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Article

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Micro, small and medium enterprises and their linkage with key actors in Ethiopia: developing entrepreneurial ecosystem mapping

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Abstract

Since micro, small, and medium enterprises (MSMEs) are a basic source of income and employment opportunities for the least developed countries, more emphasis has recently been given to those enterprises, and a number of research studies have been conducted. Ethiopia, as one of the Least Developed countries, could also benefit from those MSMEs if the sector is supported enough. Accordingly, this research is conducted to identify the basic determinants of the performance of MSMEs in Ethiopia and to try to develop an entrepreneurial ecosystem mapping to connect those enterprises with the concerned stakeholders, which can contribute to the improvement of the performance of MSMEs. Primary data from randomly selected 400 sampled enterprises is analyzed using ordered logistic regression, and data collected from stakeholder interviews is analyzed using descriptive analysis to develop the ecosystem mapping. Accordingly, academic institutions, such as universities, financial institutions, such as banks and credit associations, non-governmental organizations, such as GIZ and Reach for Change, and government organizations are important actors in entrepreneurship in Ethiopia. Finally, the result of the ordered logit model indicates that access to finance, training, and raw materials, experience, level of education, and sectoral dummy are statistically significant factors that affect the performance of MSMEs. Based on the results, we recommend the government of Ethiopia give more emphasis to MSMEs in different forms, such as providing support in the form of financial, training, market, and raw material linkages.

Keywords: Ethiopia, Ordered logit model, Ecosystem mapping, Micro, small and medium enterprises

Introduction

The world economy is strangely growing due to the contributions of small and micro businesses because of the huge employment opportunities, wealth and income-creating capacity of those enterprises (Aphu & Adator, 2018). In contrast to the classical gains of multinational corporations, micro, small, and medium-sized enterprises (MSMEs) are better suited to serve the developmental needs of poor countries in Africa, Asia, and Latin America (Chaokromthong & Sintao, 2021). Currently, the African information on enterprises indicates that a total of 90% of all private businesses fall within the bracket of

MSMEs. By this same estimate, their employment also stands at 50%, with a correspondingly high contribution to the overall productivity output of most African economies.

Ethiopia is a country implementing a variety of development plans and strategies to become a middle-income country by 2025 and taking multidimensional measures to aggressively reduce poverty. To achieve those plans, much is done in the area of entrepreneurship development, focusing on the youth, where more than 2 million youth are joining the workforce per year (Endris & Kassegn, 2022). According to the Job Creation Commission report of 2021, although SMEs make a significant contribution to the Ethiopian economy, there are about 2.2 million and 2850 employees in these enterprises. According to the Ethiopian Job Creation Commission report of 2020, 1.5 million MSMEs running in the country employed 4.5 million laborers and generated 40.7 billion birr in monthly income (Ababiya, 2018; Kassa, 2021).

The contribution of MSMEs to the Ethiopian economy has decreased compared to the previous year due to the dismissal of workers. Millions of people lose billions of dollars in sales each month. Another 37% have already closed. For a country with very few private enterprises per capita and the lowest entrepreneurial activity in Africa, this poses a major problem and needs more attention. Because of this, MSME has attracted the attention of researchers, and a number of studies have been carried out by international organizations and academic researchers as well (Berhanu et al., 2022).

MSMEs need business knowledge, skills, and entrepreneurial spirit to operate their businesses sustainably and profitably within existing business dynamics (Buli, 2017). However, personal factors such as lack of business vision, member risk aversion, and personal business contacts make it difficult for MSME members to stay in the business (Endris & Kassegn, 2022). Efforts to expand existing businesses and launch more new ones have a far greater impact on the growth of small businesses than micro enterprises (Amha, 2015).

Moreover, market linkages enable MSMEs to supply products and gain input in the commercial value chain, creating jobs and improving business efficiency. However, the existing vertical links between MSMEs and large firms are very limited, with limited access to raw materials Mohammed and Beshir (2019) and high raw material costs, and this is a major challenge for MSMEs in Ethiopia (Seifu et al., 2017). The lack of alignment with the market has revealed a significant problem facing companies (Tamene & Daba, 2020). Besides, lack of proper guidelines for starting new businesses, lack of access to finance, low skills and knowledge of managers, poor infrastructure, and entrepreneurship are the main challenges for Ethiopian MSMEs (Endris & Kassegn, 2022).

Entrepreneurship development has the potential to change a given country's economy if supported enough Amha (2015), and conducting the business ecosystem in Ethiopia is very important to know the challenges, opportunities, and areas that need greater attention by the business community in Ethiopia. In addition, this study will identify the key actors in the entrepreneurial ecosystem mapping that helps to create the smooth functioning of MSMEs in addition to identifying determinants of the performance of MSMEs. Many studies are conducted on the entrepreneurial ecosystem and they recognize that it is about networking and a major way of minimizing the challenges of MSMEs by clearly mapping the interaction between the components, such as actors and factors (Kreuzer et al., 2018). Brydges and Pugh (2021) indicate that entrepreneurial ecosystem

mapping is then very important in the process of solving the problems of MSMEs by identifying the challenges and key actors that can help those enterprises by providing support through training, finance, and other pillars.

Developing an entrepreneurial ecosystem from the perspective of individual and institutional pillars to address the strengths and weaknesses of MSMEs will promote the economic growth of a given country's economy by creating a bridge between individual firms and institutions that are capable of providing support in many aspects, such as finance, human capital development, market linkage, and cultural support (Cunningham et al., 2019).

Therefore, the contribution of this study to existing knowledge is twofold. First, previous studies stated above and others tried to identify the factors that determine the performance of MSMEs, and the reasons for low performance are known, but this study will add by identifying the key actors that can solve those problems that lead to low performance by developing entrepreneurial ecosystem mapping. Second, a recent study by Yigezu (2021) identifies the major determinants of the performance of MSMEs by applying a binary choice model, but this study will use a more appropriate model, ordered logit models, by creating three groups of MSMEs as low, medium, and high performance enterprises, and this will help us to identify the determinants of MSMEs performance separately for each group.

The article contributes to the existing literature on the determinants of MSMEs, which has been widely studied in the context of developing countries and the key actors of the entrepreneurial ecosystem mapping in Ethiopia. The study is particularly relevant for Ethiopia, a country that has experienced sustained decline of the contribution of the MSMEs to the economy.

Hence, the research questions of the study are to answer: what are the determinants of MSMEs performance? What are the key actors of entrepreneurial ecosystem mapping in Ethiopia? Using a cross-sectional data from a sample of 400 MSMEs found in Addis Ababa for the fiscal year of 2022 and employing the ordered logit econometrics model.

The rest of the paper follows this association: the coming section presents a skimpy review of the theoretical and empirical literature on the determinants of MSMEs performances and conceptual framework of the ecosystem mapping. Section “[Data and methodology](#)” outlines the methodology, followed by a discussion of the estimation results in Sect. “[Conclusion and recommendation](#)”. The last section provides the conclusion and recommendation.

Literature review

Definition of small and micro enterprises

Businesses or enterprises are organizations (collections of two or more people who are coming together with their own resources—knowledge, skill, abilities, and financial assets—to achieve a stated common goal) that are established and work for profit (Esubalew & Raghurama, 2017).

In every country, business is regulated by a number of laws and other national or international normative documents, including European Company Law, etc. According to the Commercial Law of the Federal Democratic Republic of Ethiopia, there are four types of

businesses: self-employed, sole traders, partnerships (general partnerships and limited partnerships), and corporations (limited liability companies and joint-stock companies).

Companies that utilize the mentioned types of businesses can be divided into micro, small, medium, and large enterprises.

Enterprises are the most important components of the economy, representing organizations that consist of two or more persons and which, by economic means, perform activities whose goal is to make profit. SMEs are part of these enterprises with unique characteristics and roles (Abagissa, 2021).

SME is an acronym that stands for micro and small enterprises. Though these enterprises play a vital role in many nations' economic growth and development, there is no generally accepted definition. Different countries, agencies, and institutions have defined SMEs differently to suit their own concepts and operations (Abagissa, 2021).

However, Policies and strategies to provide result-oriented and sustainable support to micro and small enterprise development should be based on a uniform national definition of SMEs. It is imperative to ensure that all support programs result in direct benefits to the SMEs targeted (MoUDH, 2012).

The definition provided in the 1997 SME strategy

The formulation of the 1997 Micro and Small Enterprise Development Strategy (2005) took into account the experiences of South Africa and other countries. During that time, the use of a single criterion, namely, paid up capital, was preferred as it was thought that there were difficulties in obtaining information on the numbers employed in SMEs as most of the enterprises were operated by family members Ebabu Engidaw (2021) (Table 1).

Small and medium enterprises in Ethiopia

SMEs have a significant effect on a country's operation from both economic and socio-economic aspects. Economically, SMEs can enhance economic growth and accelerate socio-economic progress by providing traders with the resources to exploit market opportunities and further accelerate the development of rural regions. Socio-economically, SMEs provide deprived communities with the financial stability to afford a better quality of life. Therefore, the Ethiopian government continuously creates reform policies to promote SMEs development (Oshora et al., 2021).

In the strategy, micro and small enterprises are assumed to operate under "Agricultural Development Leads to Industrialization" (ADLI) strategy and market economy principles is considered as fundamental principles. However, as the data by Central Statistical Agency (1997) witnessed, most of the SMEs already established are urban based and the agriculture is insignificant (only 5%) which possibly twisted the effort and commitment of resources to indelicate direction (Esubalew & Raghurama, 2017).

Table 1 Definition of micro and small enterprises

Sector	Paid up capital
Micro enterprises	≤ ETB 20,000 (USD 1200)
Small enterprises	≤ ETB 500,000 (USD 30,000)

Though most SMEs are facing problems with access to finance, business types that have a low-cost nature of operation are not taken as one of the eligibility criteria for government support. Moreover, facilitating access to finance is stated under "Other Specific Support Areas or Programs" from "the Basic Principles" category, which is ostensibly less focused (Esubalew & Raghurama, 2017).

In the strategy, among others, one of the targeted support measures and beneficiaries is small enterprises in nomadic and disaster-prone areas. Nomads are culturally movable and cannot reside in a specific area, which makes the provision of lending services difficult. These areas could have been supported in other ways rather than unnecessarily committing resources (Esubalew & Raghurama, 2017).

To alleviate the financial constraints, the strategy dictates that the state governments guarantee the credit of the SMEs through the Credit guarantee fund beyond the 20% compulsory saving amount. Nonetheless, Enterprises are supposed to pay a 1% service fee so as to sustain the credit guarantee fund system, which is another burden for the enterprise, and Credit delivery is on a loan ceiling basis, which is to be paid back within not more than 36 months (Esubalew & Raghurama, 2017).

saving program for lease machines and investment materials, which is intended to solve micro and small industries capital and asset problems and enable them to get loans without guarantee. Accordingly, operators and actors can get 60% of their loans or credits from the bank when they save 40% in the bank. The Lease financing program is run jointly by the Commercial Bank of Ethiopia and Micro Finance Institutions, and it is accessible to all SMEs in urban and rural areas. Taking on the role of commercial banks in alleviating SMEs financial constraints is a positive response from the strategy, though it has said nothing about the private commercial Banks involvement (Esubalew & Raghurama, 2017).

At the end of the strategic period (2014–15), a total of 271,519 new SMEs were established, which employed about 2.8 million people with a loan grant of more than Birr 6.5 billion. From a new enterprise establishment and employment creation perspective, remarkable results are obtained. However, most of the establishments are micro enterprises, and transitions to the next level are unrealized (NBE, 2015).

Empirical literature review

Country specific

Ebabu Engidaw (2021) conducted a study on entrepreneurial culture and its socio-cultural Determinants of Woldia University graduate scholars, the study result of this exploration portrays that entrepreneurial education had a positive effect on scholars' entrepreneurial intentions as one unit increased in entrepreneurial education; intentions to come an entrepreneur increased by 0.09 units. Kassa (2021) empirical study verified that the need for independence and occasion-seeking actions of scholars who have taken entrepreneurship course are advanced than those of scholars who did not. In addition, also grounded on Jones and Matlay (2011) findings, entrepreneurial education increases entrepreneurship intentions and raises the knowledge and chops of individuals as well. Entrepreneurship intention can be told to address colorful private morals and coffers which are walls to produce new gambles. It has been shown that positive relationship occurs between economics and business education and business creation.

The study conducted by Cherkos et al. (2018) discloses that the donation of small enterprises in creating job openings and in the development of our frugality is vital. still, their donation is veritably low as compared to that of other countries' due to colorful reasons. The productivity of cabinetwork manufacturing MSEs is not competitive enough and substantially follows the usual product process. Though these failings may be result of different factors, there is no well-conducted and proved studies on the field. In general, there are external (contextual) and internal factors, which are still affecting performance of cabinetwork manufacturing MSEs.

Cross country empirical works

To explore the state of the City of Johannesburg's entrepreneurship ecosystem and identify the gaps and weaknesses that cause the ecosystem not to function optimally Msimango-Galawe and Majaja (2022) did a cross-sectional, quantitative study with a sample of 1099 entrepreneurs. Their data analysis included aggregating and analyzing the data through descriptive statistics, simple observation, comparison, and pattern recognition. Their findings showed a map of the City of Johannesburg's entrepreneurship ecosystem's issues and how entrepreneurs across different regions are not affected differently by the geographic region. De Brito and Leitão (2021) conducted a systematic literature review to map and define entrepreneurial ecosystems. Khan (2013) critically reviewed the existing initiatives of Saudi Arabia for entrepreneurship growth. The study used primary and secondary resources to explore the initiatives and understand entrepreneurship growth ecosystem. The researcher proves that the Saudi's ecosystem was not complete and whatever available was in infancy stage. Challenges also remained for the effective intervention at strategic, institutional and enterprise levels to streamline and trigger the entrepreneurship development.

Conceptual frame work of entrepreneurial ecosystem mapping

A variety of mapping systems and models exist, and we choose one we think would work better. In this regard, to conduct green entrepreneurial ecosystem mapping for this specific charge, it is intended to make use of and apply Chaves-Maza and Fedriani (2022), De Brito and Leitão (2021), and Glancy and Isenberg (2011) entrepreneurship ecosystem model, as developed by the ILO for the inclusive entrepreneurship ecosystems approach, to support the development of inclusive entrepreneurship ecosystems that support entrepreneurs in creating sustainable businesses. The approach emphasizes six core pillars that together form a holistic support system for entrepreneurs, as well as two cross-cutting confines inclusiveness and Pathways to Decent work—that ensure that the support system is inclusive of all entrepreneurs (Fig. 1). Our platoon has named this model for better adoption, simplicity, and effective mapping. Thus, we propose that the approach on this specific charge will substantially use this model, with practical variations as needed and when the requirements appear. All conversations, including the data collection and analysis, would be in close association with the model, unless otherwise agreed upon and decided in discussion with the crucial actors.

Possible additional dimensions (cutting across the entire ecosystem or selected components are technology and environmental sustainability). The following description gives additional information on what each pillar represents and includes in the mapping

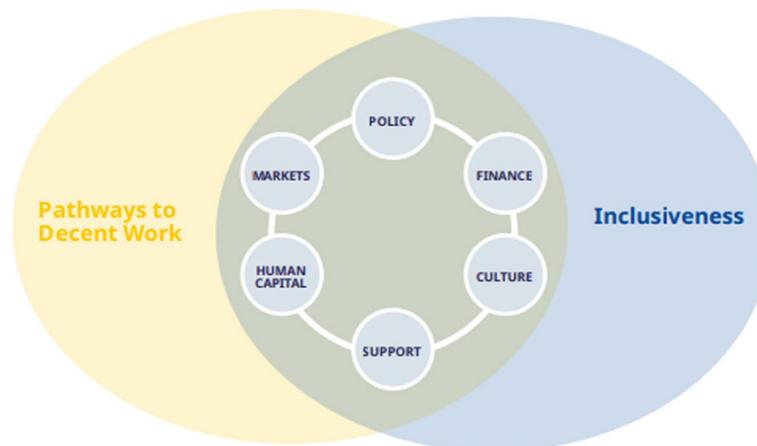


Fig. 1 ILO's inclusive entrepreneurship ecosystem framework

exercise. Building on Isenberg's (2011) entrepreneurship ecosystem model, the approach has designed six ecosystem pillars and other cross-cutting dimensions. These are:

Human capital: Human capital in this study refers to the availability of skilled and motivated labor, which is central to entrepreneurs' ability to build sustainable businesses. The skills of workers are expected to be developed by the access to training given to enterprises, and then training is used as a proxy variable for highly demanded qualified labor.

Policy and leadership: Legislation and policies that foster business creation are key for enterprise development. These include easy and transparent business registration procedures, fair taxation policies, and policies that actively promote entrepreneurship.

Appropriate finance: Access to financial resources is crucial for entrepreneurs seeking to start and grow a business, and the availability of a diversity of financial products and services is an important component of entrepreneurial ecosystems.

Culture: This component describes the legitimacy of entrepreneurship in the wider society of a given context, i.e., whether entrepreneurship is considered a viable career path and whether entrepreneurs have a positive reputation.

Support: This component refers to the variety of support services available to entrepreneurs. This includes the availability of demand-driven and accessible non-financial business development services, such as business management training, capacity building mentoring, and coaching, as well as operational services, such as accounting and legal advice, IT and design support, and sector-specific support.

Markets: The availability of and access to markets is crucial for any business. In the entrepreneurship inter-linkage with key actors, this component is specifically related to the availability of customers who are willing and able to purchase new products and services. Where local demand is low, strong entrepreneurial ecosystems are often characterized by accessibility to regional or international markets for local green entrepreneurs.

In addition to the six pillars, the model includes two other dimensions, namely, the cross-cutting dimension and the path to decent work.

Inclusiveness: Entrepreneurship ecosystems differ not only by context but also between target groups in a given context. Furthermore, informal norms and values (the Culture

component of the ecosystem framework) may impede business creation among marginalized groups, such as women, youth, disabled people, and others.

Data and methodology

Research design

Both experimental and diagnostic research designs were applied in this research. The first is important to identify causal relationships between dependent and independent variables, which is important to achieve the objective of identifying determinants of enterprise performance, and the second is important to identify root causes of the problems and identify possible solutions that will be applied to develop the entrepreneurial ecosystem mapping. In the first step, literature and project documents related to the assignment were reviewed to understand the resources available and the context of the ecosystem and develop appropriate tools for capturing data from primary and secondary sources. At the second step, available data from relevant sources, both primary and secondary, is collected to identify factors that can be used as determinants of the performance of MSMEs. At the last stage, the collected data will be organized and synthesized into its parts, making it more ready for further interpretation and writing.

Sample size and sampling procedure

The sampling frame for this study is grouped into two categories: MSMEs and stockholders of entrepreneurship, which are determined to be key actors. Therefore, first, from the perspective of key actors in the ecosystem mapping, governmental (minister of finance, minister of planning, minister of education), non-governmental, financial, and academic institutions are considered to be part of the sample. With this regard, seven banks in Addis Ababa, namely, the National Bank of Ethiopia, the Commercial Bank of Ethiopia, Abyssinia Bank, Oromia International Bank, Dashen Bank, Oromia International Bank, and Debub Global Bank, are included with other credit institutions, such as Addis Savings and Credit Unions. From academic institutions, Addis Ababa University, Bahir Dar University, Jimma University, Unity University, Ethiopian TEVT College, Tegbared Vocational School, and St. Marry Universities are part of the sample. Fana Broadcasting Corporation, ETV, Reporter Ethiopia from Media Stream, Job Creation Commission, GIZ, IFAD, UNIDO, Reach for Change, and the United Nations are possessively selected for the sake of easily accessing data, and key informant interviews are held with the concerned bodies of those institutions to develop the ecosystem mapping. Second, owners of MSME in Addis Abeba are selected using random sampling techniques to obtain respondents for the purpose of identifying the most important determinants of the performance of enterprises from the pillars of the ecosystem mapping. From the very beginning, enterprises from urban agriculture, service-giving, and industrial small firms are included as part of a sampling frame. Then, finally, the total number of enterprises is given to be 16,720, and then the appropriate sample is determined using the formula presented below.

From total population appropriate sample size is selected by applying sample size determination of Chaokromthong and Sintao (2021), the sample size for this study is given by

$$n = \frac{N}{1 + N(e)^2} = \frac{16720}{1 + 16720(0.05)^2} = 400$$

where n = desired sample size.

N = total population (total number of small and micro enterprises).

e = margin of error (0.05).

Types of data

To achieve the objectives of the study, both primary and secondary data are used. Secondary data collected from various offices on different related pillars (especially to analyze policy-related issues) is applied to draw the ecosystem mapping, and primary data collected from sampled enterprises is applied to identify determinants of entrepreneurship performance and draw the Ethiopian entrepreneurial ecosystem mapping. The year of data collection is the 2022 fiscal year.

Method of analysis

In this study, both qualitative and quantitative, as well as descriptive and econometric methods of analysis, are applied. To investigate the key actors of entrepreneurial ecosystem mapping and their role in improving micro, small and medium enterprises has been analyzed qualitatively, and the primary data collected from sampled enterprises is discussed with the help of descriptive statistics. Moreover, to identify the determinants of the financial performance of those MSMEs, the ordered logit model is applied by having the performance grouped into three categories based on their monthly profit earning.

Econometric model specification and estimation technique

In this study, an econometric model is applied to identify the determinants of the performance of MSMEs. The dependent variable, performance of MSMEs is measured using the proxy variable of monthly gross profit, which is determined by applying profit margin as a percent of paid-up capital. There are three basic categories. Based on the MSME strategy of Ethiopia, enterprises are classified into three main categories: micro, small, and medium enterprises based on their paid-up capital, as stated in Table 2.

The three categories of dependent variables lead to the application of the ordered logistic regression model. Therefore, the ordered logit model is specified as follows:

Profit = f (access to credit, sector of engagement for enterprises, access to training, Business location, level of education, age of the business, access to raw material, market access, Experience)

Table 2 Classification of enterprises performance

Level of enterprises	Sector	Head count staff	Paid up capital (fixed asset) ETB
Micro enterprises	Industry	≤ 5	≤ 100,000
	Service	≤ 5	≤ 50,000
Small enterprises	Industry	6–30	101,000–1,500,000
	Service	6–30	50,0001–500,000
Medium enterprises	Industry	> 30	> 500,000
	Service	> 30	> 500,000

Source: (National MSME development strategy of Ethiopia, 2019)

In this study, profit is specified as a function of an independent variable, and the model is ordered to take the form of a multinomial case, where three categories, namely, micro, small, and medium enterprises, profit as a percent of their paid-up capital are included under the dependent variable.

In the ordered logit model, there is an observed ordinal variable Y , which is a function of another continuous and unobserved latent variable Y^* , and the value of Y is determined by the latent variable Y^* which has various threshold levels.

$$\text{Recall, } Yi^* = \beta_0 + \beta_1\text{CRED} + \beta_2\text{EDUOW} + \beta_3\text{LOCB} + \beta_4\text{SEC} + \beta_5\text{TRAIN} + \beta_6\text{AGEB} + \beta_7\text{RAWM} + \beta_8\text{MKT} + \beta_9\text{EXPER} + \text{error}$$

The three categories of the dependent variable Y_i can be explained as follows;

$Y_i = 1$, if $Y_i^* < k_1$, where k_1 is the highest value of low profit groups.

$Y_i = 2$, if $k_1 < Y_i^* < k_2$, where k_2 is the maximum value in medium profit earners threshold.

$Y_i = 3$, if $k_2 < Y_i^* < k_3$, where k_3 is the maximum profit in high income group HHS.

In general, $Y_i^* = \sum_{k=1}^3 (\beta_k X_{ki} + ei)$, ei follows the logistic distribution.

After considering all the above assumptions, the logistic regression is formed below. General formula for ordered logit model as presented by Abegaz et al. (2014) with M categories

$$p(Y) = \frac{M}{x} = \frac{\exp(Xi\beta - K_{M-1})}{1 + \exp(Xi\beta - k_{M-1})}$$

$$p(Y = 1/x) = 1 - \frac{\exp(Xi\beta - k_1)}{1 + \exp(Xi\beta - k_1)} = \frac{1}{1 + \exp(Xi\beta - k_1)}$$

$$p(Y = 2/X) = \frac{1}{1 + \exp(Xi\beta - k_2)} - \frac{1}{1 + \exp(Xi\beta - k_1)}$$

$$p(Y = \frac{3}{X}) = \frac{1}{1 + \exp(Xi\beta - k_2)}$$

Description of variables

See Table 3.

Results and discussion

Descriptive analysis

The descriptive summary of both the categorical and continuous variables is analyzed using measures of mean, minimum, maximum, standard deviation, frequency, percentage, skewness, and kourtosis, as displayed in Tables 4 and 5.

The tabular presentation of categorical variables can indicate the number of observations in each group of the dummy variable. In this regard, the first hot issue in today’s world is gender analysis, and we start our descriptive analysis with the gender aspects of owners of MSMEs. From the total sample of 400 owners of MSMEs, only 95 (accounting for 23.58%) are owned and run by females, and the large portion, which is about 76.42%, is owned by males. This indicates that the participation

Table 3 Description of explanatory variables

Variables	Definition	Expected sign
Access to credit	1 = If the firm accessed Credit, 0 = Elsewhere	+
Education level of the owner	The number of years of education of the owner	+
Location of the business	1 = If the firm has access to road infrastructure, 0 = Elsewhere	+
Type of sector engaged in	1 = If the firm engaged in service sector 0 = Elsewhere	+
Training	1 = If the firm get training 0 = Elsewhere	+
Age of the enterprises	The number of years of the enterprises stay on the market	-
Access to raw material	1 = If the firm easily access inputs of production 0 = Elsewhere	+
Access to market for products	1 = If the firm can get market for their product easily 0 = Elsewhere	+
Business experience of the owner	Business experience of the owner in years	+

Table 4 Summary statistics of dummy variables

Variables	Type of variable with category	Number of observation	Freq	Percentage
Location of business	Urban area = 1	400	322	80.5
	Rural area = 0		178	19.5
Gender of owners	Male = 1	400	305	76.42
	Female = 0		95	23.58
Access to training	Own = 1	400	121	30.25
	Has no		280	69.75
Credit access	Yes = 1	400	184	46
	No = 0		216	54
Access to raw material	Have access = 1	400	287	71.75
	Have no access = 0		113	28.25
Access to market	Have access = 1	400	242	60.5
	Have no access = 0		158	39.5

Table 5 Descriptive summary of continues variables

Variables	Type	mean	Std	Min	Max	Skewness	Kourtosis
Owners experience	Continues	36.13	10.6	20	61	0.69	3.43
Age of business enterprises	Continues	22.69	25.8	10	95	- 0.80	2.26
Education level of owners	Continues	11.5	2.5	0	14	0.30	3.20

of females is still limited in the area of micro and small enterprises, and it needs the highest intervention to develop the participation of women in this area. Out of the total of 400 enterprises, 322 (80.5%) are located in urban areas with access to different facilities, including road infrastructure facilities, and the remaining 19.5% of the sample enterprises are located in rural areas with no access to infrastructural facilities. In addition, the descriptive summary shows that even if more enterprises have

high access to markets and raw materials, credit and training are not easily accessed by micro and small enterprises in the study area.

In addition to categorical variables included in the model, the descriptive statistics of continuous explanatory variables are presented in Table 5 (Table 2). Based on this result, the Owners experience and age of the business enterprises had a respective mean of 36.13 and 22.69, with respective minimum and maximum values of 20 and 61, 10 and 95. The education level of business owners ranges from 0 to 16, indicating that the farmers' education level has a maximum variance starting from illiterate persons to 14 years of education, meaning that individuals who completed their secondary and preparatory schools are practicing traditional farming agriculture in addition to those individual owners who have graduated with a first degree.

The skewness and kurtosis values need more explanation, since those values are helpful to understand whether the distribution of observations is normal or not. A negative Skewness value indicates that variables are skewed to the left, and positive values indicate a positively skewed distribution.

The kurtosis value of for education is more than three (leptokurtic distribution) to mean that few observations lied in the middle of distribution (around the mean) and more observation has an extreme education status of very high level and low status or being illiteracy level. The remaining variables age, family size and dependency ratio has a kurtosis less than three (platikurtic distribution) tell us, the distribution of less of those observations lies on the outliers than the normal distribution.

Cross tabulation profit status and determinant variables

The profit status of sampled enterprises is expressed in Fig. 2 in three mutually exclusive groups of low, medium, and high profit margin categories. Out of a total of 400 sampled firms, the majority failed under low and medium categories (126 firms are low profit earners and 134 firms are under medium profit groups), while only 26 enterprises, which account for only 6.5% of the sample firms, are earning high profit margins. This indicates that most of the enterprises (56.5%) are in the low-profit group, whereas 37% of the enterprises are in the medium-profit group.

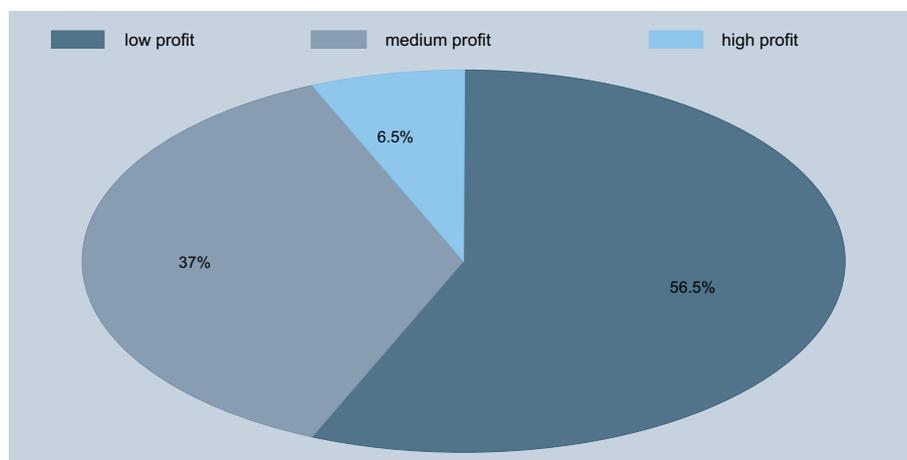


Fig. 2 Profit status of sampled enterprises in the study area

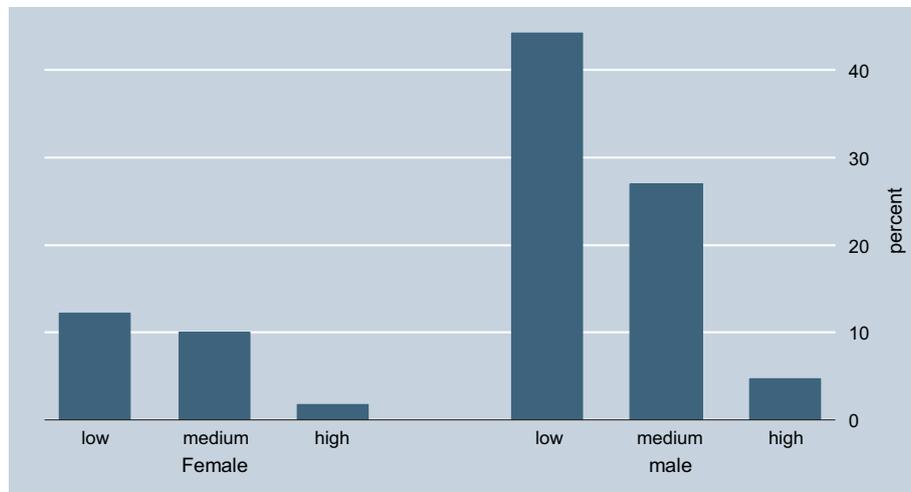


Fig. 3 Cross tabulation of gender with profit status of enterprises

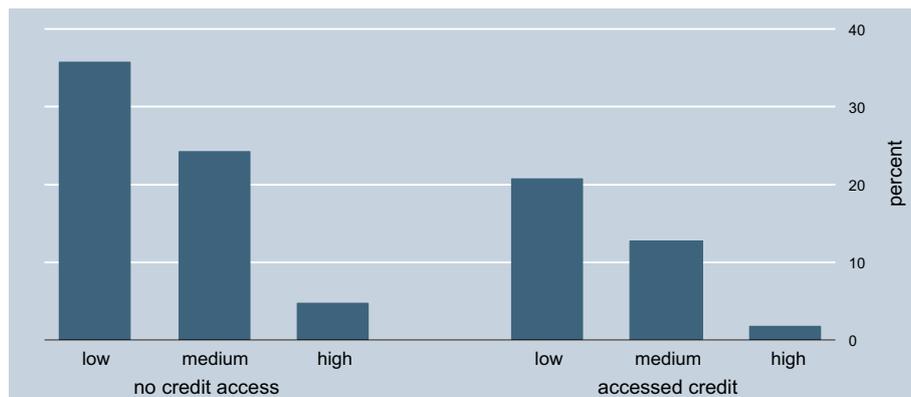


Fig. 4 Cross tabulation of access to credit with profit status of enterprise

The three categories of profit margin group firms and their relationship with the status of some explanatory variables (gender, access to credit, and training) are expressed in the bar graphs drawn below (Figs. 3, 4, 5). Those graphs clearly present how the profit status of enterprises is correlated with explanatory variables of access to training, finance, and gender differences to illustrate how many enterprises that access training and finance are failing in three categories of profit margin, in addition to gender analysis, which compares the male–female gender difference in relation to low, medium, and high profit status.

As we can observe from Fig. 3, the gender difference has a significant relationship with the profit status of micro, small, and medium enterprises. The majority of sampled enterprises are male-owned (only 96 out of 400 sampled enterprises are female-owned). Out of a total of 96 enterprises owned by women, 49 and 40 of them are failing under low and medium profit status, respectively. Only 3% of female-owned firms earn a high profit margin on their paid-up capital. Besides, more than 10% of female-owned enterprises were found in low-profit categories, while medium- and high-profit-earning female-owned enterprises accounted for less than 10%. In addition, their male counterparts

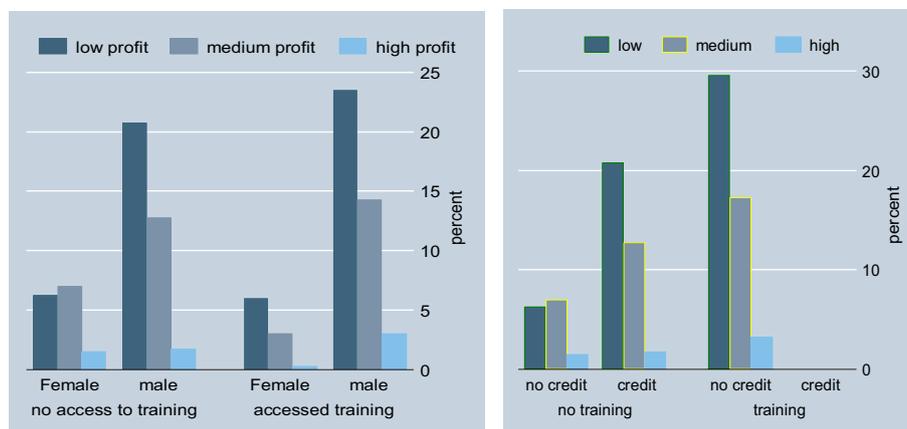


Fig. 5 Cross tabulation of training with gender and access to finance for profit status

cover 76% (304 out of 400) of the total sample, from which more than 40% are in the low profit category, about 28% are in the medium profit group, and 6% are earning profit margins of high status.

In Fig. 4, the profit status of sampled enterprises in relation to access to credit is illustrated. Out of enterprises that gained credit access from different sources, how much of it fell under three profit categories is analyzed in comparison with enterprises that had no access to credit provision.

From the above graph, we can observe that only 35% of the total sampled enterprises have access to credit, and the majority of them (65%) do not. Out of the credit accessed by sampled enterprises, about 1.7%, 12.75%, and 20% are failing under their respective categories of high, medium, and small profit earner groups. When we observe our non-credit-access counterparts, about 5% of enterprises are earning high profit margins. The remaining 35.75% and 24.25% of non-credit-accessed categories are failing under low and medium profit margin categories, respectively.

From now on, the cross-tabulation is made on the interaction of three variables at a time. Therefore, on the left side of Fig. 5, the profit status of the enterprises is cross-tabulated with gender and access to training. On the right side of Fig. 5, we present a cross-tabulation of the profit status of firms with training and access to credit.

From the left side of Fig. 5, we can say that, even if training is more provided for low-profit categories, male-owned enterprises are more benefited by the training support when compared with female-owned MSMEs. Among male-owned and training-accessible enterprises, 23.5%, 14%, and 3.75% are failing under low, medium, and high profit margin categories, respectively. Out of the female-owned firms with training support, about 6%, 4.2%, and 1% are under respective low, medium, and high profit statuses. On the other hand, about 14.75% of female-owned and 35.25% of male-owned enterprises are not accessing training, which is important to develop the human capital level of MSMEs. From those non-training-accessible female-owned enterprises, 1.5% are found in high profit status, 6% are in low profit status, and the remaining 7.25% are found in medium profit margin.

The right-hand side of Fig. 5 illustrates the provision of training with access to credit for the three categories of low, medium, and high profit margin enterprises. Among

micro, small, and medium enterprises that have no access to both training and finance, 6%, 7.5%, and 1.75% are failing under low, medium, and high profit margin enterprises, respectively. From sampled enterprises that have no access to training but access financial support, about 21%, 12.5%, and 1.75% are earning a respective profit margin of low, medium, and high status. From the micro, small, and medium enterprises that have been provided training but have not been granted financial support, about 39.25% are earning low profit status as measured by the percentage of their paid-up capital. The remaining medium- and small-profit enterprises account for 17.6% and 5.4%, respectively, while no firm is granted both financial and training support simultaneously. In addition, the other surprising fact is that there are no enterprises that get both financial and technical support.

Econometric model results

To identify the determinants of Performance of MSMEs ordered logistic regression model is applied. In addition, the result of the marginal effect for each independents variable is presented in Table 6.

With 5% level of significance, the null hypothesis $\beta_j = 0$ is tested to identify the most important and powerful variables to affect performance. As indicated in Table 6, Access to credit, experience, level of education, access to raw materials, sectoral dummy, and access to training are statistically significant to affect the performance of micro and small enterprises in the study area, since their probability value is less than 5%. The other variables, such as age of business, location of business, and access to market, are statistically insignificant with a probability value greater than 5%. With this regard, access to credit has a positive impact on improving the performance of MSMEs, and hence access to credit is associated with a high probability of high-profit enterprises and a low probability of low-performance firms. In addition, this result the same with the result of Kassa (2021) and Hagos (2012). Other continuous variables, such as experience and years of education, are positively correlated with performance, meaning that an increase in experience and education level can bring high economic profit, since educated and experienced owners obtain more awareness about different marketing strategies to develop their own businesses. This study agrees with the findings of research conducted by Mohammed and Beshir (2019).

Table 6 Marginal effect of ordered logistic regression model

Var	dy/dx (y = 1)	p > z	dy/dx (y = 2)	p > z	dy/dx (y = 3)	p > z
CRED	0.0076675	0.069	0.0716776	0.039	0.0226079	0.049
AGEOB	0.0028439	0.524	0.0257241	0.499	0.0057842	0.490
EXPER	- 0.0006793	0.034	- 0.0062541	0.014	- 0.0016389	0.016
Edu	- 0.0014101	0.008	- 0.0129827	0.000	- 0.0034022	0.000
LOCB	- 0.0009432	0.791	- 0.0086611	0.793	- 0.0022193	0.792
RAWM	- 0.000654	0.092	- 0.0006025	0.046	- 0.0001579	0.045
MKT	- 0.0000571	0.950	- 0.0005254	0.950	- 0.0001377	0.950
SEC	0.0041378	0.238	0.0378868	0.248	0.0096342	0.0235
TRAIN	- 0.172492	0.026	- 0.1386479	0.003	- 0.0073423	0.001

Source: own computation using STATA 13 software

It is obvious that access to raw material and training are basic for profitability of businesses (Cherkos et al., 2018) and the result of this study is similar to this theoretical foundation. MSMEs that access training and have high availability of raw materials are earning the highest profit from their business activities when compared with enterprises that do not. The other relevant variable to affect profit is a dummy variable for the sector. Therefore, enterprises engaged in the production sector are more likely to earn a high profit and continue with high performance when compared with small and medium enterprises engaged in service-giving activities. This result is the same with the findings of Mamo (2022) and Kassa (2021).

Post estimation tests

Test of proportional odds assumption

The proportional odds assumption, also known as the parallel regression test, is applied to check whether the explanatory variables equally affect three categories of the dependent variable, which are low, medium, and high profit enterprises in this study. The Brant–Wald test of the parallel regression assumption yields a Chi-square statistic (Appendix A2) of 0.259, which is greater than 5% probability, indicating that the proportional odds assumptions for the full model (with the null hypothesis H0: there is parallel regression) are held, since the null hypothesis of parallel regression exists and has failed to be rejected. This suggests that the effect of each explanatory variable on the dependent variable is the same irrespective of the categories, showing a consistent effect of regressors across the categories of low, medium, and high profit levels.

Test of multicollinearity

Moreover, the model result is also tested against the assumptions of Multicollinearity. The VIF mean value of 1.15 levels of tolerance indicates that there are no multi-collinearity problems. For all continuing independent variables, the correlation result is less than 10, proving that there is no multi-collinearity problem (Table 7).

Test of heteroscedasticity

The Brush–Pagan test for heteroscedasticity (Appendix A3) is given a probability value of 0.78, and hence we failed to reject the null hypothesis, which states the presence of constant variance. This means there is no heteroskedastic variance of the error term, and the estimation and hypothesis testing are proved to be correct.

Table 7 Variance inflation factor of the continues variables

Variable	Vif	1/vif
AGOB	1.25	0.802242
EXPER	1.21	0.824736
Edu	1.01	0.986698
Mea vif	1.15	0.115

Test of normality of the error term

Finally, the Shapiro–Wilk test for normality has a probability value of less than 5% ($p > z = 0.000$) to indicate that there is a non-normally distributed error term, and robust regression is used as a solution to this normality problem (Appendix A4).

Entrepreneurial ecosystem mapping of Ethiopia

In this part, we tried to interconnect the key actors in entrepreneurship using the result of the ordered logit model as a base. With this regard, three pillars of the entrepreneurial ecosystem mapping, namely, finance, human capital, and business culture, are analyzed below using data obtained from sampled enterprises and key informant interviews.

Pillar of finance

As per the key informants report, it was revealed that MFIs are the main finance sources for MSME operators and entrepreneurs. The National Bank of Ethiopia gives special privilege to MFIs to focus on MSMEs, where 99% of their loan portfolio is to cover MSME and only 1% is for high-profile companies for investment loans. This gives special emphasis to MFIs to support of MSMEs by restricting all MFIs to giving only 1% of their loans to MSMEs for high investment loans. It was noted that MFIs have an outstanding loan of 70 Billion birr. The main reasons for this, among others, as per the key informants and secondary data are that MFIs are the only option for reaching out to the missing middle, where the banks are reluctant to address this target group due to the risks involved in financing micro and small enterprises, including smallholder farmers (Figs. 6, 7).

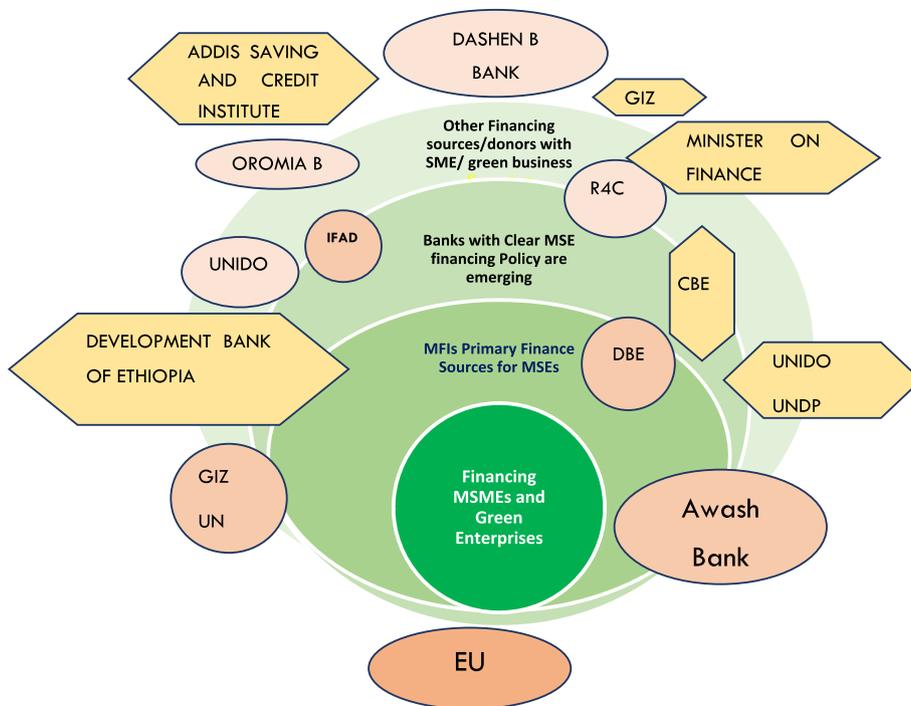


Fig. 6 Key actors in financing MSMEs

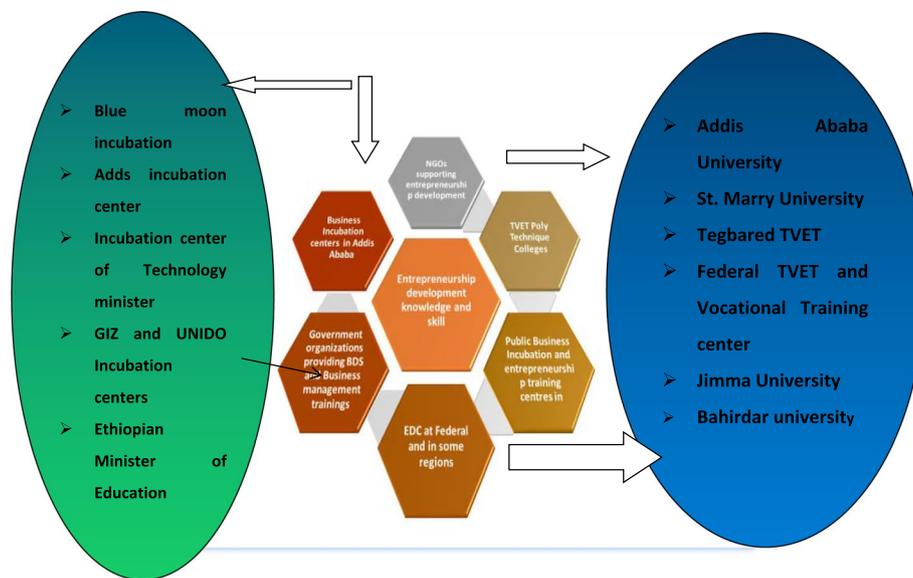


Fig. 7 Key actors of human capital in Ethiopia entrepreneurship

MFIs are fundamentally mandated in their establishment to mobilize savings from the marginalized community and give loans to the same target group through less stringent collateral systems and other risk-sharing financing mechanisms in collaboration with other development actors. NBE has mandated MFIs to allocate 99% of their loan portfolio to SMEs, and this sector is totally left to the MFIs and other local financing sources, whether for productive or non-productive loans. The capacity of banks to penetrate the community with their existing financial products is unlikely to cover the financial needs of people engaged in micro and small enterprises or any other productive activity in relation to farming and non-farming interventions.

The KII information collected from key banking sector senior officials and MFIs indicated that financing SMEs is highly risky as the businesses are volatile and the operators do not have adequate collateral systems. However, recent thinking indicates that there is growing interest among the major private (Awash, Dashen, and Oromia Banks) and public (DBE and CBE) banks in financing SMEs, as SMEs represent the majority of the missing middle in the banking industry. To this end, it was interesting to see that the banks have opened an SME financing directorate in both CBE and private banks, understanding the opportunity and future prospects of creating a potential client base with a broad base of clients.

Concerning the existence of green business financing, there was no mention of a clear policy indicated in the SME financing of the key actors, even though there are some donor-funded green businesses implemented on the basis of on-and-off conditions. For instance, it was mentioned that GIZ, UNDP, UNIDO, the EU, and other funders have supported green entrepreneurship development initiatives in the past and at present in various sectors of the economy. One common thing that all KII respondents from MFIs and banks mentioned is that during credit worthiness analysis, the impact of the

business on the environment is reviewed, and the loan will be released after making sure that the business has no negative impact on the environment or society.

The Ethiopian Development Bank, in collaboration with selected MFIs, and the Ministry of Water and Energy, now called the Ministry of Irrigation Water and Energy, have been working in green business, promoting and expanding the base of the private sector in distributing renewable and clean energy since 2005. This program has been supported by key donors such as GIZ, Energize Development, the EU, and German cooperation in collaboration with the ministries of Water, irrigation, and electricity. The Development Bank of Ethiopia has financed these projects in the past in collaboration with MFIs in the regions to promote clean energy, help households get access to solar power, and replace the traditional kerosene lamp that uses fuel for lighting their homes. Moreover, UNIDO, GIZ, IFAD, EU AID, the World Bank, the Master Card Foundation, and other International Non-Governmental Organizations are supporting entrepreneurship development through providing finance.

Key actors in human capital development

Human capital is the most important asset of entrepreneurs, which enables companies to saturate and run sustainable businesses. The main sources of knowledge and capacity development in relation to entrepreneurship development are universities, technical and vocational education, and Training colleges. Universities are output-oriented, but TVETs are result-oriented. This means TVETs intend to produce manpower that can be self-employed or employed by the industry. As such, the TVET polytechnic colleges work in close collaboration with industry associations, with regular revision of the training fields every 2 years. The revision of the training fields helps to make adjustments and incorporate the dynamism in the economic development and changes in the skill and orientation of the economy from time to time. Federal and regional-level Technical and Vocational Education and Training Development Institutes and Bureaus are coordinating this human capital development process to make it more context-specific and feed the economy by increasing productivity and quality of SMEs products.

The knowledge of Ethiopians on entrepreneurship is limited, since there is no practice of business at an early age; even the majority of individuals hear what entrepreneurship means after joining universities. Due to this, there is no good understanding or enough knowledge of business creation. As per our KII responses, the skill and knowledge of society related to business creation and management are investigated to be low, and a number of initiatives are undertaken to improve this at the national and regional levels. In addition, there are many institutions working to improve it as part of entrepreneurial ecosystem mapping. From government organizations, the minister of Innovation and technology, the Entrepreneurship Development Center (EDC), and the Minister of Education are involved in improving entrepreneurial skills and knowledge. The Minister of Innovation and Technology developed an incubation center and trained entrepreneurs for 6 months. Business ideas that pass this stage will proceed to the next stage, which is the production stage, and start promoting samples of products. EDC has also developed incubation centers in collaboration with higher education institutions, such as Addis Ababa, Jimma, and Bahir Dar Universities, providing support for youth entrepreneurs. The Minister of Education conducted a project called "Zoning Study" with the objective of identifying opportunities and potential resources for new entrepreneurs

for the last 5 years, and the results will be provided soon to all concerned bodies. Higher education institutions and vocational and technical colleges are centers of excellence in promoting knowledge and skills in entrepreneurship via teaching courses, providing training, and then creating initiatives. With this regard, Addis Ababa University, Ethiopian Technical University, Tegbare'ed TVET Center, Addis Ababa TVET College, and all vocational colleges at district level are the main stockholders of the entrepreneurial ecosystem mapping, since they are providing demand-driven training and developing projects that can scale up the knowledge of SME in Ethiopia. The training includes financial management, Kaizen, updated technologies, and any other demand-driven topics.

Business culture and attitudinal change in Ethiopia

The fact that business culture is not well-developed can be explained in the following three aspects: first, almost all of society gives more acceptance to white collar workers, and this attitude leads to less initiative in business creation. Being on staff of a government office is preferred, and that is why graduate students expect the government to create jobs and hire them instead of creating them on their own. The second manifestation of business culture in Ethiopia can be expressed as the transfer of MSMEs from family to children. For those who engage in businesses, it is just like the transfer of a job from father to son (if the father practiced retail trade, the child would continue with it; if the mother is experienced in garments, then her child would follow it), and this is a barrier to new business ideas being developed and put into practice.

Finally, the majority of business owners want to do business with their relatives or friends, and more focus is placed on forming good friendships. Because of this, business activities, including meetings of MSME members, are informal and do not emphasize how to scale up businesses and make them more profitable. When we assess the culture of the society in relation to green entrepreneurship, it is derived from the general business culture. The society does not use green product targets fully to initiate green production and sustain the environment. Production of environmentally friendly products requires the use of organic inputs with relative high costs, but the society does not understand this and compares only products based on their prices, then purchases cheap products. This business culture in society creates a conducive environment for polluting production and discourages the development of green enterprises. Media were expected to do better to improve the business culture of Ethiopia, but the majority of mainstream media failed, and only little has been done. Among the good practices of media to develop entrepreneurship activities, Fana B.C., in its program named "Alem Shemach," which connects products of MSME with customers, Entrepreneurial competition on ARTS TV, and promotion in Capital magazine can be taken as examples. Capital magazine has done well by promoting entrepreneurship for the past 15 years under a column called "Entrepreneurial Profile".

Conclusion and recommendation

This research was conducted to identify the basic determinants of the performance of MSMEs in Ethiopia and to try to develop an entrepreneurial ecosystem mapping to connect those enterprises with the concerned stakeholders, which can contribute to the improvement of the performance of micro, small, and medium enterprises. To achieve the objectives of the study, both primary and secondary data have been used. Primary data from 400 sampled enterprises

is analyzed using ordered logistic regression, and data collected from stakeholder interviews is analyzed using descriptive analysis to develop the ecosystem mapping. Accordingly, academic institutions, such as universities, financial institutions, such as banks and credit associations, NGOs, such as GIZ and R4C, and government organizations are important actors in entrepreneurship in Ethiopia. Finally, the result of the ordered logit model indicates that access to finance, training, and raw materials, experience, level of education, and sectoral dummy are statistically significant factors that affect the performance of MSMEs. Since those enterprises are very important in achieving economic growth, support in the form of training, finance, and market raw material provision is expected from the government of Ethiopia. Based on the result of the data analysis process, we recommend the government of Ethiopia give more emphasis to MSMEs in different forms, such as providing support in the form of financial, training, market, and raw material linkages, since those enterprises are the driving forces for economic growth. Additional international and local NGOs are playing a significant role in supporting small firms, and they had better continue their financial and technical support, starting from awareness creation to the production process, to continue being key actors in supporting small businesses in Ethiopia.

Appendix

Stata result of ordered logit model

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. ologit profitstatus exper sector accesstorawmaterial creditaccess education training accesstom
> ness , robust

Iteration 0:  log pseudolikelihood = -328.2406
Iteration 1:  log pseudolikelihood = -297.12415
Iteration 2:  log pseudolikelihood = -296.6962
Iteration 3:  log pseudolikelihood = -295.42347
Iteration 4:  log pseudolikelihood = -295.4215
Iteration 5:  log pseudolikelihood = -295.4215

Ordered logistic regression          Number of obs   =       400
                                   Wald chi2(9)      =       80.81
                                   Prob > chi2       =       0.0000
                                   Pseudo R2         =       0.1000

Log pseudolikelihood = -295.4215
```

profitstatus	Robust		z	P> z	[95% Conf. Interval]	
	Coef.	Std. Err.				
experience	-.3403517	.1582955	-2.15	0.032	-.6506052	-.0300981
sector	.0148857	.0041455	3.59	0.000	.0067607	.0230107
accesstorawmaterial	-1.057931	.2064877	-5.12	0.000	-1.46264	-.6532231
creditaccess	.0149492	.0071187	2.10	0.036	.0009968	.0289017
education	-.5654391	.1744702	-3.24	0.001	-.9073944	-.2234839
training	-.3409179	.1583003	-2.15	0.031	-.6511807	-.0306551
accesstomarket	.0558429	.2387491	0.23	0.815	-.4120968	.5237825
ageofbusiness	-.0240473	.2148682	-0.11	0.911	-.4451813	.3970867
locationofbusiness	-.0073559	.0102348	-0.72	0.472	-.0274157	.0127038
/cut1	-4.234459	.5930455			-5.396806	-3.072111
/cut2	-.4538781	.5432117			-1.518553	.6107972

Proportional odds assumption test

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. oparallel
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Tests of the parallel regression assumption

	Chi2	df	P>Chi2
Wolfe Gould	20.55	14	0.114
Brant	16.95	14	0.259
score	20.1	14	0.127
likelihood ratio	23.11	14	0.059
Wald	17.66	14	0.223

Heteroscedasticity test

```
. hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
 Ho: Constant variance
 Variables: fitted values of lny

chi2(1)	=	2.05
Prob > chi2	=	0.1517

Normality test of the error term

```
. swilk r
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Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
r	4877	0.78052	581.624	16.690	0.00000

Abbreviations

- CBE Commercial Bank of Ethiopia
- DBE Development Bank of Ethiopia
- ETV Ethiopian Television
- GIZ Deutsche Gesellschaft Fur International Zusammenarbeit
- IFAD International Fund for Agriculture
- MFI Micro Finance Institutions
- MSMEs Micro Small and Medium Enterprises
- NGOs Non-Governmental Organizations
- UNIDO United Nations Industrial Development Organization
- R4C Reach for Change
- TVET Technical and Vocational Education and Training Center

Acknowledgements

We want to acknowledge R4C and the GW consultancy office for their support to collect the data and technical contribution in analyzing the data in the process of developing the ecosystem mapping.

Limitation of the study

At the time of conducting this research, financial constraints were the most challenging issue. The researchers face a lack of money to collect data from sampled enterprises after paying their per-diam fees, in addition to the low willingness of the key informants to provide information about the support provided by their institution to the development of MSMEs.

Author contributions

TWA (Principal Researcher) developed the methodology and analysed the data and HES (Co-Author) contributed in data collection and data interpretation.

Funding

No funding was obtained for this study.

Availability of data and materials

The data are in the hands of the principal researcher, and we can provide it to editors when needed.

Declarations**Competing interests**

The authors declare that they do not have any competing interests.

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