

Determinants of Firms' Access to Formal Credit and Intensity of Loan in Ethiopia ***Meshesha Zewdie*¹**

Abstract

Availability of credit is crucial for business survival and growth, especially in emerging nations like Ethiopia. Launching new firms, meeting working capital requirements, and growing current companies all require credit. As a result, the purpose of this paper is to examine factors that impact access to and amount of credit from a financial institution in Ethiopia. The 2015 round of the World Bank's Enterprise Survey, which drew responses from 848 enterprises, provided the information. Both descriptive and econometric data analysis techniques were used. For an estimate, the Heckman selection model (two-step process) was used. The descriptive finding showed that 488 people (57.75%) did not have access to credit, while 360 (42.45%) of the entire sample did. Similarly, over 67% of businesses encountered financial challenges in obtaining loans from financial institutions, and 59.3% of companies were unsatisfied with their access to external finance. The Heckman two-step technique revealed that IMR is significant at a 1% probability level, implying that simultaneously estimating the selection and outcome equation was correct. Furthermore, the Heckman two-step estimation result showed that firm size, manager experience, annual sales, product innovation, informal competition, and website influence the amount of credit given to firms, whereas manager experience, annual sales, product innovation, sex of owners, and region of operation determine the ability of firms to access credit. Grounded on the findings of the study, easing access to credit, controlling informal competitions, smoothing collateral conditions, and close collaboration between the government, enterprises, and financial institutions will be significant in easing access to credit and the amount of loans given to firms.

Key Words: Heckman selection model, credit, firm, enterprise survey, Ethiopia

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Introduction

Both developed and developing countries are increasingly recognizing the economic function of firms in terms of income generation, employment, and technology transfer. Firms in emerging countries, in particular, contribute significantly to rapid economic growth due to their size, location, capital investment, and capacity to produce larger savings and employment. A firm is a business that is controlled by one person or a group of people that engages in a productive activity of some kind for the sake of profit or some other well-defined goal (Daunfeldt et al., 2015). For businesses to thrive and survive, access to formal financing is essential, especially in emerging nations like Ethiopia (Beck & Cull, 2014). According to Akoten et al. (2006), credit is crucial for businesses to operate successfully and thrive in the economy. But it appears that many developing countries experience a difficulty with limited access to financing, which inhibits the economic development of businesses (Ngo & Chi, 2017). Small and medium-sized enterprises are 30% and 14% less likely to have a formal loan than large firms (Beck & Cull, 2014).

Credit information availability is also one of the factors of the institutional environment that aids enterprises in gaining access to capital by addressing the problem of asymmetric information. Borrowers have more detailed information than lenders about their possibilities of repaying their loans and the riskiness of their business activity, resulting in information asymmetries in credit markets. As a result, adverse selection may occur when lenders fail to distinguish between good and bad borrowers, resulting in market inefficiencies as lenders ration credit, excluding potential borrowers who might be ready to pay a higher interest rate or put up additional collateral (Stiglitz & Weiss, 1981). Credit information can also assist lenders to gain a better understanding of their potential clients' businesses, as well as better estimate the likelihood of loan payback, increase borrower (firm) discipline and make them more loanable (Jappelli & Pagano, 2006).

Firms that can provide collateral and have developed long-term ties with lenders are more likely to be approved for loans by financial institutions (Mabhungu et al., 2011). Furthermore, a company's collateral security and asset structure have a significant beneficial impact on credit availability and loan size. Firms with a lower percentage of tangible assets in their overall assets are more likely to have less access to formal credit due to their inability to offer the collateral that financial institutions demand (Anthony et al., 2013).

There are empirical evidence on the determinants of access to and amount of credit from a formal financial institution by firms; such as firm age, age of the manager of the firm, education, training, member of business association, saving culture, gender of owners, firm size, owning bank accounts, business location, use of ICT, high cost of credit, business networks, lack of business records, collateral, poor loan screening, lack of accurate information about the financial status of firms, lack of general skills of management, (Ajibade & Khayundi, 2017; Maksimov et al., 2017; Martinez-Solano, 2014; Fraser et al., 2013, Klapper, 2010; Muravyev et al., 2009; Kira & He, 2012; Honhyan, 2009; Ngoc et al., 2009). Variable identification of this research also relies on the works of these scholars.

In Ethiopia, as in most other developing and underdeveloped countries, access to finance is the most significant barrier to firms' expansion. Small enterprises can usually start a business using resources from the informal sector, but they find it exceedingly difficult to survive and grow without additional funding from institutional lenders (Haftu et al., 2009). Firm financing is vital since it allows them to expand their operations, innovate, and invest in new manufacturing facilities and employees (Organization for Economic Cooperation and Development (OECD), 2006b).

Many firms that want to expand find it difficult to secure financing from financial institutions, putting them in a credit-constrained situation. This is essentially the "funding gap" that organizations face, and it is more frequent in poor countries than it is in advanced economies because banks have

evolved various risk-coping measures for lending to businesses (OECD, 2006b). As a result, the finance gap is primarily a concern for developing countries. African countries are significantly disadvantaged in terms of financial development when compared to developing countries on other continents (Allen et al., 2011; Fowowe & Abidoye, 2013). As a result, the firm-financing gap will most certainly be a bigger issue for African countries than for other developing countries.

On the other hand, most previous studies on firms' access to credit in Ethiopia were area-specific and case (firm) specific, making it difficult to apply their findings in different regions of the country with differing socio-economic settings, so that this nationwide survey data was extremely useful in identifying determinants of credit access and amount of loan in Ethiopian context. Moreover, previously done researches have methodological limitations, in that, they failed to clearly show presence and absence of selectivity bias. If selectivity bias existed logit, probit or OLS techniques could produce biased result. This study tests presence of selectivity bias and applied heckman selection model ((Brehanu & Mesfin, 2015; Birhane, 2014; Selamawit et al., 2014).

Thus, this study has investigated the factors that influence firms' access to credit from financial institutions in Ethiopia and identify the determinants of amount of loans that firms in Ethiopia acquire from financial institutions using the Enterprise Survey 2015 data set. The study's findings may add to the body of knowledge and provide policymakers and other academics with up-to-date empirical data on the topic.

Materials and Methods

Source of Data

The data used to address the objectives of this study was secondary data gathered and stored by World Bank's Enterprise Survey (ES) 2015 round because no data was collected from enterprise after 2015 by WB (www.enterprisesurveys.org). The WB applied a global and uniform sampling methodology and standardized survey tools to collect the data. The data was collected

from 848 enterprises operating in the manufacturing and key service sector from Addis Ababa, Dire Dawa, Oromia, Amhara, Tigray, and SNNPR. Many elements that define the business climate are considered in the Enterprise Survey 2015.

Data Analysis

Data were analyzed using descriptive and econometric methods. Descriptive analysis was used to look at the mean, frequency percentage, maximum and minimum values of firm characteristics, finance, sales and supplies of firms, management practice, competition, and innovation of firms, while econometrics analysis was used to infer the effect of a set of explanatory variables over the explained variable.

Econometrics Model Specification

Several factors influence a firm's ability to access credit and the amount of credit it receives; some are firm-specific, while others are not. Firm size, sex of owner, age, collateral requirements, annual sales, informal competition, and other factors all have an impact on credit availability and amount. As a result, firms are not equally likely to access credit and receive the amount demanded or requested by the financial institution. This indicates that there is a bias in the selection process. And if Ordinary Least Square (OLS) methods and censored models are applied, our finding leads to a biased parameter estimate. Thus, Heckman selection model has been used to examine determinants of access to credit and the amount of credit from the formal financial institution by firms. Heckman (1976) developed a sample-selection model to correct for such selection bias. It is a means of correcting for not having a randomly selected sample. However, the inverse mills ratio (IMR) should be statistically significant for the heckit model and the value of rho is significant ($\rho \neq 0$) for maximum likelihood (ML) estimates, otherwise, the Heckman selection model could not be applied. The estimation result revealed that IML is statistically significant at the 1% level and rho (ρ) is also different from zero and statistically significant at the 1% level.

Firms that want to start a new line of business or expand an existing one require funding. Finance will come from either an

internal or external source (borrowing). To borrow; businesses must once again have access to credit. When businesses are asked if they have a line of credit or a loan from a financial institution, they have to make two decisions: These two decisions can be represented by two equations, the accessibility equation for binary decision called selection equation and the outcome equation for the amount of loan obtained by firms. After identifying relevant explanatory variables from the WB data set, 2015 and relevant other empirical works that can affect the independent variables, the two equations (Selection and outcome equations) were estimated simultaneously by the Heckman two-step estimator.

The Heckman selection model is specified (Heckman, 1976&1979) as;

$$Y_i = X_i\beta + U_{1i} \quad (2.1)$$

Where Y is the outcome variable called the amount of loan obtained; X is a vector of explanatory variables that determine the amount of loan; β is a vector of parameters to be estimated U_1 is the error term. Thus, amount of loan- log normalized (lnk11) is dependent variables, and firm size (a6b), manager experience(b7), annual sale(lnd2), innovation(h1), financial statement(k21), informal competition(e11), year of establishment(b5), sex of owners(b4), website(c22b) and industrial sector(a4b) are explanatory variable included in the model(WB, 2015). The outcome equation is fit as;

$$\ln k11 = \beta_0 + \beta_1 a6b + \beta_2 b7 + \beta_3 \ln d2 + \beta_4 \text{innovat} + \beta_5 \text{stattment} + \beta_6 \text{informalcompt} + \beta_7 \text{age} + \beta_8 \text{sexowner} + \beta_9 \text{webbsitee} + \beta_{10} \text{sector1} + u_1 \quad (2.2)$$

In the selection equation, the dependent variable called access to credit for firm i is observed if:

$$Z_i\gamma + u_{2i} > 0 \quad (2.3)$$

Where: $U_1 \sim N(0, \sigma)$; $u_2 \sim N(0, 1)$; $\text{Corr}(u_1, u_2) = \rho$ and ρ implies the correlation between the residuals from the outcome and the selection equations. Z is a set of explanatory variables included in the selection equation

to determine access to loans from the financial institution (1 if yes, 0 otherwise) and contains all explanatory variables included in the outcome equation and adds one more variable, region of establishment location (a3a), which has no/ little effect on the amount of loan but affects access to credit for the selection equation. γ is a vector of parameters to be estimated for the selection equation. Based on this, it is assumed that loan amount is observed or credit amount greater than zero if;

$$\gamma_0 + \gamma_1 a6b + \gamma_2 b7 + \gamma_3 \ln d2 + \gamma_4 \text{innovat} + \gamma_5 \text{stattment} + \gamma_6 \text{informalcompt} + \gamma_7 \text{age} + \gamma_8 \text{sexowner} + \gamma_9 \text{webbsitee} + \gamma_{10} \text{sector1} + \gamma_{11} \text{region} + u_2 > 0 \quad (2.4)$$

Definition of Variables

Definition and working hypothesis of variables are formulated from enterprise survey_2015; (ES-Questionnaire manual_2019), relevant literature, and the researcher's intuitive knowledge.

Dependent Variables

Access to finance (k8): It is a dummy variable used in the selection equation to show whether a firm has access to credit or loan from the financial institution and represented by "1" if a firm has access to credit and "0" otherwise.

Amount of loan (lnk11): It is a continuous variable used in the outcome equation, recoded for missed values, and log-normalized.

Independent Variables

Region of the establishment (a3a): This refers to regions where the firms operate during the survey period that represent the largest centers of production and business enterprise in Ethiopia. Moreover, regional establishment directly affects access to credit (selection equation) not the amount of loan. The geographical area where a firm is located in the proximity of financial institutions is also believed to influence the firm's ability to access credit (Abor, 2008). Based on their region of operation, firms were grouped into those working in Addis Ababa (coded as "1") and out of Addis Ababa (coded as "0"). And region affects access to credit either negatively or positively.

Industrial sector (a4b): The enterprise survey was stratified by business sectors into manufacturing, retail, and service. Firms engaged in the retail and service sector need more short-term credit than those engaged in the manufacturing sector (Abor & Biekpe, 2007). On the other hand, a business engaged mostly intangible assets like construction and manufacturing could borrow more because of the collateral provided by their assets. Therefore, industrial sectors affect access to and amount of credit either positively or negatively depending on the terms of credit.

Firm size (a6b): Firm size is a composite measure of permanent and temporary workers. The number of temporary workers is adjusted by the average number of months worked in a year. This variable is categorical and grouped into small, medium, and large. A firm is said to be small if it has 5-19 workers, medium 20-99 workers, and large if it has more than 99 workers. Smaller firms could have less access to loans and are more constrained to credit compared to medium and large-size firms. This implies as the size of a firm increases the likelihood of access to credit will increase. Hence firm size is hypothesized positively in affecting firms' access to credit and the amount of loans (Kim et al., 2016). For analysis, firm size has been grouped into two, small and medium and large, and generated as "frmsz".

Sex of owner (b4): It is a dummy variable (sex owner) that assumes "1" if the owner is male and "0" otherwise. The sex of the owner affects the amount of loans and access to finance by firms. Some studies showed that male entrepreneurs are most favored by financial institutions than female counterparts (Kofi et al., 2013). Hence, the sex of the owner either determines access to and amount of credit positively or negatively.

Establishment year (b5): It refers to the year in which the establishment started producing (or providing services), not to the year in which it was registered for the first time. It is a continuous variable used as a proxy for the age of the firm (age). As the age of the firm increase, it is expected that firms will be more productive and profitable and able to achieve economies of scale. This feature makes firms get loans easily; hence it

affects access to and amount of credit positively (Coad et al., 2014; Haltiwanger et al., 2013).

Manager experience (b7): This refers highest-ranking management individual working in the type of sector that the establishment presently operates. Experienced owners or managers know how to get financial needs. Creditors have also great trust for a stable borrower than an unstable one. From the lender's perspective, experienced firms are believed to be better performers than less experienced firms. Experience, as measured by the number of years in the firm, enhances the availability of credit (Cole, 1998). As a result, it affects access to credit and its amount positively.

Own website (c22b): It refers to whether an establishment has its website or not, including only for promotional purposes. It is a dummy variable and generated as "webbsitee". This includes maintaining an account on social media to promote goods or services, including if any business or operations are run through that account. The use of information technology in business operations such as e-mails, websites, Facebook, etc by firms has a positive and significant effect on the probability of receiving formal credit (Buyinza & Bbaale, 2013).

Annual sales (ln d2): It is a log-normalized continuous variable. It refers to the value of all annual sales counting manufactured goods, goods the establishment has bought for resale, and services provided. If the annual sale of firms increases, then, the revenue of the firm increases and gradually makes the firm grow faster. Therefore, firm sales are a key and positive determinant of a firm's access to and amount of credit (Martinez-Solano, 2014; Kira & He, 2012).

Informal competition (e11): It refers to competition against informal or unregistered firms. It is a dummy variable labeled by "1" if yes to competition and "0" otherwise and generated as "informalcompt". Informal sector competition could impede the growth of formal sector firms and reduce demand for access and the amount of loans is hypothesized to affect access and amount of credit negatively (Distinguin et al., 2016; Wang, 2016).

Product innovation (h1): This refers to the introduction of products or services that are new to the establishment of the market or products or services that have significant improvements in capabilities, user-friendliness, components, or sub-systems during the reference period, but do not include minor changes, regular seasonal changes, routine upgrades purely aesthetic design changes that do not affect the functionality and the resale of a good purchased from other enterprises. It is a dummy variable generated as "innovate". As the innovation potential of the firm increases, the demand for credit also increases to produce more goods and services and the firm will have greater growth potential, thus it is hypothesized to affect positively access and amount to loans (Goedhuys & Veugelers, 2012).

Financial statement (k21): It refers to the presence of a firm's financial statement which is checked and certified by an auditor. It is a dummy variable generated as "stattment". If firms have a proper financial statement, it makes them simple for the financial institution to evaluate the firm's performance (Mulaga, 2013), so having a financial statement affects firms' access to and amount of credit positively.

Results and Discussion

Descriptive Statistics Result

General Characteristics of Firms

The enterprise survey consists of 848 firms. Out of 848 firms, 53.9 % were based in Addis Ababa, while the remaining 46.1% were located out of Addis Ababa. Addis Ababa is the leader in hosting more firms followed by Oromia and Tigray. The average age of a firm is 14.49 years with maximum and minimum ages of 1 and 90 years respectively. The survey results in Table 3.2 also revealed that 63.7 % of the enterprises' owners were male-headed, while 36.3 % were female-headed. Managerial experience is important when it comes to running a firm. Table 3.1 shows that a top manager has an average of 15.38 years of work experience, with a minimum and maximum of 2 and 15 years of experience, respectively and 8.84% of top managers were female-headed and the rest 91.04 % were male-headed.

Table 1: Summary of Dependent and Independent Variables

Variable name(generated)	Label and measurement	Type	Hypothesized Sign
credittacc	Access to finance (yes=1; no=0)	Dummy	0
lnk11	Amount of loan	Contin	0
region	Region of establishment (located in Addis Ababa=1; Out of Addis Ababa=0)	Dummy	+/-
Sector1	Industrial sector (1=manufacturing; 0=otherwise)	Dummy	+/-
frmsz	Firm size (1= small, 0=medium and large)	Dummy	+
sexowner	Sex of owner (1=male; 0=otherwise)	Dummy	+/-
age	Year of establishment	Contin	+
b7	Top manager experience	Contin	+
websitesee	Own website (no= 1; yes=0)	Dummy	+
ln2	Annual sales	Contin	+
informalcompt	Informal competition (no=1; yes=0)	Dummy	-
innovat	Product innovation (no=1; yes=0)	Dummy	+
stattment	Financial statement (yes=1; no=0)	Dummy	+

Source: Own formulation, 2021

The size of the firm is categorized into small which consists of 5-19 workers (49.3%), medium which has 20-99 workers (29.6%), and large which has more than 99 workers (21.1%). Regarding industrial sectors, 41.4% of firms, were engaged in manufacturing while retail and other services accounted for the remaining 58.6 % (Table 3.2). The survey result also showed that 292 (34.4%) of enterprises do not have officially audited financial statements whereas the rest 65.6% have legally audited financial statement (Table 3.2).

Access to Finance and Informality

The enterprise survey 2015 highlights how businesses fund their operations and the financial features of their operations. The survey result indicated that 360 (42.45 %) enterprises had access to credit from various financial institutions, while 488 (57.55 %) firms claimed they don't have access to credit. The time it takes for credit requests to be approved is another issue for firms. Some financial institutions will approve credit applications sooner than others. As a result, 51.94 % of enterprises with access to credit were granted credit in 2014; however, only 5.56% of firms were granted credit between 2005 and 2010. This indicates that credit acceptance for businesses have improved over time, particularly after 2011 (Table 3.2).

Firms that have access to loans were asked to state from which financial institution they got the loan. Accordingly, 245 (68.1%) firms

received credit from private commercial

banks, 90 (25%) firms received credit from state-owned banks or government agencies, and 25 (6.9%) firms got credit from non-bank financial institutions, respectively.

The descriptive result also showed that 360 enterprises received an average of 12.4 million birr, with minimum and maximum loan amounts of 10,000 and 340 million birr respectively. The average number of months provided to repay a loan is 30.44, with a minimum of 6 and a maximum of 100 months. The firm's annual sales averaged 6.61 billion birr, with minimum and maximum sales of 14, 034 million and 7 billion birr, respectively (Table 1).

Firms were also asked if their access to external finance has changed over the last three years. Therefore, 475 (44%), 243 (28.7%), and 130 (15.3%) of enterprises said that their access to external finance showed no change, improvement, or worsened, respectively. This indicates that 59.3 % of firms were dissatisfied with their access to external financing (Table 2).

Table 2: Descriptive Results of Continuous Variables

Variables	N	Mean	St.dev	Min	Max
Loan amount	360	12,400,000	32,700,000	10,000	340,000,000
Collateral	322	121,000,000	1,670,000,000	60,000	30,000,000,000
Loan repayment months	360	30.44	16.43	6	100
Annual sales	848	6,6100,000	314,000,000	14034	7,000,000,000
Manager experience	848	15.38	9.8	2	47
Age of the firm	848	14.49	12.85	1	90

Source: Computed from the WB data set, 2022

Informal competition is another factor that limits the expansion of legally established businesses. Accordingly, 35.4 % of firms

faced informal competition while 64.6% of firms did not face informal completion against unregistered informal firms. Simultaneously, 314 (37%) businesses use new production technologies, which could help them get more loans (Table 3.2). In today's global environment, websites play an important role in promoting a firm's output and services. The descriptive result showed that 39.54% of enterprises have built their website, while the remaining 69.46% have not.

Loan Application and Obstacles for Accessing Finance

The descriptive result showed the reason why firms did not apply to get credit. Table 3 indicated the possible reasons.

Firms were also questioned about how much access to financing hinders their current business operations. Hence, 33.01% answered there is no obstacle, 21.22% said there is a little obstacle, 16.98% said there is a moderate obstacle, 15.21% said there is a

Table 3. Descriptive Results of Categorical Dummy Variables

Variable	Choice	Frequency	Percent
Region	Addis Ababa	457	51.89
	Oromia	133	15.48
	Tigray	109	12.84
	Amhara	69	8.14
	SONPR	53	6.25
	Diredawa	37	4.38
Sex of owners	Male	340	63.7
	Female	308	36.3
Access to credit	yes	360	42.45
	no	488	57.54
Collateral	Land and building (N=322, yes)	224	69.6
	Equipment (N=322, yes)	171	53.1
	Personal asset (N=322, yes)	135	42
Financial statement	yes	596	65.6
	no	292	34.4
Working capital	Internal source	528	62.1
	Quality Certificate	65	7.67
Access to external finance	no	172	61.00
	In process	11	1.3
	Improved	243	28.7
	No change	475	44
	Worsened	130	15.3
Financial institution(N=360)	Private commercial banks	245	68.1
	State-owned banks or government agency	90	25
	Non-bank financial institutions	25	6.9
Sector	Manufacturing	351	41.4
	Retail and other services	497	58.6
Legal status	Sole proprietorship	421	49.7
	Partnership and plc	389	45.9
	Share company	38	4.5
Adoption of new production technology	no	534	63
	yes	314	37
Informal competition	yes	300	35.4
	no	348	64.6
Own website	yes	259	30.54
	no	389	69.46
Firm size	Small	418	49.3
	Medium	251	29.6
	large	179	21.1

Source: Computed from the WB data set, 2022. Observation=848

big obstacle, and 13.56% said there is a very severe obstacle. Data shows that about 67% of businesses had trouble getting credit from financial institutions (Fig 2.). Firms won't be

Table 4 Reasons for Not Applying for Credits

Reasons not applying for the new line of credit	Frequency	Percent
No need for a loan (the establishment had sufficient capital)	231	38.63
Application procedures were complex	44	7.36
Interest rates were not favorable	35	5.35
Collateral requirements were too high	122	20.40
Size of loan and maturity were insufficient	22	3.68
Did not think it would be approved	20	3.34
Other	124	20.74
Total	598	100

Source: Own computation, 2022 N=598

able to contribute as fully to economic and social progress as a whole unless this financial barrier is lifted. For this reason, removing the financial barriers requires close cooperation between financial institutions, governments, and firms.

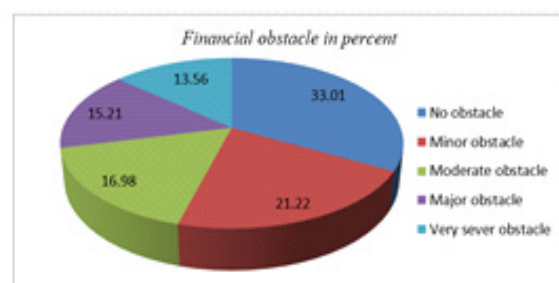


Figure 1: Access to finance as an obstacle for firms

Econometrics Result

Both the Heckman two-step method and the Heckman ML method showed that there is sample selection bias in the credit amount (outcome model) because the inverse mills ratio (IMR) is statistically significant at a 1% probability level for the Heckit model and the value of rho is significant for ML, that is, LR test of independent equation ($\rho = 0$): $\chi^2(1) = 8.04$ Prob > $\chi^2 = 0.0046$. Hence, the two equations (selection equation and outcome equation) are not independent and there is evidence of sample selection bias. Thus, the two equations were estimated

simultaneously by Heckman's two-step technique. Estimation coefficients were reported by the Heckman two-step method (Table 4).

The coefficient of rho (ρ) which measures the correlation between the error terms in the outcome and selection equation has a negative value (-0.983) and is significant which implies that the unobservable is negatively correlated with one another. The statistical result of Lambda (IMR) or selectivity bias correction factor has a negative ($\lambda = -1.81$, $p = 0.008$) impact on firms' access to credit. In addition, the negative sign of the IMR showed that there are unobserved factors that are negatively affecting both access to credit and the amount of credit. Wald χ^2 statistics are also significant at a 1% level and revealed that the joint model is preferred to the independent probit and linear regression model or explanatory variables jointly explained the probability of firms' access to credit (Table 5).

Discussion

From the descriptive results, most of the firms are located in Addis Ababa (53.9%). This showed that firms seek a location that has adequate infrastructure, is centrally located, and is relatively peaceful (Table 3.2). Regarding the size of the firm, most of them are small in size (49.3%). This could be due to a lack of funds to launch a large business. 421 (49.7%), 389 (45.9%), and 38 (4.5%) of them are organized as sole proprietorship, partnerships, and limited liability companies, respectively (Table 3.2). This means that most firms prefer to operate under the legal business form of a sole proprietorship, which is a business owned and run by a single natural person. This type of business form is simple to set up, has no influence over the business, and decision-making is quick. Having an internationally recognized quality certificate, such as ISO 9000, 14000, or HAPC, helps businesses compete in the local and worldwide market and speed up credit approval. However, according to the survey results, just 7.67% of the 848 firms have an internationally recognized certificate, 1.3% is still in the p

Table 5: Estimation Results by Heckman Two-Step Method

Variable	Coef.	Std. Err.	p> z
Loan amount(log)			
Firm size	-0.784	0.225	0.001***
Manager experience	-0.021	0.001	0.050**
Annual sales(log)	0.399	0.083	0.002***
Product innovation	0.421	0.188	0.024**
Financial statement	0.327	0.269	0.531
Age of the firm	-0.005	0.007	0.417
Sex of the owner	0.189	0.177	0.287
Informal competition	0.426	0.172	0.013**
Website	-0.427	0.199	0.032**
Industrial sector	-0.303	0.168	0.539
_cons	12.59	1.93	0.000***
Access to credit			
Firm size	-0.844	0.122	0.721
Manager experience	0.036	0.005	0.002***
Annual sales(log)	0.175	0.029	0.000***
Product innovation	-0.162	0.097	0.098*
Financial statement	0.101	0.108	0.351
Age of the firm	0.002	0.004	0.647
Sex of the owner	-0.166	0.097	0.086*
Informal competition	-0.013	0.096	0.892
Website	-0.020	0.114	0.860
Industrial sector	-0.001	-0.096	0.992
Region of operation	-0.430	0.105	0.000***
_cons	-2.77	0.31	0.000***
Mills(lambda)	-1.81	0.68	0.008***
Rho	-0.983		
Sigma	1.842		

***, **and * significant at 1%, 5% and 10% level. Number of obs=848. Censored obs=160. Uncensored obs= 488. Wald $\chi^2(10)=99.73$ prob > $\chi^2=0.000$. The reference category for firm size is "medium and large"; the reference category for product innovation is "yes"; the reference category for financial statement is "no"; the reference category for sex of owner is "female"; the reference category for the informal competition is "yes"; the reference category for Website is "yes"; the reference category for the industrial sector is "retail and other services" and the reference category for the region are "out of Addis Ababa".

process, and the remaining 91.03 % do not have a quality assurance certificate.

Firms' access to finance is one of the most significant variables that firms usually faced in running their enterprises, and is influenced by a range of circumstances. In addition, the establishment has inquired as to whether or not it has access to credit from financial institutions. The majority of firms do not have access to credit in Ethiopia, only 42.45% have access to credit. Those firms which have access to credit get most of the credit from private commercial banks (68.1%). This implies that getting credit from state-owned banks is most likely bureaucratically onerous compared to private ones.

The collateral requirement is one of the most important elements that determine access to credit and the amount of money lent by firms. Excessive collateral requirements might result in discrimination and moral hazard. Collateral refers to the businesses or the manager's or owner's personal property, not third-party personal guarantees, that are used to secure the loan if the establishment defaults on its payment obligations. As a result, the average value of the collateral was 121 million birr. Similarly, land and building (69.6%), equipment (53.1%), and personal assets (53.1%) were all required as collateral for the most recent loan (Table 1).

Working capital financing refers to the funding of short-term activities such as purchasing inputs and raw materials, paying wages, and so on. The survey result showed

that 528 (62.26%) firms finance 100% of their working capital from internal sources or retained earnings, 288(33.96%) firms finance their working capital partly from an internal source and partly from external sources, while 32 (3.77%) firms do not use internal sources and rely on other sources such as borrowing from friends, relatives, private banks, and state-owned banks to finance their working capital (Table 3.2). This shows that enterprises use internal sources or retained earnings to finance both working capital and fixed asset purchases in the biggest percentage, implying that obtaining external credit is difficult for firms to run their business operations successfully.

During the study, enterprises were asked whether their establishment did apply for a new loan in the last fiscal year (2014). Accordingly, 70.5% of the firms claimed they had not applied for a new line of credit while the rest 31.5% applied for a loan. The main reasons for not applying for a new loan (Table 3.3) were no need for the loan (38.63 %) and excessive collateral requirements (20.40%), complex application procedures (7.36%), and unfavorable interest rates (5.35%). This showed that 38.63% of firms were unconstrained for finance and the rest 61.37% were constrained for finance and this suggests that the presence of dread of bureaucracy in obtaining a loan may demotivate firms.

Regarding the econometric result, firm size was expected to have a positive impact on credit amount and access. The statistical result revealed that the coefficient of firm size is negative and has a significant effect on the amount of credit at a 1% significance level. When compared to small businesses, medium and large businesses received more credit. This suggests that medium and large enterprises can obtain more credit from financial institutions than small firms since their business activities require more working capital and can provide collateral to access the loan. Gebru (2009) reported a similar result. Firm size, on the other hand, has no effect on access to credit for small and medium, and large firms. The finding is inconsistent with the result of Dereje et al. (2020).

Another factor that influences the amount and access to loans is the top manager's experience. Table 3.4 shows that the top manager experience has a negative sign, contrary to our expectations, and hurts loan amount at the 5% level of significance. As manager experience grows by one year, the loan amount decreases by 2.1%. This implies that even though skilled managers contribute significantly to the governance and management of the organization, their negotiation efforts to obtain finance may be inadequate, and there may be information asymmetry between lenders and borrowers (Table 4). Moreover, Yos et al (2007) found a similar result and justified it as experienced managers are more dependent on retained earnings than on borrowing more from the financial institution. Nevertheless, manager experience positively and significantly affects access to credit at a 1% significant level. An increase in manager experience by one year will increase the likelihood of access to credit by 1.6%. This finding is in line with the findings of Anthony et al, 2013; Derese & Zerihun, 2017).

The amount of credit available and its access are both influenced by the firm's annual sales. At a 1% probability level, it has a positive and significant effect on the credit amount. A 1% rise in annual revenue results in a 0.26% increase in credit. This means that as a firm's annual sales increase, its profit may rise, causing the firm to expand its size and add additional production lines. As a result, they seek additional credit for the new line. Annual sales, likewise, impact credit access with a positive sign and significance at the 1% likelihood level. A 1% rise in annual sales raises the chances of getting credit by 17.5% (Table 4). This shows that if a company's annual sales improve, so will its overall revenue, and financial institutions will be more willing to lend to them. This finding is consistent with the findings of Martinez-Solan (2014), Kira&He, (2012), and Buyinza et al, (2018).

Product innovation is hypothesized to affect the credit amount and access to credit positively. The econometrics result showed firms that do not engage in product innovation obtained more credit as compared to those which did engage in product innovation at a 5% probability level. This is

most likely true that 62.97% of firms did not involve in product innovation; only 37.08% of firms engaged in product innovation. Firms that did not engage in product innovation, on the other hand, are less likely to have access to finance than those that did, at a 10% significance level (Table 4).

Informal competition is hypothesized to affect credit amount negatively but since the reference category is "yes", the sign to be positive is plausible. Firms that did not face any form of informal competition got more credit compared to those firms which have faced informal competition. Firms that did not face informal competition got loans by more than 42.6% compared to those that faced informal competition at a 5% level of significance. But the presence of informal competition did not affect the access to credit of firms (Table 4).

Access to a website is negatively associated with the amount of credit at a 5% level of significance. Firms with no access to websites got less credit compared to those with access to credit. This implies that firms with access to the website can advertise their product and can increase sales and ultimately build goodwill. However, access to the website did not determine access to credit by firms ((Table 3.4). From the descriptive result, 69.46% of firms do not have a website while 30.54% have a website. The same result was reported by Buyinza et al. (2018).

The sex of owners influences access to credit at a probability level of 10%. Male-owned firms are less likely to be creditworthy than female-owned firms. Even though women make up 36.32 % of business owners, they have a greater influence on financial institutions than male-owned businesses (Table 4). This finding is consistent with the findings of Buyinza et al, 2018 and inconsistent with the findings of Maksimov et al, (2017). Being male or female, on the other hand, has no bearing on the quantity of credit offered to firms.

The region of operation is an important variable only included in the selection equation. It has no direct impact on the amount of credit and is hypothesized to affect access to credit either positively or negatively. The estimation statistics showed that the region of operation affects access to

credit negatively and significantly at a 1% probability level. Firms operating in Addis Ababa are less likely to have access to credit compared to those firms operating out of Addis Ababa. This might be due to the many small sizes of firms operating in Addis Ababa and the financial institution may not accommodate the credit demand for all of them at a time (Table 4).

Conclusion

Access to finance for firms plays an indispensable role in allocating capital efficiently and also determines a firm's growth. If firms couldn't get the finance their prospect of growth may shrink and this represents a loss in potential growth for the economy. Thus this study investigated factors that affect access to and amount of credit by firms from a financial institution in Ethiopia using the Enterprise Survey_ 2015 data set. Based on the main findings of the study we can conclude that. The majority of firms do not have access to credit in Ethiopia, only 42.45% have access to credit. Those firms which have access to credit get most of the credit from private commercial banks (68.1%). This implies that getting credit from state-owned banks is most likely bureaucratically onerous compared to private ones.

The collateral requirement is one of the most important elements that determine access to credit and the amount of money lent by firms. The study depicted that collateral requirement in terms of monetary and physical assets are an obstacle, especially for small and medium-sized firms. To undertake day-to-day activity, working capital is essential for firms. However, obtaining this working capital is another obstacle for firms. The findings of the study indicated that 62.26% of firm's finance 100% of their working capital from internal sources or retained earnings, and only 33.96% of firms finance their working capital partly from an internal source and partly from external sources, the rest 3.77% firms finance their working capital by borrowing from friends and relatives. This suggests that obtaining external credit is difficult for firms to run their business operations successfully.

There are a lot of factors that affect a firm's access to credit and the amount of loan. The

Heckman two-step estimation result indicated firm size, manager experience, annual sales, product innovation, informal competition, and website influence the amount of credit given to firms, whereas manager experience, annual sales, product innovation, sex of owners, and region of operation determine firms' access to credit.

Based on the findings of the study, it will be better to remove barriers and improvements in collateral requirements to ease access to credit and the amount of loans demanded by firms. Informal competition is one factor that hinders firm's growth. Hence, the government needs to manage informal competition in the market to make credit more accessible to enterprises with legal status and to make it easier for firms to obtain credit from financial institutions. It will be better for firms to engage in product innovation activities and website development to introduce their product and service to consumers. This helps them increase their sales to generate sufficient revenue to finance their working capital. To reduce the bureaucracy of obtaining credit from the financial institution, the government, financial institutions, and firms need to work closely to address the problem of credit access and loan intensity since enterprises play a critical role in economic growth, foreign exchange acquisition, and job creation.

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