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Firm Growth and Its Determinants of Micro and Small Scale Manufacturing Enterprises in Selected Towns of Jimma Zone, Oromia National Regional State

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Abstract

This paper is conducted to analyse the growth determinants of Micro and Small Scale Manufacturing Enterprises in Selected Towns of Jimma Zone, Oromia National Regional state using the Binary logistic regression model. The analysis utilizes cross-sectional data collected from 343 Micro and small scale manufacturing enterprises in 2018. The result shows that the initial investment, operator experience, access to credit, training for the firm operator's have a significant positive effect on firm's growth. Likewise, the model revealed that there is a significant difference in the firm growth between female and male managed enterprises and between Jimma and Sokoru towns. Female managed enterprises are more likely to grow than male managed enterprises. Firms in Sokoru towns are less likely to grow than those in Jimma town. Hence, we can conclude that increasing credit access, training the operators and retaining experienced operators can increase firm's growth.

Keywords: *Micro and small scale enterprises; growth; cross-sectional and binary logistic regression model*

1. INTRODUCTION

Development economists over the years have solicited the use of small and medium industries (SMI) to accelerate the pace of industrialization and economic growth, particularly in developing economies (Essein and Aminu, 2007). Micro and Small Enterprises (MSEs) have been recognized as a major source of employment and income in many countries of the Third World. Detailed surveys in a number of countries suggest that as many as a quarter of all people of working age are engaged in MSE activities. There is a reason to believe that the share of the total population engaged in such activities is growing over time (Donald and Carl, 1998).

Microenterprises are potentially sustainable means of combining equity with efficiency in low-income countries. They can stimulate the local economy by increasing the aggregate demand and allow for greater investment. Microenterprises are also particularly suitable to areas that are unsuitable for viable medium and large scale firms; and contribute to decentralized development, regionally balanced growth and small-town growth (Henderlink and Titus, 2002).

According to the Ethiopian Federal Micro and Small Enterprise Development Agency (FMESDA) of Ethiopia, a total of 70,500 new MSEs were established in 2011/12 employing 806, 3000 people across the country. Jobs created by SMEs have been growing since 2010/11. The total number of jobs in 2010/11, 2011/12, 2012/13 and the first nine months of 2013/14 were 289 thousand, 806.3 thousand, 1223.7 thousand and 963.8 thousand, respectively (EEA, 2015).

Industrial development has been the main objective of Ethiopiaôs economic program. The economic agenda of government has been rapid structural transformation of the agrarian economy into a modern industrial one. To achieve this objective various policy programs were formulated during the Imperial, Derg and the current regimes, specifically focusing on Micro and Small Scale Enterprises so that they are the base for industrial development.

The imperial Government of Ethiopia had enacted legislation to encourage business activities in the country in earlier times. The government had also participated in investment in enterprises that had high capital costs, to further encourage business operations. In 1975 the military junta, called the Derg, nationalized most industries and subsequently reorganized them into state-owned corporations. In February 1975, the government released a document that describes Ethiopia's new economic policy that was socialist in philosophy and intent, though it has changed its mind later on. In addition to relatively better-sized businesses, Ethiopia's retail sector consists mostly of small shops, local markets, and roadside stands, many of which are part of the informal sector of the economy, which remained unregulated and untaxed. Most big businesses in Ethiopia have started as small and Micro and have grown to their maturity over a long period by cumulating capital and business management experiences. There are enterprises that are graduating into medium-size enterprises and contribute a lot to the economic growth of the country though limited in number (Amare and Raghurama, *2017)*.

The current directions pursued by the government during the Growth and Transformation Plan I (GTP I) implementation period (2010/11-2014/15), focusing on promoting the development and competitiveness of Micro and small scale enterprises (MSEs). The various business and public development programs have been used to promote the development of SMEs and generate employment opportunities. Of cottage manufacturing industries has grown, on average, by 4.8

percent during the first three GTP implementation years which is lower than the average growth (6.0 percent) registered during preceding plan (PASDEP) period despite heavy promotion activities. Moreover, SMEs engaged in manufacturing activities have been growing by rate slower than the growth by large and medium scale manufacturing industries over the last decade (EEA, 2015).

The MSEs sector has been considered by academicians and policymakers as an engine of economic growth, poverty reduction, and social development due to its effect on employment and income generation, import-substitution, springboard to entrepreneurship and industrialization, the base for medium and large industries and distribution of their products through linkage and sub-contracting, and income distributions among different sections of the society (Mead &Liedholm, 1998; Liedholm, 2002; Bekele & Worku, 2008). For instance, the sector takes 48% of the labor force in North Africa, 51% in Latin America, 65% in Asia, 72% in Sub-Saharan African Countries (ILO, 2002). Mead and Liedholm (1998) found that micro and small-scale enterprises (MSEs) in five African countries (Botswana, Kenya, Malawi, Swaziland, and Zimbabwe) generate nearly twice the level of employment that was registered by large-scale enterprises and the public sector. According to Goldmark and Nicher (2009), while over 96% of businesses are small enterprises in USA; approximately 97% of firms in Mexico and Thailand are MSEs.

Despite the large potential contribution of MSEs, the sector in most developing countries faces constraints both at their start-up and after the operation phase (World Bank, 2004). Three-fourth of the MSEs in rural Tanzania are non-growing due to the problem of access to finance, road infrastructure and communication (Kinda & Loening, 2008). In addition, the majority of MSEs in Eldoret, Kenya has experienced minimal or no growth due to the inadequacy of availability of finances, poor business management skills, poor marketing and entrepreneurial attribute of the owner managers (Mbugua et al., 2013).

At the end of the First Growth and Transformation Plan (GTPI) period of Ethiopia, the share of the industry sector in overall GDP has reached 15.1% (manufacturing 4.8%, construction 8.5%, electric and water 1.0% and mining 0.8%). However, this performance fell short of the 18.8% target set to be achieved by the end of the plan period. This indicates the challenges to bring about rapid structural transformation in the economy. The growth performance of the manufacturing industry in particular, which is a key indicator of the degree of structural transformation in the economy, was lower than the target for the plan period. The poor growth performance of micro and small scale manufacturing industries and delay in the implementation of large manufacturing projects were the major contributors to the slow growth in the overall manufacturing sector. In GTP I, the emphasis has been given to micro and small enterprises development. The significant role of micro and small enterprises for job creation, entrepreneurship expansion and industrial development has been clearly indicated (GTPII, 2016).

Though the government has tried to give focus for micro and small enterprises development, enterprises promoted to the next higher level are not as such seen since the focus was on new establishments. Small and Medium Enterprises are not clearly delineated in the MSMEs

development strategies though improvements are witnessed. The future of MSMEs is seemingly continuing at a statuesque in spite of the countryôs aspiration to be among the middle-income countries by 2025(Amare and Raghurama, *2017)*.

According to EEA (2015), the share of manufacturing SMEs in GDP has declined from about 1.6 percent in 2004/05 to 1.3 percent in 2012/13. Despite the significance of their number in the economy, their share in GDP is lower than the share of large and medium scale manufacturing industries throughout the period. As there have been SMEs graduating into medium-size enterprises, there are also those dying ones due to a variety of reasons. These developments tend to reduce the number of SMEs actually operating and the size of employment in the sector.

In Ethiopia, MSE sector is the second largest employment-generating next to agriculture. A National survey conducted by Central Statistics Agency (CSA) in 2007 indicates that more than 1.3 million people in the country are engaged in MSEs sector. But a large number of MSEs are unable to grow (expand in terms of employment) and remain to be survival (non-growing) type which cannot provide employment. Moreover, out of 1000 MSEs in the country, around 69% of them are found survival types (Gebreyesus, 2007) and particularly in capital city Addis Ababa majority (75.6%) of the MSEs are unable to grow at all since start-up and only 21.9% of the MSEs had added workers (Wasihun and Paul, 2010). In Oromia Regional state, though considerable efforts were made foe MSE growth, they have not performed creditably well and they have not played the expected role in contributing to the regional economic growth (Oromia MSE Development Agency 2nd Quarter report, 2014). As per the information obtained from Jimma town micro and small enterprise agency, and trade and industry office (20012) there are 5700 enterprise and most of them have survived. Thus, factors that affect the growth and survival of micro and small scale enterprises should be identified and appropriate policy action should be recommended. These were the purposes of this study.

2. REVIEW OF RELATED LITERATURES

According to Federal Negarit Gazeta of the Federal Democratic Republic of Ethiopia(2011) micro enterprise means an enterprise having a total capital, excluding building, not exceeding Birr 100,000 in the case of industrial sector and engage 5 workers including the owner, his family members and other employees; small enterprise means an enterprise having a total capital, excluding building, from Birr 50,001 to Birr 500,000 in the case of service sector or Birr 100,001 to Birr 1,500,000 in the case of the industrial sector and engages from 6 to 30 workers including the owner, his family members and other employees.

Firm growth is regarded as the most important, reliable and easily accessible measure of a firm's performance (Delmar, 1997) given that badly managed growth may lead to bankruptcy. There is little agreement in the existing literature on how to measure growth thus most previous studies have used a variety of different measures such as total assets, sales, employment size, profit, capital, and others (Berkham et al., 1996; Davidsson & Wiklund, 2000; Holmes & Zimmer, 1994).

Moreover, growth has been measured in absolute or relative terms. Perhaps the most common means of firm growth is through relatively objective and measurable characteristics such as growth in sales turnover, total assets, and employment size. These measures are relatively uncontroversial, the data tend to be easily available and it increases the scope for cross-study comparability (Freel& Robson, 2004). But it is difficult to get reliable time-series data on the growth of fixed assets/sales (a better indicator of growth) and MSEs owners would be unable to report their sales or profits even at the present time expecting that their guesses as to sales of ten years ago would be accurate is folly

Many empirical studies have been conducted to investigate the determinant factors affecting MSEs growth. Generally, these factors relate to entrepreneurial, firm, inter-firm characteristics and external factors. Entrepreneurial characteristics such as owner/operator gender, age, education level, previous work experience, management skill, economic background, and marital status determine the growth of MSEs (Chirwa, 2008; Enock, 2010; Habtamu, 2012; Janda et al., 2013; Mbugua et al., 2013; Mulu, 2007; Osinde, 2013). Other studies (Clover &Darroch, 2005; Enock, 2010; Mulu, 2007; Tiruneh, 2011) found that firms related factors including age, size, initial capital, location, formality, type of business to be the most determinant factors affecting the growth of MSEs.

Moreover, some studies (Atieno, 2009; Habtamu, 2012) revealed growth of MSEs affected by interfirm related factors like linkage, network, and competition. The growth determinants of MSEs was also associated with external factors such as access to credit, infrastructure, market, working place, technology, social services and other legal and regulatory frameworks (Admasu, 2012; Ahiawodzi&Adabe, 2012; Gichana&Barasa, 2013; Hove &Tarisai, 2013; Ishen goma&Kappel, 2008; Kefale&Chinnan, 2012; Kinda&Loening, 2008; Mbugua et al., 2013; Mulu, 2007; Syed & Mohammad, 2008).

Many empirical studies (Habtamu, 2012; Haftom, 2013; Ishengoma&Kappel, 2008; Kokobe, 2011; Mulu, 2007) found that Male-headed firms grow faster than that of female-headed, but Chirwa (2008) indicated that female-owned enterprises tend to grow more rapidly in terms of employment than male-owned ones. Younger owner/manager of MSEs is more likely to grow than the older counterparts (Chirwa, 2009; Janda et al., 2013; Kokobe, 2013). Growth of MSEs improves with increase in education (Ahiawodzi&Adabe, 2012; Mulu, 2007). On the other hand, limited studies revealed the effect of increasing educational level of the owner/operator on the growth of MSEs is to some level (Habtamu, 2012; Haftom, 2013; Schiebold, 2011). Some studies (Kokobe, 2013; Mulu, 2007) reported that a firm with more years of work experience typically have faster-growing than their counterpart.

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Data Sources and Data Type

The researchers used primary data collected from owners/managers of micro and small scale manufacturing enterprises of selected towns of Jimma Zone. Jimma zone was selected by convenient sampling technique since it is in the catchment area of Jimma University. Multistage sampling technique was used in the collection of required data for the studies i.e. at first

woredasô Towns were selected from which owners/ managers were selected. Accordingly Jimma, Agaro, Sokoru and Asandabo were selected based on the consultation with the Food security and Employment creation officers, as well as trade and industry officers of Jimma zone and Jimma town. These towns have a higher number of micro and small scale enterprises as compared to other towns in the Zone. Then, the respondents were selected by random sampling technique from each town.

The data was collected using questionnaire and unstructured interview questions. The researchers developed a structured questionnaire consisting of both open-ended and close-ended questions and distributed for respondents through data collectors. The respondents were the registered Manufacturing MSE in the selected towns. The focus group discussions will take place in the form of unstructured group interviews on the most pressing issues such as input supply, product demand, credit access and the like.

3.2. Sample Size Determination

The data of Micro and small enterprises (MSEs) taken from Jimma zone office of food security and job creation is used as sampling frame. Cochranôs formula for calculating sample size determination for infinite population was used. Cochran (1977) developed a formula to calculate a

Representative sample for proportions as;

$$no = \frac{z^2}{e^2} pq$$

Where; n_o is the sample size, z is the selected critical value of desired confidence level, p is the estimated proportion of an attribute that is present in the population, q =1 ī p and e is the desired level of precision.

For this study, a sample size of a population whose degree of variability is not known; the maximum variability, which is equal to 50% (p =0.5) and taking 95% confidence level with ±5% precision, the calculation for the required sample size is as follows; p = 0.5 and hence q=1 -0.5 = 0.5; e= 0.05; Z=1.96 the sample will be 384 taken for the study.

Thus, the sample size was allocated proportionately to the selected towns based on secondary data found from Jimma zone and Jimma townôs food security and job creation, and trade and industry offices as shown in table 3.1. As it can be understood from this table, the researchers proposed to collect data from the manager/operator of 384 enterprises. But, 11 questionnaires were not properly answered and 30 questionnaires were not distributed because the respondents were not willing to respond. It means that the response rate is 89.3%. Thus, 343 questionnaires were used in the analysis.

Table 1 sample size allocation

Town	Enterprise (ownership)	Number of enterprises	Sample size/proposed respondents	Number of questionnaire properly filled and returned
Jimma	Proprietorship	110	42*[1]	
	Partnership	692	265	
	Total	**802**	**307**	**281**
Agaro	Proprietorship	58	22	
	Partnership	29	11	
	Total	**87**	**33**	**26**
Asandabo	Proprietorship	26	10	
	Partnership	31	12	
	Total	**57**	**22-6**	**17**
Sokoru	Proprietorship	35	13	
	Partnership	22	9	
	Total	**57**	**22**	**19**
Grand total		**1,003**	**384**	**343**

Source: computed from Jimma zone food security and job creation, and trade and industry offices', 2018.

3.3. Method of Data Analysis

Both descriptive and econometric tools of data analysis were used. The binary logistic model used growth of the MSE measured by the average annual employment growth as the dependent variable. Based on the average annual employment growth the MSE will be either growing or survival. The model was estimated by stata 13 software

Binary logistic regression model

Following Evans (1987), annual average employment growth will be used to measure the dependent variable micro and small enterprise growth (MSEsgr).

$$\text{MSEsgr} = \frac{\ln St\prime - lnSt}{MSEs\ age} = Y^{*}$$

This measure is used since it is objective and estimated using employment size is similar to those that use sales besides growth in sales and growth in the number of workers are highly correlated. Firm growth can be measured by different factors like Asset/wealth, profitability and employment. Among these According to OECD, in the OECD member countries employment is the most widely used criterion for determining firm size.

Where:

MSEsgr is the Average annual employment growth of MSEs

Lnstôis Natural Logarithm on current employment

Lnst is Natural Logarithm on initial employment

MSEs Age is the age of the MSEs

Based on the above growth measure firms are either growing if $Y^* > 0$ or survival if $Y^* \leq 0$.

Binary logistic regression was used to analyze relationship between a dichotomous dependent variable and independent variables. The logistic regression was fitted using the method of a firm growth as the dependent variable and the listed firm, firm owner/operator related and other variables as explanatory variables which is assumed to determine the growth of a firm and the outcome variable, profitability of the form. The response variable is binary, taking values of one if the firm is growing and zero otherwise. However, the independent variables are categorical, continuous and dummy.

Therefore, the model for the study is given as a binary choice logistic regression.

$$Y^* = \begin{cases} 1 & if \ Y^* > 0 \\ 0 & if \ Y^* \leq 0 \end{cases}$$

In a qualitative response model, the probability that Y=1 is given by the sign of the latent variable that is the probability that the latent variable becomes positive.

$Prob\ (Y^* > 0) = Prob\ (\beta' X + \varepsilon > 0)$The model will be

$Prob\ (Y^* = 1) = \alpha + \beta X + \varepsilon$

Where:

$\alpha is intercept\ , \beta is the vector of coiffficient of the growth determinats and X is the determinats$(Vector of independent variables)

Based on the dominant theories growth determinants of MSEs the study will include five owners/operators/managers related factors (gender, age, education level, previous experience, and family size), firmôs related factors (age, initial capital/investment/, distance from raw material and location) and four external factors (access to credit, infrastructure, working place and market competition) as explanatory variables. Finally, the model to be estimated will be

$$\Pr(y = 1) = \alpha + \beta_1 FsizeO\ \beta_2 SexO + \beta_3 EduO + \beta_3 AgeO + \beta_4\ ExpO + \beta_5 Iinv + \beta_6 Drm + \beta_7 Loc + \beta_8 Crdt + \beta_9 Ftown + \beta_{10} Comp + \varepsilon i$$

Table 2: Description of variables in growth determinants

Variables	Description	Expected sign
Average annual MSE employment growth	Dummy variable taking 1 if is growing , 0 otherwise(survival)	Dependent variable
Family size of op(FSizeo)	Number of family members of owner/operator/manager of the enterprise(continuous)	positive
Operators age (ageO)	Age of the business operator/decision-maker (in years)	negative
Sex of the operator(SexO)	Dummy variable 1 for male and 0 otherwise	Positive

Level of education (EduO)	Level of education of operator/decision-maker (in years)	Positive
Previous Experience of operator(ExpO)	Continuous variable (experience of the operator in years)	Positive
Initial investment(InInv)	The amount of money invested when the enterprise starts its operation(in Birr)	Positive
Distance From row material(Drm)	The average distance of the basic raw material from the firm measured in minutes to the raw material center	negative
Location of the MSE(loc)	Dummy variable taking 1 if the firm is on the main road and 0 otherwise	Positive
Credit access (Crdt)	Dummy taking 1if the firm accessed credit in the past and 0 otherwise.	Positive
Firm town (Ftown)	Dummy variable taking 1 jimma 2 if Agaro, 3 for Asandabo and 4 for Sokoru	
Competition	Dummy variable 1 if the firm doesnôt face competition, 0 otherwise	Positive
Value added (VA)	Is the proxy of profit (Total revenue less total expense) annual	

4. RESULT AND DISCUSSIONS

4.1. Descriptive results

Sex of the firm operators

Sex is one of the variables that can explain the growth of manufacturing enterprises. As indicated in Table 3 below, out of the sampled households 206 (60.1%) were male and the remaining 137 (39.94%) were female. The result revealed that the majority of the firms interview operators are male.

Table 3 Sex of the Respondents

```
. tabulate SexO

  Dummy variable 1 for male and 0 otherwise |      Freq.     Percent        Cum.
--------------------------------------------+-----------------------------------
                                     female |        137       39.94       39.94
                                       male |        206       60.06      100.00
--------------------------------------------+-----------------------------------
                                      Total |        343      100.00
```

Summary of the continuous demographic and Socio-Economic Factors

Family size of the operator of the firm is also an important demographic factor determining the firm growth. Accordingly, the average family size of the sampled operator of the firm was 2.7 with a standard deviation of 1.39.

The Education level of the operator was one of the important factors determining firm growth. In line with this, the mean and standard deviation of the operatorôs education level were 12.29 and 2.47. In addition, the experience of the operator was among the variables determining firm growth. The experience of the operators measured in years of the sampled firms has 4.72 mean and 1.98 standard deviation. The amount of initial investment is the key determinant of firm growth. As shown in the table below the mean and standard deviation of this variable is 2625.25 and 54582.52 respectively. The firm distances from Raw material are the most important determinant for a firm growth by affecting the cost and direct input for the output of the firms. The average distance of the raw material from the sample firm is 65.48km and its standard deviation is 63.4.

Table 4 Summary of the demographic and socio economic factors

variable	obs	mean	std. dev
fsizeO	343	2.7	1.39
eduO	343	12.29	2.47
expO	343	4.72	1.98
entreage	343	31.27	5.58
initlinvest	343	72625.29	54582.52
Drm	343	65.48	63.4

Source: Researchers field survey data (2018)

Characteristics of the firm

The study categorized the firm as growing or survival. Accordingly as indicated in table 5 below from the sample of firms 130 (37.9%) of them are survival while 213(62.1%) are growing. This indicates that there is a need for much focus since not small numbers of the firms are survival.

Table 5 Firm characteristics

Fgr	Frequency	Percent	Cumulative
0	130	37.9	37.9
1	213	62.1	100
Total	343	100	

Source: own computation from survey data 2018

4.2. Determinants of Manufacturing MSEs

The dependent variable which is ófirm growthô takes the value of one if the firm is growing and 0 otherwise. The growth of a firm in this study is the logarithm of the change in employment relative to the firm age in years. This measure is taken since employment is better than other growth measures. The Binary logit model identifies the factors that determine the firm to grow or not.

Before running the binary logit model different tests were carried out. The technique of variance inflation factor (VIF) was employed to detect multicollinearity among continuous variables.

According to Gujarati (2003) VIF is defined as $VIF(xi)=1/1-Ri^2$

Where Ri^2 is the square of multiple correlation coefficient that results when one explanatory variable (Xi) is regressed against all explanatory variables. The larger the VIF, the more collinear the variables Xi are. As a rule of thumb if the value of VIF of a variable exceeds 10 there is the problem of multicollinearity. From the tests shown on table 6 below all the continuous variables have VIF less than 10. Therefore, there is no problem of multicollinearity.

Table 6: The variance inflation factor *for continuous variables*

```
. estat  vif

    Variable |       VIF       1/VIF
-------------+----------------------
    Entreage |      1.35    0.742922
      FSizeo |      1.29    0.773675
        ExpO |      1.10    0.911055
    Training |      1.06    0.941251
  InitInvest |      1.05    0.950007
         Drm |      1.02    0.977048
-------------+----------------------
    Mean VIF |      1.15
```

Source: stata 13 output from survey data

Similarly, the contingency coefficients were computed to check the existence of multicollinearity problem among discrete explanatory variables. The contingency coefficients are calculated as

$$C= \tilde{a}\ X^2/N+X^2$$

Where *C= Coefficient of contingency*

X^2= Chi square random variable and N = is total sample size

The decision rule states that as the coefficient approaches to one there is high degree of multicollinearity whereas values less than 0.75 indicated there is no the problem. As indicated on the table 7 below the value of the contingency coefficient indicated that there is no problem of multicollinearity among discrete explanatory variables.

Table 7: Contingency coefficients for dummy/discrete variables

```
. corr Ftown SexO Crdt Competition Locaenter
(obs=343)

             |   Ftown     SexO     Crdt Compet~n Locaen~r
-------------+---------------------------------------------
      Ftown  |   1.0000
        SexO |   0.1597   1.0000
        Crdt |   0.0871   0.0123   1.0000
 Competition |  -0.0752  -0.0982   0.0936   1.0000
   Locaenter |  -0.2198  -0.0316  -0.0059   0.0463   1.0000
```

Source: stata 13 output from survey data 2018

Table 8: Logistic model regression output

Logistic regression				Number of obs = 343 LR chi2(14) = 66.06 Prob> chi2 =	
Explanatory variable	coefficient	Odds ratio	Std.err	z	p>IzI
Ftown	base (jimma)				
Aagaro	-0.335	0.716	0.321	-1.043	0.297
Asandabo	0.049	1.050	0.400	0.122	0.903
Sokoru	-0.857	0.424	0.396	-2.167	0.030**
SexO	base(female)				
Male	-0.556	0.574	0.262	-2.120	0.034**
Entreage	0.109	1.115	0.028	3.951	0.000***
FSizeo	-0.198	0.820	0.103	-1.929	0.054*
EduO	0.038	1.039	0.054	0.709	0.478
ExpO	0.147	1.158	0.070	2.101	0.036**
InitInvest	5.23e-06	1.999	0.000	-2.176	0.030**
Drm	0.000	1.000	0.002	0.006	0.996
Crdt	base (didnɑ̀ get credit)				
Get credit	1.138	3.120	0.313	3.631	0.000***
Locaenter	base(otherwise)				
Along main road	-0.032	0.968	0.289	-0.112	0.911
Training	0.278	1.321	0.091	3.072	0.002***
_cons	-4.000	0.018	1.117	-3.582	0.000

Notes: Odds ratio shows the predicted changes in odds for a unit increase in the predictor.
*** = Significant at 1 % ** = Significant at 5% * = Significant at 1 0%

Model evaluation

In binary dependent model goodness of fit is of secondary importance than the sign and statistical and/or practical significance. But the model can be evaluated from the simultaneous significance of the variables in the model. Similar to F-test in linear regression, we use the likelihood ratio (LR) which follows the chi squared distribution. From the model, the p-value of chi square equals to 0.0000. Hence we reject the null that the coefficient of the independent variables is simultaneously zero.

Hosmer and Lemeshow goodness of fit test

Before a model is relied upon to draw conclusions or predict future outcomes, we should check, as far as possible, that the model we have assumed is correctly specified. That is, the data do not conflict with assumptions made by the model. For binary outcomes, logistic regression Hosmer and Lemeshow (H-L) goodness of fit test is the most popular modeling approach.

The Hosmer-Lemeshow goodness of fit test is based on dividing the sample up according to their predicted probabilities, or risks. Specifically, based on the estimated parameter values for each observation in the sample the probability that *Y*=1 is calculated, based on each observation's covariate values.

The observations in the sample are then split into g groups according to their predicted probabilities. Suppose (as is commonly done) that g=10. Then the first group consists of the observations with the lowest 10% predicted probabilities. The second group consists of 10% of the sample whose predicted probabilities are the next smallest, etc.

Hosmer-Lemeshow showed by simulation that (provided $p+1<g$) their test statistic approximately followed a chi-squared distribution on $g-2$ (g=number of groups) degrees of freedom, when the model is correctly specified. This means that given our fitted model, the p-value can be calculated as the right hand tail probability of the corresponding chi-squared distribution using the calculated test statistic. If the p-value is small, this is indicative of poor fit.

The null hypothesis for the test is that ñ**there is evidence of miss specification**ò. The inferential goodness-of-fit test is the Hï L statistic that yielded a ɢ2 of 7.97with the p-value of 0.4369. Hence we reject the null and conclude that the model fit. (see appendix)

Validation of predicted probabilities

According to the test result, the prediction for Manufacturing micro and small scale enterprise which were growing and those which did not have identical accuracy. This observation was supported by the magnitude of sensitivity (85.98%) compared to that of specificity (50.77%).

Both false positive and false negative rates were not more than 50%. Sensitivity measures the proportion of correctly classified events, in this case, those enterprises which are growing, whereas specificity measures the proportion of correctly classified nonevents (surviving enterprises). The false-negative therefore, measures the proportion of observations misclassified as nonevents (surviving) over all of those classified as nonevents. The overall correct prediction was about 72.67% correct showing high acceptability of the results (see Appendices

Interpretation of the Model Results

The Binary logit model result, the maximum likelihood estimates revealed that manufacturing micro and small scale enterprises growth determined by the interaction of different potential firm related and non-firm related factors. To test the measure of goodness of fit in logistic regression analysis, the likelihood ratio test that says chi-square distribution with degree of freedom (df) equal to the number of independent variables included in the model (Gujarat, 2003). Consequently, the chi-square computed indicated, as the model was significant at 1% significance level.

The firm town

The firmôs town as the categorical variable of four selected towns was taken as the variable to analyze whether there is a significant difference in the growth of a firm among the towns. The model uses Jimma town as the base category. The model result revealed that there is statistically significant difference of firm growth between Jimma and sokoru towns at 5% (p=0.30). The coefficient of sokoru town is negative and statistically significant. This indicated that the manufacturing micro and small scale enterprises in sokoru town were 0.42 times less likely to grow than those in Jimma town. This could be because of better infrastructure and market in Jimma than Sokoru.

Sex of the operator

Sex of the operator is another demographic factor determining manufacturing enterprise growth. Sex with the base category of females was hypothesized as positive with the firm growth. The result of the model revealed that the sex of the operator significantly negatively influences the firm growth at 5% with p value (p=0.034). Hence firms managed by males were 0.57 times less likely to grow than those managed by females. This result indicated that female operated manufacturing enterprises created more jobs than those operated by males.

The Operators age

The age of the operator of the firm was hypothesized to be negative indicting that as age of the operator in yearôs increases the growth probability of a firm decreases. The operatorôs age has a positive and significant effect on firm growth at 1% (p=0.000). The result of the model indicated that other things kept constant, as the operatorôs age in years increases by one unit the odds of the firm growth increase by 11.5 percent. Hence firms with higher age in the sample grow faster than those with low age.

Experience of the operator

The experience of the operator was hypothesized to have a positive and significant effect on firm growth as more experienced operators better manage firms. From the model result the experience of the operator has a positive significant effect on firm growth at 5% (p=0.036). Other things kept constant as the operatorsô experience increases by a year the odds of the firm growth increases by 15.8 percent. This finding is in line with the theory of affirm growth indication the more experienced operators more success full the forms are.

Credit Access

Firms getting Credit access was hypothesized to be more likely to grow than those do not get access. The model result revealed that credit access has a positive significant effect on micro and small scale manufacturing enterprise growth at 1% (p=0.000). The result is interpreted as firms getting credit in the past are 3.63 more likely to grow than those which didnôt.

Initial investment

Initial investment as the economies of scale indictor was hypothesized to have positive significant effect on the growth of micro and small scale manufacturing enterprises. From the model, the initial investment has a positive significant effect on the firm growth at 5% (p=0.030). As the amount of initial investment increases by one unit (birr) the odds of the firm growth increases by 99.9 percent.

5. CONCLUSIONS AND RECOMMENDATIONS

In this study attempts have been made to assess the growth determinants of Micro and small scale manufacturing enterprises in selected towns of Jimma zone. The descriptive analysis showed that 37.79 percent of the micro and small scale manufacturing enterprises were survival. This is mainly because of poor management, low market chain, poor infrastructures like electricity, and etc.

In the binary logit model result, we observe that the experience of the operator has a significant positive effect on firm growth. This shows that experience in the area of work increases the quality of firm management and efficiency in output production. Likewise, the model revealed that there is a significant difference in firm growth between female and male managed enterprises. Female managed enterprises are more likely to grow than male managed enterprises. From the model result, we can conclude that Access to credit basically determines firm growth. Finally, we can conclude from the model that training for the firm operatorôs plays a significant positive role in firm growth.

Based on the findings, the following recommendations are forwarded:

The result of the study indicated that firms managed by females grow better than those managed by males. Hence the stakeholders in the micro and small scale development initiatives need to boost the basic femaleôs qualities in the management area.

Similarly, the study found that the experience of the operator of the firm positively and significantly associated firm growth. Therefore, the community, NGOs and government should focus on training the operators of the firms. Training related to the skill of the production and management of the enterprises must be timely given to the firm operators.

The study found that getting access to credit has a positive and significant effect on firm growth. Access to Credit theoretically also determines the firm growth by boosting its capital. Most firms in developing countries are challenged by getting credit due to lack of collateral and fear of the risk of most entrepreneurs. Hence, financial institutions and other supporting bodies should

facilitate the easy method of getting access to credit for manufacturing micro and small scale enterprises.

Finally, from the study, we found that 37.78 percent of the firms sampled for the study is survival. This indicated that we are very far back from the required growth of the manufacturing enterprises that transform the country to the industrial sector. Hence policymakers and other concerned bodies need to give better focus on the sector than today.

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