDP, 2015).

Despite, a significant number of researches have been conducted on finance as factors affecting SME growth (Fikadu, 2015; Assefa, Zerfu, & Tekle, 2014; Mohammed, Habtamu, & Dessalegn, 2014; Zemenu & Mohammed, 2014) and employment (Kefale & Chinnan, 2012) in Ethiopia, there are scant literature on determinants of access to credit and entrepreneurs financing choice. Thus, the objective of the study to assess determinants of access to credit and credit source choice by SME firm's entrepreneurs from the alternative credit sources of formal credit, NGO credit and informal credit sources in the study area. This work is organized in two five. Following the introduction, the second section reviews the theoretical and empirical aspects of literature. The third section describes research method, data type and model specification. Section four discusses and interprets results of the survey output using binary logistic regression and multinomial logit model and finally concludes the findings of the study.

## 2. LITERATURE REVIEW
### 2.1. Definition of SMEs in the Context of the Ethiopia
SMEs are defined in a variety of ways using various factors. These factors include number of employees, volume of sales, and the capital value of the business (Zemenu & Mohammed, 2014) Ethiopian SME development strategy defines SMEs using number of employees and their capital (WB, 2014; FMSEDA., 2012). According the strategy, Micro enterprise operating in the industry sector such as manufacturing, construction and mining are enterprises operating with 5 entrepreneurs including the owner and/or whose total asset are not exceeding Birr 100,000. In the service sector such as retailer, transport, hotel and tourism, and maintenance service, micro enterprise are enterprises operating with 5 entrepreneurs including the owner of the enterprise and/or with values of total asset which is not exceeding Birr 50,000. Small enterprises in the industrial sectors are an enterprise operating with 6-30 entrepreneurs and/or with a paid up capital of total asset Birr 100,000 and not exceeding Birr 1.5 million. Similarly, in the service sector, small enterprises are those enterprises operating with 6-30 entrepreneurs and/or with a paid up capital of total asset Birr 50,000 and not exceeding Birr 500,000 (FMSEDA., 2012). SMEs operating with number of members and capital beyond the above definitions small enterprise are considered as the medium enterprises.

### 2.2. Access to Credit and Credit Source Choice
The accessibility of finance by SMEs has stirred attention worldwide for many decades as access to finance is important for the growth of SMEs (Osano & Languitone, 2016). Financial problem has long been one of the stout challenges entrepreneurs faced (Legas, 2015; Hoang & Otake, 2014). Supply and access to credit are the most notable constraint, with access to capital and limited financing options emerging as the most significant challenges in Ethiopia (Monitor Group, 2014). The study by (Assefa, Zerfu, & Tekle, 2014) reveals that access to finance tops the constraint list where 37.7 percent of the MSEs reported it as a key constraint. Entrepreneurs typically start businesses primarily through their own savings because of limited access to startup capital (Kusi, Opata, & Narh, 2015) and existing firms finance their business from internal sources such as owners personal savings and retained profits (Wu, Song, & Zeng, 2008) to informal types of financing such as business credit cards, and trade credit (He & Bake, 2007) and few of them from formal external sources of financial institutions (Abdulsaleh & Worthington, 2013).The study by (Monitor Group, 2014) found retained earnings, credit cards, loan associations and investments from family and friends are the main sources of capital for small and growing enterprises. The study by (Fikadu, 2015) shows that personal saving is the major source of finance for SME. In Ethiopia, since most SMEs do not have a track record with banks, entrepreneurs are forced to borrow from informal financial markets at higher interest rates or quiet the business (Ageba & Amha, 2003). The study by (Le, 2012) found that old firms are more likely to finance themselves through their internal sources.

Formal credit is debt financing which where SMEs get finance products in a form of loan from lending institutions and give their promise to repay back at a given period of time (Osano & Languitone, 2016). Internal source of financing (equity financing) is an equity capital that can be raised either internally or externally. Internal equity is funds obtained from the current owner–manager(s), family, and friends or from the retained earnings within the firm (Noumigue, 2015). **NGO** is non-formal service providers which have strong ties to local communities and often fill gaps in public service provision by orienting their services to the disadvantaged and rural areas. They have the advantage of being less bureaucratic and more flexible than public providers, though often much more limited in scope (ILO, 2012). Informal credit is a source of finance for SMEs firm in which the entrepreneurs access from local money lenders with high interest rate.

The study by (Mostafa & Boregowda, 2014; Fatoki & Smit, 2011) grouped the major factors that influence access to finance by SMEs in two ways; internal and external. The internal factors include the business information, collateral, networking, and managerial competences (Fatoki & Smit, 2011). External factors constitute the legal environment, crime and corruption, ethical perceptions, and macro-economy (Fatoki & Smit, 2011). Internal financing is related to retained earnings and external financing could be in the form of borrowing (Mostafa & Boregowda, 2014). Extensive review of literature from previous work of (Rand, 2007; Akoten, Sawada, & Otsuka, 2006; Beck & Kunt, 2006) suggested that factors determining access to finance of SME firms can be categorized as owner's characteristics, firm's characteristics, firm's location, and ownership types. Others researcher such as (Hoang & Otake, 2014; Kira & He, 2012) found that firms' location, industry, size, business information, age, incorporation and collateral influence access to debit finance. Literature review conducted by (Abdulsaleh & Worthington, 2013) identified factors influencing financial behaviour of firms are firm size and age, ownership type and legal form, geographical location, industry sector and asset structure. Moreover, (Nawi, 2015) categorized determinants factor of SMEs in to four as owners' related factor, firm related factor, management performance and external factors.

## 2.3. Characteristics of Firm Owner/Manager
The personal characteristics of the owner-manager such as age, education, experience, and skills make a difference to the firm's ability of accessing external finance (Nguyen & Luu, 2013; Cassar, 2004) as the owner manager of SME has dominant role in the primary decision making. The issue of differences in financing sources related to gender among SMEs is more highlighted during the start-up stage (Abdulsaleh & Worthington, 2013) and Microfinance has been celebrated for its ability to reach out to women and enhance their welfare (Omonywa & Muturi, 2015). The study by (Mijid, 2009) found higher loan denial rates and lower loan application rates among female entrepreneurs. The study by (Coleman, 2007) provided evidence of credit discrimination against female entrepreneurs as they were more frequently charged higher interest rates and asked to pledge additional collateral in order for loans to be granted. The study by (McPherson, 1996) argued that female generated funds are used to cover family's basic needs and female entrepreneurs tend to avoid taking risks that may help firm expansion. Thus, it is hypothesized gender of the firm head have an impact on access to credit and credit source choice.

Debt financing is associated with risks such as risks of bankruptcy, risk of losing collateral, risk of fluctuating interest rate (Hoang & Otake, 2014). Openness to risk taking is an important trait of the entrepreneur where entrepreneurs face uncertainties with regard to prices, demand, reliability of infrastructure and corruption (Bigsten & Söderbom, 2005). Entrepreneurs which are not afraid to take risks even under uncertain conditions and tend to invest in their businesses and strive to grow by taking risks whereas risk-averse entrepreneurs choose a conservative strategy mix which has a downward impact on profitability and employment (Bigsten & Söderbom, 2005). The study by (Hoang & Otake, 2014) revealed that personal traits of SMEs owners/managers in terms of behavioral finance factors such as debt and risk attitudes present biased on the firms' credit participation and credit source selection. Also, (Brown, Garino, & Taylor, 2013) explored that risk aversion and household debt varied in opposing directions, meaning that people with higher level of risk aversion have a tendency to employ less debt. It therefore hypothesized that risk attitude have an impact on access to credit are inversely related.

## 2.4. Internal Firm/ SME Business Characteristics
Firm capital, size, age and its historical record play a role in access to finance (Balogun, Agumba, & Ansary, 2016). According to (Mabhungu, Masamha, Mhazo, Jaravaza, & Chiriseri, 2011) formality, value of assets, business sector, operating period, financial performance and size are all important factors in determining SMEs access to finance. The determination of firm size may be based on the value of capital investment or the number of employees (Abdesamed & Wanab, 2014). Most researchers measure size of firm by total assets, sales or the number of employees (Nguyen & Luu, 2013). Size of firms is the most reliable predictor of firms' financing obstacles in fund choices (Beck & Kunt, 2006). The study by (Menike, 2015) on capital structure choices and financing of MSEs found that age, size, ownership structure are important determinants of capital structure of SMEs indicating that when firms become older and larger they accumulate enough fixed assets and tend to acquire long term loans providing fixed assets as collaterals. Also, (Asah & Fatoki, 2011) find out that firm size impacts SMEs access to debt finance from commercial banks whereby SMEs are less favored to large firms. Small firms encounter difficulties in obtaining credit (Abdesamed & Wanab, 2014). The study by (Beck & Kunt, 2006) suggested that small firms finance a larger share of their investment with informal sources such as money lenders, family or friends, or heavily depend on short term bank loans whereas larger firms facilitate their investment by a greater share of formal external sources of financing. Thus, it is hypothesized that as the firm size has an impact on access to finance and credit source choice.

Firm's age refers to the age of the firm at the time of the survey in years (Nawi, 2015). Firm age has been reported as determinants of the choice of source of finance (Nguyen & Luu, 2013). The longevity of the firm stays in operation, the more persistence to unpleasant economic circumstances (Kira & He, 2012). The study by

(Gregory, Rutherford, Oswald, & Gardiner, 2005) argued that older firms should be less reliant on external financing sources than younger firms as older firms have more opportunities to accumulate retained earnings than younger firms and more internal funds are available to finance their operations. Also, (Klapper, Laeven, & Rajan, 2010) found that the firms with less than five years (younger firms) in operation are less likely to rely on debt financing from lenders. Similarly, (Ngoc & Nguyen, 2009) supported the argument that younger firms face hardship and more costs in accessing external financing from lenders because information asymmetry. Moreover, (Rand, 2007) shows a negative relation between age and holding debts. Thus, it hypothesized that firm age have an impact on access to credit and credit source choice.

A business plan is a written document that explains the business and is a living document that used as a benchmark for a firm's internal performance assessment as well as a tool for accessing funds (Kusi, Opata, & Narh, 2015). It is an important tool for applying for and obtaining external formal finance (Abdesamed & Wanab, 2014). Information about the needs and the viability of the business are described in the business plan and can help in the analysis of the business to confirm for the granting of credit to SMEs (Fatoki., 2014). SMEs firms by nature avoid formal planning, and as such do not have proper business plans (Abdesamed & Wanab, 2014) which makes them not to be able to assess funds such as loans (Kusi, Opata, & Narh, 2015) as obtaining funding requires conducting a rigorous analysis of business. The study by (Fatoki., 2014) indicated that the availability of business plan and a good credit score are critical lending requirements. Thus, having business plan is expected to have an impact on access to credit and credit source choice.

The national MSE development strategy favors cooperativization at first followed by partnerships than sole proprietorship (Kefale & Chinnan, 2012) for the provision of supports like credit guarantee and working premises. The study by (Abor, 2007) identified that form of business is one of the factors explaining the capital structure decisions of SMEs and found as ownership structure and the type of firm were found to have a significant impact on the use of bootstrap financing. In terms of legal form (Cassar, 2004) notes that incorporation may be perceived by banks and other finance suppliers as an encouraging sign of the firm's formality and creditability as incorporated firms appear to be in a very favored position in receiving external funding in comparison with unincorporated firms. Also, (Asah & Fatoki, 2011) shows the presence of positive association between debt financing and legal formation of business. Thus, it is hypnotized firm incorporation is have an impact on access to credit and credit source choice.

Firm capital can be financial capital or social capital. The literature on social capital suggested small businesses that hardly meet the lenders' requirement of collaterals with financial capital and have poor information record, could resort to use social capital to improve their credit accessibility that is widely spread in developing countries (Hoang & Otake, 2014). In relation to financial capital, lenders use firm's business information on firm capital to assess current and future performance of the firm (Kitindi, Magembe, & Sethibe, 2007) as lenders are interested to know the status of their loan interest and principal by evaluating the firm's capital structure. Moreover, (Fatoki & Smit, 2011) suggested that operators of SMEs have to own more tangible assets that can create higher value on their firm to accelerate borrowing security. Thus, firm capital is expected to have an impact on access to credit and credit source selection.

## 2.5. External Business Environmental

The external environments are factors outside the business that inform the shape of the venture, its operations, ability to mobilize key resources (Justino & Tengeh, 2016). Access to information is concerned with awareness of funding opportunities by SMEs (Osano & Languitone, 2016). Lack of access to formal loan by SMEs is attributed to information asymmetry and they are suffering from shortage of financing (Abdesamed & Wanab, 2014). Due to the information asymmetry, SMEs use internal financial resources rather than external ones (Peci, 2015). The lending in developing economies to SMEs is affected by information asymmetries between borrowers and lenders and causes difficulties to startups and expansion potential in obtaining external financing leading to depend on internal financing or informal external financing such as friends and family (Abdesamed & Wanab, 2014). The study by (Sarapaivanich & Kotey, 2006) found that lenders use business information to decide borrower's credibility whether to issue or extend a loan or not. Lack of information leads to information asymmetry and jeopardize access to credit (Sarapaivanich & Kotey, 2006). Moreover, unawareness may hinder borrowers from accessing formal credit sources (Hoang & Otake, 2014). Thus, access to business information is expected to have an impact on access to credit and credit source selection.

Another important issue is concerned with corruption. Firms will use more debt when the legal system has less integrity which means high levels of corruption (Nawi, 2015). Due to the protracted negotiations and barriers presented by a corrupt system, many entrepreneurs or managers are persuaded to participate in corruption in order to sustainably compete in the market (Justino & Tengeh, 2016). Formal firms have experienced big problems in dealing with authorities relating to regulatory red tape, corruption, and lack of security (Bigsten & Söderbom, 2005). A small business can fail if the owner does not comply with the demands to operate in an illegal, unethical and dishonest manner called corruption (Justino & Tengeh, 2016). The study by (Nwibo & Okorie, 2013)

showed that corruption deters agribusiness firms' investments and the growth of start-up firms. Also, (Musara & Gwaindepi, 2014) found a positive and significance correlation between access to credit and bureaucracy and corruption. Thus, it is hypothesized that corruption has an impact on access to credit and credit source choice.

The geographical area where a firm is located in the proximity of market and infrastructures is believed to have an influence on the firm's ability to gain external finance (Abdulsaleh & Worthington, 2013). The study by (Abor, 2007) found that SMEs located outside major cities face greater difficulties in acquiring external finance, especially long term debt, compared with their counterparts operating in cities. Also, (Asah & Fatoki, 2011) found SMEs located in urban are successful in access to debt financing compared those located in rural areas as physical closeness between lenders and borrowers produce an improved form of environmental scrutinize that aid SMEs to access credit from lenders. Thus, it is hypothesized firm location has an impact on access to credit and credit source choice.

Access to work premises is the major challenges that hamper the growth and development of MSEs in Ethiopia. Owing suitable and sufficient work premises is the main criteria for loan disbursement that microfinance institution in Ethiopia looks at in the process of SMEs loan application appraisal. Accesses to working and sales premises are the other challenges to SMEs operating in the Ethiopia as the supply of working spaces is small relative to demand (Assefa, Zerfu, & Tekle, 2014). The study by (Fikadu, 2015) shows that SMEs operating in government constructed work premises complain for its sufficiency and suitability of the location for running business. Also, (Reddy, 2007) found that in spite of the relatively high cost of rentals, SMEs owners preferred to move their firms' activities to urban areas to escape the negative impact of the local environment features of rural areas on raising external finance. Moreover, (Ageba & Amha, 2003) indicated lack of premise is major bottleneck for SMEs operating in Ethiopia. Thus, access to work premise have an impact on access to credit and credit source choice.

## 2.6. Conceptual Frame Work

The conceptual framework of this study stems on the theory of utility maximization and rational choice within a probabilistic framework which states that entrepreneurs are rational and hence they are likely to choose the financing sources that will enable them to minimize costs and maximize returns from the sources of finance for their firm. Based on this, the study makes the distinction between credit participation and credit source selection as it was done by (Hoang & Otake, 2014) in Vietnam. These terms contribute to a fully constituted process of the debt financing decision. When making decisions regarding the firm's capital structure, which is a mix of debt and equity (Balogun, Agumba, & Ansary, 2016), at the first stage the SME owner has to decide whether or not to use debt in the firm capital structure (access to credit). Then, if the owner decides to go with debt or participate in the credit markets, he or she must select the credit source choice, meaning that they will go with formal credit sources, NGO credit program or informal credit sources (credit source selection). The conceptual frame work is developed based on the work of (Ntimba & Akyoo, 2016; Osano & Languitone, 2016). The sources of credit are formal credit and is debt financing which refers to the case where SMEs get finance products in a form of loan from lending institutions (Osano & Languitone, 2016). The other is informal credit is a source of finance for SMEs firm in which the entrepreneurs access from local money lenders at high interest rate. NGO credit is another source of debit financing for the SME firm in the study area. There are some non financial institutions that focus in funding SMEs sectors as revolving loan free of interest. Local Economic Development Program is among which that provide interest free credit for SME firms in the study area. Own source of finance is internal financing in which members of the firm contribute from personal income.

Figure 1: Conceptual frame work of the study
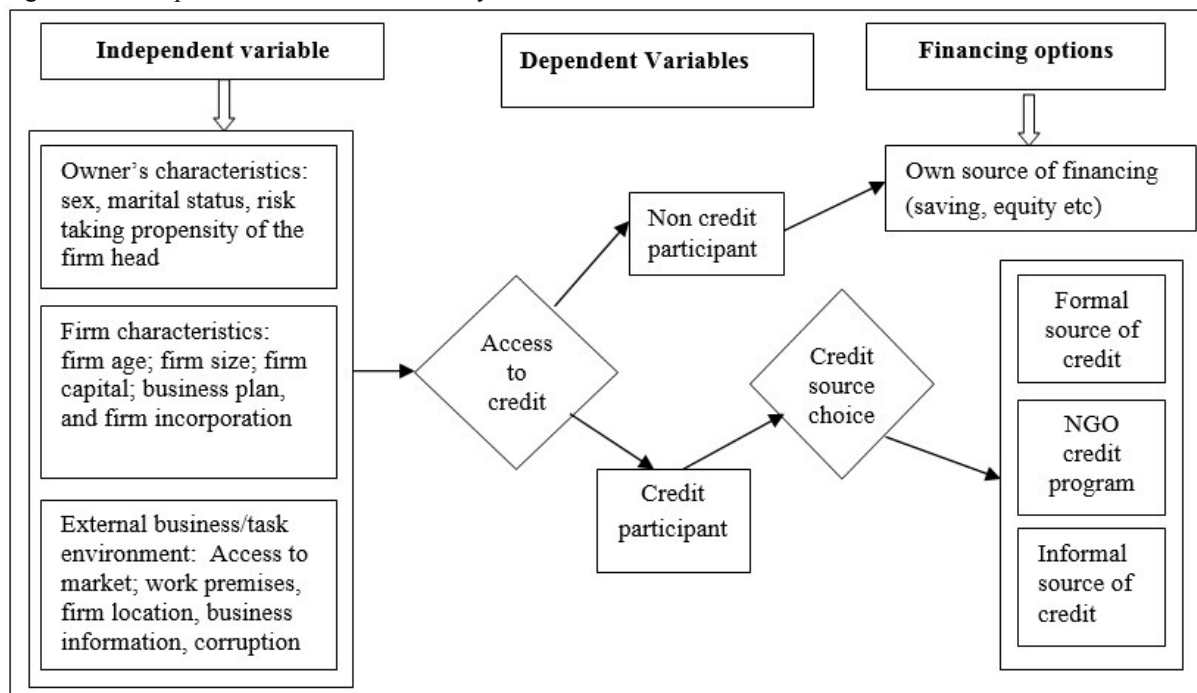


Source: Modified based on the work of (Ntimba & Akyoo, 2016; Osano & Languitone, 2016)

### 3.1. Research Setting, Research Design and Data Sources

The study is conducted in Nekemte town is located at 327 km from Addis Ababa. Nekemte is a medium size town and one of the first grades of 20 cities of Oromia. The administrative structure of the town was established as a form of municipality in the year 1949. The administrative structure of the town is divided into six sub-city administrations with a population of 76,817 of which 39,167 are male and 37,650 are female (CSA., 2007). Research design is the conceptual structure within which research is conducted. The study used the quantitative research design, which (Ghauri & Gronhaug, 2005) describe as studies whose findings are mainly the product of statistical summary and analysis. The main feature of quantitative research is the heavy reliance of the researcher on data analysis to arrive at findings or conclusions. The empirical approach consists of primary research and collection of data through the use of questionnaires in a survey. The main sources of data for the study were collected from secondary and primary sources. The survey method was employed for the collection of data from SME firms' entrepreneurs operating in Nekemte. Self administered semi structured questionnaire was used for data collection from the study participant.

### 3.2. Sample Size Determination and Sampling Technique

The sample size is determined from the total population of 5,186 entrepreneurs of SME firm. The study is conducted with 5 percent marginal error and 95 percent confidence interval and none response rate of 5 percent. The sample size is determined using the methods of sample size determination formula developed by (Watson, 2001) as follows;

$$n = \frac{\frac{P[1-P]}{\left(\frac{A^2}{Z^2} + \frac{P[1-P]}{N}\right)}}{R} = \frac{\frac{0.3[1-0.3]}{\left(\frac{(0.05)^2}{(1.96)^2} + \frac{03[1-0.3]}{5186}\right)}}{0.95} = \underline{173 \text{ entrepreneurs}}$$

Where: **n** is the sample size required for the study from the total population;

**N** is the number of total operational MSE that are operating in the town (5,186);

P is the estimated variance in a population in terms of access to credit as a decimal of 0.3 for 70-30;

**A** is the precision desired, expressed as decimal of 0.05 for 5 percent;

**Z** is the confidence level of 1.96 for 95 percent; and

**R** is the estimated response rate, as decimal of 0.95 for 95 percent response to be returned.

The sample size determined was proportionally allocated among the five business sectors of manufacturing, construction, agricultural, trade and service sectors based in order to keep the proportion of the study participants from all SME business sectors. Following this, simple random sampling technique is used to select the ultimate SME entrepreneur representative for data collection using semi structured questionnaires. The required data was

collected by six trained data collectors who are employed for the data collection. For the validity and reliability of data, a panel of experts is consulted to evaluate the research instrument for conceptual clarity. The pre-testing the research instrument is conducted on 10 entrepreneurs using probability sampling method using self-administered questionnaires.

### 3.3. Model Specification and Data Analysis

This study considers access to credit from the perspective of SME firm entrepreneurs who are operating their business in the study area. The study used binary logistic regression as (Balogun, Agumba, & Ansary, 2016) used in their work for estimating determinants of access to credit using the model. The logit model is used to derive the determinants of access to credit by ensures that the probability lies in the interval of 0 and 1 (Field, 2009) as access to credit considerer a dependent variable, *ACS,* with 2 possible outcomes (1, 0) in which the expression ACS=1 represents an event that a firm has accessed credit and ACS=0 represents an event that is not. Binary logistic regression analysis is used for predicting the probability that ACS=1 for known values of the predictor variables $X_1, . . , X_k$. The technique enables us to identify the most influential predictor variables affecting access to credit (ACS=1). In binary logistic regression, the dependent variable ACS is defined as follows:

$$Y = \begin{cases} 1 \text{ if } \text{ credit particpant} \\ \quad 0 \text{ if otherwise} \end{cases}$$

Generally, the binary logistic regression of a dichotomous outcome variable ACS on a combination of k discrete and continuous independent variables $X_1, X_2, \dots, X_k$ is defined by the following logit function:

$$logit(P_i) = In\left(\frac{P_i}{1-P_i}\right) = \hat{\beta}_0 + \hat{\beta}_1X_1 + \hat{\beta}_2X_2 + \cdots + \hat{\beta}_kX_k \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots Eqn \ (1)$$

The probability of MSE accessed formal credit is given by the statistical expressions:

$$\Pr(Y = 1) = \frac{1}{1 + exp^{(-Z)}} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots Eqn(2)$$

*Where*

$$Z = \hat{\beta}_0 + \hat{\beta}_1X_1 + \hat{\beta}_2X_2 + \cdots + \hat{\beta}_kX_k \qquad \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots Eqn \ (3)$$

Using equation (3), the probability of ACS=1 (the probability of firm credit participant), given the values contributing variables for access to credit $X_1, X_2, \dots, X_k$, can be done for any randomly selected firm in the study. Similarly, to analyze factors that determine entrepreneurs' choice of source of credit, the multinomial logit model was used. Multinomial logistic regression was preferred because it allows the analysis of decision across more than two categories of dependent variables (Wooldridge, 2012). The multinomial logit model is derived from random utility function (Greene, 2002) that assumed individuals maximize their utility by choosing one of the alternatives available for them. In this case, it is assumed that entrepreneurs maximize his/her utility by choosing one among the available mutual exclusive alternative source of credit. Hence, for the *i* entrepreneurs faced with *j* alternative source of credit for financing their business. The utility of choosing among source of finance j can be represented as:

$$U_{ij} = \beta x_{ij} + \varepsilon_{ij} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (4)$$

Where, $U_{ij}$ is the utility derived from choosing source of credit $i$, $x_{ij}$ is the vector of attributes of the source of credit choice, ß is the vector of parameter coefficients and $\varepsilon_{ij}$ is the error term.

In this study, entrepreneurs have alternatives of three categories of choices of source of credit and the decision was based on the option, which maximized their utility, subject to factors associated with each sources of credit. The credit source choice model was expressed as follows:

$$P(Y_i = j|x) = \frac{\exp(x_i\beta_i)}{1 + \sum_{h=1}^{J} \exp(x_i\beta_i)} \ for \ j = 1,2,3 \dots J \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (5)$$

The response probabilities P(y = j|x), j = 1, 2 …, J is therefore determined by the factors associated with source of credit choice. However, according to (Greene, 2002) the coefficients of multinomial regressions only provide the direction of the effect of the independent variables on the dependent variable. Thus the estimates represent neither the actual magnitude of change nor the probabilities. Instead, the marginal effects are used to measure the expected change in probability of a particular technique being chosen with respect to a unit change in an independent variable from the mean. The marginal effect was computed by differentiating the coefficients at their mean as follows:

$$\frac{\partial P_j}{\partial x_k} = P_j(\beta_{jk} - \sum_{j=1}^{J-1} P_j\beta_{jk}) \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (6)$$

Access to credit is examined by using binary logistic regression using ACS to finance with value 1 if the firm has access to credit and 0 otherwise. Determinants of SMEs credit source choice, with source of finance choice (SF), is described by 1 if the source of credit is *formal source of credit*, 2 if the source of credit is from *NGO credit* and 3 if it is *informal credit.* The independent variables employed both in binary logistic and multinomial models are;

Table 1: Code & description of independent variables used in binary logistic regression & Multinomial logit models

| Code | Description of variables | Measurement unit of the dependent variables |
|------|--------------------------|---------------------------------------------|
| SEX | Sex of firm's head | Dummy (1 if firm head is male & 0 if female) |
| RISK | Risk taking propensity | Dummy (1 if risk taker & 0 if risk averse) |
| FSZ | Firm size | Category (1 if the firm is micro; 2 if small & 3 if medium firm) |
| MAGE | Age of the firm | Continuous indicating age of the firm (1 to 10 years in operation) |
| LSF | Legal status of firm | Dummy (1 if it is partnership & 0 if cooperative) |
| BPL | Business plan | Dummy (1 if firm has business plan & 0 otherwise) |
| AWP | Access to work premises | Dummy (1 if firm has work premises & 0 otherwise) |
| FLN | Firm location | Dummy (1 if firms has located in suitable place & 0 otherwise) |
| BINF | Business information | Dummy (1 if firms has access to information & 0 otherwise) |
| CPTL | Firm capital | Continuous that is used in thousands (1,000) of Birr |
| COR | Corruption problem | Dummy (1 if corruption is a problem & 0 otherwise) |

A number of methods were used to analyze the collected data. Descriptive analysis of the survey data was conducted. Following the necessary tests, binary logistic regression analysis was conducted to identify influential factors of access to credit. Finally, multinomial logit regression analysis was used to investigate determinants of SMEs credit source choice.

## 4. RESULT AND DISCUSSION
### 4.1. Descriptive Analysis
The study analyzed data collected from 173 SME entrepreneurs of which 60% of the respondents are male and 40% of them are female. Also, 90% of the entrepreneurs are willing to accept risk whereas 10% of them are risk averse entrepreneurs. The incorporation of the entrepreneurs shows that 74% of entrepreneurs are organized as partnership types of organization that requires a minimum of 3 entrepreneurs up to a maximum of 9 entrepreneurs to form SME business whereas 26% of them are organized by the cooperative law that requires a minimum of 10 entrepreneurs to be organized as SME business. The study also shows 75.2% lack business plan whereas 24.8% of them have the required business plan. The study reveals that 57.8% of entrepreneurs have accessed work premises whereas 42.2% of them are not. Also, it is clear that the range of the firm age ranges from 1 to 10 years and the average firm age is about 3 years and four months. Similarly, table 2 shows that firm' capital ranges from 1 to 250 thousand birr with an average capital of about 21 thousand birr for the study participants.

Table 2: Descriptive statistics of variables used in logistic regression and multinomial logit model

| Variable | Mean | Std. Dev. | Min | Max | Label of variable |
|----------|------|-----------|-----|-----|-------------------|
| ACS | .4739884 | .5007724 | 0 | 1 | Access to credit |
| SEX | .6011561 | .4910819 | 0 | 1 | Sex of the firm head |
| FSZ | 1.346821 | .5664596 | 1 | 3 | Firm size |
| LSF | .7398844 | .4399709 | 0 | 1 | Legal status of firm |
| BPL | .2485549 | .4334297 | 0 | 1 | Business plan |
| AWP | .5780347 | .4953066 | 0 | 1 | Access to work premises |
| FLN | .6647399 | .4734517 | 0 | 1 | Firm location |
| BINF | .8092486 | .394034 | 0 | 1 | Business information |
| RISK | .9017341 | .2985379 | 0 | 1 | Risk taking propensity |
| MAGE | 3.358382 | 1.96152 | 1 | 10 | Firm age in years |
| CPTL | 20.93266 | 34.82646 | 1 | 250 | Firm capital in thousand of Birr |
| COR | .150289 | .3583918 | 0 | 1 | Corruption |
| Estimation sample mlogit | | | Number of obs = | 173 | |

Source: Research finding, 2016

Also, 66.5% of entrepreneurs firms are located in suitable location whereas 33.5% of them are not. Moreover, 19.1% of entrepreneurs have access to business information whereas 80.9% of them do not. The study reveals that 15% of the entrepreneurs complain as there was a corruption problem whereas 85% of them are reported as access to credit is free from any corruption. The study result also reveals that 47.4% of entrepreneurs have got access to credit whereas 52.6% of the entrepreneurs used internal source of financing. The formal source of credit accounts for 22.5% followed by 13.3% of entrepreneurs for whom informal source of credit used for financing their business. Finally, With respect to the size of the SME business, the result show that 69.9% of the entrepreneurs business is micro followed by 25.4% with the least number of entrepreneurs from medium sized enterprise (see figure 2).

Figure 2: Financing sources and firm size of entrepreneurs



Figure A: Source of finance for firms

Figure B: Firm size
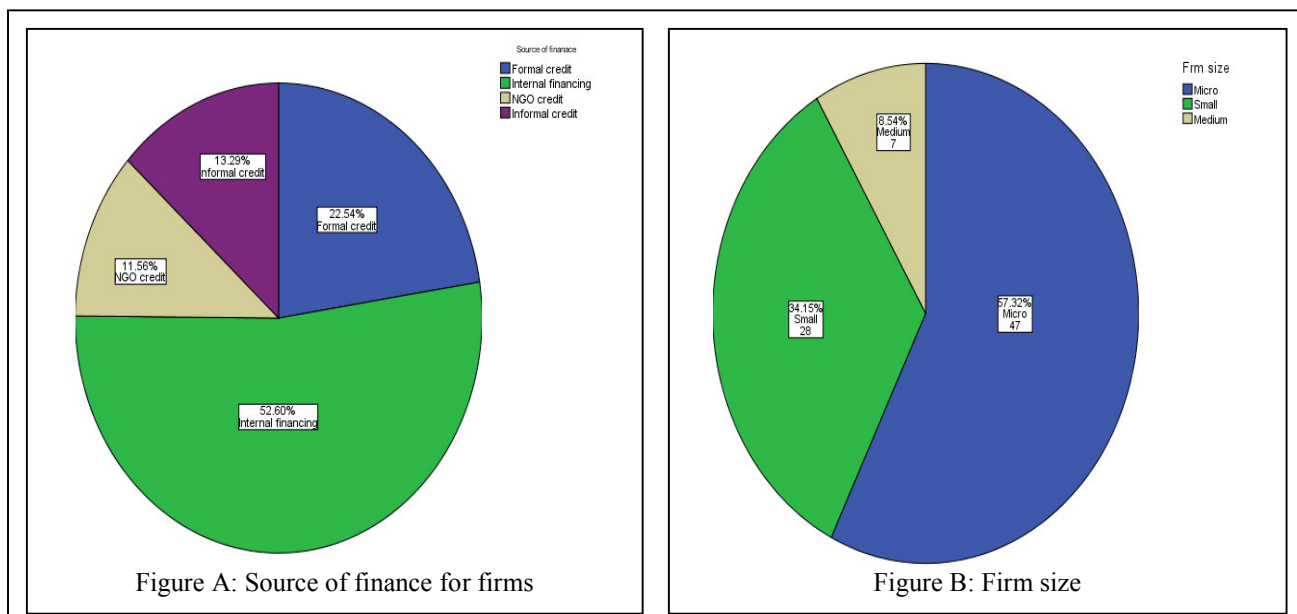
Source: Research finding, 2016

## 4.2. Econometric Analysis

The econometric analysis section consists of two step analysis. The first step is used to analysis credit participation by binary logistic regression model. On the second step, only firms that accessed debit are considered in multinomial logit model for analyzing credit source choice. Prior to running logistic regression, explanatory variables are checked for the existence of multicollinearity problem by using Variance Inflation Factor (VIF). Based on the rule of thumb in which VIF of the variable has to be less than 10 and the tolerance statistics (1/VIF) has to be above 0.2 (Field, 2009), the study reveals that the VIF values are all well below 10 and the tolerance statistics all well above 0.2. Therefore, it can be safely conclude that there is no collinearity problem within the data. According to (Field, 2009), multicollinearity is likely to be a problem in a data set if correlation coefficient between predictors is greater than 0.80 (r >0.80). The study result reveals that the correlation is between 0.580 and -0.380 indicating as there is no multicollinearity problem among data used in the analysis.

### 4.2.2. Analysis of binary logistic regression results

The association between access to credit and its determinants were explained by using the binary logistic regression model. In logistic regression, the observed and predicted values are used to assess the fit of the model. The Wald test for linear hypotheses about parameters from the logistic regression estimated reveals that all the coefficients except for the intercept are simultaneously equal to zero. The Hosmer and Lemeshow test for the goodness of fit in the logistic model (Field, 2009) has Prob>chi2 of 0.221 which indicates that it is not statistically significant and therefore the model is quite a good fit. In reporting results of a binary logistic regression, the estimated odd ratios for the coefficients, their confidence intervals and associated P-values should be presented (Freeman, Walters, & Campbell, 2008). The value of 1 indicates SMEs are credit participant and value 0 indicates firms that are not. Table 3 presents the estimated results result from binary logistic regression on access to credit and shows that 6 of the 11 variables are highly influential on access to credit which includes: risk taking propensity of the firm head; having business plan; firm size; firm location; firm age; and corruption. The other variables such as sex of the firm head, legal status of the firm (incorporation), access to work premises, access to business information, and firm capital seem not important in determining what sources of credit to finance the firm.

Table 3: Binary logistic regression output for determinants of access to credit for SME firms

| Access to credit (ACS) | Odds Ratio | Std. Err. | z | P>z | [95% Conf. | Interval] | Marginal effect |
|---|---|---|---|---|---|---|---|
| Sex of firm head (SEX)* | .4999332 | .2573433 | -1.35 | 0.178 | .1822852 | 1.371111 | -.0851444 |
| Small  firm size (IFSZ_2) | 6.255882 | 3.755862 | 3.05 | 0.002*** | 1.928636 | 20.2921 | .2894884 |
| Medium firm size (IFSZ_3) | 11.97697 | 14.37893 | 2.07 | 0.039** | 1.138777 | 125.9666 | .5018596 |
| Legal status of firm (LSF)* | 1.288059 | .8782316 | 0.37 | 0.710 | .3385049 | 4.901249 | .028132 |
| Business plan (BPL)* | 3.327853 | 1.896564 | 2.11 | 0.035** | 1.089079 | 10.16879 | .1735255 |
| Access to premise (AWP)* | .4768902 | .247769 | -1.43 | 0.154 | .1722549 | 1.32032 | -.0902146 |
| Firm location (FLN)* | 4.722145 | 2.957741 | 2.48 | 0.013** | 1.383518 | 16.11736 | .1544424 |
| Business          information (BINF)* | 2.334153 | 1.537395 | 1.29 | 0.198 | .6419244 | 8.487405 | .0816688 |
| Risk              taking propensity(RISK)* | .2903278 | .2115293 | -1.70 | 0.090* | .0696168 | 1.210775 | -.200239 |
| Firm/MSE age (MAGE) | 1.456037 | .2074066 | 2.64 | 0.008*** | 1.101342 | 1.924964 | .0436319 |
| Firm capital  (CPTL) | .9945594 | .0069689 | -0.78 | 0.436 | .980994 | 1.008312 | -.0006335 |
| Corruption (COR)* | .1579168 | .1362375 | -2.14 | 0.032** | .0291127 | .8565925 | -.1384445 |
| Number of obs  =        173 | LR chi2(12)    =     61.93 | Pseudo R2      =     0.3354 | | | | Pr          (ACS) | |
| Log likelihood = -61.365892 | Prob > chi2    =     0.0000 | Micro sized firm (code 1) is omitted | | | | = .1341164 | |

(*) dy/dx (marginal effect) is for discrete change of dummy variable from 0 to 1.

Hosmer-Lemeshow chi2 (8) = 10.66 at Prob>chi2 = 0.2218.

Note: ***, ** and * indicates the variables are significant at 1%, 5% and 10% significance level respectively

Source: Binary logistic regression model output

The highest credit participation influencing factor is firm size (small and medium sized firms) followed by firm location and the third variable was having business plan. According to survey result, the variable small sized firm size has a positive and statistically significant effect on SMEs access to credit at 1% level of significance with an odds ratio of 6.255 indicating being small sized firms are 6.255 times more likely affected to access credit than other sized types of SMEs. The variable medium sized firm size has a positive and statistically significant effect on SMEs access to credit at 5% level of significance with an odds ratio of 11.977 indicating being medium sized firms are 11.977 times more likely affected to access credit than other sized types of SMEs. The study result is evidence that small sized firms are more sensitive to access to credit as compared to medium. This result is consistent with previous studies by (Asah & Fatoki, 2011) who find out firm size impacts SMEs access to debit financing. It is also consistent with the work of (Abdesamed & Wanab, 2014) which reveled financial institutions are more likely to approve loans to firms that are relative better in terms of capital and number members. This implies lending institutions and informal lenders base their lending decisions on the size of the firm/SMEs.

Similarly, the coefficient of firm's location was positive and statistically significant and confirms our expectations of our hypothesis. The variable firm location has a positive and statistically significant relationship with SMEs' access to credit at 5% level of significance. An odds ratio of 4.722 indicates SMEs which are found in suitable location are 4.722 times more likely to access credit from lending institutions than those who do not. Again, this finding is the second which is very consistent to the assumption. Firms which are located in suitable location, where all the facilities are available and access to market are either, are supposed to access more formal credits than informal credit due to relatively lower transaction cost for entrepreneurs and financial institutions. This result is also convinced by the finding suggested by by (Reddy, 2007) who found that SMEs owners preferred to move their firms' activities to urban areas to escape the negative impact of rural areas on raising external finance. The result is consistent with the work of (Abdulsaleh & Worthington, 2013) which states firm located in the proximity of market and infrastructures is believed to have an influence on the firm's ability to gain external finance. The implication of the study is the similar to the study by (Abor, 2007) that found SMEs located outside major cities face greater difficulties in acquiring external finance. The result is also consistent with the work of (Asah & Fatoki, 2011) found out that SMEs located in urban are successful in access to debt financing compared those which are not.

Also, the variable having business plan shows the expected result and has a positive and statistically significant relationship with MSEs' access to credit at 5% level of significance with an odds ratio of 3.327, SME entrepreneurs who have a business plan are 3.327 times more likely to access credit from lending institutions and informal sector than those who do not have business plan for their firm. The study by (Fatoki., 2014) indicated that the availability of business plan is critical lending requirements. The study  result is also consistent with a study by (Kusi, Opata, & Narh, 2015) who stated the business used as a benchmark for a firm's accessing funds (Kusi, Opata, & Narh, 2015; Abdesamed & Wanab, 2014) from formal credit sources as business plan convince lenders in the process of credit appraisal as the information about the needs and the viability of the business are described in the business plan and  can help in the analysis of the business to confirm for the granting of credit to SMEs (Fatoki., 2014). Rather SME who do not able to submit valid business plan for the formal institutions are forced to prefer to take loan from the informal credit institutions for the sake of ease even if it charges higher interest rates.

The coefficient of the variable firm's age (in years) indicates a positive association between access to

credit and age of firm as per the hypothesis at 1% significance level. The odd ratio of firms' age is 1.456 with a p-value of 0.008 which implies a one year increase in the ages of the firm is more likely increase access to credit by 4.3%. The result of the study is consistent with the work of (Kira & He, 2012) who find out that the longevity of the firm stayed in operation are more persistence to unpleasant economic circumstances that affects access to credit. Similarly, (Ngoc & Nguyen, 2009) supported the argument that younger firms face hardship in accessing external financing from lenders because information asymmetry. However, this study is contradicting with the study conducted by (Gregory, Rutherford, Oswald, & Gardiner, 2005) who find that older firms should be less reliant on external financing sources than younger firms as older firms have more opportunities to accumulate retained earnings than younger firms and more internal funds are available to finance their business operation. Also, it is contradicts the work of (Rand, 2007) which shows a negative relation between age and holding debts.

Another important variable is the risk taking propensity of the firm head which shows the expected result with a negative and statistically significant relationship with SMEs' access to credit at 10% significance level. The odds ratio of risk taking propensity of firm head is 0.290; SME head that have the willingness to take risk are 0.290 times less likely to access credit from lending institutions and informal sector than firm heads that have the trait of risk averse which implies as the risk taking propensity of the firm head increases, access to credit decreases. The study is in line with the work of (Hoang & Otake, 2014) that revealed personal traits of SMEs owners/managers in terms of behavioral finance factors such as debt and risk attitudes present biased on the firms' credit participation. It is clear that debt financing is associated with the risks of business bankruptcy and risk of losing collateral (Hoang & Otake, 2014). As most of the study participants are micro and small enterprises lack material capital for collateral at the lending institutions, and instead they use the social capital of the firm head as the firm head is the figure of the firm that have close relations with lending institutions.

Moreover, another important variable considered is corruption problem which shows the expected result with negative and statistically significant relationship with SMEs' access to credit at 5% level of significance. The odds ratio of corruption is 0.158; SME entrepreneurs who have encountered corruption problem are 0.158 times less likely to access credit from lending institutions and informal sector than firms who do not. This implies as corruption problem increases firms access to credit decreases. This was in line with the work of (Nwibo & Okorie, 2013) which found corruption deters agribusiness firms' investments. It is also in line with the work of (Bigsten & Söderbom, 2005) that found formal firms have experienced big problems in dealing with authorities relating to regulatory red tape, corruption, and lack of security. As (Justino & Tengeh, 2016) argued, entrepreneurs are persuaded to participate in corruption to comply with the demands to operate in an illegal, unethical and dishonest manner. But, the study is contradicting with the study by (Musara & Gwaindepi, 2014) which found a positive and significance correlation between access to credit and bureaucracy and corruption.

Finally, the result of the study shows that the variable sex of the entrepreneurs had negative relationship but not significant effect on access to credit from lending institutions. This implies that formal financial institutions do not set a difference in lending to MSE operators by gender and females are not different from males in accessing credit from lending institutions. Firm capital has negative but not significant effect on firm's access to credit. This implies that contrary to other studies, gender of the firm head or firm capital of the enterprise does not create a difference with respect to access to credit lending institutions. Similarly, there is a negative relationship between access to work premises and access to credit but not statistically significant in access to credit from lending institutions between SMEs have an access to work premises and those who do not. Moreover, firm capital and access to credit are inversely related. This could probably firms with sufficient internal source may be reluctant to access loan s compared to firms that are highly constrained by finance. However, the legal status of firm and business information has positive but insignificant relationship with access to credit. This implies creditors do not discriminate SME entrepreneurs who are organized as partnership from those who are organized as cooperatives. The result of the study also implies creditors and money lenders do not discriminate SME operators on the bases of entrepreneurs' access to information in the provision of credit.

### 4.2.3. Analysis of multinomial logit model result

On the second step, firms that are credit participant are considered in assessing determinants of credit source choice by using multinomial logit model. Similar to logistic regression, multinomial logistic regression uses the Wald test for linear hypotheses about parameters from multinomial logistic regression estimated and reveals that all the coefficients except for intercept are simultaneously equal to zero. There is also an implicit assumption in multinomial logi models that the odds between any pair of alternatives are independent of irrelevant alternatives (IIA). This assumption requires the inclusion or exclusion of categories does not affect the relative risks associated with the regression in the remaining categories (Hausman & McFadden, 1984). This is strong assumption and if it is violated, multinomial logit may not be a good modeling choice. The assumption of IIA in the multinomial logit model is tested by Hausman test (Hausman & McFadden, 1984). The hypothesis that IIA ($H_{IIA}$) is asymptotically distributed as chi-square with degree of freedom equal to the rows if the IIA is true and significant values of $H_{IIA}$ indicate that the IIA assumption has been violated. The result of the study verified the null hypothesis of IIA could not be rejected. On examining the result from the hausman test, there is no evidence that the IIA assumption has

been violated. Log likelihood is used in the Likelihood Ratio Chi-Square test and shows that all predictors' regression coefficients in the model are simultaneously zero at a p-value 0.000.

The estimated results from multinomial logit model are represented in Table 4. The study shows that firm size, access to work premises, access to business information, firm capital and corruption variables affected entrepreneurs' primary choice of NGO credit sources over the formal credit sauces in the first equation. In other words, firm size, access to work premises, lack of capital, lack of access to business information, and absence of corruption increase the probability of embedding a SME entrepreneurs' in a group with more relative preference for formal sources of credit compared to NGO credit sources. Sex of the firm head, legal status of firm, owing business plan, firm location, risk taking propensity of the firm head, and firm age were found statistically not significant in explaining entrepreneurs'' choice between NGO credit source and formal credit source alternatives. Concerning the household's choice of informal credit sources over the formal credit source alternative, firm size, firm location, access to business information and firm age variables were statistically significant. However, sex of the firm head, legal status of firm, owing business plan, access to work premises, risk taking propensity of the firm head, firm capital, and corruption were found statistically not significant in explaining entrepreneurs' choice between informal credit source and formal credit source alternatives.

From the result of multinomial logit model (Table 4), it is obvious that the sign of firm size variable is negative and statistically significant in both equations. These show that micro sized entrepreneurs of SMEs respondents are less likely to choose formal credit sources over NGO credit and informal credit sources. In other words, it depicted that micro sized entrepreneurs are enterprises who have no enough capital for collateral at formal financial institutions in accessing credit as compared to small and medium sized enterprises. The result of this study also reveals that there would be a negative relationship between access to business information and formal credit sources. The sign of access to business information variable is negative and statistically significant in both equations. The results suggest that entrepreneurs who have access to business information are less likely to choose price NGO credit and informal credit sources over formal credit. As a result, they are more sensitive about formal credit sources than who do not. It is also observed that there is a similar situation for access to work premises variable in the first equation. The results suggest that entrepreneurs who have of access to work premises are less likely to choose price NGO credit sources over formal credit. As a result, it is concluded that entrepreneurs who have access to work premises are more sensitive about formal credit sources than who do not.

Table 4: Estimation of multinomial logit model for entrepreneurs credit source choice: three categories

| Source of credit (SF) | Coef. | Std. Err. | Z | P>z | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| **Characteristics in numerator of P(Y=2) (NGO credit sources vs. formal source of credit)** | | | | | | |
| Sex of firm head (SEX)* | -.1055545 | 1.081453 | -0.10 | 0.922 | -2.225164 | 2.014055 |
| Small firm size (IFSZ_2) | -4.075398 | 1.653725 | -2.46 | 0.014** | -7.316639 | -.8341573 |
| Medium firm size (IFSZ_3) | -6.97022 | 3.142334 | -2.22 | 0.027** | -13.12908 | -.8113596 |
| Legal status of firm (LSF)* | -.3163453 | 1.14883 | -0.28 | 0.783 | -2.568012 | 1.935321 |
| Business plan (BPL)* | .5988623 | 1.141685 | 0.52 | 0.600 | -1.638799 | 2.836524 |
| Access to work premise (AWP)* | 2.090415 | 1.19278 | 1.75 | 0.080* | -.2473914 | 4.428222 |
| Firm location (FLN)* | -1.217058 | .9626298 | -1.26 | 0.206 | -3.103778 | .6696615 |
| Business information (BINF)* | -4.298321 | 1.52771 | -2.81 | 0.005*** | -7.292579 | -1.304064 |
| Risk taking propensity (RISK)* | -.9874577 | 1.340187 | -0.74 | 0.461 | -3.614177 | 1.639262 |
| Firm/MSE age (MAGE) | -.3653932 | .2885393 | -1.27 | 0.205 | -.9309198 | .2001334 |
| Firm capital (CPTL) | .0533757 | .0188832 | 2.83 | 0.005*** | .0163652 | .0903861 |
| Corruption (COR)* | 4.302292 | 1.503894 | 2.86 | 0.004*** | 1.354713 | 7.24987 |
| _cons | 3.48973 | 2.173477 | 1.61 | 0.108 | -.7702069 | 7.749667 |
| **Characteristics in numerator of P(Y=3) (Informal source of credit vs. formal source of credit)** | | | | | | |
| Sex of firm head (SEX)* | .3279467 | .9114912 | 0.36 | 0.719 | -1.458543 | 2.114437 |
| Small firm size (IFSZ_2) | -3.320453 | 1.578429 | -2.10 | 0.035** | -6.414118 | -.2267881 |
| Medium firm size (IFSZ_3) | -.7703352 | 2.728351 | -0.28 | 0.778 | -6.117804 | 4.577134 |
| Legal status of firm (LSF)* | 1.401308 | 1.266962 | 1.11 | 0.269 | -1.081891 | 3.884508 |
| Business plan (BPL)* | -.537205 | .9991478 | -0.54 | 0.591 | -2.495499 | 1.421080 |
| Access to work premise (AWP)* | 1.12668 | .9472553 | 1.19 | 0.234 | -.729906 | 2.983267 |
| Firm location (FLN)* | -1.747525 | .8869601 | -1.97 | 0.049** | -3.485935 | -.0091155 |
| Business information (BINF)* | -2.810782 | 1.44469 | -1.95 | 0.052* | -5.642322 | .0207572 |
| Risk taking propensity (RISK)* | .6979405 | 1.168687 | 0.60 | 0.550 | -1.592643 | 2.988524 |
| Firm/MSE age (MAGE) | -.6888383 | .2870364 | -2.40 | 0.016** | -1.251419 | -.1262574 |
| Firm capital (CPTL) | .0196774 | .0186546 | 1.05 | 0.292 | -.0168849 | .0562397 |
| Corruption (COR)* | 1.924931 | 1.490799 | 1.29 | 0.197 | -.9969822 | 4.846843 |
| _cons | 3.074444 | 2.275404 | 1.35 | 0.177 | -1.385265 | 7.534154 |
| **Model fitting information** | Number of obs  = 82 | | Pseudo R2 =  0.4724 | | | |
| Log likelihood = -45.606663 | LR chi2(24) = 81.67 | | Prob > chi2  = 0.0000 | | | |

SF = Formal source of credit is the base outcome and micro sized firm coded 1 is omitted

Note: ***, ** and * indicates the variables are significant at 1%, 5% and 10% significance level respectively

Source: Multinomial logit model regression output

Similarly, results of this study reveals that there would be a positive relationship between firm capital and formal credit sources in both equation and statistically significant in the first equation. The results suggest that

firms with small capital are less likely to choose formal credit sources over NGO credit sources. As a result, it is concluded that firms with small capital are more sensitive about NGO credit sources. Moreover, similar situation is observed for corruption variable. The sign of corruption is positive in both equation and statistically significant in the first equation. On the basis of these results, wealthier respondents were more likely to prefer formal credit sources and NGO credit sources, the condition of the business environment and conditions determine. Also, table 4 shows that a negative relationship between firm location and formal credit sources in both equation and statistically significant in the second equation. The results suggest that entrepreneurs of the firm who are not operating their business in a suitable location are more likely to choose informal credit sources over formal credit sources. As a result, it is concluded that firms which are operating in a suitable location are more sensitive about choice formal credit sources. Finally, similar situation is observed for firm age variable. The sign of firm age is negative in both equation and statistically significant in the second equation. The results suggest that older firms are less likely to informal credit sources over formal credit sources. As a result, it is concluded that older firms are more sensitive about formal credit sources as they have developed more reputation than young firms.

However, as (Greene, 2002) noticed, the meaning of coefficients of multinomial model is not straightforward and therefore, it is necessary to compute marginal effects to provide a better understanding of the model. In this model, marginal effect measures the change in the probability of the entrepreneur's primary preference outcome with respect to a change in each explanatory variable. It is the effect of a change in one of the dependent variable, everything else constant, on the probability that an individual choose among the alternatives. The marginal effect of binary independent variable measures a discrete change which shows how the predicted probabilities change as the binary independent variable changes from 0 to 1. The marginal effect for continuous variables measure an instantaneous rate of change that provides a good approximation for the amount of change in dependent variable that will be produced by a one unit change in the independent variable. Results of calculating variables marginal effects are presented in Table 5.

The marginal effect of sex variable indicates that female respondent's chooses formal credit and NGO credit alternatives as the primary preference in credit source choices more than male respondents. Consequently, the marginal coefficients of formal credit and NGO credit alternatives are 0.035 and 0.0296 respectively. However, male respondents chose informal credit as the primary preference in credit source choice more than female respondents, with their marginal coefficient 0.065. This finding indicates that female respondents are concerned with the formality of credit sources, while male respondents do not worry about the formality of sources credit. The study is in line with the work of (McPherson, 1996) that argued female entrepreneurs tend to avoid taking risks that may help firm expansion. Table 5 shows that SME entrepreneurs which are risk taker choose formal credit and informal credit alternative as the primary preference in credit source choice than SME entrepreneurs who are risk averse. The marginal coefficients of formal credit and informal credit alternative of SME entrepreneurs which are risk taker are 0.062 and 0.152 respectively. However, SME entrepreneurs which are risk averse chose NGO credit as the primary preference in credit source choice more than SME entrepreneurs which are risk taker, with their marginal coefficient of 0.214. The finding an evident that risk taker entrepreneur do not worry about interest rate risk and choose formal credit and informal credit whereas risk averse entrepreneurs chose NGO credit which have no interest rate risk. The study is supported by (Hoang & Otake, 2014; Brown, Garino, & Taylor, 2013) that reveal debt and risk attitude have an effect on credit participation and credit source selection.

Also, the marginal effect of firm size variable indicates that micro sized SME entrepreneurs chooses NGO credit and informal credit alternative as the primary preference in credit source choices, more than small sized and medium sized MSE entrepreneurs whereas small sized and medium sized SME entrepreneurs chose formal credit as the primary preference in credit source choice, more than micro sized SME entrepreneurs. The marginal coefficients of formal credit for small sized and medium sized firm are 0.655 and 0.3277 respectively. The results of this study reveal that SME with better sized in terms of number of members and capital preference formal credit sources as they can easily assess credit for formal creditors by the virtue of their size that used as collateral. The result is supported by (Beck & Kunt, 2006) that suggested small firms (micro in our case) finance a large share of their investment from informal sources. It is also supported by the work of (Abdesamed & Wanab, 2014; Asah & Fatoki, 2011) that found small firms are less fevered than lager once in access to formal credit sources.

Similarly, the marginal effect of firm legal status variable indicates that SME entrepreneurs organized by cooperative law chooses formal credit and NGO credit alternatives as the primary preference in credit source choices more than SME entrepreneurs organized by partnership. The marginal coefficients of formal credit and NGO credit alternatives of SME organized by cooperative law are 0.125 and 0.103 respectively. However, entrepreneurs organized as partnership chose informal credit as the primary preference in credit source choice more than entrepreneurs organized by cooperative law, with their marginal coefficient of 0.228. The finding indicates that entrepreneurs organized by cooperative law are concerned with legal source of credit by virtue of their large number of member relative to entrepreneurs organized by partnership with few numbers of members. It is supported by (Cassar, 2004) that stated incorporated firms are very favored from formal finance supplier than unincorporated firms. In Table 5, it is obvious that SME entrepreneurs who have business plan choose formal

credit and NGO credit alternative as the primary preference in credit source choice more than SME entrepreneurs that do not. The marginal coefficients of formal credit and NGO credit alternatives of SME who have business plan are 0.006 and 0.115 respectively. However, SME entrepreneurs who have no business plan for funding chose informal credit as the primary preference in credit source choice more than SME entrepreneurs that have business plan, with their marginal coefficient of 0.122. The finding indicates that entrepreneurs who have business plan chose legal source of credit whereas SME entrepreneurs without business plan chose informal credit sources. This study is supported by the work of (Fatoki., 2014) that shows the availability of business plan is the critical requirement for lending by financial institutions.

Table 5: Marginal effects averaged over individuals

| Dependent variables | Possible sources of credit for choice | | | Mean variable |
|---|---|---|---|---|
| | Formal credit | NGO credit | Informal credit | |
| | dy/dx  (P>\|z\|) | dy/dx   (P>\|z\|) | dy/dx  (P>\|z\|) | |
| Sex of firm head (SEX)* | -.0353349 (0.865) | -.0296928 (0.837) | .0650278 (0.661) | .573171 |
| Small  firm size (IFSZ_2)* | .6553059 (0.000 ***) | -.3248256 (0.014**) | -.3304803 (0.035**) | .341463 |
| Medium firm size (IFSZ_3)* | .3277175 (0.416 ) | -.2747767(0.003***) | -.0529409 (0.895) | .085366 |
| Legal status of firm (LSF)* | -.1256515 (0.602) | -.1032457(0.566) | .2288972 (0.112) | .731707 |
| Business plan (BPL)* | .0064282 (0.977) | .115707 (0.487) | -.1221353 (0.409) | .378049 |
| Access to premise (AWP)* | -.3424793 (0.065*) | .2244776(0.086*) | .1180016 (0.404) | .621951 |
| Firm location (FLN)* | .3671504 (0.036**) | -.0808371 (0.528) | -.2863134 (0.074*) | .695122 |
| Business information (BINF)* | .6705655(0.000***) | -.5522076 (0.003***) | -.1183579 (0.486) | .768293 |
| Risk taking propensity(RISK)* | .062509 (0.824) | -.2141446 (0.425) | .1516356 (0.235) | .865854 |
| Firm/MSE age (MAGE) | .1355544 (0.023**) | -.0228434 (0.543) | -.112711 (0.017**) | 3.81707 |
| Firm capital  (CPTL) | -.0082212 (0.046**) | .006882 (0.005**) | .0013392 (0.665) | 31.6567 |
| Corruption (COR)* | .6180517(0.000***) | .6729129 (0.000***) | -.0548612 (0.716) | 31.6567 |
| | P(Y=1)=.57519534 | P(Y=2) = .17608868 | P(Y=3)=.24871598 | |

(*) dy/dx is for discrete change of dummy variable from 0 to 1
Note: ***, ** & * in parenthesis indicates variables are significant at 1%, 5% & 10% significance level respectively
Source: Multinomial logit model regression output

Furthermore, Table 5 shows that SME entrepreneurs who have access to government constructed work premises choose NGO credit and informal credit alternative as the primary preference in credit source choice more than SME entrepreneurs that do not. The marginal coefficients of NGO credit and informal credit alternatives of SME who have access to government constructed work premises are 0.224 and 0.118 respectively. However, SME entrepreneurs who have no access to government constructed work premises chose formal credit as the primary preference in credit source choice more than SME entrepreneurs that have access to government work premises, with their marginal coefficient of 0.342. The finding indicates that entrepreneurs who have accessed government work premises chose NGO credit and informal credit as they may not get double support from government institution in terms of collateral for accessing loan from formal credit sources such as microfinance institutions in the town. Table 5 shows that SME firms which are located in suitable places choose formal credit alternative as the primary preference in credit source choice more than SME firms that do not located in suitable location. The marginal coefficient of formal credit alternative of SME firm located in suitable place is 0.367. However, SME firms which have no appropriate location chose NGO credit and informal credit as the primary preference in credit source choice more than SME firms that are located in appropriate places, with their marginal coefficient of 0.081 and 0.286 respectively. The finding indicates that firms with appropriate location choose formal credit whereas firms which are not found in suitable location chose NGO credit and informal credit. The study is supported by (Asah & Fatoki, 2011; Abor, 2007) who found that SMS located in urban center are success full in access to debit financing compared to those located in rural area.

Table 5 also shows that SME firms which have access to business information choose formal credit alternative as the primary preference in credit source choice more than SME firms that do not. The marginal coefficient of formal credit alternative of SME firm which have access to information is 0.671. However, SME firms which have no access to business information chose NGO credit and informal credit as the primary preference in credit source choice more than SME firms that have access to business information, with their marginal coefficients of 0.552 and 0.118 respectively. The finding indicates that firms with appropriate business information choose formal credit whereas firms which lack appropriate business information chose NGO credit and informal credit. This is supported by (Sarapaivanich & Kotey, 2006) that reveals absence of business information leads to information asymmetry and jeopardize access to credit. Table 5 reveals that SME entrepreneurs who agree that there is corruption problems chose formal credit and NGO credit alternative as the primary preference in credit source choice more than SME entrepreneurs who believe that there is no corruption problem in the process of financing. The marginal coefficients of formal credit and NGO credit alternative of SME entrepreneurs are 0.618 and 0.673 respectively. However, SME entrepreneurs who do not agree on the existence

of corruption chose informal credit as the primary preference in credit source choice more than SME entrepreneurs agree that there is corruption problem, with their marginal coefficient of 0.054. The result is supported by (Nawi, 2015) which states firms will use more debit hen the legal system has less integrity and also with the work of (Musara & Gwaindepi, 2014) who find positive and significant correlation between access to credit and bureaucracy and corruption.

Finally, the marginal effect of firm capital variable depicts that each 1,000 birr increase in SME income decreases the probability of selecting formal credit alternative as the primary preference in credit source choice by 0.0082. Simultaneously, the probability of choosing NGO credit and informal credit increases by 0.0068 and 0.0013 respectively. The variable of firm age shows that an increase by one year in the age of firm will increase the probability of selecting formal credit as the preference in credit source choice by 0.1355 and decreases the probability of choosing NGO credit and informal credit alternatives as the primary preference in credit source choice by 0.0228 and 0.1127 respectively. It is in line with the work of (Klapper, Laeven, & Rajan, 2010; Ngoc & Nguyen, 2009) who argued that younger firm faces hardship in accessing external finance from lenders.

## 5. CONCLUSION AND POLICY IMPLICATION

The study has contributed to the knowledge on determinants access to debt financing from different external sources of financing and credit source choice in Ethiopia. The results from binary logistic regression demonstrate that there is interdependence and significant relationship between the firms' access to credit and firm size, having business plan, firm location, risk taking propensity of the firm head, firm age, and prevalence of corruption problem in the study area. The result of multinomial logit model shows that firm size, access to work premises, firm location, access to business information, firm age, firm capital and prevalence of corruption in loan processing have a significant effect on credit source choice decision by MSE entrepreneurs. The study reveals that firm size, firm age, prevalence of corruption problem and favorable locations nearby main road significantly determine access to credit and credit source choice. The study recommends that government should formulate policies that will make sources of financing such as commercial banks, micro finance institutions and other sources to relax their credit regulations and operations which encourage borrowing and offer more credit facilities for firms especially which are found at micro and small sized level. Also, the government should establish stringent rule that curbs the problem of corruption in the loan processing by SMEs. Moreover, the government through its SME support institution has to facilitate favorable business location for SME business.

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