

DETERMINANTS OF PRIVATE INVESTMENT DECISION USING TOBIT ANALYSIS: CASE STUDY OF DESSIE AND KOMBULOCHA CITY-ETHIOPIA

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ABSTRACT

Private investment is a crucial pre-requisite for economic growth because it allows entrepreneurs to set economic activity in motion by bringing resources together to produce goods and services. Ethiopian Government provides opportunities to private investment but still there are many challenges in terms of cost and investment risks. There is a need to conduct research on micro level factors affecting private investment in Ethiopia particularly with Dessie and kombolcha City Administration. For this purpose, 130 private investors are selected based on started operation and implementation stages in their investment activities as willing and non-willing investors and also used both primary and secondary data. Econometric Method of analysis was adopted using Tobit Model and also employed descriptive analysis to analyze the survey data. The results of the research showed that firm size, education, access to land, interest rate, legal system and corruption were the most important determinants of private investment in the study area. Based on these, the Government and Ministry of Finance and Economic Development should formulate policies to expand the education activities to more regions, introduce proactive land development and administration procedure, make loans available at reasonable interest rate etc. to control investment challenges and make economically prosperity nation.

Keywords: Private Investor, startups and implementation stages, Tobit Model, Willing and non-Willing Investor.

JEL Code: C39, G29, M13

INTRODUCTION

Ethiopia is one of the poorest countries in the world. It is among least-developed countries and ranked 170 out of 177 countries in the UNDP human development index of 2003 (UNDP, 2005). The Ethiopian economy is highly dependent on agriculture, which in turn depends on nature. Over 85% of the employment is generated in this sector and it accounts for about 52% of GDP and 90% of the export earnings. The industrial sector on the other hand accounts for about 12% of GDP (Alemayehu Geda and Befkadu, 2002).

The private sector is the main engine of growth in market economies. It is expected to deliver sustained growth when combined with conducive environment for the private sector to develop. Private investment is increasingly important for creating employment, raising growth rates and reducing poverty. Not only the expansion of private production capacity matters for economic growth; the productivity gains that result from capital deepening and modernization are important as well (OECD, 2005).

Ethiopia is now strongly seeking investment in all sectors in general and in agro processing sub sector in particular from foreign as well as domestic sources. The Foreign Direct Investment (FDI) which most of the time takes the form of private investment is expected to bring entrepreneurial skills and new technologies in addition to capital. Private Sector Development (PSD) is about enabling the enhanced utilization of labor and other resources of the country through the growth of private business by providing enabling environment both in domestic and overseas markets (MoFED, 2000).

A close look at the evolution of private investment in Ethiopia reveals that during 1992-2006 the Federal Investment Commission and Regional Investment Offices have licensed 18,769 investment projects with a planned initial investment capital of Birr 222.25 billion (EAI, 2006). Ethiopia has been implementing the Sustainable Development and Poverty Reduction Program (SDPRP) since 2001, as an on-going commitment of the Government and, as a framework for strategies and policy formulations. The program is under implementation based on the Agricultural Development Led Industrialization (ADLI) policy of the country. This is accompanied by civil service and justice system reforms, aimed to achieve good governance, decentralization and empowerment and, institutional capacity building (Teigist, 2006).

Ethiopia provides many opportunities for profitable investment primarily due to the large domestic market, favorable climate, and availability of cheap labor force. However, there are many challenges facing the private sector growth in Ethiopia. Poor infrastructure, bureaucratic regulations, and limited access to finance constrain the growth of the private sector. All of these challenges increase the costs and risks associated with investing in Ethiopia. In light of these challenges, the private sector needs to work in partnership with government and civil society to create the appropriate enabling environment for sustainable business growth (UNDP, *Unleashing Entrepreneurship : Making Business Work for the Poor*, 2004).

In the UNCTAD survey for Africa, Ethiopia is ranked third from the bottom (ahead only of Uganda and Malawi) in terms of perceptions of its attractiveness for foreign direct investment between 2000-2003 and its progress in improving the business environment during the same period was ranked fifth from the bottom only ahead of Zimbabwe, Zambia, Malawi, and Angola (UNCTAD, *World Investment Report*, 2004).

Therefore, Private investment is at the heart of growth and poverty reduction, creating opportunities and employment, increasing the choice and lowering the cost of goods and services, and providing a source for tax revenue. Private sector in Ethiopia is still in an early stage of growth, having been discouraged during the Derg regime. Most private businesses are family businesses, although some larger private companies are now managed by professional managers and boards of directors. Over the last ten years, a number of businesses including banks, insurance companies, hotels, travel agencies, manufacturing industries, real estates, health and education institutions, commercial farms and others have been set up by private investors. This paves the way to explore the current state of the private investment activities and the attendant constraints in the Dessie and Kombolcha City Administrations

LITERATURE REVIEW

Empirical studies conducted in Africa, Asia and Latin America have established the critical linkage between investment and the rate of growth (Ghura D. a., 1996), (Collier, 1999).

Throughout the 1990s, the ratio of total gross domestic investment to gross domestic product in Asia, which experienced a high average rate of growth compared with the rest of the world, was about 27 percent, while in Latin America and sub-Saharan Africa the corresponding ratios were 20 percent and 17 percent, respectively (Herandez-Cato, 2000).

Econometric evidence indicates that private investment has a stronger, more favorable effect on growth rather than government investment, probably because private investment is more efficient and less closely associated with corruption (Ghura D. H., 1996,1997,1999). It was reported that the ratio of private investment to GDP in the sub-Saharan African countries which had experienced poor rates of growth in the 1990s was less than 10 percent, compared with 16 percent in Latin America, 18 percent in advanced countries and 16.5 percent in newly industrialized countries in Asia (Herandez-Cato, 2000).

Neude (2000) investigated the determinants of investment and exports of South African Manufacturing Firms based on data from 61 manufacturing firms. Their findings showed that labor costs were high in comparison to other African countries where similar surveys were conducted. The capital intensity for large firms was comparable to the capital intensity of large firms in Zimbabwe, but was significantly higher than that observed in Ghana or Mauritius. Given that labor productivity was comparable, but capital intensity and monthly wages were significantly higher than those observed for Mauritius, the authors suggested that South African firms might face a cost disadvantage vis-à-vis successfully exporting firms located in Mauritius.

Getachew (1997) in his study on the determinants of private industrial investment in Ethiopia reported that severe constraining factors to private manufacturing investment included market, financial, infrastructure, policy, technology and input related factors. He further noted that the root causes for these problems were many and interdependent and the degree of severity of these problems was found to be independent of location of the enterprises.

Kaufmann (2003) have analyzed the business environment in Ethiopia in 2002. Among their conclusions were that the business climate in Ethiopia was inferior to the corresponding situation in sub-Saharan Africa in terms of “Voice and Accountability”, “Political Stability”, “Government Effectiveness” and “Regulatory Quality”, whereas the Ethiopian situation regarding “Rule of Law” and “Control of Corruption” was better in comparison with the sub-Saharan average.

The majority of reviews considered the factors relating to socio-economic and cultural to identify the determinants of private investment and also applied to other African countries and capital of Ethiopia. Further, the certain factors were not considered in firm level characteristics and Investment climate. Hence, the researcher fills the gap to ascertain the determinants of Private Investment in Ethiopia particularly in Dessie and Kumbolcha.

METHODOLOGY

In this research, both quantitative and qualitative designs were employed. To select sample respondents precisely, a probability sampling technique was used because the individual investor is actually responsible for making decisions on investment activities. Because of heterogeneity among investor groups, stratification of the private investors was found to be imperative.

Accordingly, the population of the study was private investors in Dessie and Kombolcha city that is registered and licensed by Amhara National Regional State Investment Bureau (ANRSIB). Total population of such investors was about 501 (ANRSIB, 2017). More specifically, the main stratification criterion was the status of their investment project. Stratum 1 encompassed investors who started operation and the total number of investors categorized under this stratum was 130. Stratum 2 consisted of investors who were in the implementation stage of their investment project and their total number was 126. Stratum 3 was composed of investors who were in the pre-implementation stage of their investment project and the total number of investors under this category was 245.

In the final stage sample investors were selected randomly using probability proportional to sample size sampling techniques. Since in proportional sampling the number of samples drawn from each stratum is proportional to the size of the stratum, 34, 33 and 63 private investors were randomly selected from stratum 1, stratum 2 and stratum 3, respectively. The total number of sample investors selected for this study added up to 130. Using the appropriate sample size (n) was determined by the formula (Panneerselvam, 2004).

$$n = \left(\frac{z\alpha}{D} \times \delta \right)^2 = \left(\frac{58.27 \times 1.96}{10} \right)^2 = 130.42$$

n=130

Where $z\alpha$ = standard normal distribution take value of 1.96

σ = standard deviation of investment return from previous study which is 58.27

D= desired accuracy to mean mostly assume 10

In this study both primary and secondary data were gathered for analytical purpose. The structured questionnaire was administered to the 130 selected sample investors in the study area. Secondary data include detailed information about approved private investment by Amhara National Regional State Investment Bureau and Dessie and Kombolcha City Administration Investment offices for the period under consideration. Moreover, other relevant government and non-government organizations like the Ministry of Finance and Economic Development (MoFED), Central Statistical Authority (CSA), Industrial Project Service (IPS) were also used as sources of secondary data.

The dependent variable of this study is the amount of initial investment capital. This refers to the total initial capital in Birr, registered for investment activities. This is a continuous variable that will help to capture the preference of an investor to participate in investment activities by contributing money, labor, time and his entrepreneurial ability.

The Investors who are started operations or under the implementation phase were categorized as “willing” investors. The amount of capital that an investor registered while obtaining his/her investment permit is used to measure the intensity of capital use for the investment project in question. This variable takes a value of greater than zero for those investors who had started operation or under the implementation phase. Whereas, those investors who were in the pre-implementation stage or those who did not start any investment activity by the time the survey was conducted were categorized as “non-willing” investors so that their initial registered investment capital was censored to zero.

The independent variables of the study are those variables which have associations with private investment decision. Thus, 16 variables were identified to have direct/and indirect effect on private investment decision. The potential explanatory variables, which were

hypothesized to influence investors' decision on private investment in the study area, were classified in to two, namely firm level characteristics and investment climate indicators. Firm level characteristics included in this study are ownership structure (OWRST), level of education (EDLEV), firm size (FIMSZ), source of investment finance (SORIF), and access to adequate credit (ACACR). Whereas, the investment climate indicators considered in this study include interest rate (INTRT), access to infrastructure facility (ACINF), access to land (ACLND), legal system (LEGSY), bureaucratic red tape (BEURT), corruption (CORUP), access to adequate market (ACCMK), source of raw material (SORRM), cost of raw material (COSRM), practice of competitors (PRACO) and political instability (POLIN).

Econometric model

There are three types of regression models under the limited dependent variable models. These are censored or Tobit regression, Truncated regression and Sample Selection regression models. Inferring the characteristics of a population from a sample drawn from a restricted part of the population is known as truncation. A truncated distribution is the part of an untruncated distribution that is above or below some specified value (Green, 2000) whereas a sample in which information on the regressed is available only for some observation is known as censored sample. Therefore, the Tobit model shown below is a censored regression model because it is possible to view the problem as one where observations of the dependent variable (Y^*) at or below zero are censored (Johnston, 1997). While, truncation changes the sample size, censoring does not.

The Tobit model used to identify factors influencing the willingness to invest and intensity of capital use is shown in equation (1). This model will be employed because; it has an advantage over other models (such as Linear Probability Models, Logit, and Probit) in that, it reveals both the probability of willingness to invest and intensity of investment capital use. The coefficients of the Tobit model can be disaggregated to determine the effect of a change in one variable on changes in the probability to invest and in the expected intensity of investment capital use.

Following Tobin (1958), the Tobit model can be defined as:

$$Y_i^* = \beta X_i + u_i \quad i = 1, 2, \dots, n \quad (1)$$

$$Y_i = Y_i^* \text{ if } Y_i^* > 0 \quad (2)$$

$$= 0 \text{ if } Y_i^* \leq 0$$

Where:

Y_i = the observed dependent variable, in this case amount of initial investment capital registered for investment activities.

Y_i^* = the latent variable which is not observable.

X_i = vector of independent variables affecting willingness to invest and intensity of investment capital use

β_i = vector of unknown parameters

u_i = residuals that are independently and normally distributed with mean zero and a constant variance σ^2

$i = 1, 2, \dots, n$. (n is the number of observation)

Note that the threshold value in the above model is zero. This is not a very restrictive assumption, because the threshold value can be set to zero or assumed to be any known or unknown value (Amemiya, 1985).

The model parameters are estimated by maximizing the Tobit likelihood function of the following form (Amemiya, 1985) and (Maddala, 1997).

$$L = \prod_{Y_i^* > 0} \frac{1}{\sigma} f\left(\frac{Y_i - \beta_i X_i}{\sigma}\right) \prod_{Y_i^* \leq 0} F\left(\frac{-\beta_i X_i}{\sigma}\right) \quad (3)$$

Whereas: f and F are the density probability function and cumulative distribution function of Y_i^* , respectively. \prod Means the product over those i for which $Y_i^* \leq 0$, and $\prod_{Y_i^* > 0}$ means the

product over those i for which $Y_i^* > 0$.

A SPSS_v20 software was employed to run the Tobit model. It may not be sensible to interpret the coefficients of a Tobit in the same way as one interprets coefficients in an uncensored linear model (Johnston, 1997). Hence, one has to compute the derivatives of the estimated Tobit model to predict the effects of changes in the exogenous variables.

The Tobit coefficients do not directly give the marginal effects of the associated independent variables on the dependent variable. But their signs show the direction of change in probability of investment and the intensity of investment capital use as the respective explanatory variable changes (Amemiya, 1985).

Mc Donald, (1980) proposed the following techniques to decompose the effects of explanatory variables into the probability to invest and intensity of investment effects. Thus, a change in X_i (explanatory variables) has two effects: it affects the conditional mean of Y_i^* in the positive part of the distribution, and it affects the probability that the observation will fall in that part of the distribution. This decomposition approach is used in this study.

1. Change in the probability (willingness) to invest as independent variable X_i changes is:

$$\frac{\partial F(Z)}{\partial X_i} = f(z) \frac{\beta_i}{\sigma} \quad (4)$$

2. The marginal effect of an explanatory variable on the expected value of the dependent variable is:

$$\frac{\partial E(Y_i)}{\partial X_i} = F(z) \beta_i \quad (5)$$

Where, $\frac{\beta_i X_i}{\sigma}$ is denoted by z , following (Maddala, 1997)

3. The change in intensity of capital use for investment with respect to a change in an explanatory variable among those who invested:

$$\frac{\partial E(Y_i / Y_i^* > 0)}{\partial X_i} = \beta_i \left[1 - Z \frac{f(z)}{F(z)} - \left(\frac{f(z)}{F(z)} \right)^2 \right] \quad (6)$$

Whereas: $F(z)$ is the cumulative normal distribution of Z , $f(z)$ is the value of the derivative of the normal curve at a given point (i.e., unit normal density), Z is the z-score for the area under normal curve, β is a vector of Tobit maximum likelihood estimates and σ is the standard error of the error term.

Diagnosis of multicollinearity

Before proceeding with the estimation of the specified model, the variance inflation factor (VIF) technique was used to evaluate the degree of multicollinearity among the continuous explanatory variables. In this case, a series of 'test' regressions are run such that each continuous explanatory variable is regressed on all other continuous explanatory variables, the coefficient of determination R^2 being computed in each case. If an approximate linear relationship exists among the explanatory variables, then this should show up a 'large' value of R_i^2 in at least one of the test regressions. In such a case, one may drop X_i from the model, provided it does not lead to a serious specification bias (Gujarati, 1995).

Following (Gujarati, 1995), VIF is defined as:

$$VIF(X_j) = \left(\frac{1}{1 - R_j^2} \right) \quad (7)$$

Where:

X_j = the j^{th} explanatory variable regressed on the other explanatory variables.

R_j^2 = the coefficient of determination in the (auxiliary) regression of X_j on the remaining regressors.

As a rule of thumb, if the VIF of a variable exceeds 10 (this will happen if R^2 exceeds 0.90), that variable is said to be highly collinear and it can be concluded that multicollinearity is a problem (Gujarati, 1995).

Similarly, Contingency Coefficients were computed to check for the degree of association among the discrete variables. A contingency coefficient is a measure of association from cross-classification data and is computed as:

$$C = \sqrt{\frac{\chi^2}{n + \chi^2}} \quad (8)$$

Where:

C = coefficient of contingency;

χ^2 = a Chi-square random variable; and

n = total sample size.

With respect to the decision criteria, a value of 0.75 or more is judged to indicate a stronger relationship among qualitative variables (Healy, 1984).

RESULTS

The sample investors are categorized into two groups that who are reported have operation and implementation stage of their investment project at the time of study were categorized as “willing” investors whereas; those investors who reported to have pre-implementation stage were classified as “non-willing”

Table 1: Types of Approved Investment Projects and its capital

Investment Project status	Approved investment projects		Investment capital	
	Number	%	In million Birr	%
Operation	126	25	1111.8	11.4
Implementation	130	26	1033.4	10.5
Pre-implementation	245	49	7652.7	78.1
Total	501	100	9797.9	100

Source: Computed by Author, 2019

Accordingly, out of 130 sample investors 67 and 63 were categorized as “willing” and “non-willing”, respectively. In this study it was found that 51% of the “willing”, 49% of the “non-willing”.

From the Table 2 shows about willing and non-willingness of investors, out of 130 sample investors, 60 (46 %) reported that they fully financed their investment projects from their own savings. Whereas the rest (54 %) reported that they used both their savings and bank loans to finance their investment projects. In this respect, the survey results show that 66% of the “willing”, 97% of the “non-willing” and 80.8% of the total sample respondents had a high school and beyond level of education. The results of the survey indicate that 66% of the

“willing” and 35% of the “non-willing” investors reported to have had access to institutional credit. Whereas, 34 % of the “willing” and 65% of the “non-willing” sample respondents reported that they had no access to institutional credit due to collateral problem, bureaucracy, corruption or inadequate credit. Moreover, 67% of the “willing” and 86% of the “non-willing” sample respondents believed that the prevailing interest rate was high and other sample respondents reported that the interest rate was not high. The survey results reveal that 57 % of the “willing” and 57% of the “non-willing” sample respondents reported that they had access to well develop infrastructure. Analysis of the survey data shows that 60% of the “willing” and 22% of the “non- willing” sample respondents reported that they had access to land. The survey results show that 75% of the “willing” and 35% of the “non-willing” sample investors reported that they perceived corruption as a serious problem. Accordingly, 60% of the “willing” and 83%

of the “non-willing” sample respondents had the feeling that output market access was not a problem. A great majority of the total sample respondents (77.7%), the “willing” sample investors (66%) and the “non-willing” sample investors (90%) reported that the costs of raw materials were quite high. In this respect, the sample respondents were asked to express their views on Political stability/instability at the national level nearly 70% of the “willing”, 71% of the “non-willing” and 70.8% of the total sample respondent reported that political instability was a serious problem in the country.

Table 2: Distribution of sample respondents based on type of investment projects

Description		Willing		Non-willing		Total	
		Number	%	Number	%	Number	%
Type of Investment fund	Own capital	30	45	30	48	60	46
	Own capital and bank loan	37	55	33	52	70	54
level of education	High school and beyond	44	66	61	97	105	80.8
	Below high School	23	34	2	3	25	19.2
access to institutional credit	Have access	44	66	22	35	66	51
	Have no Access	23	34	41	65	64	49
Level of interest rate	High	45	67	54	86	99	76.2
	Not high	22	33	9	14	31	23.8
Access to good Infrastructure	Yes	38	57	36	57	74	56.9
	No	29	43	27	43	56	43.1
Access to land	Yes	40	60	14	22	54	41.5
	No	27	40	49	78	76	58.5
Perception about the problem of corruption	It is a problem	50	75	22	35	72	55.4
	It is not a problem	17	25	41	65	58	44.6
Judgment about access to output market	Is not a problem	40	60	52	83	92	70.8
	Is a problem	27	40	11	17	38	29.2
Judgment about raw materials costs	Reasonable	23	34	6	10	29	22.3
	Very high	44	66	57	90	101	77.7
Source of raw material	Purely domestic	37	55	46	73	83	63.8
	Domestic and Foreign	30	45	17	27	47	36.2
perception of the country's political environment	Stable	20	30	18	29	38	29.2
	Unstable	47	70	45	71	92	70.8

Source: Computed from survey data, 2019

The average firm size of the total sample investors from the table 3, as measured by the number of employees in a firm was found to be 49.3 with a standard deviation of 50.2. This average masks differences among firms which ranged from 6 to 268 employees. The “willing” sample respondents employed on average 63 employees (Table 4). The corresponding figure for the “non-willing” sample respondents was 40.4. The t-test reveals the existence of statistically significant difference between the two sample investor groups with respect to this variable at 5% probability level.

Table 3. Distribution of sample respondents by firm size

Respondent group	Statistics		t -ratio
	Mean	St.dev.	
Willing	63	60.7	-2.34**
Non-willing	40.4	40.1	
Total sample respondents	49.3	50.2	

** Significant at 5 % probability level

Source: Computed from survey data, 2019.

Table 4. Summary of the composite index for investment climate proxy variables by respondent group (Mean and standard deviation)

Attribute	Willing		Non-willing		Total		t-ratio
	Mean	St.dev.	Mean	St.dev.	Mean	St.dev.	
Practice of competitors	0.61	0.06	0.60	0.09	0.60	0.08	-1.079
Bureaucratic red tape	0.36	0.26	0.27	0.28	0.30	0.28	-1.700
Status of the legal system	0.44	0.09	0.50	0.09	0.47	0.09	3.857***

*** Show significance at 1% probability level

Source: Computed from survey data, 2019.

A closer look at the practice of competitors reveals that the mean values of the composite index for the “willing”, “non-willing”, and the total sample investors were 0.61, 0.60 and 0.60, respectively (Table 4). The t-test indicates that there was no statically significant difference between the two groups of investors with respect to perception of the practices of competitors. The composite index capturing the respondents’ perception of administrative hurdles had mean values of 0.36 for the “willing”, 0.27 for the “non-willing” and 0.30 for the entire sample respondents. The t-test indicates the absence of statistically significant difference between the groups (Table 5). Likewise, the mean values of the composite index for respondents’ perception of the efficiency of the legal system were 0.44, 0.50 and 0.47 for the “willing”, “non-willing” and total sample respondent, respectively (Table 4). The t-test shows the existence of a statistically significant mean difference between the two groups of sample respondents in terms of their perception of the efficiency of the legal system at 1% probability level. This implies that the respondents’ perception of the efficiency of the legal system is a decisive factor in determining private investment decision in the study area.

Results of Econometric Model

Under this section, the effects of important socio-economic and institutional factors which were hypothesized to influence private investment decision were analyzed using the Tobit model and the Maximum Likelihood estimation procedure.

Table 5: Variance Inflation Factor for the continuous explanatory variable

Variables	R_j^2	Variance Inflation Factor (VIF) $VIF=(1-R_j^2)^{-1}$
FIMSZ	0.013	1.013
BEURT	0.003	1.003
PRACO	0.01	1.006
LEGSY	0.007	1.009

Source: Computed from survey data, 2019.

It is seen from the above table that all the VIF values are less than 10. This proves that there was no serious problem of multicollinearity among the continuous explanatory variables. Consequently, all of the continuous explanatory variables were used in the estimation of the specified model.

Table 6: Contingency coefficient for discrete variable

Variables	OWRST	EDLEV	SORIF	ACACR	INTRT	ACINF	ACLND	CORUP	ACCMK	SORRM	COSRM	POLIN
OWRST	1	0.159	0.111	0.057	0.073	0.183	0.099	0.019	0.115	0.044	0.056	0.034
EDLEV		1	0.024	0.033	0.002	0.070	0.024	0.072	0.099	0.159	0.067	0.056
SORIF			1	0.097	0.083	0.008	0.017	0.063	0.114	0.100	0.095	0.165
ACACR				1	0.079	0.620	0.066	0.187	0.103	0.001	0.035	0.066
INTRT					1	0.132	0.149	0.150	0.042	0.008	0.090	0.082
ACINF						1	0.005	0.032	0.056	0.057	0.056	0.089
ACLND							1	0.003	0.195	0.048	0.073	0.134
CORUP								1	0.036	0.001	0.035	0.069
ACCMK									1	0.061	0.100	0.041
SORRM										1	0.171	0.009
COSRM											1	0.060
POLIN												1

Source: Computed from survey data, 2019

The contingency coefficients were computed for each pair of discrete variables and the results are set out in table 7. From the table it can be concluded that there was no problem of strong association among the discrete variables as the respective coefficients were very low. Consequently, all the discrete explanatory variables were included in the estimation of the specified model.

DISCUSSION

Results of the Tobit model estimation are presented in Table 7. The results are very significant whereby the Chi-square value, capturing the goodness-of-fit, indicates that the model is significant at 1 percent probability level. The model results show that the coefficients of six of the sixteen explanatory variables that were hypothesized to affect potential investors' decision to invest were statistically significant. It is worth noting that all of these six explanatory variables that were found to significantly affect the level of investment had the hypothesized signs.

More precisely, the sample investor's level of education (EDLEV), firm size (FIMSZ), perception of the level of interest rate (INTRT), access to land (ACLND), perception of the legal system (LEGSY), and perception of the problem of corruption (CORUP) were found to significantly affect the level of investment. Among the six variables that were found to significantly affect the level of investment, the coefficients of the sample investor's level of education, firm size, access to land, and perception of the legal system were positive, implying that these variables had a significant investment-enhancing impact. Whereas the coefficients of perception of the level of interest rate, and perception of the problem of corruption had negative signs, implying that these variables had a significant investment-detering impact.

Table 7. Maximum likelihood estimates the Tobit model and the effects of change on selected explanatory variables on intensity of willingness to invest

Explanatory Variables	Estimated Coefficients	Standard Error	t-ratio	Change among the whole	Change among willing	Change in Probability
Constant	7.232	3.202	2.258			
OWRST	6.288	6.116	1.028	3.740102	2.63442	0.246434
EDLEV	1.341	5.506	2.435***	0.797627	0.561825	0.052555
FIMSZ	2.098	0.416	5.043***	1.24789	0.878978	0.082223
SORIF	-3.582	5.334	-0.671	-2.13057	-1.50071	-0.14038
ACACR	7.423	4.745	1.564	4.4152	3.10994	0.29092
INTRT	-1.393	6.365	-2.189**	-0.82856	-0.58361	-0.05459
ACINF	0.054	4.950	0.011	0.03212	0.02262	0.00212
ACLND	1.169	5.052	2.313**	0.695321	0.489764	0.045814
LEGSY	7.431	2.581	2.879***	4.419959	3.113291	0.291229
BUCRT	3.751	8.663	0.432	2.23109	1.57152	0.14701
CORUP	-1.127	5.182	-2.176**	-0.67034	-0.47217	-0.04417
ACCMK	2.329	5.448	0.427	1.385289	0.975758	0.091276
SORRM	-6.033	4.587	-1.315	-3.58843	-2.52759	-0.23644
COSRM	-0.598	5.486	-0.109	-0.35569	-0.25054	-0.02344
PRACO	-1.048	3.147	-0.333	-0.62335	-0.43907	-0.04107
POLIN	-5.976	5.159	-1.158	-3.55452	-2.5037	-0.23421

Source: Computed from survey data, 2019

*** and ** indicate significance at 1% and 5% probability level, respectively.

Log likelihood function = -951.4329 F (z) = 0.5948

Sigma (σ) = 9.89 f (z) = 0.3876

Z = 0.24

A closer look at Table 7 shows that the significant explanatory variables do not all have the same level of impact on investors' decision to invest. It is, therefore, important to discuss the effects of the significant explanatory variables on individual basis.

Accordingly, as expected, education level of the sample investor was found to be positively and significantly ($p < 0.01$) related to the likelihood that the investor chooses to proceed with the investment. The marginal effect of education level of the sample investor on the level of investment was 0.79 and education increased the probability of investment among the "non-willing" investors by 5.2%. Firm size was found to positively and significantly ($p < 0.01$) affect the propensity to invest. The marginal effect of firm size on the level of investment was 1.25 and firm size increased the probability of investment among the "non-willing" investors by 8.2%. One explanation for the positive and significant effect of firm size on the level of investment may be that the number of employees increases the opportunity of good returns on investment. Given that a considerable proportion of investment projects in the country are labor-intensive in nature, this argument appears plausible.

Another variable that played an important role in explaining variations in investment was access to land. The sign of its coefficient was found to be positive and significant ($p < 0.05$), indicating that investors with access to land showed greater propensity to invest. The marginal effect of access to land on the level of investment was 0.69 and access to land increased the probability of investment among the "non-willing" investors by 4.6%.

Similarly, the proxy for the efficiency of the legal system was positively and significantly ($p < 0.01$) related to the level of investment, implying that, other things being equal, if potential investors have positive opinion about the efficiency of the legal system, investment is more likely to occur. In other words, the positive and significant coefficient of LEGSY is a clear indication that the efficiency of the legal system is highly valued by potential investors. The marginal effect of the variable legal system on the level of investment was 4.42 and this variable increased the probability of investment among the “non-willing” investors by 29.1%. As illustrated in Table 7, the coefficient of the perception of the level of interest rate is negative and significant ($p < 0.05$), implying that higher interest rate does not increase potential investors’ propensity to invest. The marginal effect of this variable on the level of investment was -0.83 and this same variable decreased the probability of investment among the “non-willing” investors by 5.4%. As expected, investors’ perception of the prevalence of corruption was estimated to have a significant ($p < 0.05$) investment-detering effect. This result is consistent with the view that corruption impedes investment and thus economic growth. The marginal effect of corruption on the level of investment was -0.67 and the variable corruption decreased the probability of investment among the “non-willing” investors by 4.4%.

Intensity of capital use for investment activities

The second part of the Tobit model measures the extent of capital use with respect to a unit change of the explanatory variables among the “willing” group. The marginal effects of the significant explanatory variables of the censored regression on the level of investment by the “willing” investors are presented in the 6th column of Table 7.

The effect of change in the education level of sample investors increases the intensity of capital use by 0.56 million Birr among the “willing” investors. In the same manner, the change in firm size increases the extent of capital use by 0.88 million Birr among the “willing” group. As expected, access to land influences the level of capital use positively. In general, land accessibility increases the intensity of capital use by 0.49 million Birr among the “willing” investors. Perception of the efficiency of the legal system by sample respondents is another important variable, which significantly affected the level of capital use. The existence of an efficient legal system increases the extent of capital use by 3.11 million Birr among the “willing” group.

On the contrary, corruption and interest rate have a negative effect on the extent of capital use for investment. Holding other variables constant, the perception of the problem of corruption reduces the intensity of capital investment by 0.47 million Birr among the “willing” investors. Likewise, the fact that “willing” investors believe that the official bank interest rate is high would decrease the extent of their capital use by 0.58 million Birr.

CONCLUSION AND RECOMMENDATION

The econometric results show that the level of private investment in Dessie and Kombolcha City Administration was significantly and positively influenced by firm size, investor’s level of education, access to land and perception of the efficiency of the legal system by the sample investors. However, the perception of the level of interest rate by the sample investors and the problem of corruption were found to be negatively and significant related to the level of investment, implying that these variables had deleterious effects on the level of private investment in the study areas. The coefficients of the other variables, namely ownership structure, source of investment fund, access to institutional credit, access to infrastructure,

access to adequate and reliable market, cost of raw materials, source of raw materials, bureaucratic red tape, practice of competitors and political instability were not significant. It can be concluded that what can be drawn from this study is that micro level factors coupled with a favorable socio-political environment situations are essential ingredients for promoting private investment at operational level.

Based on the results, some policy implications are suggested to promote private investment in the study areas. The research indicates that education attainment is an important determinant of private investment in the study areas. This result is consistent with the findings of several studies (Smith, 2004; Kefay, 2005) carried out in many developing countries that have concluded that investing in human resources development is essential for poverty reduction, efficient utilisation of available resources, and economic development. The demand for competent and experienced professionals has always been high in Ethiopia. To address the problem of skilled manpower, the Ethiopian Government is engaged in reorganizing higher education institutions, including expansion of higher education activities to more regions and increasing institutional independence.

To encourage private investment in Dessie and Kombolcha City Administrations should introduce proactive land development and administration procedure, for accessing land for private investment.

The level of interest rate was found to have a significant investment-deterrent effect in the study areas. The implication is that a comprehensive measure to make loans available at reasonable interest rate is more capable of attracting private investment.

The problem of corruption and inefficiency of the legal system were found to have deleterious effects on private investment in the study areas. To create a favorable institutional environment, the investors' rights should be protected, laws and contracts are enforced, and public authorities and government officials discharge their responsibilities with transparency and accountability, must be given priority. In a nutshell, issues related to the legal system and corruption should be considered as an integral part of economic development policy formulation and implementation.

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