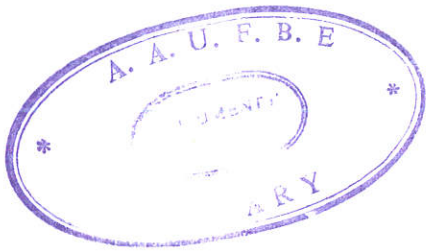
THE ROLE OF MICROFINANCING PROGRAMMES AND THE SUCCESS OF SMALL BUSINESSES IN URBAN ETHIOPIA: A CASE STUDY OF ADDIS ABABA



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The Role of Microfinancing Programmes and the Success of Small Businesses in Urban Ethiopia: A Case Study of Addis Ababa

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LIST OF ACRONYMS

CSA: Central Statistical Authority

ILO: International Labour Organisation

MTI: Ministry of Trade and Industry

MSEs: Micro and Small Enterprises

NGOs: Non-Governmental Organisations

POCSSBO: Project Office for the Creation of Small Scale Business Opportunities

AdCSI: Addis Credit and Saving Institute

MEs: Micro enterprises

LDCs: Less Developed Countries

GDP: Gross Domestic Product

IDA: International Development Association

MTDP: Market Towns Development Project

DBE: Development Bank of Ethiopia

LPM: Linear Probability Model

OLS: Ordinary Least Squares

CDF: Cumulative Distribution Function

ABSTRACT

The study examined the role of micro financing programmes and the success of small businesses in urban Ethiopia considering the case of the POCSSBO micro financing programme in Addis Ababa. The investigation is based on descriptive analysis and identification of the determinants of the probability of success in beneficiaries' businesses using the logit model. The data used for the study is primary and cross-sectional, collected with the help of structured questionnaire between March and April 2000, from a sample of 236 beneficiaries who benefited from POCSSBO micro financing scheme in Addis Ababa.

The results indicate that the POCSSBO micro financing scheme contributed positively to employment creation and income generation, which paves the way for the development of micro enterprises. Through the expansion of self-employment opportunities to the beneficiaries of the programme, the credit scheme played a key role in raising the beneficiaries' income.

The maximum likelihood estimation result of the logit model reveals the existence of some factors that significantly influence the probability of success in beneficiaries' businesses. The results indicate that the initial loan size, sufficiency of the loan for intended purposes, training given to borrowers before the loan, convenience of business area, business experience before the loan and high school level education of borrowers are important determinants of the probability of success in beneficiaries' businesses.

Of these determinant factors of the probability of success in beneficiaries' businesses, sufficiency of the loan for intended purposes, training given to borrowers before the loan, convenience of business area, business experience before the loan and high school level education of borrowers are found to be enhancing factors of the probability of success in beneficiaries' businesses. On the contrary, the initial loan size is found to be inhibiting factor of the probability of success in beneficiaries' businesses. The project office should take into consideration these enhancing and inhibiting factors of the probability of success in beneficiaries' businesses in designing improved micro financing programmes in the future.

CHAPTER ONE

INTRODUCTION

The Ethiopian Economy was highly depressed under the previous regime owing to the fact that the country followed a socialist oriented command economy prior to 1991. In order to reverse this situation, the country has been in transition from socialist oriented command economy to private oriented market economy in recent years (especially, since 1991). In other words, the Ethiopian economy is recently undergoing a transition from a command-driven socialist oriented economy to a demand-driven market oriented economy. Accordingly, micro enterprises are flourishing in urban areas of various parts of the country in general and in Addis Ababa in particular through launching of small retail trade, manufacturing and service rendering activities.

The Federal Government is encouraging investment in the private sector business and industrial activities putting into action laws and regulations in favour of the development of the private sector. In this respect, the government has formulated the National Strategy to promote the development of Micro and Small Enterprises (MSEs) and to facilitate the development of the Microfinance[1] support Institutions. The Microfinance support Institutions are governed by Proclamation No. 40/1996 on Licensing and Supervision of Microfinance Institutions through regulating the operations of these institutions in urban as well as rural Ethiopia.

The ultimate goal of this paper is to assess the role of micro financing programmes and the success of small businesses in urban Ethiopia paying special attention to the case of Addis Ababa. As far as the organisation of the paper is concerned, it is divided into five chapters.

[1] Very small amount of deposits and loans together are referred to as 'microfinance' (Johnson and Rogaly, 1997: 1).

Accordingly, Chapter One deals with an introductory part, which contains the background of the study, statement of the problem, and objective, significance as well as limitation of the study. Chapter Two is concerned with a brief review of related literature summarizing the available theoretical and empirical literature in the area of micro financing both at the global level and in the context of Ethiopia. Chapter Three presents the methodology adopted for data collection and analysis. Chapter Four deals with descriptive analysis and empirical results. Finally, the last Chapter presents the conclusion and recommendations.

1.1 The Background of the Study

Addis Ababa is characterised by rapid migration of people from various parts of the country[2], which together with ever-growing natural growth rate of population aggravated unemployment problem in the city. "Urban migration and high population growth rates have made unemployment a critical problem for developing country governments, and donors have responded by financing the programs that develop microenterprises, which are meant to absorb a portion of this excess labor" (Fidler and Webster, 1996: 8-9). This shows that urban migration and high population growth rate aggravated the problem of unemployment not only in urban Ethiopia but also in urban areas of other developing countries as well.

In order to reduce the rate of unemployment in urban areas (especially, in Addis Ababa), the government of Ethiopia has been trying to promote the expansion of self-employment opportunities through the growth of the private sector. To this end, the government has been implementing a

[2] The 1994 National Population and Housing Census of Ethiopia indicated " nearly half (47 percent) of the total population of Addis Ababa are migrants. ... the in-migrants substantially contributed to the observed average annual population growth rate of Addis Ababa which is 3.8 percent" (CSA , 1995: 7).

policy that enables to create market-oriented economy so as to enhance the growth of the private sector. In addition, the government also tried to assist the private sector to participate in a wide range of economic activities to ensure efficiency in the management and reallocation of public expenditures in favour of the priority sectors that play a key role in the process of economic growth.

The government has undertaken various policy measures so as to create favourable conditions for the development of market-oriented economy. This is because the private sector was highly depressed in the previous regime and restricted to a few sectors in the economy since the public sector had dominated most of the economic activities. Consequently, the private sector was denied access to credit from the prevailing financial institutions since the available loanable fund was almost entirely allocated to the public (socialised sector) in the economy. According to Gebrehiwot (1997), "Bank credit was administratively allocated, mainly to the socialised sector (i.e. Public Enterprises, State Farms, and Co-operatives)". This portrays that the private sector had little access to bank credit since the socialised sector was highly favoured in credit allocation owing to the fact that the country was pursuing socialist oriented command-driven economy.

The recent policy measures of the government include: currency devaluation, abolishing price and distribution controls, eliminating export taxes (with the exception of coffee), reforming the financial sector, simplifying the licensing procedures, etc. In addition, the Ethiopian Privatisation Agency was established to promote privatisation throughout the country, which shows that the development of the private sector has been given special attention. This is due to the fact that without ensuring a well-developed private sector that paves the way for the expansion of employment opportunities, it is impossible to alleviate the existing problem of unemployment in general terms.

Apart from the problem of unemployment, the removal of price and distribution controls has to some extent affected the poor in urban areas who used to benefit from the previous government's rationing of consumer goods through kebele shops at low administered prices.[3] As a result, some of such poor people, who were engaged in other activities before have joined the so called the informal sector through starting small business activities like small shops, retail/petty trade, handicraft, and other small scale businesses around their residential places.

The informal sector does not have a commonly used well-accepted definition. According to the International Labour Organization (ILO), the term informal sector refers to informal economic activities. But in the current literature, the term informal sector is used in two senses:

i) To refer to illegal economic activities by individuals (and/or organisaions) operating outside the formal sphere to evade taxes[4] and other regulatory practices; and

ii) To refer to the term as shorthand for very small enterprises with ten or fewer workers that use low-technology modes of production and management with no reference to legal status.

The second definition is widely used and more common among development policy analysts. Fidler and Webster (1996) also used this definition in studying the informal sector of West Africa and argued that

> Medium and large firms typically attract the most attention from governments and donors, but most workers and enterprises are located in the informal sector. Diversity is its trade mark, and it includes survivalists (very poor people who work part-time in various nonfarm, income-generating activities); self-employed people who produce goods for sale, purchase goods for resale, or offer services; and very small businesses (micro-enterprises) that usually operate from a fixed location with more or less regular hours. Participants include very poor, marginal people as well as members of the working class.

[3] Administered prices refers to those prices which are established by the conscious decision of some individual or agency rather than by the impersonal play of market forces (see The Dictionary of Modern Economics, 1983: 7).

[4] Collection of sales taxes from the informal sector might be more tax, and MEs may benefit from higher effective tariff protection due to their more modest contribution to value added (Dessing, 1990).

In this study, micro-enterprises are defined as those very small enterprises with ten or fewer wage workers using low-technology (i.e. rudimentary technology) of production and management representing the vast majority of nonformal small businesses operating outside the formal sector in urban Ethiopia.

Like other developing countries, the informal sector is regarded as the main job creator compared to the medium and large-scale industries in Ethiopia. In this respect, the Micro and Small Enterprises Development Strategy Paper (MTI, 1997: ii)[5] indicated that "the number of people earning their livelihood from the informal sector activities and small scale manufacturing industries is eight times larger than those engaged in the medium and large scale industrial establishments". For example, as reported in the Strategy Paper, 739,898 persons were engaged in the informal sector activities and small scale manufacturing industries whereas only 90,213 persons were engaged in the medium and large scale manufacturing industries. The Strategy Paper further revealed that "the Informal and Small Manufacturing sector contributed value added of Birr 8.3 million in 1996" (MTI, 1997: 3).

Recently, it is recognised that poor people engaged in small business activities have limited access to credit from the formal financial institutions in Ethiopia. In fact, lack of finance is one of the major impediments of the informal sector operators in Ethiopia. "At present, the financial sector is not adequately equipped to provide medium-and long-term loans, credit to small and micro-enterprises, or venture capital" as indicated in the Policy Framework Paper (Government of Ethiopia, 1998: 17). As a result, some Non-Governmental Organisations (NGOs)[6] have tried to extend credit to poor

[5]The Micro and Small Enterprises (MSEs) Development Strategy Paper is based on the findings of the recent survey conducted by the Central Statistical Authority (CSA) in May 1997.

[6] According to Johnson and Rogaly (1997: 1), NGOs refer to private sector organisations that are not profit oriented.

households in some parts of the country. Such NGOs include: Relief Society of Tigray, Ethiopian Relief Organisation, Redd Barna (Norwegian), National Association of Development, Action- Aid Ethiopia, etc.

The government is also taking various measures to promote the expansion of micro financing programmes in Ethiopia. Consequently, National MSE Development and Promotion Strategy has been formulated. The main objective of this strategy is to create an enabling legal, institutional and other supportive environment for the growth and development of MSEs in order to reduce the problem of unemployment through the expansion of employment opportunities to the jobless and poor people. In this respect, it was revealed in the strategy paper that:

> ... the MSEs sector is characterised by highly diversified activities which can create job opportunities for a substantial segment of the population. This indicates that the sector is a quick remedy for unemployment problem. To curb unemployment and facilitate the environment for new job seekers and self-employment a direct intervention and support of the government is crucial (MTI, 1997: 2).

As mentioned earlier, Addis Ababa experienced serious social and economic problems like high population growth and unemployment. Specifically, some observations indicate that unemployment among the youth has become a serious problem for the Addis Ababa City Government. Considering this fact, the Addis Ababa City Government started to promote self-employment opportunities to the youth through the launching of micro and small enterprises so as to raise employment and income-earning capacity of the poor in general and that of the unemployed youth in particular.

In order to achieve this objective, the Addis Ababa City Council proposed the establishment of the Project Office for the Creation of Small-Scale Business Opportunities (POCSSBO). Accordingly, the City Municipal Council established POCSSBO in 1995. The main objective of the Project

Office was to reduce unemployment and alleviate poverty by expanding self-employment opportunities through the provision of start up capital to the poor and unemployed people.

Currently, POCSSBO is transformed into a legally registered Micro Financing Institute called Addis Credit and Saving Institute. Thus, the National Bank of Ethiopia gave the Small Scale and Micro Finance Business License to Addis Credit and Saving Institute (AdCSI) under the Small Scale and Micro Finance Institution Proclamation No. 40/1996 in January 2000. And the transformation of the Project Office into a Micro Financing Institute is accompanied by changes in its organisational structure as well as modes of operation. Accordingly, the office has opened four branch offices since the end of 1998. The major objectives of the newly established Addis credit and saving institute are:

a. To organise youth into voluntarily associations;
b. To identify potential income-generating projects for the unemployed;
c. To provide training for the unemployed youth on business start-ups and in the development of individual or groups business plans;
d. To establish savings and investment scheme; and
e. To provide credit to the youth and unemployed people without collateral, using funds from the City Government.

The potential/target beneficiaries of the credit programme are the poor, unemployed youth (both male and female), who live in Addis Ababa. Most of the beneficiaries of the programme have high school level education (the majority of them completed 12^{th} grade). Moreover, the target beneficiaries include women who are heads of households and individuals with disabilities who are

able and willing to engage in income generating productive and service activities. The target beneficiaries are selected by the Kebele Credit and Saving Committee. Criterion for the selection[7] of beneficiaries include the following:

1. Beneficiaries should be permanent residents of a given kebele in Addis Ababa who are poor unemployed youth and women that are able and willing to engage in productive activities;
2. Age: for women 18-55 years and for the youth 18-35 years;
3. All unemployed people irrespective of whether experienced and/or educated or not;
4. The disabled who are willing and able to engage themselves in productive or service activity;
5. Individuals who are willing to enter into group collateral; (A group consists of a maximum of 5 individuals who live in the same kebele that know one another very well to be honest among themselves and ready to serve willingly as collateral to one another.)
6. Individuals/groups who agreed to be abide by the rules and regulations of the Institution;
7. Individuals who are known in their locality to be disciplined, honest and free from notorious deeds and bad habits; and
8. If the applicants have ever taken credit from any organisation/individuals before, they should settle their debt at maturity and must be free from any debt at the time of application.

The lending procedure of the Project Office consists of selection of potential borrowers, training the potential borrowers, gathering personal information on the condition of each potential borrower, evaluating the eligibility of each of the potential borrowers, group formation, loan application and approval, disbursement of the loan, supervision and repayment. These procedures are performed sequentially in the given order in the lending process of the Project Office in general terms.

[7] See the Operation Manual of Addis Credit and Saving Institution (AdCSI) previously called POCSSBO.

One of the criteria often used in assessing the role of a microfinancing scheme is *outreach.* Outreach is "the extent to which financial systems and their instruments reach the poor directly, increasing their participation in market processes and by this empowerment, in political processes" (Von Pischke et al., 1997: 10, quoted in Berhanu, 1999: 26). These authors argue that outreach must be the ultimate goal of micro financing programmes since poverty reduction calls for empowerment of a large number of people. In this connection, Fidler and Webster (1996: 32) also argued that "If the objective of microfinance institutions is to deliver financial services to large numbers of previously underserved low-income people, an evaluation of how well this objective is met would measure levels of outreach (the number of poor people reached)". When the POCSSBO's outreach is considered, it has extended credit to over 4264 people since its establishment.

As far as the term of lending is concerned, the Project Office was providing 3 types of credit based on the maturity date of the loan. These are short-term credit of 1 year, medium term credit of 2 years, and long-term credit of 3 years maturity. The maximum amount of loan that the office provides to borrowers is Birr 3000. The major source of fund for this credit programme is the City Council and interest free credit[8] is given to beneficiaries. The office retains 5% of the total credit approved to each beneficiary as contingency to put in the groups saving account used to settle the debt in case any of the group members defaulted. This paper tries to assess the contribution of micro financing programmes to the development of micro enterprises in urban Ethiopia paying special attention to the case of the POCSSBO in Addis Ababa.

[8] Currently, the Institute started to charge 12.5% interest per annum on the credit it provides to borrowers.

Sustainability of a micro financing scheme requires considerable positive effect of the programme on the target beneficiaries together with better loan repayment performance. In fact, better loan repayment performance is related to the success of the target beneficiaries in their businesses. However, not all beneficiaries succeed in the sense that they continue to survive and undertake normal business operations. Accordingly, a specific case study is necessary to investigate what proportion of the beneficiaries in the micro financing programme succeed in business and what proportion failed to succeed. But at present, such a study is hardly found in the context of Ethiopia. So this study is intended to fill this gap considering the case of the micro financing scheme operating under POCSSBO in Addis Ababa.

1.3 Objective of the Study

The broad objective of this study is to analyse the role of micro financing programme operating under POCSSBO and the success of small businesses in Addis Ababa.

The specific objectives of the study are:

1. To assess the success (survival) rate among beneficiaries' businesses;
2. To identify factors which determine success (survival) of beneficiaries' businesses; and
3. To highlight ways of expanding improved micro financing programmes across the country.

1.4 Significance of the Study

As explained earlier, micro enterprises under the micro financing schemes have significant contribution in generating income and providing employment opportunities to the jobless and poor people. Furthermore, they are also expected to have additional benefits of improved savings,

nutrition and better access to health care and educational services. These microfinancing programmes should be sustainable in order to enhance the development of micro-enterprises in the short-run but targeting at promoting economic growth in the long run. This requires success in business of borrowers that results in efficient loan repayment performance.

Given the limited research in this area, this study, which, is concerned with the micro financing scheme under POCSSBO in Addis Ababa, will provide essential information on the success and/or failure of the beneficiaries of this micro financing programme. In addition, the factors that may lead to either success or failure of the beneficiaries in business are also analysed in detail. This will help the concerned bodies and fund supplying institutions to design and implement an effective micro financing scheme in the future.

1.5 Limitation of the Study

A critical evaluation of micro financing programmes in terms of identifying success and failure of the beneficiaries' businesses is necessary to understand about the sustainability of such programmes. Furthermore, it is important to have an insight into the appropriateness of such micro financing programmes as a means of promoting economic growth. A detailed analysis of the survival and growth of microenterprises requires a series of consecutive surveys together with the measurement of different variables of interest with respect to some reference period. However, this study uses a one-time survey and tries to assess the role of the POCSSBO micro financing programme to the development of microenterprises by analysing factors that may result in success and/or disruption/failure of the borrowers' businesses. Consequently, the basic limitations of this study are:

i) It does not go into the detailed analysis of survival and growth of microenterprises due to lack of relevant data (especially to analyse growth) since only a one-time survey is used.

ii) The survey depends on the beneficiaries' memory and perception and hence, it is what the beneficiaries recall and perceive that is used in the analysis of factors influencing success in beneficiaries' businesses.

iii) It ignores the analysis of the role of other micro financing programmes owing to the resource and time constraints so that no comparisons can be made (based on the result of this study) among different micro financing institutions' role (operating in various parts of the country) to the development of microenterprises.

CHAPTER TWO

REVIEW OF THE LITERATURE

In this chapter, an attempt is made to review some global findings as well as the research work in the context of Ethiopia pertaining to small and micro enterprises. Thus, the study examines the relevant available materials so as to have an insight into the work done in this area in the past. This is important in order to make comparisons for the purpose of formulating ways and means that enable one to analyse the success of micro enterprises in urban Ethiopia in general and in Addis Ababa in particular. Hence, a review of relevant theoretical and empirical literature, micro financing in the context of Ethiopia and factors that determine success of micro enterprises will be given in the subsequent sections.

2.1 Theoretical Literature

Like other developing countries, a new approach to provide credit to the poor has been designed to promote the expansion of small business activities in Ethiopia in recent years. This is because provision of credit to the poor in general and to the poor urban households in particular could play an important role in reducing poverty. It is belied that if such households get the required capital to start small business activities, they can promote further self-employment thereby increasing their income generating capacity. In this connection, it was revealed that:

> An alternative and innovative approach to provide credit to the poor has been designed and successfully tried in many developing countries. The new approach, the best example of which is the Grameen Bank of Bangladesh, focuses its credit schemes on poor households, especially poor women, and offers credit on the basis of group collateral. This approach was introduced in Ethiopia in 1993 under the Market Towns Development Programme. The main targets of the scheme are the bottom poor living in the urban centres who are engaged in or wish to pursue micro-activities (Solomon, 1996).

The main objectives of the Grameen Bank[9] include: to extend credit facilities to the poor, to create employment opportunities to under utilised manpower and to raise the income generating capacity of the poor irrespective of whether they are living in urban or rural areas.

The Grameen Bank is considered as a specialised bank that provides credit to the poor. The salient features of the Grameen Bank are: exclusive focus on poor households, priority to poor rural women, collective borrowers' responsibility or group/peer pressure for loan repayment, suitable loan conditions and procedures, individuals self-chosen loan activities, through compulsory group savings, and individual savings to promote self-reliance (Solomon, 1996).

Generally, most studies dealing with the role of micro financing programmes underscored the importance of such programmes in reducing poverty. "With the success of the Grameen Bank and the evolution of the Bangladesh Rural Advancement Committee (BRAC) and other targeted programs that combined credit, organization, and skill development training, policy makers realised that sustained poverty reduction was feasible" (Khandker et al., 1995: 3). In fact, a micro financing programme should be sustainable in order to accomplish its required tasks. The sustainability of a programme is defined as "the ability of a programme to continuously carry out activities and services in pursuit of its objectives" (Khandker et al., 1995).

[9] The Grameen Bank was first started as a research project on rural based programme directed to help poor farmers under the Chiffagong University. Eventually, the project was extended to operate in 5 districts with the help of the state bank of Bangladesh in 1979. The establishment of the Bank was officially realised in 1983. Initially, it was established with a share capital of U.S $33 million contributed by the government and the member borrowers contributing 40% each and the remaining 20% was subscribed by the other banks. However, at present, the capital share holdings of the government has been reduced to only 25% while that of the borrowers raised to 75%.

There are four basic conditions for the overall sustainability of a micro financing institution (Khandker et al., 95): *financial viability, economic viability, institutional viability* and *borrower viability*. A credit programme is said to be financially viable if it can at least equalise the cost per loan given out with the interest rate that it charges its borrowers. These authors argued that the Grameen Bank could only sustain the provision of credit to the poor if it remains financially viable. A credit programme is said to be economically viable if it can meet the economic cost of funds (i.e. the opportunity cost) used for credit as well as other activities with the income generated from lending. Institutional viability requires effective and well-organised procedures to ensure administration and management succession in order that leadership is independent of a particular individual. Finally, borrower viability has to do with whether or not the borrowers have achieved higher income over time and be able to repay their loans at maturity.

Currently, the existing literature regards the development of micro-enterprises through micro financing as a major tool of poverty reduction (e.g. Johnson and Rogaly, 1997; Khandker et al., 1995; Holt and Ribe, 1991; Dessing, 1990). However, there is a debate on this issue and there is no general consensus among scholars in this area. Micro-enterprises have very limited access to formal finance-credit from banks (Fidler and Webster, 1996). Moreover, an insufficient supply of credit is found to be a major constraint to microenterprises in many developing countries. Thus, it has been argued that making credit available to the poor microenterprise operators is considered to be essential to alleviate poverty and promote economic development (Khandker et al., 1995). Hence, special financing programmes should be designed and implemented so as to facilitate access to credit by the micro-enterprise operators thereby enhancing their productivity as well as income generating capacity in general terms.

Microfinancing programmes are expected to promote equity and facilitate the process of economic growth. The emphasisers of equity aspect of micro financing programmes underscored that the provision of credit facility to the poor has to do with poverty reduction through raising income of the poor. Furthermore, they claimed, "Lending services enable the poor to invest in opportunities that will increase their incomes, such as buying instead of renting tools, increasing their livestock, or getting access to bulk prices of raw materials" (Fidler and Webster, 1996). In contrast, those who focus on growth aspect underscored the efficiency gains of credit provision to the poor. They argued "financial sector plays a key role in the efficient allocation of resources by shifting funds from surplus to deficit locations and from less profitable to more profitable activities" (Fidler and Webster, 1996).

As a result, both the industrialised and developing countries adopted the provision of financial support programmes to the unemployed as a policy to expand employment opportunities through either starting new businesses or strengthening the existing ones. In this connection, Wilson and Adams (1994) indicated, "Programs to support new business start-ups by the unemployed and to help established enterprises expand and create new employment have been part of the policy framework adopted by industrialised and developing countries to meet the demand for productive employment." The expansion of productive employment is one way of achieving efficient allocation of resources since putting idle resources to best alternative uses increases their opportunity costs.

2.2 Empirical Literature

Nowadays, most analysts of development issues in less developed countries (LDCs) devote much time to evaluate the role of the informal sector to the development of national economies.

In this respect, some researchers view the informal sector as the most important job creator (e.g. Wilson and Adams, 1994; Fidler and Webster, 1996). They also tried to associate this situation to the failure of the modern formal manufacturing, trade and services sectors to provide adequate and reliable employment opportunities to the growing labour force in LDCs. Furthermore, one of the World Bank studies indicated that

> Small owner-operated enterprises that function outside the official regulatory framework contribute substantially to employment and productivity. Recent estimates by the International Labour Organization (ILO) indicate that the informal sector accounts for 59 percent of Sub-Saharan Africa's urban labor force and an ILO survey of 17 African Countries found that the informal sector contributes, on average, 20 percent of GDP (or $ 15 billion a year) to the economies studied (World Bank, 1989).

Generally, the informal sector operators pursuing micro-enterprises are regarded as the cornerstone for the development of small and medium enterprises at large. In this connection, it was indicated that "Initially, unskilled workers develop their entrepreneurial and managerial talents by exercising in small businesses that are relatively easy to start and manage" (Abraham, 1997). This shows that small businesses play a key role in helping unskilled workers develop business experience and skills of management, which is necessary to microenterprise operators. Some scholars regarded the informal sector as an "incubator" of small and micro-enterprises as well as training ground for prospective businessmen in the formal sector. According to Fidler and Webster (1996: 6-7),

> Development specialists have emphasized the informal sector's importance as a creator of jobs and an incubator of small and medium enterprises. In this view, the informal sector is a giant sponge, absorbing much of the shock of periodic economic contraction by soaking up excess labor and by providing second incomes to individuals whose real incomes have been eroded by inflation and public spending cutbacks. In addition, very small enterprises often are viewed as training grounds for prospective formal business owners (who are in notably short supply in many African Countries).

It should be recognised, however, that the preceding arguments of greater job creation and incubation of enterprises are challenged on certain grounds. Some scholars challenged the argument

on employment creation on the ground that the net job creation by the informal sector has recorded little increase. This is due to high death rate of informal sector enterprises that outweighs the large number of newly established ones. In light of this, one of the studies made in Southern African countries revealed a 7% net employment growth per year in the 1980s and early 1990s (Fidler and Webster, 1996). Moreover, others challenged the argument for enterprises incubation by explaining that few micro-enterprises were able to develop into small and medium enterprises. For example, (Mead and Liedholm, 1998) argued that "The contribution of small enterprises to the creation of new jobs has been a controversial issue around the world".

Evaluation of the effect of micro financing programmes on beneficiaries revealed that borrowers have been able to have higher income compared to the income level prior to their participation in these programmes. In this respect, it was confirmed that "evaluations of micro-enterprise lending projects indicate that such programmes can improve poor people's incomes and productivity considerably" (Holt and Ribe, 1991). For instance, in their study of the Calcutta's small-scale enterprise credit programme, these authors reported that participants' income has increased, on average, by 82%. Furthermore, these authors indicated, in their study of the small business programme of the National Council of Churches in Kenya, that there was 10-14% increase in the net income of the programme participants.

Those studies made on the Grameen Bank Credit Programme participants in Bangladesh indicated the importance of the programme in raising income of households, expenditure on basic consumer goods and employment. A similar study made on the role of Indonesia's Bank Rakyat, currently the

largest microfinance institution, reveals that its borrowers have increased their net household incomes by 75 percent and net enterprise income by 93 percent (Fidler and Webster, 1996:23).

2.3 Micro Financing in the Context of Ethiopia

In Ethiopia, micro financing widely began after the credit agreement was signed between the Ethiopian Government and the International Development Association (IDA) in 1990. Following the agreement a fund was made available to launch a microfinancing programme under the Market Towns Development Project (MTDP). In relation to this, it has been indicated that

> In 1990, an urban micro financing scheme was initiated on a national scale with a credit agreement signed between the Government of Ethiopia and the International Development Association (IDA). The credit scheme aimed at financing the Market Towns Development Project, planned to improve infrastructure in towns considered market and service centres for the agricultural hinterland and to alleviate poverty problems in selected urban areas of the country through employment generation and income enhancement (The Ethiopian Economic Association, 1999/2000: 330-331).

Initially, the Market Towns Development Project (MTDP) designed a micro financing programme to implement in 16 towns outside Addis Ababa. Later on, the coverage has gradually increased and incorporated about 59 towns up to the present. Under this micro financing programme IDA provides credit to the Development Bank of Ethiopia (DBE) and DBE extends credit to micro enterprises. The Regional Trade and Industry Bureaux are responsible for organising and screening micro enterprise operators for the credit programme as well as accomplishing tasks that require specialised and trained personnel in the area. But whether the institutional capability of these bureaux is adequate to carry out such tasks is open to question.

The micro financing programme under the MTDP is a group based credit programme and among other criteria households with a monthly income of less than Birr 100 who voluntarily form groups of 5 people are considered eligible for loan under the programme. According to Solomon (1996),

"Members of a group often have similar social and economic status, live in the same village or locality and perform similar activities. Each group consists of five members and 4-6 groups form a centre or micro-enterprise". The Zonal Trade and Industry Bureaux organise and give license to these micro enterprises and prepare business plans for each borrower in the micro-enterprise. Eventually, the business plans together with other relevant documents are delivered to the DBE for the disbursement of the loan. According to Mengistu (1997: 7), the actual financing operation of microenterprises got underway in 1994. The credit programme began by giving a maximum loan of Birr 1000 to each borrower. Gradually, the maximum amount of credit was raised to Birr 5000 per head. Under this credit scheme, every member of the group is responsible in case default occurs.

Studies that assess the effect of micro financing are quite limited in the context of Ethiopia. However, since the launching of the micro financing programme some authors have found encouraging results. In this respect, Mengistu (1998) indicated the achievement of some encouraging results regarding the increasing number of beneficiaries of the programme. Moreover, he argues that an increase in the number of beneficiaries of the programme is one indicator of the contribution of the micro financing programme to employment creation and income generation. In addition, he also cited an increase in the amount of fund allocated to each of the beneficiaries up to a maximum of Birr 5000 and the use of saving account as an indicator of the growth of micro-enterprises into the formal sector.

But the study suffers from a serious limitation in the sense that it fails to relate the achievement of these results directly to the benefits obtained from the programme. The number of beneficiaries of the credit programme could increase due to increased access to information about the programme or

due to increase in the demand for credit or it could be even because of a rise in the number of the poor. Furthermore, the income of beneficiaries may increase as a result of increased income from other sources obtained after the loan. Likewise, an increase in the credit ceiling could be due to other factors such as increase in the amount of the loanable fund allocated to the credit programme and the nature of businesses that the beneficiaries propose when they request the credit. By the same reasoning, the use of saving account can not be considered as an indicator of the growth of micro enterprises into the formal sector.

Kassa (1998) also analysed the effect of micro financing scheme under the micro-enterprise project in Southern Ethiopia in the area of education, consumption expenditure, medical expenditure, family assistance, employment creation, income generation, saving and input use. He found that before the credit scheme 1584 beneficiaries of the programme were able to send 5504 children to school whereas after the credit scheme was introduced 1680 beneficiaries of the programme were able to send 5952 children in the first credit cycle. In the second credit cycle, out of 460 beneficiaries of the programme 406 of them were able to send their children to school before the credit scheme while 421 of them were able to send their children to school after the credit scheme.

Moreover, Kassa (1998) reported a 30.8%, 10.5% and 19.7% annual growth in consumption expenditure of the first, second and third credit cycle beneficiaries case, respectively. Regarding medical expenditure, he reported a 38.6%, 7.1% and 2.1% growth in the case of first, second and third loan cycle beneficiaries, respectively. Besides this, he mentioned the creation of 4187 employment opportunities as an additional benefit. He further indicated 52.6% income growth was recorded in the first credit cycle while a 24.4% and 14.4% growth was recorded in the case

of the second and third credit cycles. He ascribed all such outcomes to the credit scheme. Using Non-Parametric Test, he rejected the null hypothesis of equality of average income before and after the loan at 5% level of significance indicating that the average income after the loan is greater than that before the loan in the 3 loan cycles. He also mentioned the contribution of the micro financing scheme to the development of saving culture and increased input use.

The study ascribed all changes after the loan to the credit scheme. This means that it is not clearly indicated whether the growth in consumption expenditure and income is directly associated with increased income from the business financed by the loan. In other words, there is no evidence, which shows that the growth in consumption and income results from the profitability of the beneficiaries' businesses financed by the loan. This is because nothing is mentioned about the income of other family members as well as who covers the consumption expenditure after the loan.

Besides the studies cited above, Tamiru (1998) indicated the positive impact of the micro financing programme under the MTDP to employment creation, production growth, skill development and the avoidance of backward cultural practices facing women. And also in analysing the effect of the micro financing scheme in Debre Brehan Town it was claimed that "preliminary impact evaluation of the randomly taken 65 borrowers show that about half (49 percent) of sample households have experienced an increase in income levels due to the loan" (Solomon, 1996). However, it is important to note that whether this increase in income results from the profitability of the business of borrowers financed by the loan or due to income obtained from other sources after the loan is open to question.

In spite of their limitations, all of these studies underscored the importance of the credit programme to employment creation through the expansion of small business opportunities, which is obviously valid on reasonable grounds. This implies that micro credit programme is essential to expand small-scale self-employment opportunities so as to reduce the prevailing unemployment problems in the country in general and in Addis Ababa in particular. Hence, micro financing could play an important role in the expansion of small businesses in order to raise income-generating capacity of the poor and informal sector operators. In fact, this is expected to enhance the development of micro and small enterprises at least in some urban areas of the country.

In general, when the situation of Ethiopia is considered, the literature is not well developed since micro financing is a recent phenomenon in the country. In particular, studies dealing with the role of micro financing programmes and the success of small businesses considering factors that influence the success and/or failure of micro-enterprise operators are rarely found. As a result, there is little to say in this regard at least at this stage. In light of this, the study is intended to contribute to the Ethiopian literature in order to narrow the gap in this area.

2.4 Factors that Determine the Success of Microenterprises

There are several factors that influence the success/survival of microenterprises in a given socio-economic environment at a particular point in time. Some studies indicated the closure or death rate of small businesses or microenterprises is high and it is necessary to identify factors affecting the success of microenterprises. In this respect, it was revealed that "Small businesses are known to have a high failure rate" (Wilson and Adams, 1994: 18). Some authors tried to associate the success

of small business enterprises to the ability of the entrepreneurs to withstand problems faced in the business environment. For example, Buckley (1997) argued that

> Enterprise success is largely determined by how entrepreneurs cope with their environment. The informal sector environment may imply that entrepreneurs place an "invisible ceiling" on their enterprise growth defined by an inhibitory or interfering regulatory environment, poor infrastructure, a lack of access to capital and so on. The paucity of economic opportunities and severe demand constraints often imply the need to surmount survival barriers which may limit the potential for entrepreneurial behavior. It may be that the closer one is to the margin of base survival the harder it is to be entrepreneurial because risk of failure increases.

Other authors (e.g. Mead and Liedholm, 1998) identified factors that determine the survival/success rate of microenterprises. These factors are found to be both internal and external to the enterprise and the major ones include the characteristics of microenterprises such as age of the enterprise, sector of activity, and location or business area, sex of borrowers, human and financial capital and the macroeconomic conditions.

It has been found that the majority of microenterprises often close during the early years of their establishment. "Given the high rates of MSE closures, particularly in the initial years, it is helpful to know the characteristics of the MSEs that are most likely to survive" (Mead and Liedholm, 1998). From this point of view, one can argue that the age of an enterprise may affect its success/survival. For example, a study conducted by Mead and Liedholm (1998) on four African countries (Botswana, Kenya, Swaziland and Zimbabwe) indicated that among the closed MSEs, over 50% of the closures had taken place within the first three years of their establishment. MSEs closures were high before the first year especially in Botswana and Swaziland, while it was high between year one and two in Kenya and Zimbabwe as the study revealed. "Clearly, MSEs are particularly vulnerable during the fragile initial years, when entrepreneurs are learning how to operate a new business" (Mead and Liedholm, 1998). This shows that age of the enterprise is one of the determinants of the success/survival of microenterprises.

It was found that there is a direct relationship between MSEs initial size and their probability of survival. According to Mead and Liedholm (1998), there is a direct relationship between MSEs initial size (measured in employment) and the probability of survival in three developing countries (Swaziland, Zimbabwe and the Dominican Republic). These authors indicated, "Firms that started the smallest, other factors held constant, were more likely to survive than their counterparts that started larger". This reveals that size of a firm or an enterprise is one of the determinants of its probability of success/survival.

The survival of microenterprises was found to vary across sectors of activity as well. This means that the sector of activity in which a microenterprise is engaged plays a significant role in determining the survival of the enterprise. In this respect, Mead and Liedholm (1998) in their study of five developing countries (Botswana, Malawi, Swaziland, Zimbabwe and the Dominican Republic) found that MSEs engaged in retail trade faced the highest closure risks. For instance, these authors indicated that MSEs engaged in retail trade were almost 30% more likely to close during any given year compared to their counterparts engaged in woodworking. This shows that the sector of activity of microenterprise operators is one of the determinants of the success/survival of microenterprises.

Furthermore, the business area or location is found to play a key role in determining the probability of success of microenterprises. In other words, the location or business area in which a microenterprise is operating plays a dominant role in influencing the probability of success or the chance of survival of the microenterprise under investigation. In fact, Mead and Liedholm (1998) confirmed this idea and argued, "Location also plays a significant role in

determining an MSEs chance of survival". These authors further noted that microenterprises located in urban areas have more chance of survival than those located in rural areas. For example, in the developing countries they studied it was found that "Urban MSEs had an almost 25% greater chance of surviving the year, holding all other factors constant, compared to their counterparts in rural areas".

Sex of micro enterprise operators is found to be an important determinant of the success of microenterprises. In other words, the gender of microenterprise operators plays a significant role in determining the survival rate of microenterprises in general terms. In this connection, it was indicated that "The gender of the entrepreneurs is also a significant determinant of MSE survival rates. More specifically, female-headed MSEs were less likely to survive the year, all other factors constant, compared to their male-headed counterparts" (Mead and Liedholm, 1998). However, a relatively high closure rate of female-headed microenterprises was found to be due to personal reasons and other reasons not pertaining to business failures. "When only closing due to business failures were analyzed separately, there was no difference by gender in the likelihood of closure" (Mead and Liedholm, 1998). This shows that in terms of the closure of microenterprises resulting from business failures alone, both female-headed and male-headed microenterprises have equal probabilities of success/survival.

The entrepreneurial and managerial ability of microenterprise operators together with the level and quality of other labour input like apprentice and family labour determines the survival and growth of microenterprises. The entrepreneur's education and family background with history of business ownership/experience are expected to have a positive contribution to the success of small and

microenterprises. Consequently, the level of education and earlier business experience of the microenterprise operators are expected to affect positively the success/survival of microenterprises.

Financial capital constitutes another determinant factor of the success of microenterprises and the amount of initial financial investment determines the survival of small firms. The limited availability of financial capital is often the major impediment to the development of micro enterprises. In developing countries in general and in Sub-Saharan Africa in particular some studies reveal that micro enterprises have little chance of success due to the prevailing situations in these areas (e.g. Fidler Webster, 1996; Fafchamps, 1994). Besides the magnitude and availability of working capital required to run the business also determines the performance of micro enterprises even after starting their business. This tends to inhibit the probability of survival of micro enterprises, as it does not allow flexibility in their operations. Thus, easy access to credit by the microenterprise operators helps to reduce these problems.

Macroeconomic condition in which the micro enterprises operate is another important factor that is expected to influence the probability of success in business. There is no empirical evidence regarding the relationship between the macroeconomic conditions and the chance of survival and growth of microenterprises (Mead and Liedholm, 1998). These authors indicated that macroeconomic conditions influence the survival of such enterprises. Hence, they noted that when an economy is expanding microenterprises try to expand through employing more workers while at the same time more people close the existing businesses and start other more profitable ones. In contrast, when an economy is stagnant, micro enterprises face hard times in which case few expand their employment while many of them lay off workers.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Data Type and Source

The data used for this study is primary data on the cross-section of beneficiaries in Addis Ababa operating under the POCSSBO's micro financing programme. The data is collected with the help of a structured questionnaire designed for this purpose and administered through trained interviewers to the sampled micro-enterprise operators who benefited from the POCSSBO micro financing programme in Addis Ababa. The questionnaire is designed to get information on the following aspects of the sample beneficiaries.

i) Characteristics of sample beneficiaries like age, sex, marital status, level of education, employment status, number of dependants in the household, etc.

ii) Loan size, the purpose of the loan, attitude of borrowers regarding the sufficiency of the loan, the actual use of loan, and time loan was taken.

iii) The attitude of borrowers towards loan repayment, the cost of default, timeliness of the loan issued, and convenience of the repayment period.

iv) Number of unpaid family workers as well as wageworkers ones.

v) Average monthly income of borrowers from the business financed by the loan, availability of other source of income after the loan and the level of saving.

vi) The use of accounting records, business experience before the loan and the perception of borrowers regarding convenience of their business area.

vii) Adequacy of supervision on loan utilisation and repayment, and training given to borrowers before the loan.

viii) General opinions of borrowers about the POCSSBO's credit scheme and other variables.

Besides, additional information is collected through general discussion with the beneficiaries, the POCSSBO staff and kebele administrations.

3.2 Sample Design Procedure

The sample design procedure involved 3 stages: selection of sample Woredas, selection of sample Kebeles and selection of the sample beneficiaries. From each sample Woredas, sample Kebeles were selected. And finally, from each of the sample kebeles, sample beneficiaries were chosen. In each of the above cases, simple random sampling technique was employed in sample selection. Beneficiaries are the primary sampling units in this survey. The survey questionnaire was administered to sample beneficiaries after the sample size was determined taking into consideration the resource and time constraints.

The sample size is determined using the number of borrowers (who took credit from the Project Office up to early 1998) as the total population or the sampling frame. The list of beneficiaries[10] obtained from POCSSBO indicates that there are about 4264 borrowers who have taken credit from the project office up to February 1998. Of this total population 236 beneficiaries were randomly selected for this survey and successfully interviewed. The sample accounts for about 5.5% of the total population (or the sampling frame). This sample size is expected to generate the required information with a given level of precision.

[10] The list obtained from POCSSBO does not include 3 Woredas, viz., Woredas 23, 26 and 27. So if the list of beneficiaries in these Woredas is include, the total number of beneficiaries may exceed 4264.

3.3 Methodology

The methodological approach used in this study is based on descriptive analysis concerned with the description of economic conditions and regression analysis dealing with the identification of factors that determine the probability of success in beneficiaries' businesses. In the descriptive analysis, statistical measures like average/mean, percentages and standard deviation will be employed to see the trends of major variables while in regression analysis the logit model is used in modeling the relationship between the probability of success in beneficiaries' businesses and other variables influencing it.

In this study, the dependent variable, Y, is dichotomous. A dichotomous variable is defined as a variable which takes only two values-either 0 or 1. In regression analysis, it is intended to use the Logit Model since this is one of the models often used in the case of dichotomous dependent variables. To substantiate this point a bite further it is necessary to briefly review the discrete and dichotomous dependent variable models. Thus, the next subsection is devoted to this purpose.

3.3.1 Discrete and Dichotomous Dependent Variable Models

There are four approaches frequently used in estimating dichotomous dependent variable models. These are the Linear Probability Model (LPM), the Logit, Pobit and Tobit models.

3.3.1.1. The Linear Probability Model (LPM)

The term linear probability model is used to refer to a regression model where the dependent variable is binary or dichotomous that takes a value of either 1 or 0. "The term *linear probability model* is used to denote a regression model in which the dependent variable y is a binary variable

taking the value of 1 if the event occurs and 0 otherwise" (Maddala, 1983: 15). Consider the following simple model:

$$Y_i = ß_1 + ß_2 X_i + U_i \quad \ldots\ldots\ldots\ldots (1)$$

where, X = The set of explanatory variables

Y=1 if the expected outcome occurs, 0 if the expected outcome does not occur

U= the error term

Such models that express the dichotomous dependent variable Y_i as a linear function of the explanatory variables, X_i, are called Linear Probability Models (LPM). The conditional expectation of Y_i given X_i, i.e., $E(Y_i|X_i)$, can be interpreted as the conditional probability that the event will occur given X_i, that is, $Prob(Y_i = 1|X_i)$. Accordingly, in Eq (1), $E(Y_i|X_i)$ gives the probability of occurrence of the expected outcome given X_i. Since the probability of occurrence of an event lies between 0 and 1, $P_i = E(Y_i|X_i) = \beta_1+\beta_2X_i$[11], must lie between 0 and 1.

But this condition may not be satisfied in the case of the LPM, which is one of the crucial problems of this model. In this respect, it was indicated, "A major weakness of a linear probability model is that it does not constrain the predicted value to lie between 0 and 1. Because the derivative of the probability with respect to X is merely ß, nothing constrains the predicted value" (Johnston and Dinardo, 1997: 417). In general, estimating the LPM by standard Ordinary Least Squares (OLS) technique leads to some special problems (see Annex 2).

[11] See Annex 3 for details of the derivation of this expression.

3.3.1.2 Alternatives to the LPM

The LPM has several problems, such as (1) non-normality of U_i, (2) heteroscedasticity of U_i, (3) Possibility of Y_i lying outside the interval (0,1) and (4) the generally lower R^2 values. But these problems can be resolved. For example, Weighted Least Squares (WLS) procedure can be used to resolve the problem of heteroscedasticity or increase the sample size to minimize the problem of non-normality. One can even make the estimated probabilities lie within the interval (0,1) by resorting to restricted least squares or mathematical programming techniques.

But the fundamental problem with the LPM is that it assumes that $P_i = E(Y=1|X_i)$ increases linearly with X, which means the marginal or incremental effect of X remains constant throughout (Gujarati, 1995: 552). This implies that it is impossible to see a change in the probability of occurrence of an event resulting from marginal changes in the value of the explanatory variables since the explanatory variables remain constant. As a result, the LPM will not be used in this study owing to the aforementioned problems encountered in estimating it.

Actually, what is required is a probability model that has the following features: (1) As X_i increases $P_i = E(Y=1|X_i)$ increases but never stretches outside the interval (0,1), and (2) the relationship between P_i and X_i is non-linear, i.e., "one which approaches zero at slower and slower rates as X_i gets small and approaches one at slower and slower rates as X_i gets very large" (Aldrich and Nelson, quoted in Gujarati, 1995: 553).

In short, the required model would be one in which the probability lies between 0 and 1 and varies non-linearly with X. One could note that such a model much resembles the cumulative

distribution function (CDF) of a random variable[12] which has an S-shaped curve. So one can easily use the CDF to model regressions where the response variable is dichotomous, taking values 0 and 1. Although the CDFs are S-shaped, for each random variable there is a unique CDF. "For historical as well as practical reasons, the CDFs commonly chosen to represent the 0-1 response models are (1) the logistic and (2) the normal, the former giving rise to the logit model and the latter to the probit (or normit) model" (Gujarati, 1995: 553-554).

The Probit Model requires the assumption of normality for the error term. Hence, it will not be used for this study since cross-sectional data may not fulfill the assumption of normality. In relation to this, Greene (1997: 496) argued that "Heteroscedasticity usually arises in cross-section data where the scale of the dependent variable and the explanatory power of the model tend to vary across observations".

Another model commonly used in the case of dichotomous dependent variables is the Tobit Model, which is more relevant to censored data set. This model will not be used for this study since the data is not expected to be censored. Consequently, the logit model will be used in modeling the relationship between the probability of success in beneficiaries' businesses and other variables influencing it. Because it fulfills the requirements mentioned earlier since the probability lies between 0 and 1 and varies non-linearly with X.

[12] The CDF of a random variable X is the probability that it takes a value less than or equal to x_0, where x_0 is some given numerical value of X, i.e. F(X), the CDF of X is $F(X=x_0) = P(X \leq x_0)$ (see Gujarati, 1995: 553 footnote 13).

3.3.1.3 The Logit Model

The LPM was expressed in section 3.3.1.1 as

$$P_i = E(Y_i=1|X_i) = \beta_1+\beta_2X_i \quad \text{.....(2)}$$

where X is the set of explanatory variables and Y=1 means the expected outcome occurs. But now consider the following representation of this model:

$$P_i = E(Y_i=1|X_i) = \frac{1}{1+e^{-(\beta_1+\beta_2X_i)}} \quad \text{.....(3)}$$

For simplicity Eq(3) can be rewritten as

$$P_i = \frac{1}{1+e^{-Z_i}} \quad \text{.....(4)}$$

where, $Z_i = \beta_1 + \beta_2X_i$

Eq(4) represents what is known as the (cumulative) logistic distribution function[13].

Since P_i is nonlinear both in X and β, one cannot use OLS procedure to estimate the β's. However, this problem is more apparent than real because (3) is intrinsically linear. To show this one can proceed as follows: If P_i, the probability of a borrower staying in business at least 24 months after the loan, is given by Eq(4), then $(1-P_i)$ the probability of a borrower not staying in business at least 24 months after the loan, is given by

$$1-P_i = \frac{1}{1+e^{Zi}} \quad \text{.....(5)}$$

[13] As $Z_i \rightarrow +\infty$, e^{-zi} tends to zero and hence, $P_i \rightarrow 1$; as $Z_i \rightarrow -\infty$, e^{-zi} tends to infinity and hence, $P_i \rightarrow 0$. This shows that as Z_i ranges from $-\infty$ to $+\infty$, P_i varies between 0 and 1. P_i is nonlinearly related to Z_i (i.e. to X_i), hence, satisfying the 2 requirements described earlier.

Hence, it is possible to write

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \quad \text{.....(6)}$$

$P_i/(1-P_i)$ is simply the odds ratio in favour of the occurrence of an event, that is, the ratio of the probability that an event will occur to the probability that it will not occur.

Taking the natural logarithm of Eq(6) yields the following result.

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_1 + \beta_2 X_i \quad \text{.....(7)}$$

This shows that the log of the odds ratio (L), is linear both in the explanatory variables (X) and the parameters (β). L is called the logit, and hence, the name logit model is given to such models. According to Greene (1997), the logistic model is so named because of the logit transformation.

3.3.2 Definition and Description of Variables

Success in business of borrowers is important so as to ensure the continuous operation of all credit programmes in general and the POCSSBO credit programme in particular. As a result, identification and analysis of factors, which determine success in business of borrowers is indispensable. Because this plays a significant role in designing and implementing better microfinancing programmes in the future. In this study the term success is defined as follows:

Success in business of the beneficiaries is defined as a 24 months (2 years) stay of the borrowers in the same business continuously without interruption.

In this definition the term *beneficiaries* is used to distinguish the borrowers of the *POCSSBO credit programme* from other borrowers who have access to credit from formal financial institutions and/or other microfinancing schemes. Hence, the terms *beneficiaries* and *borrowers* of the POCSSBO credit scheme are *alternatively* used throughout the study.

The phrase *in the same business* is used to refer to the POCSSBO financed business of the beneficiaries. In other words, if a borrower used the loan for other types of business activities one no longer talks about the success in business of this particular borrower.

The phrase *Continuously without interruption* is used to refer to the period of time in which a borrower keeps on undertaking the POCSSBO financed business from the time of taking the loan up to the interview date. In this setting, if a borrower discontinued the business in the middle of his/her operation for a certain period of time and restarted it again making adjustments after some time, he/she should stay another 24 months in the business after restarting to be considered as successful. On the other hand, if a borrower did not complete 24 months of stay in business since he/she started to participate in the credit scheme, it is possible to consider such a borrower as an intermediate case between the successful and unsuccessful ones.

In analysing factors that affect success in business of the beneficiaries, it is necessary to assume the existence of some factors that enhance continuous normal business operation as well as those that tend to retard/disrupt it. This means in other words, it is important to realise the presence of factors, which motivate borrowers to work hard in order to increase the probability of success in their businesses and those factors that discourage them thereby reducing the probability of

success in their businesses leading to the disruption of normal business operations. Such considerations are the basis for modeling the relationship between the probability of success in business of borrowers and other factors influencing it.

In this study, it is intended to use non-price information in modeling the relationship between the probability of success in beneficiaries' businesses and other variables that are assumed to affect this probability. These variables include: borrowers' characteristics such as age, sex, education level of borrowers, etc., as well as economic variables such as income, consumption expenditure, saving, number of hired workers, etc.

Age of Borrowers (AB): It is believed that with increase in age borrowers may acquire more stability and business experience. This is expected to increase the probability of success of borrowers in business. So the expected sign of the coefficient of the variable age will be positive.

Age of Borrowers Squared (ABSQ): The probability of success in beneficiaries' businesses increases with age up to a certain limit and is expected to decline beyond a certain level of age, as borrowers get older. Hence, the expected sign of the coefficient of this variable is negative.

Sex of Borrowers (SB): (Dummy = 1 if female; 0 otherwise.) Taking into consideration the fact that women are more responsible in domestic affairs of a household, they are expected to have better loan utilising capacity and perform small business operations better than men. Hence, they are more likely to succeed in business compared to their male counter parts. In this respect, it was argued that "MSE's headed by women are more likely than their male counter parts to

operate from the home" (Mead and Liedholm 1998). On the contrary, some empirical studies found opposite results suggesting that male are better in small business operations than females. So the expected sign of the coefficient of this variable can be either positive or negative.

Loan size in Birr (LS): As the loan size increases, the amount of the monthly installment that borrowers are required to repay increases. In this case, borrowers may have difficulty to meet the monthly payment. This leads to accumulation of debt since most small businesses are not in a position to generate adequate profit per month to meet the monthly installment. In this respect, it was indicated, "An increase in loan disbursed is likely to increase loans outstanding" (Khandker and Khalily, 1996: 32). This shows that an increase in loan size tends to reduce the probability of success in beneficiaries' businesses since it leads to accumulation of debt through raising outstanding loans. So, the expected sign of the coefficient of this variable is negative.

Sufficiency of the Loan as Perceived by Borrowers (SUL): (Dummy = 1 if a borrower perceives the initial loan is sufficient for intended purposes; 0 otherwise.) A sufficient amount of loan for intended purposes as perceived by borrowers is expected to motivate borrowers to work hard. It may also enable borrowers to undertake their business operations according to their plans thereby increasing the profitability of their businesses that enhances the probability of success in business. Hence, the expected sign of the coefficient of this variable is positive.

Education Level of Borrowers (EL): With increase in the level of education, the probability of using the loan for its intended purposes is expected to increase. Some studies found that more educated borrowers tend to use the loan for intended purpose than less educated ones. For

example, according to Khandker and Khalily (1996: 19), "Education is one of the powerful tools used for developing skills, increasing social awareness and consciousness, widening the scope of economic opportunities, and improving social status". This implies that education of borrowers plays a significant role in identifying alternative business opportunities using a wide range of information disseminated through various means. Putting the loan fund to its best alternative use tends to increase the profitability of the beneficiaries' businesses, which leads to increased probability of success in beneficiaries' businesses. As a result, one expects a positive relationship between education of borrowers and the probability of success in beneficiaries' businesses.

Timeliness of Loan Disbursement (TL): (Dummy = 1 if the actual loan disbursement was timely; 0 otherwise.) A change of business plan may result from late loan disbursement. In addition, loss of market or a rise in the price of inputs could result from late loan delivery. This is expected to affect the operation of small business operators adversely. On the other hand, if loan is disbursed on time, borrowers can use it according to their plan for intended purposes in order to enhance the profitability of their businesses thereby increasing their probability of success in business. Consequently, the expected sign of the coefficient of this variable will be positive.

Average Monthly Income from the Business Financed by the Loan in Birr *(AMIL):* With increase in income from the business financed by the loan, the business operation of borrowers tends to expand over time provided that the increased income is reinvested in the same business. In fact, if beneficiaries give particular attention to the business under investigation so that it is considered as an important source of income to the household, they are expected to devote more resource and time so as to increase the profitability of the business. In other words, the higher the

income from the business financed by the loan the more attention it gets as reflected through increased effort (devoting more resource and time) which may increase the chance of success in beneficiaries' businesses. Hence, the expected sign of the coefficient of this variable is positive.

Availability of other Sources of Income after the Loan (ASIL): (Dummy = 1 if a borrower has other source of income after the loan; 0 otherwise.) Besides income from the business financed by the loan some borrowers may have other source of income from side business, government or private sector employment of other family members, through remittances from relatives and friends, etc. The availability of other source of income may increase the probability of success in business of borrowers. However, the availability of other source of income may also tend to produce carelessness on the part of borrowers in the sense that they could become reluctant to work hard thereby reducing the probability of success in business. In addition, borrowers may be obliged to share their time between the POCSSBO financed business and other activities (unless these activities are complementary). Thus, the expected sign of the coefficient of this variable is a priori ambiguous.

Attitude of Borrowers towards Loan Repayment (ABLR): (Dummy = 1 if a borrower perceives that loan should be repaid; 0 otherwise.) This refers to the willingness of a borrower to repay the loan. If a borrower has a belief that loan should not be repaid, then he/she searches for ways of defaulting thereby reducing performance in business operations. This, in turn, tends to reduce the probability of success of borrowers in business. Under this scenario, the expected sign of the coefficient of this variable will be negative. On the other hand, if a borrower has a determination that loan should be repaid, he/she will tend to work hard in order to settle the debt obligation.

Consequently, the probability of success of a borrower in business increases. In this case, the expected sign of the coefficient of this variable will become positive. Hence, it is better to leave the expected sign of the coefficient of this variable to empirical investigation.

Adequacy of Loan Supervision (ALS): (Dummy = 1 if supervision on loan utilisation and repayment is adequate; 0 otherwise.) This refers to an advisory and follow-up activity undertaken by the Project Office in collaboration with the Kebele Administration on loan utilization and repayment. Adequate and proper supervision on loan utilization and repayment encourages borrowers to strengthen their business operations thereby enhancing their probability of success in business. Thus, one can expect a positive relationship between this variable and the chance of success in beneficiaries' businesses.

Use of Accounting Records (UAR): (Dummy = 1 if a borrower uses accounting records after the loan; 0 otherwise.) The use of recording in business transactions enables a borrower to evaluate the direction of the business activity over time. This helps the borrower to assess the performance of his/her business operations in financial terms through identifying profit/loss. The knowledge of the performance of the business operation enables borrowers to devise various means in order to enhance the profitability of their businesses. This tends to raise the probability of success in their businesses. So the expected sign of the coefficient of this variable is positive.

Loan Diversion Rate (LDR): Loan diversion refers to the use of loan for purposes other than those specified in the loan agreement between the lender and borrowers. LDR is computed as a ratio of the amount of loan diverted (to other non-intended purposes) to initial loan size approved

to each of the beneficiaries. The effect of this variable depends on the actual use of the diverted loan. If the diverted loan is used for non-productive purposes, profitability of the beneficiaries' businesses will be depressed thereby reducing the probability of success in beneficiaries' businesses. Under this scenario, the expected sign of the coefficient of this variable is negative. On the other hand, if the diverted loan is used for income generating (productive) purposes, the profitability of the beneficiaries' businesses may be enhanced thereby increasing the probability of success in business. In this case, the expected sign of the coefficient of this variable will be positive. Consequently, the expected sign of the coefficient of this variable is a priori ambiguous.

Business Experience of Borrowers before the Loan (BEL): (Dummy = 1 if a borrower had business experience before the loan; 0 otherwise.) The business experience that borrowers acquired through various means prior to their participation in the credit programme plays a significant role in assisting them to run their businesses effectively. If the beneficiaries are able to run their businesses effectively, the profitability of their business operations increases, ceteris paribus. As a result, the probability of success in beneficiaries' businesses may increase. So the expected sign of the coefficient of this variable is positive.

Training Given to Borrowers before the Loan (TBL): (Dummy = 1 if training was given to borrowers before the actual loan disbursement; 0 otherwise.) The training given to borrowers before the actual disbursement of the loan is expected to help borrowers in using the loan properly for intended purposes so as to increase the profitability of their POCSSBO financed businesses. In this connection, it was indicated, "The acquisition of relevant vocational, technical and business skills is generally regarded as one of the critical factors for success in small

enterprises" (MTI, 1997: 18). So the training given to borrowers prior to the disbursement of the loan plays a key role in equipping them with basic business skills that assist them to increase the profitability of their businesses thereby enhancing the probability of success in business. Thus, the expected sign of the coefficient of this variable will be positive.

Convenience of Business Area as Perceived by Borrowers (CBA): (Dummy = 1 if the business area is convenient; 0 otherwise.) Business area refers to the place where the business is located and the actual business operation takes place. If the business area in which a borrower operates is convenient in the sense that it is accessible to more customers as a result of its proximity to a large market centre, the profitability of the beneficiaries' businesses is likely to be high. As a result, the probability of success in beneficiaries' businesses will be enhanced. Consequently, the expected sign of the coefficient of this variable is positive.

Unpaid Family Workers (UFW): The presence of unpaid family workers in the household reduces the labour cost of borrowers and a reduction in labour cost tends to raise the profit of the beneficiaries. As a result, the assistance of unpaid family workers in the borrowers' business activity is expected to increase the profitability of the business financed by the loan. Hence, the expected sign of the coefficient of this variable will be positive.

3.3.3 Specification of the Model

As mentioned earlier, the logit model will be used in this study in modeling the relationship between the probability of success of the beneficiaries in business and other relevant variables affecting it. The major reason for using the logit model for this dichotomous dependent variables case is due to

the inefficiency of the Ordinary Least Squares (OLS) method. If one uses the OLS method, which in this dichotomous dependent variable case is called the Linear Probability Model (LPM), the following problems arise: 1) The error terms do not follow normal distribution; 2) The error terms are heteroscedastic; and 3) Possibility of estimated probabilities lying outside the interval (0,1).

In general, the estimates of β in LPM are inefficient and LPM is also logically weak in that it assumes $P_i = E(Y_i = 1/X_i)$ increases linearly with X_i, implying that the marginal effect of X remains constant across all sample values. Hence, there is a need for a probability model such as the logit model, which shows that as the explanatory variable increases the probability that the dependent variable will occur (i.e. $Y_i = 1$) remains within the (0,1) interval.

Based on these considerations as well as the description of the explanatory variables given in the preceding section, the following model is used:

$$Y_i = \alpha_1 + \beta_1 AB + \beta_2 ABSQ + \beta_3 SB + \beta_4 EL + \beta_5 LS + \beta_6 SUL + \beta_7 BEL + \beta_8 TBL + \beta_9 AMIL + \beta_{10} TL + \beta_{11} CBA + \beta_{12} UFW + \beta_{13} LDR + \beta_{14} ALS + \beta_{15} ASIL + U_i \quad \ldots\ldots(1)$$

where, Yi = 1 if a borrower stays at least 24 months in business after the loan; 0 otherwise

U_i = the error term, and the other variables are as described in section 3.3.2 above.

The variable education is qualitative in nature. As a result, it is necessary to consider the mutually exclusive levels of education separately. These are: less than high school (grade 0-8), high school (grade 9-12) and above high school (above grade 12). Accordingly, two dummies can be introduced so as to take care of the 3 levels of education. Assuming that the 3 dummies

for the level of education affect the intercept[14] but not the slope in the regression of the probability of success on the other explanatory variables, the following model can be used.

$$Y_i = \alpha_1+\alpha_2D_2+\alpha_3D_3+\beta_1AB+\beta_2ABSQ+\beta_3SB+\beta_4LS+\beta_5SUL+\beta_6BEL+\beta_7TBL$$
$$+\beta_8AMIL+\beta_9TL+\beta_{10}CBA+\beta_{11}UFW+\beta_{12}LDR+\beta_{13}ALS+\beta_{14}ASIL+U_i \quad \ldots\ldots(2)$$

where, D2 =1 if a borrower has high school level of education; 0 otherwise

D3 = 1 if a borrower has above high school level of education; 0 otherwise

And the other variables are as described in Eq(1) above.

It is necessary to impose the restriction that the error terms are uncorrelated, which means that there is no serialcorrelation among the error terms, i.e. $Cov(U_i, U_j) = 0$, $i \neq j$ in order to proceed the regression. The maximum likelihood estimation technique is employed to estimate the model. For simplicity, Eq(2) can be rewritten as follows:

$$Y_i = \alpha_1+\alpha_2D_2+\alpha_3D_3+\beta_iX_i+U_i \quad \ldots\ldots(3)$$

where, X_i = AB, ABSQ, SB, LS, SUL, BEL, TBL, AMIL, TL, CBA, UFW, LDR, ALS, ASIL;

$\beta_i = \beta_1, \beta_2, \beta_3, \ldots, \beta_{14}$;

And the other variables are as described in Eq(2) above.

$E(Y_i|X_i)$, that is the conditional expectation of Y_i given X_i can be interpreted as the conditional probability that the event will occur given X_i. Hence, $E(Y_i|X_i)$ gives the probability of a borrower staying in business at least 24 months after the loan.

[14] In this assignment of dummy for education the less than high school level education category is arbitrarily treated as the base category. Hence, the intercept α_1 reflects the intercept for this category.

Assuming $E(U_i) = 0$, in order to get unbiased estimators, one can obtain,

$$E(Y_i|X_i) = \alpha_1+\alpha_2D_2+\alpha_3D_3+\beta_iX_i \quad \ldots\ldots(4)$$

Let P_i be the probability that $Y_i = 1$ (i.e. a borrower stayed in business at least 24 months after the loan) and $1- P_i$ be the probability that $Y_i = 0$ (i.e. a borrower did not stay in business at least 24 months after the loan), then the variable Y_i has the following probability distribution

Y_i	Probability
1	P_i
0	$1-P_i$
Total	1

$P_i = E(Y_i=1|X_i)$ where, Y=1 means borrowers stayed in business at least 24 months after the loan. By definition of mathematical expectation, one can get the following result.

$$E(Y_i|X_i) = 0(1-P_i) + 1(P_i) = P_i \quad \ldots\ldots(5)$$

Comparing Eq(4) with Eq(5), one can equate

$$E(Y_i|X_i) = \alpha_1+\alpha_2D_2+\alpha_3D_3+ \beta_2X_i = P_i \quad \ldots\ldots(6)$$

This shows that the conditional expectation of model (2) can be interpreted as the conditional probability of Y_i given X_i. The probability P_i must lie between 0 and 1 and one can have the restriction

$$0 \leq E(Y_i|X_i) \leq 1 \quad \text{.....(7)}$$

This means the conditional probability must lie within the interval (0,1).

But now consider the following representation of the borrower's stay at least 24 months in business after the loan.

$$P_i = E(Y_i=1|X_i) = \frac{1}{1+e^{-(\alpha_1+\alpha_2 D_2+\alpha_3 D_3+\beta_i X_i)}} \quad \text{.....(8)}$$

For simplicity Eq(8) can be rewritten as follows:

$$P_i = \frac{1}{1+e^{-Z_i}} \quad \text{.....(9)}$$

where, $Z_i = \alpha_1+\alpha_2 D_2+\alpha_3 D_3+ \beta_i X_i$

If P_i, the probability of success in business of a borrower, is given by (5), then $1-P_i$, the probability of a borrower not succeeding in business, is

$$1-P_i = \frac{1}{1+e^{Zi}} \quad \text{.....(10)}$$

Hence, it is possible to write

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \quad \text{.....(11)}$$

Here, $P_i/(1-P_i)$ is the odds ratio in favour of succeeding in business of a borrower, that is, the ratio of the probability that a borrower will succeed in business to the probability that he/she will not succeed in business.

Taking the natural logarithm of Eq (11) yields the following:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + \beta_i X_i \quad \text{.....(12)}$$

This shows that the log of the odds ratio (L), is linear both in the explanatory variables (X) and the parameters (β).[15] L is called the logit, and hence, the name logit model is given to such models.

Eq (12) was estimated using the Maximum Likelihood estimation technique. The estimation results are discussed in the next chapter.

[15] The linearity assumption of OLS does not require that the explanatory variable (X) be necessarily linear. Hence, one can have X^2, X^3, etc., as regressors in the model. For the purpose of estimating the parameters, it is linearity in the parameters that is crucial (see Gujarati, 1995, p.555 footnote 17).

CHAPTER FOUR

DESCRIPTIVE AND EMPERICAL ANALYSIS

This chapter is devoted to the analysis of the results of the survey data, which is accomplished in two ways. First, the descriptive analysis will be presented which contains an assessment of the role the POCSSBO micro financing programme, general characteristics of sample beneficiaries, factors that induced continuous business operation of the beneficiaries, factors that led to the disruption of the beneficiaries' businesses, and beneficiaries' duration of stay in business after the loan. Secondly, empirical analysis of estimation results of the logit model will be discussed.

4.0 Descriptive Analysis

4.1 The Role of POCSSBO Micro Financing Programme

The main objective of POCSSBO's credit scheme is to create self-employment opportunities to the unemployed people and the poor. The survey result shows that most of the beneficiaries of this credit programme are women and unemployed youth who had high school level education prior to their participation in the credit scheme. An assessment of the performance of this credit programme enables one to have an insight into the progress of the beneficiaries in their business operations. Knowledge about the progress of the programme beneficiaries helps to analyse the role of the POCSSBO micro credit programme in the development of micro-enterprises in Addis Ababa. Accordingly, the role of the credit programme in the area of employment creation, income generation, saving promotion and raising consumption expenditure to the beneficiaries' households will be analysed in the subsequent sections.

4.1.1 Employment Creation

The survey result shows that about 49 (20.8%) of the sample beneficiaries were unemployed before the credit programme. However, after the credit programme only 7 (3%) of them are unemployed[16]. This shows that the credit scheme plays a significant role in employment creation and unemployment reduction. Table 1 below summarises major types of beneficiaries' activities before and after the credit scheme.

Table 1 Major types of beneficiaries' activities before and after the credit programme.

Type of activity	Before the credit		After the credit	
	Number	Percent	Number	Percent
Selling Bread/Injera	26	11.1	19	8.1
Retail trade	66	28	86	36.4
Shoe repair/polish	8	3.4	9	3.8
Handicraft	15	6.4	18	7.6
Private organisation employee	12	5.1	8	3.4
Textile/garment/sewing clothes	9	3.8	5	2.1
Barber/Beauty salon	10	4.2	29	12.3
House wife*	16	6.8	0	0
Student*	6	2.5	0	0
Public enterprise employee	0	0	14	5.9
Mini Bar/Restaurant	5	2.1	13	5.5
Casual worker	5	2.1	2	0.9
Wood work	3	1.3	6	2.5
Preparing/selling papper, 'Shiro' and spices	6	2.5	20	8.5
Unemployed	49	20.8	7	3.0
Total	236	100	236	100

*These are not forms of business activity but included here just to trace occupational status of the borrowers prior to their participation in the credit programme.

[16]The main reason for unemployment of beneficiaries after the loan is lack of favourable working premises and loss of the initial loan fund due to unpredicted circumstances as the respondents reported.

As depicted in Table 1 above, 26 (11%) of the sample beneficiaries were engaged in selling Bread/Injera prior to their participation in the credit programme while 19 (8.1%) were engaged in the same activity after the credit. All of the beneficiaries engaged in this activity are female who reported this as their main activity. Out of the sample beneficiaries 66 (28%) were engaged in retail trade prior to their participation in the credit scheme. However, after the credit the number of beneficiaries engaged in retail trade has increased to 86 (36.4%) and most of them are female who were unemployed before the loan as reported by the respondents themselves.

In addition, 16 (6.8%) of the sample beneficiaries were housewives who were extremely poor prior to the credit scheme. This shows that the credit programme played a significant role in expanding small business opportunities to female beneficiaries since the number of housewives became nil after the loan. This suggests that there is a room for improvement in the living condition of at least some female beneficiaries since the launching of the credit scheme as the respondents themselves confirmed in the course of the survey.

The survey result shows that some new employment was generated in retail trade and barber (hair cutting) or beauty salon (hair dressing). As shown in Table 1, 10 (4.2%) of the sample beneficiaries were engaged in hair cutting (barber) and hair dressing (beauty salon) before the credit programme. But the number of programme participants engaged in such activities has risen to 29 (12.3%) after the credit programme. Most of the beneficiaries engaged in this activity were unemployed prior to their participation in the credit programme. In effect, most of these constitute newly established businesses indicating that the credit programme has a positive contribution in generating employment in newly established small businesses. So the expansion of small business opportunities plays a key role in reducing the problem of unemployment.

Besides the creation of employment opportunities directly to the beneficiaries of the programme, the credit scheme has generated some employment opportunities to hired workers as well. The survey result indicates that none of the beneficiaries included in the sample reported the employment of hired workers in their businesses[17] prior to their participation in the credit progarmme. However, after the credit programme, there is a slight increase in the number of beneficiaries employing hired workers in their business operations. Accordingly, 25 (10.6%) of the sample beneficiaries hired a total of 34 wageworkers to help them in running their POCSSBO financed business. Of the 25 sample beneficiaries that hired workers after the loan, the survey result shows that 17 hired 1 worker each, 7 hired 2 workers each and only one hired 3 workers. Generally speaking, the performance of the credit programme is not much satisfactory in the area of hired labour employment creation. Because the amount of loan from such financing arrangement is not high enough to establish large-scale businesses that absorb more labour force.

In general, such unsatisfactory performance of the credit programme in the area of employment creation for hired workers should in no way undermine the positive contribution of the POCSSBO's micro financing programme. In other words, the role of the credit programme in generating self-employment opportunities to the direct beneficiaries of the credit progarmme participants should not be underestimated although the performance is very low in the area of employment creation to hired workers. Essentially, the POCSSBO microfinancing programme has empowered most of the sample beneficiaries to participate in marketing process thereby enabling them to ensure self-reliance in their small business operations at large.

[17] There were some borrowers engaged in various small business activities before the loan as shown in Table 1.

4.1.2 Income Generation

It is evident that the promotion of equity is one of the benefits of all microfinancing programmes in general and that of POCSSBO in particular. As described in the previous section, the findings of this study regarding the generation of employment opportunities for the direct beneficiaries of the POCSSBO credit programme revealed that the programme has a positive contribution to income generation as well. This is due to the fact that the expansion of self-employment opportunities leads to an increase in the income of the beneficiaries under normal circumstances. Of the total sample beneficiaries, only 72 (30.5%) reported the presence of reliable source of income to their households prior to their participation in the credit programme.

73 (30.9%) of the sample beneficiaries reported an average monthly income below Birr 100 while 95 (40.3%) reported an average monthly income from the business financed the loan ranging from Birr 100-200 as shown in Table 2. The mean of average monthly income from the business financed by the loan is about Birr 178 and roughly over 30% of the sample beneficiaries earn an average monthly income above the mean. The standard deviation is Birr 134 indicating that there is a big disparity among the beneficiaries' average monthly income from the business financed the loan.

As shown in Table 2 below, 15 (6.4%) of the sample beneficiaries are able to generate an average monthly income above Birr 400 from the POCSSBO financed business. Generating this amount of income from small business operations is not a simple task, which can be regarded as a positive contribution of the credit programme in income generation[18]. From these results, one

[18] The survey result reveals that only 24 (10.2%) of the sample beneficiaries get additional income from sources other than the POCSSBO financed business after the loan. This implies that the majority of the beneficiaries of

can conclude that the POCSSBO micro financing programme has registered advancement in the area of income generation to the direct beneficiaries of the programme.

Table 2 Frequency distribution of average monthly income of borrowers from the business financed by the loan.

Level of income (Birr)	Frequency	Percent
Below 100	73	30.9
100-200	95	40.3
201-300	42	17.8
301-400	11	4.7
401-500	7	3.0
Above 500	8	3.4
Total	236	100

4.1.3 Promoting Saving

When credit delivery is combined with saving it is expected to help in smoothing income of the beneficiaries, which paves the way for accumulation of surplus. In this respect, Fidler and Webster (1996: 21) indicated that "Specifically, saving services enable the poor to accumulate even very small surpluses that can be used at a later date to ride out dips in income or respond to emergencies." Moreover, one can argue that incorporating saving services in the micro financing programmes plays an important role in generating local funds to enhance the development of micro enterprises to ensure sustainability of micro financing institutions. One of the objectives of the POCSSBO's micro financing programme is to facilitate saving mobilisation. However, the performance of the progarmme in this area is not much satisfactory owing to the absence of a link between the saving service and credit delivery as well as lack of concerted effort on the part of the project office towards facilitating saving mobilisation.

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this microfinancing programme are getting reliable income from the business financed by the loan. So the

Table 3 Frequency distribution of beneficiaries' responses on the use of saving account

Response on the availability of saving account	Before the credit programme		After the credit programme	
	Frequency	Percent	Frequency	Percent
Yes	20	8.5	26	11.0
No	216	91.5	210	89.0
Total	236	100	236	100

As shown in Table 3, there were 20 (8.5%) of the sample beneficiaries who had saving account before the credit while 26 (11%) have saving account after the credit. There is only about 2.5% increase in the number of beneficiaries who use saving account after the loan. Thus, the performance of the programme in the area of saving mobilisation is not satisfactory since the majority (89%) of the sample beneficiaries do not have saving account at all after the credit programme. This shows that efforts should be directed towards designing and implementing saving mobilization strategy to disseminate the culture of saving among the beneficiaries so that the credit programme plays a key role in poverty reduction. In this connection, it was argued that "... credit alone cannot reduce poverty, but that well-designed and implemented savings and credit schemes can be effective instruments of poverty reduction" (Halt and Ribe, 1991: 7).

The dissemination of saving culture helps to smooth out the income of beneficiaries thereby enhancing the positive effect of the credit programme in this area. This is necessary since saving generates interest earning which leads to the accumulation of surplus that can be used in the future when beneficiaries experience decline of income due to the occurrence of unpredictable circumstances. In relation to this, Halt and Ribe (1991: 8) argued that "The financial needs of very poor men and women may be best served by increasing their access to interest-bearing

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POCSSBO's credit scheme played a key role in generating sufficient income for some of its beneficiaries.

deposit accounts". This implies that the use of saving accounts plays a key role in reducing the financial problems of the poor in general and micro enterprise operators in particular.

4.1. 4 Raising Consumption Expenditure

A rise in income of the beneficiaries of the credit programme after the loan leads to an increase in household consumption expenditure under normal circumstances. This means that if average monthly income from the business financed by the loan increases, there will be a corresponding increase in the monthly household consumption expenditure, other things remaining the same. However, the probability of success in business of a borrower will be reduced if the borrower covers increased consumption expenditure using income from the business financed by the loan.

In fact, the reverse will occur if the increased consumption expenditure is financed using income generated from other sources through the employment of other family members (or other private business activities). This means in other words, if the beneficiaries do not spend any thing for consumption so that other household members fully cover consumption expenditure, the likelihood of success in business of the beneficiaries normally increases unless they are extravagant. As shown in Table 4, 64 (27.1%) of the sample beneficiaries cover the monthly consumption expenditure of their households prior to their participation in the credit programme. But after the credit, only 60 (25.4%) cover their household's monthly consumption expenditure. On the other hand, 87 (36.9%) of the sample beneficiaries do not bear any portion of their household's monthly consumption expenditure before the loan since the other family members fully cover the consumption expenditure. However, after the loan only 55 (23.3%) of the beneficiaries enjoy monthly household consumption expenditure covered by other family

members. This is because the number of households whose consumption expenditure is covered by other household members and the beneficiaries together has increased from 75 (31.8%) to 106 (44.9%) after the loan as shown in Table 4 below. In effect, from these results, one can conclude that the credit programme has played a significant role in increasing the monthly consumption expenditure of the beneficiaries' households in general terms.

Table 4 Frequency distribution of the bearer of monthly household consumption expenditure

Bearer of consumption Expenditure	Before the credit		After the credit	
	Frequency	Percent	Frequency	Percent
Beneficiary him/her self	64	27.1	60	25.4
Other family members	87	36.9	55	23.3
Beneficiary and other family members	75	31.8	106	44.9
Beneficiary and other relatives	0	0	3	1.3
Beneficiary, other family members and donors	3	1.3	5	2.1
Other family members and donors	2	0.9	4	1.7
Other relatives	5	2.1	3	1.3
Total	236	100	236	100

4.2 General Characteristics of Sample Beneficiaries

This section is devoted to the discussion of the characteristics of the sample beneficiaries. As mentioned earlier, 236 beneficiaries were randomly selected from 4264 beneficiaries using the list of borrowers obtained from POCSSBO as a sampling frame. Out of the total sample beneficiaries, 70 (29.7%) are male while 166 (70.3%) are female. The following table shows the frequency distribution of the sample beneficiaries by age group.

Table 5 Frequency distribution of sample beneficiaries by age group

Age Group	Frequency	Percent
18 – 22	35	14.83
23 – 27	80	33.90
28 – 32	41	17.37
33 – 37	22	9.32
38 – 42	23	9.75
43 – 47	8	3.39
48 – 52	17	7.20
53 – 70	10	4.24
Total	236	100.00

As shown in Table 5 above, 80 (33.9%) of the sample beneficiaries are in the age group[19] 23–27. On the other extreme, 8 (3.39%) of the sample beneficiaries are in the age group 43–47. Here, it can be seen that the beneficiaries in the age group of 43–47 are about 10% of those in the age group of 23-27 as Table 5 indicates. This portrays that most of the sample beneficiaries are the youth in the middle of 20s (i.e. in the age group of 23-27).

As far as education is concerned 106 (44.92%) of the sample beneficiaries had high school level education prior to their participation in the credit programme. On the other hand, 11 (4.66%) of the sample beneficiaries are found to be illiterate (cannot read and write) while 10 (4.24%) of them are found to have above high school level education. Of those who have high school level education 72 (30.5%) had completed grade 12 while 20 (8.5%) of them completed grade 9. Table 6 depicts the frequency distribution of beneficiaries by education level in which they are

[19] Age is expressed in completed years and the group is set arbitrarily.

categorized by the highest level of schooling completed and the illiterates group is also include as one category[20].

Table 6 Frequency distribution of beneficiaries by the level of education completed

Category	Frequency	Percentage
Illiterate	11	4.66
Grade 1 – 4	57	24.15
Grade 5 – 8	52	22.03
Grade 9 – 12	106	44.92
Above grade 12	10	4.24
Total	236	100.00

With respect to business experience before the loan, the survey result shows that 164 (69.5%) of the sample beneficiaries had business experience acquired in various ways prior to their participation in the credit programme. On the contrary, 72 (30.5%) of the sample beneficiaries had no business experience prior to their participation in the credit programme. As far as convenience of the business area is concerned, 142 (60.2%) of the respondents reported that the business area in which they operate is convenient. On the other hand, 94 (39.8%) of the sample beneficiaries complained that the business area in which they operate is inconvenient.

Regarding the presence of unpaid family workers, 140 (59.3%) of the respondents reported that they did not have any unpaid family workers at all prior to their participation in the credit programme. But after the loan, 52 (22.0%) of the respondents reported to have one unpaid family worker each while 24 (10.2%) of them reported to have two unpaid family workers each.

[20] The category is formed arbitrarily and the illiterates are included just for comparison purposes.

Concerning the timeliness of loan disbursement 200 (84.7%) of the respondents confirmed that the loan was issued on time while only 36 (15.3%) complained that it was not issued on time. However, most of those who complained confirmed that no inconvenience was created as a result of the delay in loan disbursement.

With regard to loan size, the mean is about Birr 1,292 and the majority of borrowers are in the loan group of 600–1,099 Birr. As shown in Table 7, 80 (33.9%) of the sample beneficiaries took credit ranging from 600–1,099 Birr followed by 76 (32.2%) of them who took credit ranging from 1,100–1,599 Birr. In so far as the repayment period is concerned, 167 (70.8%) of the sample beneficiaries assured that the loan repayment period was found to be convenient while 69 (29.2%) complained that the repayment period was inconvenient.

Table 7 Frequency distribution of beneficiaries by loan size.

Loan size (in Birr)	Frequency	Percent
100 – 599	16	6.8
600 – 1099	80	33.9
1100 – 1599	76	32.2
1600 – 2299	54	22.9
2300 – 2500	10	4.2
Total	236	100

With regard to training given to beneficiaries before the credit, 121 (51.3%) of the sample beneficiaries reported that they were given training before the loan and confirmed that the training was found to be relevant and useful to their business operations. On the other hand, 115 (48.7%) of the sample beneficiaries reported that they were not given training before the loan.

As far as adequacy of loan supervision is concerned, 125 (53%) of the sample beneficiaries confirmed that supervision on loan utilisation and repayment is adequate. The remaining 111 (47%) reported that the supervision on loan utilisation and repayment was inadequate. Inadequacy of the supervision on loan utilisation and repayment leads to accumulation of debt which inhibits the probability of success in business through its adverse effect on the business performance of the programme beneficiaries as the respondents assured during the survey.

Regarding the sufficiency of the initial loan size approved and disbursed to each of the beneficiaries, 120 (50.8%) of them reported that the loan size was sufficient for the intended purposes. But the remaining 116 (48.2%) complained that the initial loan size was insufficient for intended purposes. Table 8 summarises the frequency distribution of beneficiaries' responses regarding adequacy of loan supervision (ALS), business experience before the loan (BEL), convenience of business area (CBA), sufficiency of the loan for intended purposes (SUL), training given to borrowers before the loan (TBL) and timeliness of loan disbursement (TL).

Table 8 Frequency distribution of responses regarding ALS, BEL, CBA, SUL, TBL and TL.

Variable	Response of beneficiaries			
	No		Yes	
	Frequency	Percent	frequency	percent
ALS	111	47.0	125	53.0
BEL	72	30.5	164	69.5
CBA	94	39.8	142	60.2
SUL	116	49.0	125	53.0
TBL	115	48.7	121	51.3
TL	36	15.3	200	84.7

4.3 Factors that Induced Continuous Business Operation of the Beneficiaries

With regard to performance in continuous business operation, the survey result shows that 118 (50%) of the sample beneficiaries are successfully undertaking their POCSSBO financed business till the date of the interview. As reported by the beneficiaries themselves, the major factors that contributed to this achievement of continuous business operations after the loan include the following:

i) Presence of unpaid family workers in the household: Unpaid family workers devote their full time in assisting the beneficiaries in business and even run the business in the absence of the beneficiaries in order to increase the profitability of the beneficiaries' businesses. Furthermore, since unpaid family workers offer free labour service, the labour cost of the beneficiaries is expected to be lower which tends to raise profit. Hence, the presence of unpaid family workers tends to increase the probability of success in beneficiaries' businesses as the majority of sample beneficiaries confirmed during the survey.

ii) Sufficiency of the loan for intended purposes: The majority of respondents reported that the sufficiency the loan for intended proposes enabled them to perform their business operation according to previous plans. Consequently, the beneficiaries became successful in their business operations since they accomplished the required tasks according to their plan.

iii) Business experience before the loan: Business experience that the beneficiaries had acquired through various means such as working in government/private organisations (as a purchaser or a

sales person) and offering services in various private businesses (or production sectors) have played an important role in increasing the probability of success of the beneficiaries in business.

iv) *Training given to borrowers before the loan:* This has played a significant role in assisting the borrowers to use the loan properly thereby enhancing the profitability of their business operations as most of the respondents confirmed during the survey. In this connection, it was revealed "Literacy and entrepreneurial awareness are seen as particularly important requirements to enable people to advance lower level activities into larger and better earning enterprises" (MTI, 1997: 18). This shows that the training given to borrowers before the actual disbursement of the loan plays a key role in increasing the probability of success in beneficiaries' businesses.

v) Convenience of business area: The business area in which the beneficiaries operate plays a significant role in determining the profitability of beneficiaries' businesses as confirmed by almost all of the sample beneficiaries during the course of the survey. Hence, the variable highly affects the probability of success in beneficiaries' businesses. This can be deduced from the fact that most of the beneficiaries whose businesses are located by the side of main roads in different parts of the city and those located nearer to the growing markets were found to be more successful as the survey result shows. This finding is consistent with the findings of other studies pertaining to microenterprises. For instance, Mead and Liedholm (1998) in their study of MSEs in four African countries found that "MSEs located in rural towns and villages were less likely to grow than their urban counterparts. Moreover, MSEs located in commercial districts were more likely to survive than those that operated out of the home. Proximity to growing markets would thus seem to be an important determinant of the prospects for an enterprise to survive."

vi) Devotion and determination of the borrowers themselves to work hard: It is evident that devotion and determination to work hard leads to success in all aspects of life (provided that efforts are exerted in the right direction) in general and in business operations in particular. Accordingly, devotion and determination of borrowers to work hard increased the profitability of their businesses. This enhanced the probability of success in beneficiaries' businesses thereby enabling them to ensure self-reliance. In fact, some of the beneficiaries expanded their business operations as a result of increased proceeds from the POCSSBO financed business and earn higher income thereby improving the living condition of their households. This is particularly true among the sample beneficiaries who were organised in groups and engaged in retail trade using small shops constructed by the Pepsi Cola Company found in most cases by the road side in different parts of the city of Addis Ababa.

vii) Good way of handling customers: Some of the beneficiaries confirmed that good way of handling customers contributed to success in their business operations. This is particularly true in the case of those beneficiaries engaged in preparing and selling local drinks, shoe polishing and repairing, hair cutting (barber), hair dressing (beauty salon), retail trade and mini-bars/restaurant (selling beverages and food) as the majority of respondents assured during the survey.

viii) Education of borrowers: Educated borrowers are able to use the loan fund properly and more effectively compared to uneducated ones as the respondents reported. Hence, education is one the most important factors that enhanced the profitability of beneficiaries businesses as most

of them confirmed in the course of the survey. Accordingly, education played a crucial role in inducing success in beneficiaries' businesses in general terms.

4.4 Factors that Led to the Disruption of the Beneficiaries' Businesses

The survey result shows that 50% of the sample beneficiaries fail to continue their business operations up to now owing to a number of reasons. The major factors, which the respondents mentioned as the cause for the disruption of the beneficiaries' businesses, include the following.

i) Securing employment: Some of the beneficiaries were able to get a job in various government and/or private organisations after the loan, which enable them to earn higher income than their POCSSBO financed business. Hence, they closed their business and started wage employment thereby changing their profession.

ii) Lack of appropriate business area: Some of the beneficiaries operate in residence areas located far a way from the market centres that are not commonly accessible to more customers. Hence, they have serious problems to sell their products as a result of which they became unsuccessful in their business operations in general. So they have no alternative but to close their businesses and became jobless due to lack of appropriate business area.

iii) Increased competition: Various beneficiaries are engaged in similar types of business activities and hence, there is a competition among themselves. Some of the beneficiaries are unable to withstand the increased competition and became unsuccessful in their businesses.

iv) Shortage of working capital: Most of the beneficiaries do not have sufficient capital to run their businesses. So shortage of working capital is one of the binding constraints that inhibits the probability of success in beneficiaries' businesses. This is because they cannot operate with full capacity to expand their businesses as a result of which most of them became unsuccessful in general. The inability of the beneficiaries to work with full capacity shows there is some degree of inefficiency of the working capital, as the available working capital itself cannot be properly allocated to its best use in small business operations. "With inefficient working capital, small businesses must wait for proceeds to accumulate before they can purchase materials. This commonly results in inefficiency and discontinuities in products and sales" (Halt and Ribe, 1991:7).

v) Theft/robbery and other problems: Some of the beneficiaries closed their businesses due to loss of the initial loan fund through theft and/or robbery, health problem of the beneficiaries themselves, lack of market for their products and other personal problems.

4.5 Beneficiaries' Duration of Stay in Business after the Loan

The mean of beneficiaries' duration of stay in business after the loan is found to be 24.5 months with a standard deviation of 11.5. The survey result reveals that 36 (15.3%) of the sample beneficiaries stayed in business for less than 12 months after the loan. This means that these beneficiaries fail to continue normal business operation and hence, discontinued their businesses before completing 12 months. According to the definition of success used in this study, this category is regarded as the unsuccessful group.

In addition, 69 (29.2%) of the sample beneficiaries stayed in business from 12 to 23 months after the loan. This category consists of those beneficiaries who stayed in business for more than 12

months but less than 24 months after the loan. However, some of the beneficiaries that fall under this category did not complete 24 months since they took the loan but continued normal business operations up to now. In effect, this category contains mixed group of borrowers. Namely, the unsuccessful group who did not stay 24 months in business after the loan together with those beneficiaries that continued their business operations up to now and have a potential to succeed but cannot be regarded as either successful or unsuccessful group for the time being.

On the other hand, 95 (40.3%) of the sample beneficiaries stayed in business from 24 to 36 months after the loan. Obviously these are regarded as the successful group on the basis of the definition of success used in this study. Furthermore, 36 (15.3%) of the beneficiaries stayed in business for more than 36 months after the loan which can be regarded as more successful group.

Table 9 Frequency distribution of beneficiaries' duration of stay in business after the loan

Duration of stay in business after the loan (in months)	Frequency	Percent
Below 12	36	15.3
12 – 23	69	29.2
24 – 36	95	40.3
Above 36	36	15.3
Total	236	100

In general, 131 (55.5%) of the sample beneficiaries are found to be successful in the sense that they stayed 24 months and above in business after the loan. This means in other words, 55.5% of the sample beneficiaries succeeded in business according to the definition of success used in this study. Unfortunately, 69 (29.2%) of the sample beneficiaries are found to be intermediate cases

between the successful and unsuccessful group in the senses that both the potentially successful and unsuccessful groups are incorporated in this category as depicted in Table 9 above

4.6 Estimation Results of the Logit Model

This section is devoted to analysis of empirical results and interpretation of the parameters which are obtained by estimating the logit model. As far as identification of determinants of probability of success in business of beneficiaries is concerned, the logit model is estimated using LIMDEP VERSION 7.0. It is well known that the problem of heteroscedasticity is common in cross-sectional data. Moreover, model specification errors can also lead to serious problems in the estimation of dichotomous dependent variable models. These problems were taken into consideration to take care of the problem of heteroscedasticity and specification errors. First the homoscedastic model is estimated (i.e., without correcting for heteroscedasticity) and the result is given in Annex 3. No specification error is observed in the data set but heteroscedasticity problem is detected. Next a correction is made for heteroscedasticity and the corrected version of the model is estimated and the result is presented in Table 10 below.

Table 10 Maximum Likelihood Estimates of Heteroscedastic Logit Model (Standard Errors are Given in Parentheses)

```
Number of observations                    236
Log likelihood function                -141.4458
Restricted Log likelihood              -162.1476
Chi-squared                             41.40364
```

Variable	Coefficient	Z-value	P[|Z|>z]	Slope	Z-value	P[|Z|>z]
constant	-3.704 (2.805)	-1.321	0.187	-0.647 (0.475)	-1.361	0.174
AB	0.150 (0.153)	0.977	0.329	0.026 (0.026)	1.006	0.315
ABSQ	-0.0024 (0.0021)	-1.120	0.263	-0.0004 (0.0004)	-1.162	0.245
SB	-0.374 (0.469)	-0.796	0.429	-0.065 (0.082)	-0.794	0.427
LS	-0.0007 (0.0004)	-1.739	0.082	-0.0001 (0.0001)	-1.650	0.099
SUL	0.720 (0.391)	1.840	0.066	0.126 (0.070)	1.799	0.072
TBL	0.824 (0.409)	2.016	0.044	0.144 (0.072)	1.996	0.046
BEL	0.873 (0.409)	2.138	0.033	0.152 (0.071)	2.154	0.031
AMIL	0.0014 (0.0013)	1.121	0.262	0.0003 (0.0002)	1.066	0.286
CBA	0.791 (0.402)	1.968	0.049	0.138 (0.070)	1.964	0.050
UFW	0.394 (0.402)	0.979	0.328	0.069 (0.061)	1.121	0.262
ASIL	0.517 (0.405)	1.274	0.203	0.090 (0.072)	1.261	0.207
D_2	1.196 (0.478)	2.504	0.012	0.209 (0.091)	2.294	0.022
D_3	2.125 (1.697)	1.252	0.211	0.371 (0.288)	1.288	0.198
LOGUFW	0.879 (0.567)	1.551	0.121	-0.065 (0.087)	-0.744	0.457

The estimation result of heteroscedasticity corrected version of the logit model indicates that the Likelihood Ratio (LR) statistic having a chi-squared distribution with 13 degrees of freedom is statistically significant at 5% level of significance. From this result, one can conclude that the estimated model fits the data well.

The age of borrowers is positively related to the probability of success in beneficiaries' business, which is consistent with a priori expectations. However, the coefficient of the age variable is found to be statistically insignificant. The square term for the age of borrowers was added to test

for non-linearity and it was found that age follows the predicted trend. This means that the square of age of borrowers is negatively related to the probability of success in beneficiaries' businesses as expected even though its coefficient is found to be statistically insignificant.

Sex of borrowers is negatively related to the probability of success in beneficiaries' businesses indicating that being a female tends to reduce the probability of success in business of borrowers. The coefficient of this variable is statistically insignificant. This finding is in line with some other studies which found similar result and can be explained on the basis of various constraints facing females in business activities compared to males. For example, Berger (1989) argued, "They lack the capital, technical and managerial know-how, access to credit, markets, raw materials, and services necessary to expand or even make marginal improvements in productivity and income." This shows that there are several factors, which make females less likely to succeed in business compared to their male counterparts.

Loan size is negatively related to the probability of success in business of borrowers, which is consistent with a priori expectations. The coefficient of this variable is significant at less than 10% level of significance. This shows that the higher the loan size the lower the likelihood of the borrowers' success in business. The reason for this is that as the loan size increases, the amount of monthly installment also rises. In this case, the borrowers cannot meet the monthly payment to settle their debt obligations. This leads to accumulation of debt since most small businesses are not in a position to generate adequate profit per month that enables them to pay the monthly installment. Consequently, an increase in loan size tends to reduce the probability of success in beneficiaries' businesses.

Sufficiency of the loan for intended purposes variable is positively related to the probability of success in beneficiaries' businesses. This is consistent with a priori expectations and the coefficient of this variable is statistically significant at less than 10% level of significance. This reveals that sufficient amount of loan size for intended purposes increases the probability of success in business of the beneficiaries of the credit programme.

The training given to borrowers before the actual disbursement of the loan is positively related to the probability of success in beneficiaries' businesses, which is again consistent with a priori expectations. The coefficient of the variable is statistically significant at 5% level of significance. This shows that the training given to borrowers before the loan tends to increase the probability of success of the beneficiaries in their business operations. In fact, this finding is consistent with the common sense hypothesis and economic theory in general terms.

Business experience of borrowers acquired before the loan is positively related to the probability of success in beneficiaries' businesses and consistent with a priori expectations. The coefficient of this variable is significant at less than 5% level of significance. This reveals that the business experience that borrowers acquired through various means prior to their participation in the credit programme raises the probability of success of borrowers in their business operations. This finding is in line with economic theory and common sense hypothesis since experience is the basis for successful accomplishment of all tasks in general and business activities in particular.

Another variable that is positively related to the probability of success in beneficiaries' business and consistent with a priori expectations is convenience of business area in which the borrowers

operate. The coefficient of this variable is statistically significant at 5% level of significance. This indicates that the business area in which borrowers operate plays a significant role in raising the probability of success in beneficiaries' businesses.

High school level education is positively related to the probability of success in beneficiaries' businesses and the sign of the coefficient of this variable is consistent with prior expectations. The coefficient of this variable is statistically significant at less than 5% level of significance. This result suggests that education tends to increase the probability of success in business since borrowers with more education earn higher income, have fewer children, and less suffer from unprecedented circumstances compared to less educated ones.

On the other hand, average monthly income from the business financed by the loan, availability of other sources of income after the loan, unpaid family workers and above high school level of education are positively related to the probability of success in business of borrowers. All of these variables have a priori expected signs though the coefficients are statistically insignificant.

In general, the results summarized above reveal that loan size, sufficiency of the loan for intended purposes, the training given to borrowers before the loan, the business experience that borrowers acquired prior to their participation in the credit scheme, convenience of business area and high school level education of borrowers are found to be more important determinants of the probability of success in business of beneficiaries under the POCSSBO micro credit programme.

4.6.1 Prediction with the Logit Model

The following summary is obtained from the logit estimate of heteroscedasticity corrected maximum likelihood estimation.

Frequencies of actual & predicted outcomes
Predicted outcome has maximum probability.

	Predicted		
Actual	0	1	Total
0	59	46	105
1	31	100	131
Total	90	146	236

The estimated model is significant, with a likelihood ratio test of the hypothesis that all the coefficients are zero based on a chi-squared value of 41.4 with 13 degrees of freedom.

The actual number of observations that have 0 value is 105 whereas 131 of them have a value of 1. However, as depicted in the preceding Table, 59 observations are correctly classified to have a 0 value while 100 observations are correctly classified to have a value of 1.

Hence, the model predicts 159 of 236 or 67.4% of the observations correctly. A naïve model, which always predicts that $Y_i = 0$ because $P<0.5$ (P is the proportion of observations that have a response of 1 in the sample), predicts 105 of 236 or 44.5% of the observations correctly. This suggests that the estimated model fits the data very well. The maximum likelihood estimator produces several significant influences on the probability and makes 4 more correct predictions

than the naïve predictor (as indicated in Annex 3, the naïve model always predicts 155 observations correctly).

The probability of success in beneficiaries' businesses is estimated to be

$$\text{Prob(success in business)} = \frac{1}{1+e^{-Z_i}}$$

where, $Z_i = \alpha_{1+} \alpha_2 D_2 + \alpha_3 D_3 + \beta_i X_i$

Since all the parameters (α's and β_i's) are estimated, it is possible to compute the value Z_i by substituting the values of the explanatory variables of the model into the expression for Z_i. Once the value of Z_i is obtained e^{-Zi} is then computed from which the probability of success in beneficiaries' businesses is estimated.

In general, if the estimated probability of an event is less than 0.5, one predicts that the event will not occur. On the other hand, if the probability is greater than 0.5, one predicts that the event will occur. Accordingly, in the situation under consideration if the probability of success in beneficiaries' businesses is greater than 0.5, one can predict that a borrower will succeed in business. In contrast, if the probability of success in beneficiaries' businesses is less than 0.5, one can predict that a borrower will not succeed in business.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

It is evident that in all developing countries the vision is to have a well-developed economy in the long run. However, this is impossible without having a well-developed industrial sector, which absorbs more labour force thereby reducing the level of unemployment. Apparently, the reduction of unemployment paves the way for poverty alleviation. To this end, a new approach was designed and successfully tried in many developing countries to expand self-employment opportunities to the poor and jobless people through the provision of micro credit that promotes the growth of micro enterprises.

Ethiopia is no exception to this and recently adopted this strategy and started implementing it through the provision of micro credit to the poor and unemployed people. The POCSSBO's micro financing programme is designed to extend micro-credit to the unemployed poor people in Addis Ababa. This programme is intended to expand self-employment opportunities to the poor and unemployed people in order to reduce poverty and the existing problem of unemployment in the city. Most of the sample beneficiaries are women and unemployed youth who had high school level education prior to their participation in the credit scheme.

The findings of this study summarised in section 4.1 could be regarded as the point of departure in assessing the performance of POCSSBO micro financing scheme in achieving its objectives. It was found that this micro financing programme has contributed positively to the development of

micro-enterprises. This task has been accomplished through the expansion of self-employment opportunities to the beneficiaries of the programme in Addis Ababa.

The credit programme has also positively contributed to income generation to its beneficiaries through the expansion of self-employment opportunities. The observed increase in the number of newly established small business enterprises that enable the beneficiaries of the programme to generate reliable income in order to ensure the sustainability of their business operations has led one to make the preceding generalisations.

The survey result shows that 15.3% of the sample beneficiaries stayed in business less than 12 months after the loan. This group is considered as the unsuccessful group. On the other hand, 40.2% of the sample beneficiaries stayed in business from 24 to 36 months while another 15.3% stayed in business for more than 36 months after the loan. In effect, this is the successful group constituting a total of 55.5% of the sample beneficiaries of the POCSSBO credit scheme.

The analysis of empirical result summarised in section 4.6 shows that there are some factors, which significantly affect the probability of success in beneficiaries' businesses. One of these factors is loan size, which has a significant role in reducing the probability of success in beneficiaries' businesses. One possible reason for this is that with increase in loan size the amount of monthly installment that borrowers are required to repay also increases. Eventually, the borrowers are not in a position to regularly settle their debt obligations since they cannot generate sufficient profit per month from such small business operations. This situation leads to

accumulation of debt that results in default of borrowers. The default of borrowers inhibits their business performance and depresses the probability of success in their businesses.

The regression result also indicates that sufficiency of the loan for intended purposes, training given to borrowers before the loan, business experience acquired before the loan, convenience of business area and high school level education of borrowers are the other important determinants of the probability of success in beneficiaries' businesses. The signs of the coefficient of all these variables are positive as expected and the coefficients are statistically significant. This shows that the probability of success in beneficiaries' businesses increases with better training that will be given to borrowers before the actual disbursement of the loan, provision of sufficient loan size as perceived by the borrowers, and giving priority to borrowers that have business experience and high school level education prior to their participation in the credit programme.

In general, higher loan size inhibits the probability of success in business of the beneficiaries. On the other hand, the sufficiency of the loan size for intended purposes, the training given to borrowers prior to the actual disbursement of the loan, business experience of borrowers, convenience of business area and high school level education of borrowers are found to be important determinant factors in enhancing the probability of success in their businesses. Such a systematic identification of factors influencing the probability of success in business of the beneficiaries with their inhibiting and/or enhancing effects is indispensable in designing and implementing improved micro financing programmes throughout the country in the future.

5.2 Recommendations

On the basis of the findings of this study described earlier, some suggestions can be made. The positive contribution of the POCSSBO's micro financing programme in the expansion of small business opportunities and income generation to the programme beneficiaries implies that micro financing is crucial to curtail the prevailing problem of unemployment in the country in general and in Addis Ababa in particular. The government should further strengthen and encourage such micro credit schemes in order to reduce the problem of unemployment which is obviously crucial to poverty alleviation in general terms.

The achievement of unemployment reduction objective requires proper identification of the jobless and poor people through vividly set selection criteria. To this end, the selection criteria of the beneficiaries of the programme should be clearly stated and disseminated to the public in order that all unemployed people in general and the poor people in particular have equal access to participate in the credit programme. Furthermore, there should be a mechanism of monitoring the activities of those people who participate in the selection process to reduce selection bias resulting from the actions of individuals involved in selecting beneficiaries. Because individuals involved in the selection process could use credit allocation to favour certain groups who are in line with their own self-interests or possibly to achieve their political motives. Hence, strict monitoring and follow-up is essential on the part of the project office so as to ensure that credit is allocated to the target groups (i.e., the poor and jobless people).

Since saving mobilisation plays a central role in credit allocation by taking laonable funds from the surplus units to the deficit ones, POCSSBO should design and implement a means of

improving its performance in this area. So, it is necessary to incorporate saving facility into this microfinancing programme in the future. In addition, efforts should be directed towards reducing operational problems (such as inappropriate planning due to lack of information, lack of adequate working premises, shortage of working capital, etc.) facing the beneficiaries.

Loan size is negatively related to the probability of success in beneficiaries' businesses implying that the higher the loan size, the lower will be the probability of success in beneficiaries' businesses. Consequently, the optimal loan size that is approximately equal to the cost of the proposed projects should be provided to the beneficiaries to enhance the probability of success in beneficiaries' businesses. The identification of the optimal loan size requires a critical evaluation of the proposed projects, which necessitates skilled personnel in the area of project evaluation.

In this study loan size, sufficiency of the loan for intended purposes as perceived by borrowers, training given to borrowers before the loan, convenience of business area, business experience and high school level education of borrowers are found to be important determinants of the probability of success in beneficiaries' businesses. This implies that the project office should:

i) Provide optimal loan size, which is approximately equal to the cost of the proposed projects to the beneficiaries in order to enhance the probability of success in beneficiaries' businesses.

ii) Provide sufficient amount of loan for intended purposes as perceived by the borrowers.

iii) Strengthen the training programme and encourage potential borrowers to actively participate in the training.

iv) Make sure that the beneficiaries have business areas that are convenient to the proposed types of businesses.

v) Give priority to borrowers who have business experience prior to their participation in the credit programme.

vi) Give priority to borrowers with high school level education prior to their participation in the credit programme.

It is necessary to test the stability of the observed relationships among the variables used in the analysis of factors that determine success in beneficiaries' businesses through time. Because a one-time analysis of the relationship among these variables may not enable one to make generalization about the relationship that is expected to prevail at all times in the future. As a result, it is crucial to undertake further research in this area with the help of more representative sample drawn from all parts of the country. Besides, further research is required to identify the factors that determine the survival and growth of micro enterprises across all parts of the country.

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Annex 1: Survey Questionnaire

Zone _____ Woreda _____ Kebele _____ House No. _____
Interviewer _____ Date _____

I. Basic Information about Borrowers

1.1 Name _____
1.2 Age (in years) _____
1.3 Sex _____ Male.....1 Female.....2
1.4 Marital Status _____
Single .....1 Widowed.....4
Married.....2 Separated.....5
Divorced.....3 Other (specify) _____.....6
1.5 Level of Education (the highest grade completed) _____
1.6 Household Size_____
1.7 Number of dependents living outside the household (if any)_____

II. Loan and Related Issues

2.1 Did you have access to credit from sources other than the POCSSBO?_____
Yes.....1 No.....2 ⇨2.7 (If 'No' go to Q 2.7)
2.2 If 'Yes', how much did you get and when was it?
Amount Birr _____ Month and year _____
2.3 What was the purpose of the loan?_____
2.4 How many months were required to fully repay the loan?_____
2.5 Did you fully repay the loan? _____ Yes.....1 No.....2
2.6 If 'No', give the amount unpaid and reason for not repaying.
Amount unpaid Birr _____
Reason _____
2.7 How much did you borrow from the POCSSBO? Indicate amount of the loan and when did you take it.
First Loan Amount Birr _____ Month and year _____
Second Loan Amount Birr _____ Month and year _____
2.8 What was the purpose of the loan?_____
2.9 Was the loan adequate to meet the cost of the project you plan to undertake?_____
Yes.....1 No.....2
2.10 If the loan was not adequate, how did you finance the difference? _____
Own saving/own labour income.....1
Loan from relatives or friends.....2
Sale of assets.....3
Money obtained from 'Equb'.....4
Other (specify)?_____.....6
2.11 Did you use the loan only for the purpose specified in the loan agreement? _____
Yes.....1⇨ 2.14(If 'Yes' go to Q 2.14) No.....2
2.12 If not, for what other purposes did you use the loan? (Give details below.)

Item	Amount in Birr
1._____	
2._____	
3._____	

2.13 Why did you use the loan for other purposes? Give up to 3 reasons in order of importance.

1. _____
2. _____
3. _____

2.14 Do you think that the loan was issued on time? _____Yes…...1⇨2.16 No……2

2.15 If not issued on time, what were the problems created due to the delay? (Multiple answers possible ranking in order of importance.)

1. _____
2. _____
3. _____

2.16 What is the amount of the loan repayment per installment? Birr _____

2.17 What was the repayment period per installment? _____

Weekly……1 Monthly……..3

Biweekly……..2 Other (specify) _____ ……4

2.18 Was the repayment period convenient? _____ Yes……...1⇨2.20 No……..…2

2.19 If not, give the reason and suggest the appropriate repayment period that you think.

Reason _____

Appropriate repayment period _____

2.20 What is the outstanding amount that you are required to repay? Birr _____

2.21 Do you pay interest for the loan obtained from the POCSSBO?_____Yes…..1 No…...2

2.22 If 'Yes', specify the amount of interest (in percent). _____ %

2.23 How much was the start up capital of your POCSSBO financed business? Birr_____

2.24 Are you successfully undertaking your POCSSBO financed business up to now? _____

Yes……..1 No……..…2

2.25 If 'Yes', what factors contributed for the success of your business? (Give the major reasons in order of importance.)_____

_____

2.26 If 'No', what are the reasons for the disruption and/or failure of your business? (Give the major reasons in order of importance.) _____

_____

III. Supervision on Loan Usage

3.1 Has there been supervision on loan utilisation from the POCSSBO? _____

Yes…...1 No……2

3.2 Has there been supervision on loan utilisation from Kebele Administration?_____

Yes……...1 No……..…2

3.3 Has there been supervision on loan repayment from the POCSSBO?_____

Yes…...1 No……2

3.4 Has there been supervision on loan repayment from Kebele Administration?_____

Yes……..1 No……..…2

3.5 In your opinion, is the supervision adequate? _____Yes……1 No……2

3.6 If not adequate, do you think that it contributes to default of the loan? _____

Yes……..1 No……..…2

IV. Employment and Business

4.1 When did you start your POCSSBO financed business? Month and year _____

4.2 Did you have any business experience through apprentice-ship or other means before starting the POCSSBO financed business? _____ Yes……..……..1 No……..…2

4.3 Could you tell us the type of activity you were engaged in before participating in the POCSSBO's credit programme? (Multiple answers possible) _____

Selling Bread/Injera.....1
Preparing and selling local drinks.....2
Retail trade.....3
Shoe repair/polish.....4
Wood/metal works.....5
Handicraft.....6
Public enterprise employee.....7
Private organisation employee.....8
Textile/garment/sewing clothes.....9
Barber/Beauty Salon.....10
Mini-Bar/Restaurant.....11
Daily labourer 12
House wife 13
Military.....14
Casual worker.....15
Other (specify)_____.....18

4.4 What type of labour did you use? (Multiple answers possible) _____

Your own labour only.....1
Your own and other family members...2
Hired labour and your own labour 3
Hired labour, yourself and other members.....4
Hired labour and other family members 5
Other (specify)_____.....8

4.5 If you used other than your own labour, specify the number of workers by category.
Unpaid family members_____ Hired labourers _____ Others (specify)_____

4.6 When did you start to participate in this credit scheme? Month and year _____

4.7 What type of activity are you engaged in after you started to participate in the POCSSBO's credit programme? (Multiple answers possible) _____

Selling Bread/Injera 1
Preparing and selling local drinks 2
Retail trade.....3
Shoe repair/carpet making.....4
Wood/metal works/welding.....5
Textile/garment/sewing clothes.....6
Barber/Beauty Salon.....7
Mini-Bar/Restaurant.....8
Shop keeping.....9
Other (specify)_____.....12

4.8 Who chose the activity (mentioned in Q4.7) for you and why was it chosen?
It was chosen by _____
Reason _____

4.9 Were you given any training before taking the loan? _____ Yes.....1 No.....2⇨4.11

4.10 Did you find the training relevant and useful to your business? _____Yes.....1 No.....2

4.11 What type of labour are you using after you started to participate in the POCSSBO's credit programme? (Multiple answers possible) _____

Your own labour only.....1
Hired labour and your own labour.....2
Your own labour and unpaid family members.....3
Hired labour and unpaid family members..... 4
Hired labour, your own labour and unpaid family members 5
Other (specify)_____.....8

4.12 If you are using other than your own labour, specify the number of workers by category.
Unpaid family members___ Hired labourers _____ Others (specify)_____

4.13 Is the price of your product favourable? _____Yes.....1⇨4.15 No.....2

4.14 If not favourable, list up to 3 reasons in order of importance.

1._____ _____
2._____
3._____

4.15 How would you assess the trend in the price of your product? (One answer only)_____

Constant over time.....1
Increasing over time.....2
Decreasing over time.....3
Fluctuates over time.....4

4.16 If increasing, what are the major reasons? (Multiple answers possible) _____
High demand of the product.....1
The location of the business is favourable.....2
Better quality of the product.....3
Increase in cost of production.....4
Other (specify) _____ 6

4.17 If decreasing, what are the possible reasons? (Multiple answers possible) _____
Low demand of the product.....1
Unfavourable location of the business.....2
Low quality of the product.....3
Increased competition.....4
Decrease in cost of production.....5
Other (specify) _____ 8

V. Income and Wealth

5.1 Did your household have a reliable source of income prior to your participation in the credit scheme?_____ Yes.....1 No.....2 ⇨ 5.3

5.2 If 'Yes', specify the source(s) and average amount of income per month.
Source(s) of income _____
Average monthly income (in Birr) _____

5.3 What is the average monthly income of your POCSSBO financed business? Birr ____

5.4 Do you get income from other sources after your participation in the credit programme? ____
Yes.....1 No.....2 ⇨ 5.6

5.5 If 'Yes', indicate the source(s) and average amount of income per month.
Source(s) of income _____
Average monthly income (in Birr) _____

5.6 If there is any increase in your income after the loan, is it due to increased income from the POCSSBO financed business? _____ Yes.....1 No.....2

5.7 What was the estimated value of your total assets before you participate in the (POCSSBO's) credit programme? Birr _____

5.8 Did you buy any asset after your participation in the credit programme? _____
Yes.....1 No.....2

5.9 If 'Yes', what are the major assets bought after your participation in the credit programme?
_____

5.10 What is the estimated value of your total assets after your participation in the credit programme? Birr _____

5.11 If there is any increase in the value of your total assets after your participation in the credit programme, is it mainly due to increased income from the POCSSBO financed business?
__Yes.....1 No.....2

5.12 Is there any improvement in the living standard of your family after your participation in the credit programme? ___Yes.....1 No.....2

5.13 If 'Yes', is the improvement mainly due to increased income from POCSSBO financed business?____ Yes.....1 No.....2

5.14 How do you evaluate the trends in your POCSSBO financed business activity?_____
Constant over time.....1
Increasing over time.....2 ⇨ 5.15
Decreasing over time.....3 ⇨ 5.16
Fluctuates over time.....4

5.15 If increasing over time, what are the major reasons? (Give reasons in order of importance.)
_____
_____

5.16 If decreasing over time, what are the major reasons? (Put reasons in order of importance.)

_____

_____

5.17 What is the total capital of your POCSSBO financed business at present? Birr_____

VI. Consumption Expenditure

6.1 How much was the estimated monthly consumption expenditure of your family prior to your participation in the credit programme? Birr _____

6.2 Who covered this consumption expenditure? (Multiple answers possible)_____

You yourself 1	You and other family members.....5
Other family members.....2	You, other family members and donors.....6
Donors.....3	Other family members and donors.....7
You and donors.....4	Other (specify) _____.....8

6.3 How much is the estimated monthly consumption expenditure of your family after your participation in the credit programme? Birr_____

6.4 Who covers this consumption expenditure? (Multiple answers possible)_____

You yourself 1	You and other family members 5
Other family members.....2	You, other family members and donors.....6
Donors.....3	Other family members and donors.....7
You and the donors.....4	Other (specify) _____.....8

6.5 If there is a rise in consumption expenditure of your family after the loan, is it mainly due to increased income from the POCSSBO financed business? _____ Yes.....1 No.....2

6.6 Is there any improvement in the quality/composition of your family's consumption items after your participation in the credit scheme? _____Yes.....1 No.....2

6.7 If 'Yes', do you think that the nutritional intake of your family has improved mainly due to increased income from the business financed by the loan? ____Yes.....1 No.....2

VII. Input Usage

7.1 Did you use purchased inputs in your business operation before you participate in the credit programme?_____Yes.....1 No.....2 ⇨ 7.3

7.2 If 'Yes', what was your approximate monthly expenditure on inputs? Birr_____

7.3 Do you use purchased inputs in your business operation after you started to participate in the credit programme?_ Yes.....1 No.....2 ⇨ 7.6

7.4 If 'Yes', what is your approximate monthly expenditure on inputs? Birr _____

7.5 If there is a rise in the quantity of purchased inputs after your participation in the credit programme, is it mainly due to increased income from the POCSSBO financed business?___
Yes.....1 No.....2

7.6 Do you think that your efficiency of input ustilisation has improved as a result of your participation in the credit programme? _____ Yes.....1 No.....2

XIII. Saving and the Use of Accounting Records

8.1 Did you have saving /bank account prior to your participation in the credit programme? ____
Yes.....1 No.....2 ⇨ 8.3

8.2 If 'Yes', what was the approximate average amount of savings per month? Birr _____

8.3 Do you have a saving /bank account after your participation in the credit programme?_____
Yes.....1 No.....2 ⇨ 8.5

8.4 If 'Yes', what is the approximate average amount of savings per month? Birr _____

8.5 Did you keep accounting records of your business activity prior to your participation in the credit programme? _____ Yes.....1 No.....2 ⇨ 8.7

8.6 If 'Yes', what was the purpose of keeping records? (Multiple answers possible)_____
To see the profit and/or loss of the business.....1 For tax purposes 3
For loan repayment purposes.....2 Other (specify) _____ 6

8.7 If 'No', what was the reason for not keeping the accounting records?_____
The business transaction was too small to keep records.....1
Lack of knowledge to keep records 2
Lack of education to keep records.....3
Other (specify)_____.....6

8.8 Do you keep accounting records of your business activity after your participation in the credit programme? _____ Yes.....1 No.....2 ⇨ 8.10

8.9 If 'Yes', what is the purpose of keeping records? (Multiple answers possible)_____
To see the profit and/or loss of the business.....1 For tax purposes 3
For loan repayment purposes.....2 Other (specify) _____.....6

8.10 If 'No', what is the reason for not keeping the accounting records?_____
The business transaction is too small to keep records.....1
Lack of knowledge to keep records 2
Lack of education to keep records.....3
Other (specify)_____.....6

IX. Additional Questions

9.1 How long is it since the establishment of your business? _____Years and _____Months

9.2 How long is it since you started to participate in the POCSSBO's credit programme?
_____Years and _____Months

9.3 Do you really benefit from the POCSSBO's credit programme?_____Yes.....1 No.....2

9.4 If 'Yes', what are the major benefits you get from this credit programme?

_____

_____

9.5 If 'No', give reasons for not getting benefits. _____

_____

_____

9.6 Do you think that the cost of default is high?_____Yes.....1 No.....2⇨9.8

9.7 If 'Yes', which cost of default should be given more emphasis in your opinion? (Multiple answers possible ranking in order of importance)_____
Claims against personal wealth.....1
Claims against guarantees.....2
Social sanctions.....3
Loss of future access to credit.....4
Loss of other economic benefits.....5
Other (specify) _____.....6

9.8 What are the major operational problems you faced (if any) after participating in this credit programme? (Multiple answers possible ranking in order of importance) _____
Shortage of input supply.....1
Shortage of working capital.....2
Insufficient skill to run the business.....3
Inappropriate planning due to lack of information.....4
Inadequate demand for the product.....5
Unfavourable working environment.....6
Other (specify)_____.....8

9.9 What is your opinion regarding POCSSBO's loan? (One answer only)_____

It must be repaid 1
It should be repaid only partially.....2
It need not be repaid at all.....3
Other (specify) _____.....6

9.10 What is your opinion regarding NGO's loan? (One answer only)_____

It must be repaid 1
It should be repaid only partially.....2
It need not be repaid at all.....3
Other (specify) _____.....6

9.11 Finally, would you briefly tell us your overall opinion about the POCSSBO's credit programme in general? _____

_____

_____

_____

Annex 2: Problem with Estimating the LPM using OLS

The justification of the name LPM for models like (1) of section 3.3.1.1 can be seen as follows:

Assuming E(U) = 0, as usual (to get unbiased estimators), we obtain,

$$E(Y_i|X_i) = ß_1 + ß_2X_i \quad \text{.....(A.2.1)}$$

Let P_i = probability that Y_i =1 (i.e. the event occurs) and 1-P_i = probability that Y_i=0 (i.e. the event does not occur), the variable Y_i has the following distribution

Y_i	Probability
1	P_i
0	1-P_i
Total	1

Hence, by definition of mathematical expectation, we obtain

$$E(Y_i|X_i) = 0(1-P_i)+1(P_i)=P_i \quad \text{.....(A.2.2)}$$

Comparing Eq (2) with Eq (3), one can equate

$$E(Y_i| X_i) = ß_1 + ß_2X_i = P_i \quad \text{.....(A.2.3)}$$

This means the conditional expectation of the model (1) can, in fact, be interpreted as the conditional probability of Y given X_i. The probability P_i must lie between 0 and 1, then one can have the restriction

$$0 \leq E(Y_i|X_i) \leq 1 \quad \text{.....(4)}$$

This means that the conditional expectation, or conditional probability, must lie within the interval (0,1). This is one of the problems with the LPM since it may not be satisfied.

Besides this there are also other problems encountered in estimating the LPM using the standard OLS technique, which are reviewed as follows.

1. Non-normality of the Disturbance Terms U_i

In general, the OLS technique does not require the disturbance terms to be normally distributed. But the assumption of normality is necessary for the purpose of statistical inference such as hypothesis testing. However, the assumption of normality of U_i is no longer valid for the LPM because like Y_i, U_i also takes on only two values (Gujarati, 1995: 542).

In fact, the violation of the assumption of normality is not a serious problem since the OLS point estimates still remain unbiased. Furthermore, with increase in the sample size indefinitely, the Central Limit Theorem postulates that the OLS estimators tend to be normally distributed. As a result, in large samples the statistical inference of the LPM follows the standard OLS technique under the assumption of normality.

2. Heteroscedastic Variance of the Disturbance Terms

Heteroscedasticity refers to a situation where the variance of the error term changes with the number of observations as a result of which the assumption of homoscedasticity (i.e. constant variance) can no longer be valid. In other words, the disturbance/error terms are heteroscedastic when they tend to have different variances across observations. "A minor complication arises because the error term (u) is heteroscedastic in a way that depends on β" (Greene, 1997: 873).

Although $E(U_i) = 0$ and $E(U_iU_j) = 0$, for $i \neq j$ (i.e. no serial correlation), it can no longer be maintained that the disturbances U_i are homoscedastic. It is known that in the presence of heteroscedasticity the OLS estimators, though unbiased, are inefficient (i.e. they do not have minimum variance). "Because of the problem of heteroscedasticity the Ordinary Least Squares (OLS) estimates of the parameters (β) will not be efficient" (Maddala, 1983: 16).

3. Non-fulfillment of the Restriction $0 \leq E(Y_i|X_i) \leq 1$.

In the LPM, $E(Y_i|X_i)$ measures the conditional probability of the event Y occurring given that X has occurred. So it must lie between 0 and 1. Even if this is true a priori, there is no guarantee that $\hat{Y}_i$, the estimator of $E(Y_i|X_i)$, will necessarily fulfil this restriction. In fact, this is the real problem with the OLS estimation of the LPM (Gujarati, 1995:544). There are 2 ways often used to detect whether or not the estimated Y_i lie between 0 and 1. The first one is to estimate the LPM by the usual OLS method and find out whether the estimated Y_i lie between 0 and 1.

If some are less than 0 (i.e. negative) Y_i is assumed to be 0 for these cases, if they are greater than 1, they are assumed to be 1. The second procedure is to devise an estimation technique that guarantees the estimated conditional probabilities $\hat{Y}_i$ lie between 0 and 1. In fact, the logit and probit models will guarantee that the estimated probabilities will certainly lie between 0 and 1.

4. Questionable Value of R^2 as a Measure of Goodness of Fit

The conventionally computed R^2 is of limited value in the dichotomous dependent variable models. R^2 is likely to be much lower than 1 for such models. It has been found that in most practical applications the R^2 ranges between 0.2 and 0.6. Hence, R^2 cannot be used as a measure of goodness of fit in these models. In this connection, John Aldrich and Forrest Nelson counted that "use of the coefficient of determination as a summary statistic should be avoided in models with qualitative dependent variables" (Quoted in Gujarati, 1995:546).

Annex 3: Maximum Likelihood Estimates of Homoscedastic Logit Model (Standard Errors are Given in Parentheses)

Number of observations	236
Log likelihood function	-143.1000
Restricted Log likelihood	-162.1476
Chi-squared	38.09522

Variabl	Coefficient	Z-value	P[|Z|>z]	Slope	Z-value	P[|Z|>z]
constant	-2.010 (1.817)	-1.106	0.269	-0.494 (0.448)	-1.104	0.270
AB	0.0899 (0.0961)	0.935	0.350	0.022 (0.024)	0.934	0.350
ABSQ	-0.0014 (0.0013)	-1.093	0.274	-0.0034 (0.0031)	-1.092	0.275
SB	-0.293 (0.361)	-0.813	0.416	-0.072 (0.089)	-0.813	0.416
LS	-0.0008 (0.0003)	-2.545	0.011	-0.0002 (0.0001)	-2.547	0.011
SUL	0.436 (0.305)	1.428	0.153	0.107 (0.075)	1.428	0.153
TBL	0.659 (0.298)	2.210	0.027	0.162 (0.073)	2.209	0.027
BEL	0.430 (0.315)	1.364	0.173	0.106 (0.078)	1.364	0.173
AMIL	0.0017 (0.0012)	1.448	0.148	0.0004 (0.0003)	1.449	0.147
CBA	0.492 (0.298)	1.651	0.099	0.121 (0.073)	1.651	0.099
UFW	0.128 (0.150)	0.855	0.392	0.032 (0.037)	0.855	0.392
ASIL	0.316 (0.322)	0.980	0.327	0.078 (0.079)	0.980	0.327
D_2	1.076 (0.379)	2.843	0.005	0.265 (0.093)	2.843	0.005
D_3	1.703 (0.913)	1.864	0.062	0.419 (0.224)	1.869	0.062

Frequencies of actual & predicted outcomes
Predicted outcome has maximum probability.

	Predicted		
Actual	0	1	Total
0	58	47	105
1	34	97	131
Total	92	144	236

Annex 4: Descriptive Statistics of Variables Included in the Final Regression

All results based on nonmissing observations.

Variable	Mean	Std.Dev.	Minimum	Maximum
AB	31.3940678	10.2584375	18.0000000	70.0000000
ABSQ	1090.37712	781.007673	324.000000	4900.00000
SB	.703389831	.457733957	.000000000	1.00000000
LS	1291.56780	501.916836	100.000000	2500.00000
SUL	.508474576	.500990724	.000000000	1.00000000
TBL	.512711864	.500900739	.000000000	1.00000000
BEL	.694915254	.461421939	.000000000	1.00000000
AMIL	177.792373	134.057257	20.0000000	700.000000
CBA	.601694915	.490589407	.000000000	1.00000000
UFW	.682203390	.978851377	.000000000	4.00000000
ASIL	.305084746	.461421939	.000000000	1.00000000
D2	.449152542	.498465008	.000000000	1.00000000
D3	.423728814E-01	.201866516	.000000000	1.00000000

Annex 5: Correlation Matrix for the Variables Included in the Final Regression

	Yi	AB	ABSQ	SB	LS	SUL	TBL	BEL	AMIL	CBA	UFW	ASIL	D2	D3
Yi	1													
AB	-0.15	1												
ABSQ	-0.15	0.99	1											
SB	-0.10	0.31	0.28	1										
LS	-0.12	-0.17	-0.17	-0.17	1									
SUL	0.06	0.10	0.10	0.20	0.01	1								
TBL	0.12	0.04	0.03	0.11	0.09	0.23	1							
BEL	0.07	0.11	0.11	0.01	-0.06	-0.04	-0.00	1						
AMIL	0.15	-0.01	-0.02	-0.09	-0.07	-0.05	-0.02	0.06	1					
CBA	0.14	0.02	0.02	-0.09	-0.16	-0.02	-0.01	0.01	0.17	1				
UFW	0.014	0.114	0.119	0.035	0.061	-0.076	-0.022	0.085	0.04	0.045	1			
ASIL	0.056	0.114	0.085	0.148	-0.06	0.080	-0.016	0.059	0.13	-0.006	-0.001	1		
D2	0.157	-0.536	-0.507	-0.25	0.180	-0.185	-0.091	-0.104	-0.00	-0.048	-0.055	-0.117	1	
D3	0.103	-0.102	-0.103	-0.23	-0.004	-0.003	-0.047	0.002	0.09	0.042	-0.103	-0.048	-0.19	1

Declaration

The thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

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