Growth Potential and Business Constraints of Micro and Small Enterprises in South Wollo Zone, Amhara Region, Ethiopia

Addisu Molla[1]

Abstract

In Micro and Small Enterprises (MSE) sector a thorough examination of factors that constrain enterprises growth is critical to the survival and growth of the enterprises. This paper, therefore, utilized the data collected on 224 MSEs in south Wollo zone of Amhara Region, Ethiopia to analyze the extent to which the growth of MSEs is linked with the constraints. Three sets of models were employed. The MSEs employment growth was significantly and negatively affected by limited access to finance, limited access to business services, and limited access to market. In addition, limited access to premises, limited access to finance and limited access to business services were significantly and negatively affect the operators' perception on growth potential of enterprises income. Therefore, the results highlight that the growth of MSEs are highly influenced by accesses of productive resources and assets. The analysis and findings, on the other hand, should help to professionals in such field of study. On the other hand, it should help shed some light for policy makers and anyone else who may have a stake on the small business development as a positive knock on effect for growth of MSEs.

Key words: business constraints, growth potential, principal components, MSEs, south wollo.
JEL Classification: D220

[1] PhD, Assistant Professor in Economics, Director, Continuing and Distance Education Directorate
Wollo University, Dessie, Ethiopia

1. Introduction

The international community has given a great deal of emphasis to Micro and Small Enterprises (MSEs) sector under the premise that it plays a critical role in addressing both poverty reduction and economic growth goals. MSEs play multifaceted role such as boosting competition, innovation as well as development of human capital and creation of a financial system. With increased urban population dynamics, the importance of MSEs is also growing in developing countries. For instance, in Barbados, it is believed that there are approximately 6000 MSEs and they account for approximately 80% of all business activity in the island (ILO, 2000). In Sub-Saharan Africa, given the rapid rural-urban migration and deficiency to absorb this migration, MSEs have become important urban economic activities particularly providers of urban employment (Elias, 2005).

In November 1997, the Ethiopian Ministry of Trade and Industry (MoTI) published the "Micro and Small Enterprises Development Strategy: MSEDS", which enlightens a systematic approach to alleviate the problems and promote the growth of MSEs. Following the publication of MSE development strategic document, the government of Ethiopia set up Federal Micro and Small Enterprise Development Agency (FeMSEDA). The regional states also developed MSE promotion strategies based on their context and in tandem with the federal MSEDS so that the states structured Regional Micro and Small Enterprises Development Agencies (ReMSEDAs) to facilitate implementation of the strategies. Thus, in cities and towns of Ethiopia, MSEs and informal sector in general are the predominant income generating activities and thus they have a significant contribution to local economic development and used as the basic means of survival (Gebre-egziabher and Demeke, 2005).

Despite the fact that MSEs have been recognized as a major contemporary source of employment and income in a growing number of developing countries, yet relatively little is known and emphasized about the characteristics and growth of these enterprises specific to the chosen study area in the present study. In a study by Belay (2000), it is reported that 98% of business firms are micro and small enterprises out of which small enterprises

represent 65% of all businesses. The fact that the majority of enterprises are micro and small indicates that established enterprises find it difficult to grow to the next stages of middle and large scale industries. Although the MSE sector takes large proportion in the industrial sector, it contributes about only 3.4% of the GDP, 33% of the industrial sector's contribution to the GDP of the same year (Gebrehiwot G., 2006). Therefore, the MSEs are unable to grow at their full potential and hence contribute less to the national economy due to the existence of so many business constraints in the sector.

According to the study by Wolday and Gebrehiowot (2004) the leading factors contributing to the unimpressive growth and performance of the MSEs are limited access to finance, market, business services, working premises. Thus, critical assessment of the association between growth and constraints of enterprises is needed so as to achieve the contributions of their growth to the national economy by overcoming a series of constraints they are facing. This study, therefore, examines the extent to which the growth potential of MSEs is associated with the business constraints while controlling for the owner-managers' attributes and enterprises' characteristics.[2] The paper hypothesizes the following: firstly, access to productive resources is expected to have a significant positive effect on growth potential of MSEs. Secondly, MSEs operators' perception on growth potential of their income is highly influenced by business constraints.

2. Data and Methods

2.1 Source of Data and Sampling

The data set used for this study is based on primary data collected from three city administrations (Dessie, Kombolcha and Haik) of the south Wollo zone in Amhara region through a sample survey of enterprises. These towns of city administrations are chosen using purposive sampling method as they are areas with a high concentration of MSEs and are the primate cities in the

[2] Owner-managers' attributes include age, gender, marital status, family size, educational level, working experience and motivation to start the business and previous occupation of the operator whereas enterprises' characteristics include location, sub-sector, age, size-group, source of finance and legal ownership of the enterprises.

zone. A survey questionnaire was developed to fit the situation of the study areas and to collect all the necessary data and thus to test the hypotheses developed. During the survey three local enumerators were recruited and they received two days training. These enumerators were well experienced and they collected the data under strict supervision by the researcher.

Using a proportional stratified sampling technique to include representative enterprises in each city and kebelles under each city, a total of 224 enterprises were taken under the study from the above stated towns. A fixed, constant proportion (sampling fraction) of about 7 percent was selected from the target population[3] to make up the stratified random sample. 7 percent sampling fraction is satisfactory sample fraction by taking into account the relatively high search costs of collecting data from spatially dispersed sampling units (Lyne, 2003). Respondents were randomly sampled from each town with the help of simple random sampling technique.

2.2 Methodology of the Study

The study employed analytical methods to analyze the growth of MSEs. Three sets of models were utilized: the principal component analysis-PCA, the multiple regression analysis and the logistic regression analysis. To this end, the first set of model PCA is a multivariate technique of analysis used to transform the original large set of explanatory factors (potential constraints) into smaller set of constraints which helps for further analyses in the subsequent regressions. The multiple regression aims to identify the association between growth and constraints of enterprises while controlling other determinants of growth and it also identify which constraint is significant for the model as well as its degree of extent in influencing the dependent variable. The third set of model, the logit model, was employed to analyze the perception of owner-manages on growth potential of enterprise income with the constraints given control variables. A detailed and well-structured enterprise level questionnaire that assesses large number of

[3] The target population refers the total number of MSEs in the three towns which is 3369.

demographic, socioeconomic and business constraint related variables is utilized.

2.2.1 PCA as Multivariate Technique

As the first set of the model PCA is a useful multivariate technique of analysis in variable reduction procedure. It is useful when we have obtained data on a number of variables (possibly a large number of variables), and believe that there is some redundancy in those variables. In this case, redundancy means that some of the variables are correlated with one another, possibly because they are measuring the same construct. Because of this redundancy, it is believed that it should be possible to reduce the observed variables into a smaller number of principal components (artificial variables) that will account for most of the variance in the observed variables. Its goal is, therefore, to reduce the dimensionality of the original dataset with minimal information loss (Manly, 1986). A smaller set of uncorrelated variable is much easier to understand and use in further analysis than the largest set of correlated variables (Dunteman, 1999).

The smaller dimensions of variables that are derived from the original variable are called principal components (PCs). Only the first few components account for meaningful amounts of variance, are computed and extracted. So only these first few components are retained, interpreted, and used in subsequent regression analyses: the multiple regression analysis and the logit regression analysis. To determine the number of such "meaningful" components to retain there are some criteria used such as eigenvalue greater than one criterion, scree plot test, proportion of variance accounted for criterion and interpretability criterion. In this study, eigenvalue greater that one criterion, which is one of the most commonly used criteria for solving the number-of-components, is used. With this approach, we retain and interpret any component with an eigenvalue[4] greater than 1.00. This criterion is also known as the Kaiser criterion (Kaiser, 1960).

[4] Eigenvalue is a scalar or a simple real number computed from a square matrix and it refers the variance of the new variables.

Having the theoretical relevance and inter-linkage of PCA and the subsequent regression analyses to the analysis of growth in MSE sector from the above discussion, the following section provides the conceptual framework used in modeling MSE growth. To do so, the starting point is the estimated linear function of the principal components:

$$x = a_1 v_1 + a_2 v_2 + \ldots + a_N v_N \qquad \textbf{(2.1)}$$

Equation (2.1) represents a higher-dimensional space (N) where v_1, v_2, ..., v_N is a basis of the N-dimensional space and $a_1, a_2, \ldots, a_N$ is the loading.

$$\hat{x} = b_1 u_1 + b_2 u_2 + \ldots + b_K u_K \qquad \textbf{(2.2)}$$

Equation (2.2) represents the lower-dimensional space (K) derived from the above larger dimensional space where u_1, u_2, ..., u_K is a basis of the K-dimensional space and b_1, b_2, …, b_K is the loading. Note that dimensionality reduction implies information loss, which is indicated by the difference of subtracting the vector of lower dimension from the vector of higher dimension. i.e ($x - \hat{x}$), which is also called error.

Thus, the main intention here should be minimizing this error to come up with lower dimensional space with minimal information loss. So that the best low-dimensional space can be determined by the "best" eigenvectors of the covariance matrix of x (i.e., the eigenvectors corresponding to the "largest" eigenvalues -- also called "principal components"). As can be seen in Jain *et al*. (2000), this task can be accomplished through the following step-wise mathematical formulations. Suppose x_1, x_2, ..., x_M are Nx_1 vectors or matrix. The mean of these vectors is computed as:

$$\bar{x} = \frac{1}{M} \sum_{i=1}^{M} x_i \qquad \textbf{(2.3)}$$

Subtract the mean from each variables x_i and then form an NxM matrix that is consisted from mean corrected elements. Let's assume this matrix is said to be matrix A.

$$¤ = x_i - \bar{x} \quad \textbf{(2.4)}$$

$$A = \begin{bmatrix} ¤_1 & ¤_2 \ldots\ldots ¤_M \end{bmatrix} \quad \textbf{(2.5)}$$

The covariance of matrix A is obtained by:

$$C = \frac{1}{M}\sum_{n=1}^{M} ¤_n ¤_n^T = AA^T \quad \textbf{(2.6)}$$

Next compute the eigenvalues ($\lambda_1, \lambda_2, \ldots, \lambda_N$) and eigenvectors ($u_1, u_2, \ldots, u_N$) of the covariance matrix. Since C is symmetric, $u_1, u_2, \ldots, u_N$ form a basis, (i.e., any vector x or actually ($x - \hat{x}$), can be written as a linear combination of the eigenvectors):

$$x - \bar{x} = b_1u_1 + b_2u_2 + \ldots\ldots + b_Nu_N = \sum_{i=1}^{N} b_iu_i \quad \textbf{(2.7)}$$

Finally the optimal lower dimensional space is determined by keeping only the terms corresponding to the K largest eigenvalues (in most cases eigenvalues greater than one):

$$\hat{x} - \bar{x} = \sum_{i=1}^{K} b_iu_i \quad \text{Where K<N} \quad \textbf{(2.8)}$$

Therefore, the best lower-dimensional space K is derived from the higher-dimensional space N with minimal loss of information. So that $u_1, u_2, \ldots, u_K$ is the newly formed basis for the lower-dimensional space.

Once the conceptual framework of the PCA is discussed, the next step is presenting the conceptual framework of the subsequent regressions followed by PCA. With regard to the multiple regression analysis, although theoretically alternative measurement tools such as growth rate of sales or

profits could give more precise results, in practice they are not as credible as the employment growth measure because of entrepreneurs' hesitation to report the true values of their sales and profits. This hesitation, which leads to measurement errors, makes the employment-based measure preferable in studies considering enterprise growth.[5] Moreover, in a relatively high inflationary economy, avoiding data in value terms is preferable, so using the employment growth rate as the measurement tool is beneficial. In addition, taking employment as measure of enterprises growth needs to be consistent with the goal set for the sector.

As far as the employment growth is concerned, the very critical issue that has to be raised is that employment growth is defined. Although there are different growth measures in literature, the Compound Annual Growth Rate (CAGR) is used in several studies of employment growth than other measures of employment growth (Liedholm and Mead 1999). The CAGR is a rate of growth that tells what an enterprise growth in employment over the years on an annually compounded basis.

With regard to the logit model, it is extremely flexible and easily used function. In addition, this model leads itself to meaningful interpretations when the dependent variable is dichotomous outcome (Gujarati, 1998). Thus, the logistic regression is a powerful tool in its ability to estimate the individual effects of the continuous or categorical variables on the qualitative dichotomous dependent variable (Wright, 1995). Following Gujarati (2004) the logistic distribution function for the relationship between the probability of the dependent dichotomous variable and various independent variables can be specified as:

$$P_i = E(Y = 1/x_i) = 1/(1 + e^{-(B_0 + B_1 x_i)}) \qquad \textbf{(2.9)}$$

For ease of exposition this can be written as:

$$P_i = 1/(1 + e^{-Z_i}) = e^{Z_i}/(1 + e^{Z_i}) \qquad \textbf{(2.10)}$$

[5] See Liedholm and Mead (1999) for a comprehensive justification of this issue.

Where P_i is the probability that the enterprise experience growth in income and it ranges between 0 and 1 and it is nonlinearly related to Z_i (i.e. the explanatory variables $X_{i's}$). e^{Zi} standards for irrational number e to power of Z.

Z_i is the function of n-explanatory and control variables (X_i) which is also expressed as:

$$Z_i = B_0 + B_1 x_{1i} + B_2 x_{2i} + ... + B_n x_{ni} \qquad \textbf{(2.11)}$$

Where, X_1 X_2 ---, X_n = explanatory variables; B_o= is the intercept; $_1$, $_2$,., $_n$ are the logit parameters (slopes) of the equation in the model. If P_i is the probability of the growth potential of enterprise income is increased. (1-P_i), the probability of the growth potential of enterprise income is not increased, which can be written as:

$$1 - P_i = 1/(1 + e^{Z_i}) \qquad \textbf{(2.12)}$$

Thus, the expression $P_i/(1-P_i)$ is known as the odd-ratio and can be written as:

$$P_i/(1 - P_i) = \left[(e^{Z_i}/1 + e^{Z_i})/(1/1 + e^{Z_i})\right] = e^{Z_i} \qquad \textbf{(2.13)}$$

Taking the natural log of eq. (3.19), we can get:

$$L_i = \ln(P_i/1 - P_i) = Z_i = B_0 + B_1 x_i \qquad \textbf{(2.14)}$$

Where L_i, is log of the odds ratio, which is not only linear in X_i but also linear *in the parameters.* Finally, by introducing the residual term U_i we get the theoretical logit model which is given as:

$$Z_i = B_0 + B_1 x_{1i} + B_2 x_{2i} + ... + B_n x_{ni} + U_i \qquad \textbf{(2.15)}$$

2.2.2 Specification of the Model

In this study both descriptive and econometric analyses were employed. With regard to the descriptive analysis the summary statistics such as percentages and means were used to examine the nature and structure of MSEs found in towns of the south Wollo zone. In econometric analysis, three sets of models were utilized: the principal component analysis-PCA, the multiple regression analysis and the logistic regression analysis. To this regard, the first set of model PCA is a multivariate technique of analysis used to transform the original large set of correlated variables (potential constraints)[6] into smaller set of uncorrelated variables also called principal components-PCs. Its goal is to reduce the dimensionality of the original data set with minimal information loss (Manly, 1986). Therefore, the purpose of employing this model is to obtain meaningful interpretation of the PCs and hence to use them in further analysis in the subsequent regressions of the next two sets of models. A smaller set of uncorrelated variable is much easier to understand and use in further analysis than the largest set of correlated variables (Dunteman, 1999).

The PC's can be estimated as linear functions of the original 16 variables (constraints) per Equation (2.16):

$$PC_i = a_{i1}x_1 + a_{i2}x_2 + ... + a_{i16}x_{16} \qquad \textbf{(2.16)}$$

Where i = 1 … 16; a_{i1} … a_{i16} = the component loadings which represents the i^{th} PC and 1^{st}-16^{th} constraint; and X_1 … X_{16} = the 16 constraints listed in appendix A.1.

The multiple regression aims to identify the association between growth and constraints of enterprises while controlling other determinants of growth and

[6] See the constraints on Appendix Table A.1 and thus the study takes values for all constraints by assigning numbers 1, 2, 3, 4, and 5 for the degree of severity of the constraints: sever constraint, major constraint, moderate constraint, minor constraint and no constraint at all respectively as five-point-scale measurement. This is obtained by asking the respondents to give response on the degree of severity of constraints according to the extent to which the constraints affect their enterprise growth.

it also identifies which constraint is significant for the model as well as its degree of extent in influencing enterprise growth. The very important issue as far as growth of enterprises is concerned is that how enterprise growth is defined and measured. In this regard, turnover (revenue), sales (output), value added, assets, and number of workers are predominant measures of enterprise growth.

Among these alternatives the most frequently used one is a change in number of employees over the years since start up particularly in those studies of developing countries (Liedholm and Mead, 1999; USAID, 2002). Because this indicator is the most easily and accurately remembered over time by respondents; and also does not be deflated. In addition, among different techniques[7] of measuring employment growth, the one that is known as Compound Annual Growth Rate (CAGR) is employed in this study. Because it is the most widely used and gives a much more precise assessment of the timing of employment growth effects (Liedholm and Mead, 1999). CAGR is a rate of growth that tells what an enterprise growth in employment over the years on an annually compounded basis is measured in percent and its formula is presented as:

$$\left[(CE / IE)^{1/EA} - 1\right]^{8} \qquad \textbf{(2.17)}$$

Thus, the multiple regression can be specified as:

$$egrth_i = a + \ _1const_i + \ _2contrv_i + e_i \qquad \textbf{(2.18)}$$

Where egrth refers to growth of the enterprises measured as employment growth, β_1 and β_2 are parameters to be estimated, while 'a' and 'e' are the constant and the error term respectively. The terms const and contrv are vectors of constraints refer to problems encountered by MSEs and control variables such as demographic and socio-economic variables. And the term i stands for a respective enterprise which ranges from 1-224.

[7] The different techniques of measuring employment growth are Average Annual growth Rate (AAGR), Compound Annual Growth Rate (CAGR) and Average Annual Growth in Jobs (AAGJ).

[8] The designations CE, IE and EA refer current employment, initial employment and enterprise age respectively.

The third set of model, the binary logit model, was employed to analyze the effect of constraints on perception of owner-managers towards growth potential of enterprise income. To measure the perception the dummy variable income growth (ingrow) is constructed as dummy one if operators perceive that an enterprise experiences growth in income and zero otherwise. This shows the probability that the enterprise will experience growth in income while controlling for other factors. That is the conditional expectation of growth potential of income given the constraints and control variables and can be specified as:

$$E[ingrow_i/const_i,\ contrv_i] = P[e_i > -V(const_i,\ contrv_i)] = F[(const_i,\ contrv_i)] \quad \textbf{(2.19)}$$

Where e_i is a disturbance term; P is the probability distribution function and F is the cumulative normal distribution function. The term i and the vectors const and contrv are defined as earlier.

3. Results and Discussions

3.1 Descriptive Results

3.1.1 Owner-managers' Attributes and Enterprises' Characteristics

Regarding the owner-managers' or operators' attributes 63% of sample enterprises were owned and/or managed by men and the rest 37% of enterprises were owned and/or managed by women. This indicates that women's participation in the business activities particularly in heading the enterprises is relatively lower. This may be attributed mainly to the cultural norms and societal attitudes, which consider women as inferior and too much family responsibilities they have to bear instead of engaging in businesses.

As can be seen in Table 3.1, the owner-managers lowest age is 18 while highest age is 72, and thus the mean age is 31.8. Only 16% of the operators had at least secondary school education and the majority either attended primary education or have no education at all (illiterates). The mean value of experience of owner-managers is about 3.6 years. Therefore, from the studies it is clearly indicated that business opportunities are skewed towards younger, less educated, less experienced and male group operators.

Table 3.1: Variables used in the models with summary statistics

Variables	Description	Mean	Std. Dev	Min.	Max.
Gender	Gender of the operator (dummy: gender=1 if the operator is male; and 0 otherwise	0.63	0.48		
age	Age of the operator in years	31.8	9.50	18	72
Mrst	Marital status of the operator (dummy: mrst=1 if the operator is married; and 0 otherwise)	0.51	0.50		
educ	Education of the operator (dummy: educ=1 if the operator at least completed secondary school; and 0 otherwise)	0.16	0.36		
exp	Experience of the operator in years	3.63	5.42	0	27
fmlsize	Family size of the operator	3.75	2.06	0	11
Positn	Position of the operator in the enterprise (dummy: positn=1 if the operator is the owner and manager of the enterprise; and 0 otherwise)	0.14	0.35		
motivn	Motivation of the operator (dummy: motivn=1 if the operator is self motivated; and 0 otherwise)	0.31	0.46		
Preoccupy	Previous occupation of the operator (dummy: preoccupy=1 if the operator was unemployed or jobless; and 0 otherwise)	0.57	0.49		
othrinvt	Engagement of the operator on other investment (dummy: othrinvt =1 if yes; and 0 otherwise)	0.25	0.43		
locn	Location of the enterprise (dummy: locn=1 if Dessie; and 0 otherwise)	0.44	0.50		
Entage	Age of the enterprise in years	3.68	3.19	1	19
legform	Legal ownership form of the enterprise (dummy: legform=1 if cooperative; and 0 otherwise)	0.46	0.50		
subsec	Sub-sector of the enterprise (subsec=1 if textile & garment, wood & metal work and construction; and 0 otherwise)	0.58	0.49		
entsize	Size-group of the enterprise (dummy: entsize = 1 if micro enterprise; 0 otherwise)	0.70	0.46		
finsrs	Finance source of the enterprise (dummy: finsrc=1 if own source; and 0 otherwise)	0.42	0.49		

Source: Computed from own survey data, 2010

Based on the enterprise characteristics, the sample enterprises in this study have a mean of 3.68 years in business. With regard to the activities practiced in the study, 58% of the enterprises are engaged in construction, wood and metal work and textile and garment sub-sectors while 42% are engaged in food processing, urban farming and municipal activities. Of the sample enterprises, 46% were registered as cooperative type of legal ownership and the rest 54% were registered as partnership and sole proprietorship type of legal ownership. 42% of enterprises capital came from internal or own sources of finance, especially personal savings of owner-managers; the rest 58% comes from other sources such as financial assistance from their relatives and friends, financial assistance from NGOs and loan from formal and non formal financial institutions. With respect to the size-group of enterprises in the MSE sector, of the total sample enterprises most of the enterprises (70%) are micro enterprises and the rest 30% are small-enterprises.

3.1.2 Growth of Enterprises

The mean number of workers at start-up and current time for sample MSEs are 8 and 10 respectively; the range varies from 1 to 28 for start-up employment and from 1 to 51 for employment at current-time. The mean capital of MSEs during their start-up was 10,283.26 birr and the current average capital is 27,221.63 birr. The mean capital-labor ratio for start-up is 1619.84 implying that on average 1619.84 birr employed only one labor at the start up of enterprises. Similarly, the current mean capital-labor ratio is 3527.84. Intuitively, the capital-labor ratio comparison between at start up and currently shows that capital grew faster than employment and hence the enterprises became more of capital intensive (See Appendix A.2).

Having different techniques of employment growth measures[9] by size-group, micro enterprises grew on a mean of 0.13% and 0.16% annual compound

[9] The different techniques of measuring employment growth include Average Annual growth Rate (AAGR), Compound Annual Growth Rate (CAGR) and Average Annual Growth in Jobs (AAGJ). ACGR tells what an enterprise growth in employment over the years on an annually compounded basis which is measured in percent; AAGR tells the average increase in the employment over the years since start up measured in

growth rate and average annual growth rate respectively (See Appendix A.3). Also small enterprises grew on a mean of 0.09% and 0.14% annual compound growth rates and average annual growth rates respectively. This shows that the micro enterprises growth performance is relatively better than small enterprises. However, in terms of annual jobs added, the small enterprises growth performance exceeds that of micro enterprise. Because, small enterprises have increased 0.8 number of job per enterprise annually while micro enterprises have increased 0.74 number of job per enterprise annually.

The overall growth performance of MSEs in the study area indicates that the enterprises grew very much weakly compared to other developing countries experience on the same growth measures. For instance, small enterprises in Botswana and Zimbabwe have grown by 6.3% and 5.6% of annual compound growth rate respectively and by 8.4% and 7.4% of annual average growth rates respectively (Liedholm and Mead, 1999).

3.2 Econometric Results

3.2.1 Principal Component Analysis of Potential Constraints to MSEs Growth

PCA, as variable reduction technique, reduces large set of potential constraints into smaller set of constraints by extracting certain number of components. Although the number of components extracted in PCA is equal to the number of observed variables being analyzed, only those PCs with an eigenvalue greater than one (i.e., the first six components) are derived from 16 potential constraints (See Appendix A.4). Eigenvalues are scalars that give the variance of the PCs and thus eigenvalue greater than one criteria (or Kaiser's criteria) is the default criteria used to determine the number of PCs that are retained, interpreted and used in subsequent analyses (Kaiser, 1960).

Compared to the other alternative criteria[10] that determine the number of PCs extracted, the Kaiser's criterion gives a meaningful and maximum amount of

percent; AAGJ tells the average annual growth in jobs created per enterprise since start up measured in number.

[10] The alternative criteria for determining the number of PCs include; scree test, proportion of variance accounted for criterion and interpretability criterion.

variance of the model. Based on their respective eigenvalues as indicated in appendix A.4, the six retained components accounted for 21.1%, 14.9%, 8.7%, 7.9%, 7.6% and 6.5% respectively from the first PC to the sixth PC and hence all the PCs together accounted for 66.7% of the variation in the data. On the basis of the Nunnally (1967) recommended standards of the reliability coefficients of the PCs (i.e., cronbach $\sim \geq 0.60$ for the reliability of each of the factors or PCs and cronbach $\sim \geq 0.70$ for the composite reliability of PCs) to insure that they are reliable indicator of the data set and hence explain the meaningful amount of the variance, the PCs are good and suitable to be used and the variance explained by these PCs (66.7%) became meaningful amount of variance.[11]

The Component Loadings

This section discusses about correlation among the variables. The simple correlation between the original and the new variables, also called loadings, give an indication of the extent to which the original variables are influential or important in forming new variables. Therefore, each principal component is formed based on the loadings of the variables (constraints). The higher the loadings of a variable, the more influence it has in the formation of a given PC and vice verse and hence the loadings were used to determine which variables are influential in the formation of a given PC and to assign a meaning or label for the PC. This was done by rotating the components using orthogonal varimax rotation method. In the varimax rotation the main objective is to have a factor structure in which each variable loads highly on one and only one factor.[12] That is, a given variable should have a high loading on one factor and near zero loadings on the other factors.

[11] Because the cronbach's alpha for each of the PC and for the composite of PCs are confirming to the Nunnally's recommended standards as indicated on appendices A.5a and A.5b.

[12] The rationale for choosing orthogonal varimax rotation is that it is the orthogonal but not the oblique rotation that gives the uncorrelated PCs. In addition, the interpretation of factor structure resulting from an oblique rotation is more complicated than that resulting from orthogonal rotation particularly varimax rotation which is the most commonly used rotation in many researches (Sharma, 1996).

The Principal Components

It is often necessary to interpret or provide a meaning to the principal components that are the linear combination of the original variables. The six factors or PCs indicated on Table 3.2 are named or labelled firstly by observing which variables are having higher loading on each component and then trying to find a general name on the basis of the variables that had high loadings to a single component. In order to answer how high the loading should is before we can say that a given variable is influential in the formation of a PC, a loading of 0.50 or above need to be used as a cutoff point (Sharma, 1996). Even some researchers have used a cutoff values as low as 0.40. With this framework, the researcher tried to categorize the variables into six factors and then interpret the factors as it was indicated in Table 3.2.

For example, Inadequate operation space and selling outlet, insufficient technology and lack of access to physical infrastructure are the three items that are dealing with lack of access to working premises and other infrastructures and hence factor 1 is labelled as 'limited access to premises'. Factor 2 was also defined as 'limited access to finance' as limited access to working capital, limited access to start-up capital and lack of collateral had relativity high loadings for this factor and all they are elements fall in financial matters. In similar fashion, the rest PCs are labelled or named as limited access to business services; limited access to market; unfavourable government policy and weak institutional linkage.

Use of Principal components

Besides deriving manageable and meaningful constructs, PCA also derive the principle component scores that are used in subsequent analyses. Principal component scores are calculated from the eigenvectors that give weights used for forming the equation to compute the new variables. These principle components, therefore, used as input variables for further analyzing the data using the forthcoming regression analyses. Since the principle of component scores are computed from the weights of principal components and mean-corrected data of the variables they are the weighted -sum of all the observed variables being analyzed (Sharma, 1996; Ayalew, 2007). The next two sections use the scores to further analyzing the data by employing the two set of models, which are the multiple regression and the binary logit models.

Table 3.2: Rotated component loadings matrix of potential constraints of enterprise growth

Factor (Principal component-PC)	**1**	**2**	**3**	**4**	**5**	**6**
Eigenvalue	3.373	2.386	1.385	1.270	1.222	1.034
Percentage of variance explained	21.1	14.9	8.7	7.9	7.6	6.5
Potential constraints on growth Of enterprises	Limited access to premise	Limited access to finance	Limited access to business services	Limited access to market	Unfavourable gov't policy	Weak institutional linkage
Limited access to working capital	-0.072	0.656	-0.053	0.011	-0.068	0.002
Limited access to start up capital	0.048	0.575	0.078	-0.118	0.124	-0.055
Limited access to business counseling /advise	-0.042	0.082	0.584	0.012	0.068	0.001
Inadequate operation space and selling outlet	0.714	-0.027	-0.128	-0.170	0.155	-0.098
Insufficient technology	0.533	0.084	-0.003	0.039	-0.017	0.068
Lack of collateral	0.097	0.492	0.073	0.092	-0.109	0.043
Lack of access to physical infrastructure	0.504	-0.049	0.172	0.184	-0.159	0.031
Limited access to skill training	0.071	0.117	0.493	-0.059	-0.141	0.012
Lack of information access	-0.016	-0.132	0.578	0.021	0.112	-0.025
Unable to compete with large enterprises	0.055	-0.180	0.078	0.715	-0.049	-0.057
Inadequate demand for the product/service	-0.044	0.229	-0.161	0.597	0.153	0.022
Weak linkage between MSEs & gov't institutions	0.098	-0.030	-0.006	0.035	-0.096	0.570
Weak linkage between MSEs & private institution	-0.065	0.023	0.013	-0.040	0.044	0.564
Weak linkage between MSEs & large enterprises	0.005	-0.006	-0.015	-0.009	0.069	0.575
Too many and complex rules and regulations	-0.004	-0.045	0.089	-0.048	0.638	0.047
Bureaucracy in licensing and registration	-0.001	0.018	-0.037	0.092	0.658	-0.013

Source: computed from own survey data, 2010

3.2.2 Business Constraints and other Factors Inhibiting the Growth of MSEs

The multiple linear regression analysis is used to analyze the extent to which the growth of MSEs is associated with the constraints of enterprise growth. In the regression, the PCs have entered with their own scores from PCA into the regression so that they represented the business constraints with six constructs such as limited access to premises; limited access to finance; limited access to business services; limited access to market; unfavourable government policy and weak institutional linkage. In addition, several control variables were included in order to come up with the genuine association between the PCs and the growth of enterprise.

The estimation result of the multiple regression is presented in Table 3.3. Regarding the constraints of enterprise growth the variables such as limited access to finance, limited access to business services and limited access to market were found to be important in explaining growth of the enterprises in the study area and hence became statistically significant at 10%, 5% and 10% levels of significance respectively. The signs for these variables are negative, revealing strong inverse relationship between the constraints and growth of enterprises. The coefficients for these variables explain the magnitude of the constraints towards affecting the growth of enterprises. Limited access to business services found to be the most influential factor in determining enterprise growth followed by access to finance and access to market, respectively. Thus, the importance of accesses of various productive resources (finance and Business services) and access to market for MSE sector is worth considering for policy makers as a positive knock on effect for MSEs.

Indeed, the significant variables do not have equal influence on the growth of enterprises with some descriptive characteristics of the owners and the enterprises. For instance, legal form and enterprise size are statistically significant to indicate the existence of unequal influence of variables such as the productive resources and accesses to market on legal ownership of the enterprise and size-group of the enterprise. More specifically, the employment growth of the cooperative enterprises is highly affected by these variables than that of sole proprietorship enterprises. Similarly, the influence of these

variables on the growth of microenterprises is much bigger than that of small enterprises. However, variables like gender and age of the operator are not significant so that for gender aspect it can be inferred that the influence of the variables on the growth of enterprises led by men and women is not significant.

Table 3.3 Effects of constraints and other factors on growth of MSEs

Variables	Coefficients	Std. Error
Limited access to premises (accprem)	-0.096	0.129
Limited access to finance (accfin)	-0.224*	0.122
Limited access to business services (accbs)	-0.274**	0.130
Limited access to market (accmkt)	-0.208*	0.125
Unfavourable government policy (gvtpolc)	-0.054	0.124
Weak institutional linkage (instlkg)	-0.030	0.126
Gender of the operator (gender)	0.071	0.134
Age of the operator (age)	0.016	0.031
Age squared (age^2)	-0.001	0.004
Marital status of the operator (mrst)	-0.047	0.134
Education of the operator (educ)	0.298*	0.172
Experience of the operator (exp)	-0.001	0.014
Family size of the operator (fmlsize)	-0.021	0.035
Position of the operator (positn)	0.299*	0.179
Motivation of the operator (motivn)	0.239*	0.134
Previous occupation of the operator (preoccup)	-0.118	0.125
Other investment by the operator (othrinvt)	0.342***	0.126
Enterprise age (entage)	-0.251**	0.123
Location of the enterprise (locn)	-0.150	0.137
Legal ownership of the enterprise (legform)	-0.302**	0.135
Sub-sector of the enterprise (subsec)	0.066	0.129
Size-group of the enterprise (entsizg)	0.317***	0.119
Finance source of the enterprise (finsrc)	-0.134	0.129
Constant	1.593	0.618
* = Significant at 10% ** = Significant at 5% *** = Significant at 1%		
F (23, 200) = 1.60; Prob > F = 0.046; R^2 = 0.1552		

Source: computed from own survey data, 2010

As far as the owner-managers' attributes are concerned, the previous working experience of the owner-managers that they may have acquired prior to

starting up their business does not seem to influence growth of enterprises in the study area, even though, other researchers have found evidence that operators with prior work experience are more successful at raising growth (USAID 20002). Instead, the difference in performance of enterprises in the study area emanates from human capital related to the owner-manager. To this regard, education or having at least secondary education is statistically significant at 10% level of significance.

The estimated coefficients for variables position of the operator (positn) in the enterprise and motivation of the operator to start the business (motivn) are statistically significant at the 10% and have positive signs. i.e., enterprises led by the owners grow by 0.299% than those led by non-owner operators. Also enterprises established by self-motivated operators grow by 0.239% growth rate than those enterprises established by any other motivation of the operator specially those established due to lack of alternative likelihood.[1] This is also supported in the study conducted by Ishengoma and Kappala, 2008. According to this study, if the owner's motivation to establish the business is to be self-employed, then the business is likely to prosper; if the owner's motivation to start the business is to meet his/her household's subsistence needs, then the business is not likely to grow and perform well. The plausible explanation for the statistically significant positive effect of position and motivation is that if the manager is the owner and he/she is self motivated manager at a time, he/she will be dedicated for every measures and decisions that help to make the enterprise more prosperous.

Concerning to the characteristics of enterprise, enterprise age (entage) is statistically significant at 5% and negative. Thus, the younger the enterprises are the more likely they grow faster (by 0.251%). This result is consistent with Jovanovic's, 1982 model of passive learning model and competitive selection. That is, an additional year in the firm age implies a reduction employment growth rate by 0.076%. Legal form of business ownership (legform) is statistically significant at 5%. Growth rate of enterprises with cooperative

[1] Since the dependent variable (growth in employment) is computed by Average Compound Growth Rate (ACGR) in percent with the standardized formula the change in the dependent variable has to be presented in percent.

form of legal ownership decreased (by 0.302%) than those enterprises with the other form of legal ownership such as partnership and sole proprietorship.

This may be due to the fact that the policy guide to form a cooperative requires a minimum of ten members so that a cooperative starts with at least ten members and if all members are working in the cooperative, then from the beginning large number of workers is working in the cooperative. The need for an additional worker could be minimal. Moreover, even if a worker is added, the growth in terms of percentage could be minimal for the denominator in forming the percentage is already large. But if we look at a sole proprietorship or partnership forms of business, the need for additional workers could be indispensable from the beginning for there could be few workers to begin with. Moreover, if one worker is added, the percentage change in employment could be large because of the fact that there were only few workers working.

The size-group of enterprise is also found to be important in explaining growth. The variable is statistically significant at 1% and positive which reveals that micro enterprises register high growth rates than their larger counterparts.[2] This result corroborated with the results obtained in the descriptive analysis and also confirmed to the implication of theoretical models that smaller and younger firms should have higher and more viable growth rates (Stranova, 2001 and Goedhuys, 2002).

3.2.3 Linking Operators' perceptions on Growth potential of Income to Business Constraints

Since it is another pattern of dealing with growth of enterprises in terms of perceived income situation of the enterprises a set of explanatory variables used in the multiple regression analysis also involved in this model of binary logit model and hence the estimation results of the logit estimates are

[2] The size-group of the enterprise refers to the category of MSEs into two main groups as micro enterprises and small enterprises on the basis of the amount of capital acquisition and the number of employed workers as well. For further explanation see the Ethiopian ministry of trade and industry, 1997 and the central statistical authority of Ethiopia, 2003.

presented in Table 3.4. Accordingly, the first three variables limited access to premises, limited access to finance and limited access to business services significantly affect the income growth potential of enterprises. These variables are statistically significant at 1%, 1% and 5% respectively. Among these variables limited access to finance found to be most important determinant of enterprise growth in terms of income situation. This may be due to that banks and other financial institutions are usually reluctant to provide credit facilities to MSEs because lending to them brings less profit, high credit administration costs and greater risks. This is especially true when many enterprises are typically deficient in equity and acceptable collateral (Abdullah and Baker, 2000).

These results particularly the limited access to finance and limited access to business services complies with the results obtained in the multiple linear regression analysis in the previous section. These findings also corroborate with the other studies (eg. Ishengoma 2004b, Kimuyu 2004) that limited access to productive resources (finance and business services) is main obstacle to growth and performance of MSEs. In addition, the results also verify the already formulated alternative hypothesis in this study. That is, MSEs operators' perception on growth potential of enterprise income is highly influenced by business constraints.

The same descriptive variables raised in the multiple regression could also be taken in this logistic regression. To this regard, the variables such as productive resources and accesses to premises have different influential power on growth potential of enterprises income. Moreover, variables such as legal ownership of the enterprise, size-group of the enterprise and age of the operator also significantly affect the growth potential of income. Accordingly,, the growth potential of income in cooperative enterprises is more affected by these variables than that of sole proprietorship enterprises. Similarly, the influence of these variables on the growth of microenterprises is higher than that of small enterprises. With regard to age of the operator, enterprises run by younger operators are affected more than enterprises run by older operators.

Table 3.4: Logit estimates

Variables	Panel A: logit estimates		Panel B: the marginal effect (ME) after logit. y= Pr(ingrow) (predict) Thus, y = 0.46	
	Coeff.	Std.err	ME	Std.err
Limited access to premises	-0.901***	0.340	-0.221***	0.081
Limited access to finance	-1.329***	0.346	-0.319***	0.077
Limited access to business services	-0.326**	0.165	-0.181**	0.092
Limited access to market	-0.114	0.317	-0.028	0.079
Unfavourable government policy	0.292	0.319	0.072	0.079
Weak institutional linkage	0.035	0.323	0.009	0.080
Gender of the operator	-0.242	0.348	-0.060	0.086
Age of the operator	0.199**	0.089	0.049**	0.022
Age squared	-0.003**	0.001	-0.001**	0.001
Marital status of the operator	0.811**	0.349	0.199**	0.083
Education of the operator	0.067	0.454	0.017	0.113
Experience of the operator	0.006	0.034	0.001	0.008
Family size of the operator	0.103	0.089	0.026	0.022
Position of the operator	-0.279	0.468	-0.069	0.113
Motivation of the operator	-0.284	0.345	-0.070	0.084
Previous occupation of the operator	-0.443	0.323	-0.109	0.079
Other investment by the operator	0.065	0.389	0.016	0.097
Enterprise age	-0.161***	0.058	-0.039***	0.014
Location of the enterprise	0.488	0.352	0.121	0.087
Legal ownership of the enterprise	-0.759**	0.357	-0.186**	0.085
Sub-sector of the enterprise	-0.022	0.333	-0.006	0.083
Size-group of the enterprise	0.481*	0.272	0.194*	0.109
Finance source of the enterprise	-0.169	0.332	-0.042	0.083
Constant	-3.648	1.847		

* = Significant at 10% ** = Significant at 5% *** = Significant at 1%

Log likelihood = -128. 4286; LR chi^2 (23) = 52.80; Prob>chi^2 = 0.0004; Pseudo R^2 =0.1705

Source: computed from own survey data, 2010

Concerning to the owner-managers attributes the variables age and age squared (age^2) are statistically significant at 5%. The variable age is positive indicating that a probability that income experiences growth increased with age. But, the coefficient for age^2 is negative implies that the positive association between age of the operator and income growth of the enterprise does not continue throughout. It is only up to a certain level of age that both age and income growth goes together. But afterwards the relationship

becomes negative implying that at the early (young) age of the operator there is a positive probability that income experiences growth whereas at a later (old) age, it is just the opposite. For marital status, enterprises those led by married operators have a higher probability of income growth (19.9%) than those led by otherwise. This could be due to that married operators might get complementary supports from their spouse than unmarried operators although responsibility in the family could be an additional burden for married operators.

Regarding the characteristics of enterprises, enterprise age is negative and statistically significant at 1%, which indicated that young enterprises are more likely to grow faster than older ones. This result is consistent with the result in the case of growth in employment as discussed in the previous section. In addition, legal form of ownership and size-group of enterprise significantly influence income growth. That is, cooperative types of business have a lower level of probability to record income growth than other type of enterprises. With regard to enterprise size-group, the higher is the size of an enterprise, the lower the probability to experience income growth. Like enterprise age, the results of these two variables were confirmed with the results in the case of growth in employment.

Largely, the results in the two regression analyses reveal two important patterns. The first pattern concerns the employment growth of MSEs while the second pattern deals with the operators perception on the growth potential of enterprise income. With regard to the first pattern, the business constraints such as limited access to finance, limited access to business services and limited access to market are significantly and negatively affecting the employment growth of MSEs. On the basis of the second pattern, the business constraints such as limited access to premises, limited access to finance and limited access to business services are significantly and negatively affecting the growth potential of enterprise income. Hence, both patterns highlight that the growth of MSEs in the study area are highly influenced by the specified business constraints.

4. Conclusions and Recommendations

The aim of this study was to examine the extent to which the growth potential and performance of MSEs are associated with business constraints in the south Wollo zone of Amhara region. The study used a survey 224 MSEs focusing on the potential constraints and also firm owner specific characteristics that may influence the growth of the enterprises. Both descriptive and econometric tools were used to estimate and analyze the data.

The summary statistics in the descriptive analysis showed that most of the sample enterprises were operated by men and few of the owner-managers had secondary school education. The mean age of the operators is 31.8 and most of the enterprises had little experience in running the businesses. Therefore, the business opportunities were skewed towards younger, less educated, less experienced and male group operators. MSEs in the south Wollo zone started with an average paid up capital of 10, 283 birr and with an average of 8 employees. At the time of the study, enterprises included in the study had an average of approximately 27,221 birr paid up capital and 10 employees. The capital-labor ratio comparison between at start up and currently shows that capital grew faster than employment and hence the enterprises became more of capital intensive.

The regression results of the econometric analysis verified that business constraints particularly, limited access to market and productive resources (finance and business services) hinder the employment growth potential of MSEs. The employment growth of the cooperative enterprises is highly affected by these constraints than that of sole proprietorship enterprises. Similarly, the influence of these constraints on the growth of microenterprises is much bigger than that of small enterprises. So this clearly informs the concerned government bodies and some other stakeholders that much emphasis should be given to the cooperative type of enterprises and microenterprise so as to promote their growth.

In addition, when MSEs experience limited access to premises, limited access to finance and limited access to business services the growth potential of their income likely to decrease. Thus, the specified business constraints

are negatively and significantly affect the growth of MSEs. Particularly, limited access to productive resources such as finance and business services are the most important factors for MSEs to perform better and to grow. These factors have different influential power on legal ownership of the enterprise, size-group of the enterprise and age of the operator, but not on the gender of the operator. As a result, the growth potential of income in cooperative enterprises is more affected by these variables than that of sole proprietorship enterprises. Similarly, the influence of these variables on the growth of microenterprises is higher than that of small enterprises. With regard to age of the operator, enterprises run by younger operators are affected more than enterprises run by older operators.

Thus, any concerned body should be recommended to exert relatively much effort on cooperative enterprises, microenterprises and enterprises led by younger operators. As away out to financial constraints of MSEs a number of innovative mechanisms could be implemented. These include group lending approaches, small and increasing credit, and link of credit savings or micro financing institutions through NGOs. Furthermore, a guarantee schemes as such allocating finance exclusive to the MSE sector should be designed to support micro and small enterprises who cannot meet bank and financial collateral requirements.

With respect to the business services provided to the MSEs the stakeholders particularly the government should work more on the provision of services such as business counseling and advise, and skill training through establishing the MSEs operators training institutions so as to give short term and long term trainings for the enterprises operators. It is also advisable to create opportunities for the MSEs to share experiences at national and global levels through bazaars and trade fairs. This may help them to obtain better access to market, technology, knowledge and managerial skills.

When MSEs face market problems related to limited customers coupled with high competition, MSEs need to have access to differentiated market segments which operate without stiff competition. This may enable them to attain higher levels of turnover at lower transaction costs and, hence, higher profits. From the policy perspective, some practical measures like

involvement of MSEs in the public procurement market, and the strengthening of MSEs horizontal joint actions in the area of marketing should be undertaken by stakeholders to enhance MSEs' access to market. To mitigate the problems associated with access premises serving businesses with industrial land or working space is one feasible area of intervention to sustain the growth of enterprises. For example, the government should build commercial centers and transfer to the MSEs at low cost on credit basis.

References

Abdullah, M. A. and Baker, M. (2000). *Small and Medium Enterprises in Asian Pacific Countries* (eds.), Science Publishers Inc., Huntington, New York.

Ayalew, S. (2007). Empirical Impact Assessment of Business Development Services on Micro and Small Enterprises in towns of Amhara National Regional State Addis Ababa University School of Graduate Studies, Addis Ababa.

Belay, G. (2000). Evaluation of the Performance of the Private Sector Economy in Ethiopia (1991-1999). Addis Ababa: Ethiopian Ministry of Trade and Industry.

Central Statistical Authority. (2003). Urban Informal Sector Sample Survey. Addis Ababa, Central Statistical Authority of Ethiopia.

Dunteman, G. (1999). *Principal Component Analysis: Quantitative Applications in Social Science*, Sage University, United Kingdom.

Elias, B. (2005). Role of Micro and Small Enterprises in Local Economic Development, The Case of Awassa, in Tegegne Gebre-egziabher and Helmsing A. H. J (eds.), Local Economic Development in Africa, Enterprises Communities and Local Government, The Netherlands, Shaker Publishing.

Federal Micro and Small Enterprise Development Agency (FeMSEDA). (2005). Flier of Federal Micro and Small Enterprises Development Agency, Addis Ababa

Gebrehiwot, G. (2006). Managerial Performance Measurement in Small Scale Industries. Graduate Studies of Addis Ababa University, Addis Ababa.

Gebre-egziabher, T. and Demeke, M. (2005). Small Businesses in Small Towns of the Eastern Amhara Region: Nature and Economic Performance A Research Report on IDR, Addis Ababa University.

Goedhuys, M. (2002). Employment Creation and Employment Quality in African Manufacturing Firms. International Labor Organization, Geneva, International Labor office.

Gujarati, D. (1998). *Basic Econometrics*, Third Edition, McGraw Hill Book Company, New York.

International Labor Organization (ILO). (2000). Profile of Employment and Poverty in Africa: Report on Ethiopia, Nigeria, Ghana, Tanzania, Kenya, and Uganda. East Africa Multi – Disciplinary Advisory Team (EAMAT). ILO Publications, Geneva.

Ishengoma, E. (2004). The Role of Firm-Resources: Performance Differentials between Women- and Men-Owned Micro-Enterprises in Tanzania. University of Leipzig

Ishengoma, E. and Kappel, R. (2008). Business Constraints and Growth Potential of Micro and Small Manufacturing Enterprises in Uganda, German Institute of Global and area Studies, Hamburg, Germany

Jain, R. Duin, and J. Mao. (2000). Pattern Recognition in higher Dimensional Space: A Review, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 22, no. 1, pp. 4-37

Jovanovic, Boyan. (1982). Selection and the Evolution of Industry. *Econometrica* 50, no. 3: 649–70.

Johnson, Peter; Cheryl Conway; and Paul Kattuman. (1999). Small Business Growth in the Short Run. *Small Business Economics* 12, no. 2: 103–12.

Kaiser, H. F. (1960). The Application of Electronic Computers to Factor Analysis. Educational and Psychological Measurement, 20, 141-151.

Kimuyu, P. (2004). Transformation of Small Firms and its Productivity Implication: Insights from Small Manufacturers in Kenya, Nairobi: University of Nairobi Working Paper, Economics Department and Institute for Development Studies.

Liedholm, C., and Mead, C. Donald. (1999). Small Enterprises and Economic Development: The Dynamics of Micro and Small Enterprises, Rutledge Studies in Development Economics, New York.

Lyne M. C. (2003). *Personal Communication*. Professor, Discipline of Agricultural Economics, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

Maddala, G. S. (1997). *Introduction to Econometrics*: 2nd ed., 1997 Business Economics University of Florida and Ohio State University, MacMillan Publishing Company, New York.

Manly, B. F. J. (1986). *Multivariate Statistical Methods: A Primer*. Chapman and Hall, London.

Ministry of Trade and Industry. (MoTI). (1997). Micro and Small Enterprise Development Strategy of Ethiopia, Addis Ababa, Ethiopia, MoTI

Sharma, S. (1996). *Applied Multivariate Techniques*, University of South Carolina, John Wiley and Sons, Inc, New York.

Stranova, O. (2001). Determinants of Job Creation and Job Destruction in Ukraine. National University of Kirk Methyl Academy, Ukraine.

USAID and CEU Labor Project. (2002). What Makes Small Firms Grow? A Study of Success Factors for Small and Micro Enterprise Development in Romania, Bucharest

Wolday, A., and Gebrehiwot, A. (2004). Business Development Services (BDS) In Ethiopia: Status, Prospects, and Challenges in the Micro and Small Enterprise Sector. A Paper Presented in the International Conference on Micro finance Development in Ethiopia, 21-25 Jan 2004, Awassa, Ethiopia.

Wright, R. E. (1995). Logistic Regression: Reading and understanding Multivariate Statistics, American Psychological Association, Washington Dc.

Appendix A

Table A.1: Description of potential constraints used in the model

Constraints	Description
Accbuscsl	Limited access to business counseling and advise
accinf	Lack of information access
accphinfr	Lack of access to physical infrastructure
accskltrn	Limited access to skill training
accsucap	Limited access to start up capital
accwrkcap	Limited access to working capital
coltrl	Lack of collateral
complrgent	Unable to compete with large enterprises
insftdd	Inadequate demand for the product/service
instech	Insufficient technology
lgmsegov	Weak linkage between MSEs & government institutions
lgmeslaent	Weak linkage between MSEs & large enterprises
lgmseprt	Weak linkage between MSEs & private institution
licregit	Bureaucracy in licensing and registration
opspselout	Inadequate operation space and selling outlet
rulreg	Too many and complex rules and regulations

Table A.2: Growth and performance of MSEs

Variables	Obs.*	Mean	Std. Dev.	Min.	Max.
Employment at start up (empsu)	224	8	5.86	1	28
Employment currently (empcur)	224	10	7.05	1	51
Capital at start up (capsu)	224	10,283.26	16656.95	100	120000
Capital currently (capcur)	224	27,221.63	54463.78	250	600000
Average monthly sales at start up (amsvsu)	224	2803.66	5068.12	50	45000
Average monthly sales currently (amsvcur)	224	5489.06	12404.60	50	150000
Capital-labor ratio at start up (klrsu)	224	1619.84	2517.58	6.4	17835
Capital labor ratio currently (klrcur)	224	3527.84	8147.68	33.3	100000

* Observation

Source: computed from own survey data, 2010

Table A.3: Growth measures of enterprises by size-group

Growth measures of enterprises	Size-group		Both size groups		
	Micro-enterprise	Small-enterprise	Mean	Min.	Max.
Annual Compound Growth Rates-ACGR (%)	0.13	0.09	0.11	-0.81	2
Annual Average Growth Rate in Employment-AAGRE (%)	0.16	0.14	0.15	-0.42	2
Annual Average Growth in Jobs-AAGJ	0.74	0.80	0.77	-5	11

Source: computed from own survey data, 2010

Table A.4: Eigenvalues of the components (comps)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.37334	0.98698	0.2108	0.2108
Comp2	2.38635	1.00119	0.1491	0.3600
Comp3	1.38516	0.11468	0.0866	0.4466
Comp4	1.27047	0.04799	0.0794	0.5260
Comp5	1.22248	0.18803	0.0764	0.6024
Comp6	1.03444	0.25999	0.0647	0.6670
Comp7	0.77445	0.05020	0.0484	0.7154
Comp8	0.72424	0.07559	0.0453	0.7607
Comp9	0.64865	0.04090	0.0405	0.8012
Comp10	0.60775	0.02693	0.0380	0.8392
Comp11	0.58081	0.04646	0.0363	0.8755
Comp12	0.53434	0.06788	0.0334	0.9089
Comp13	0.46646	0.06468	0.0292	0.9381
Comp14	0.40177	0.05774	0.0251	0.9632
Comp15	0.34403	0.09882	0.0215	0.9847
Comp16	0.24521		0.0153	1.0000

Source: computed from own survey data, 2010

Reliability coefficients for each PCs and composite of PCs

Table A.5a: Reliability coefficients for each of PCs

No.	**PCs**	**No. of items**	**Cronbach ~ coefficients**
1	Limited access to premises	2	0.6529
2	Limited access to finance	3	0.6186
3	Limited access to business services	3	0.7241
4	Limited access to market	2	0.6727
5	Unfavourable government policy	2	0.6196
6	Weak institutional linkage	3	0.8351

Table A.5b: Reliability coefficients for the composite of PCs

Composite cronbach ~ coefficient	**No. of items**
0.7841	16