



**SURVIVAL CHANCES OF OFF-FARM MICRO AND SMALL
ENTERPRISES: THE CASE STUDY OF LILONGWE DISTRICT**

Master of Arts (Economics) Thesis

BY

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fulfillment of the requirements for the degree of Master of Arts in Economics.**

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DECLARATION

I declare that this is my original work and that it has not been presented for a degree at this or any other University. Work of others used in this study has been duly acknowledged. Any errors contained herein are entirely mine.

Candidate _____

Date _____

CERTIFICATE OF APPROVAL

We declare that this thesis is from the student's own work and effort and where he has used other sources of information, it has been acknowledged. This thesis is submitted with our approval.

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DEDICATION

To my lovely Mother, Aunt Sibbo and Maggie

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ABSTRACT

Micro and Small Enterprises (MSEs) have been widely recognized for playing significant role in poverty reduction through income generation from sales, job creation at low cost, utilization of locally found resources to add value to agriculture produce, and production of goods and services that meet basic needs of the poor. However, the contribution of MSEs to poverty reduction processes and development in general is much dependent on the length of period these enterprises survive.

This study determined the survival chances of MSEs and analyzed the impact of liquidity constraints, owner characteristics, enterprise characteristics and business environmental factors on survival chances of off-farm MSEs at any time period using Cox Proportional Hazard model. The results indicate that the survival chance of MSEs declines quickly in the first 5 years after inception. Enterprises that have operated for 5 years continuously have a survival chance of 0.5837. In addition, the results shows that initial capital invested, family size of proprietor, completion of primary school level, business training and the street vendor relocation programme significantly reduce the chances of closing an enterprise at any time. In general, proprietor characteristics have a significant impact on enterprises survival.

The policy implications are that measures should be put in place that will enhance access to credit to boost capital of small enterprises, promote business and vocational training for small entrepreneurs, and ensure that there are enough market infrastructures such that small enterprises operate from a designated market places.

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LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
DFID	Department for International Development
ECI	Ebony Consult International
DEMAT	Development of Malawian Enterprises Trust
FINCA	Foundation for International Community Assistance
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
ILO	International Labour Organization
JCE	Junior Certificate of Education
MARDEF	Malawi Rural Development Fund
MSCE	Malawi Schools Certificate of Education
MSEs	Micro and Small Enterprises
NABW	National Association of Business Women
NGO	Non-governmental Organization
NSO	National Statistics Office
OIBM	Opportunity International Bank of Malawi
OLS	Ordinary Least Squared
SED	Small Enterprise Development
SEDOM	Small Enterprise Development of Malawi
SMEs	Small and Medium Enterprises
UNCTAD	United Nations Conference for Trade and Development

CHAPTER ONE

INTRODUCTION

1.1 Background

The Micro and Small Enterprises (MSEs) have been widely recognized for playing a significant role in the development process and generally towards achievement of the Millennium Development Goals (DFID, 2000; Green *et al*, 2006).¹ Of particular interest are the contributions that the MSEs make towards reduction of poverty through income generation from sales, job creation at low cost, utilization of locally found resources to add value to agriculture produce, and production of goods and services that meet basic needs of the poor (Daniels, 1999; Daniels and Mead, 1998; ECI and NSO, 2001 and 2002; ILO, 2003). In addition, MSEs also act as seedbed for industrialization, channel for mobilizing savings, means of cultivating entrepreneur culture and acquiring entrepreneur skills, and they also foster competition in the private sector.

Proliferation and growth of MSEs have been considered as one channel through which poverty can be reduced world wide.² This perspective is being promoted after realizing that much of the population in the poor countries operates and work for MSEs (Vandenberg, 2006). International Labour Organization (ILO) is fostering an approach that aim at reducing poverty through small enterprises by working with various member states government through Small Enterprise Development (SED) programme (ILO, 2003). It considers MSEs as a refuge for those with poor prospects in wage labour market and those viable MSEs, therefore, have a significant impact on poverty reduction.

State governments are equally taking a leading role in improving the status of MSEs through policy initiatives directed towards creating an enabling environment for promoting the growth and development of such enterprises and their eventual

¹ This study considers MSE any business entity that employs less than 50 people as per defined by ILO, World Bank, European Union, ECI and NSO. In Malawi MSE Policy statement, MSEs are enterprises that employ 20 people with a sales turnover of MK4 million (GoM, 1997a, 2007)

² Poverty is a condition in which people lack satisfactory material resources, are unable to access basic services, and are constrained in their ability to exercise rights in processes which affect their life and work.

graduation into medium and large enterprises (DFID, 2000; GoM, 2007; Vandenberg, 2006). For instance, various state governments have played a significant role in making access to markets easier, undertaking legal reforms to create framework that ease the operation of businesses, making it easier to access credit and financial services, establishing vocational and training centers, improving market infrastructure and also improving access to information by small entrepreneur (GoM, 2005; UNCTAD, 2000).

In Malawi, efforts have been made to ease access to microfinance credit through adoption of microfinance policy and establishment of microfinance network; the Malawi Rural Development Fund (MARDEF) to disburse loans to the poor in rural and urban areas; the One Village One Product schemes to encourage value adding production processes; and also initiated the formation of small-scale mining and agro-processing co-operatives (GoM, 2005). All that in a bid to increase chances of survival, promote growth of small enterprises and eventual graduation into medium to large enterprises.

Over the years, there has been growing interest to understand the dynamics that relate to MSEs which has contributed to accumulation of vast research knowledge. Mead and Liedholm (1998) reports on studies conducted in a number of developing countries which used varying survey approaches to provide insights on enterprise births, growths, survival prospects and determinants of these various changes.³ These studies also considered the distributional aspects of MSEs, especially with respect to economic sector, size, location, gender ownership structure, enterprise profitability, job creation and constraints, among others.

1.2 Problem Statement

Although the role of MSEs in poverty reduction processes is much appreciated, their contribution is significantly dependent on the length of period these enterprises survive. Small enterprises that survive over a considerably longer period of time

³ Baseline surveys were conducted in Dominican Republic, Botswana, Kenya, Malawi, Swaziland and Zimbabwe in 1990-2000 period; tracey surveys were undertaken in Kenya, Sierra Leone and Nigeria; panel survey conducted in the Dominican Republic, Jamaica, Kenya and Zimbabwe. In Malawi District level base line surveys were conducted in the Districts of Lilongwe and Mangochi in 2002.

ensures that proprietors and workers have a steady source of income over a considerably longer period of time and hence avoid falling back into extreme poverty traps. In addition, it ensures that enterprises grow and graduate from MSEs to Small and Medium Enterprises (SMEs) category and hence promote a solid development of private sector.

However, the contribution of MSEs to poverty reduction process in Malawi has been greatly compromised by the short life span of these enterprises. For instance, the Malawi MSE Baseline Survey of 2000 showed that 73 percent of the MSEs closed within a period of 5 years after inception while 16 percent died within a period of 10 years (ECI and NSO, 2001). Similarly the district level baseline survey conducted in Lilongwe showed that 76.9 percent closed within the first 5 years while 9.8 percent closed within 10 years after inception (ECI and NSO, 2002). In some instances, the enterprises survived for not less than 3 months. Such enterprise mortality rates, if widely experienced, can easily compromise efforts to fight against poverty through MSEs.

Survival over a considerably longer period, growth and possibly graduating into medium or large size enterprises is a function of some factors underlying the business entity. Considerable effort should, therefore, be spent to identify such factors and deliberate policy interventions be devised to reverse the trend. ECI and NSO (2001, 2002) reported that enterprises were facing varying problems including lack of financial capital, shortage of inputs and product markets, and lack of business management skills. However, these could be symptoms and not the underlying causes of short life span. In addition, it is not known how the above mentioned factors affect the chances of surviving over a considerable longer period of time.

Studies elsewhere have established that initial capital, access to credit, owner characteristics, firm attributes and strategies, and business environmental conditions play an important role in determining survival of enterprises (Bates, 1990; Bruderl *et al*, 1992; Holtz-Eakin *et al*, 1994; Hutchinson *et al*, 1938; Romanelli, 1989). However, no study has been conducted to establish factors that significantly determine MSEs chance of surviving beyond five years in Malawi. This has,

therefore, created an information gap as far as factors determining the survival of MSEs are concerned.

1.3 Objectives and Hypothesis

This study aimed at investigating survival chances of off-farm MSEs at any time period t in months and analyzes effects of several factors on survival chances of such MSEs⁴. Specifically the study sought to;

- a. Determine the survival chances of an off-farm MSE at any time period t in months.
- b. Quantitatively analyze the effects of a number of factors on the survival chances of off-farm MSEs. These factors include liquidity constraints, owner characteristics, enterprise attributes and strategies, and business environmental factors.

The study hypotheses, based on the second specific objective, were that liquidity constraints, owner's characteristics, enterprise attributes and strategies, and business environmental factors have no impact on survival chances of MSEs.

1.4 Significance of the Study

This study has determined the survival chances of off-farm MSEs at any time t in months and analyzed factors that affect those chances of survival. The results obtained provide valuable inputs in policies and programmes that promote MSEs' survival and growth. In addition, they contribute to literature on the dynamics of MSEs and application of duration models of analysis in economics.

1.5 Organization of the Study

The rest of the paper is outlined as follows. Chapter 2 gives a brief overview of MSEs in Malawi and Lilongwe district in particular, which is our case study. In Chapter 3, theoretical and empirical literature was reviewed while chapter 4 outlines the methodology used in this study. Chapter 5 presents the results and discussion while the final chapter provides conclusion, policy implications and limitations of the study.

⁴ Off-farm activities include activities such as manufacturing, construction, commerce and trade, and services while on-farm activities include activities such as agriculture, forestry and mining.

CHAPTER TWO

BRIEF OUTLINE OF MSEs IN MALAWI AND LILONGWE DISTRICT

2.1 MSEs in Malawi and Lilongwe District

Most MSEs in Malawi are purely informal and operate with relatively small capital. They are often categorized as on-farm activities (agriculture, forestry and mining) and off-farm activities (manufacturing, construction, commerce and trade, and services). This section will look at their geographical distribution, profitability, contribution to employment and income, business support services and major constraints based on baseline surveys conducted in 2000 and 2002 (ECI and NSO, 2001 and 2002).

ECI and NSO (2001) estimated that Malawi had 747, 396 MSEs of which 83 percent are rural based and 74.6 percent were off-farm activities. The district level MSEs Baseline Survey estimated that Lilongwe had 130, 688 MSEs of which 67.5 percent were rural based and 65.6 percent were off-farm based enterprises. Commerce and trade was the largest sector nationwide as it accounted for 41 percent, followed by manufacturing which accounted for 26.3 percent of all MSEs. The distribution is reversed in Lilongwe where crop production accounted for a larger share of MSEs at 32 percent followed by manufacturing, and commerce and trade at 26.3 percent and 25.7 percent respectively.

The informal nature of these MSEs was depicted by location of the enterprises as 73.3 percent and 85.6 percent operated from home or near home nationwide and in Lilongwe district respectively. Only 7.7 percent operated from a traditional market place in both cases, 9.7 percent operated along the roadside nationwide and 2.9 percent operated along the roadside in Lilongwe district.

Individual women ownership of MSEs was smaller at 34 percent in Malawi as compared to figures for Africa which stood at 72 percent (ECI and NSO, 2000). Men hardly dominated at 35 percent and couples accounted for 30 percent nationwide. However, the distribution was slightly different for Lilongwe as females owned 23.7 percent as compared to men's 26.3 percent and couples dominated at 36.7 percent of

enterprises. The nationwide survey showed that 43 percent of women operate in manufacturing sector as compared to men's 27 percent. The district survey showed that men in Lilongwe owned 32.1 percent of construction enterprises and 43 percent of women owned manufacturing enterprises.

These MSEs generated annual profits of US\$ 281 million nationwide in 2000, which represented 15.6 percent of country GDP at 2000 prices. Average annual profit for MSEs in Lilongwe was at MK 38, 593 representing 42 percent of sales. Transport sector generated more profits followed by fishing, mining, construction and commerce and trade nationwide. The MSEs sector provided additional income to about 26 percent of household national wide and in Lilongwe district 88.3 percent of profits generated were used to meet household needs (ECI and NSO, 2001, 2002).

One significant contribution of MSE is creation of employment opportunities for individuals without a chance of getting a job elsewhere. MSEs employed 1.7 million people nationwide, representing 38 percent of total working age population in Malawi. In Lilongwe it employed 252, 404 people, including owners and unpaid employees, representing 26 percent of working age population in Lilongwe. In terms of job creation by sector, crop production employed 45.5 percent followed by commerce at 23 percent. However, in terms of overall employment creation, off-farm activities created 53 percent of employment opportunities.

According to ECI and NSO (2001, 2002), the major constraint facing small enterprises was limited capital for operating businesses. The average start-up cost for an average MSE was about MK4, 500, with others as little as MK165 nationwide. In Lilongwe, the average start-up cost was MK4, 027 with others requiring as little as MK 187. Major source of start-up capital was own saving from manual labour (Ganyu), agricultural produce sales, and other non-agricultural activities which together accounted for 61 percent, both national wide and in Lilongwe district. Loan from credit institution only accounted for 2 percent nation-wide and 5 percent in Lilongwe district. Re-investment of realized profits was low as only 15.64 percent of realized profits were invested back nationwide and 7.3 percent in Lilongwe. Minor constraints included market problems and lack of inputs.

Use of business support services such as seeking microfinance credit, business training and other business advice is quite limited. Only 15 percent of MSEs nationwide received financial assistance from microfinance institutions, 23 percent obtained training and 6 percent obtain other business services. The picture was quite similar in Lilongwe district where 15.5 percent sought financial assistance, 16 percent obtained business training and 4.4 sought other business support services. This trend may be attributed to lack of information on the business support services available in the country, localized provision of such services, high user prices, and lack of well coordinated policy and institutional framework.

The easy entry and exit nature of MSEs sector partly explains the short life span of these enterprises. It was noted that 73 percent of MSEs nationwide did not survive the first 5 years, operating continuously. Others lasted for a period as short as two months. Similar trends were noted in Lilongwe district where 76.9 percent of MSEs could not last the first 5 years. Overall more female owned enterprises closed within 5 years of inception than their male counterparts both nationwide and in Lilongwe district. The principal reason for closure of enterprises was financial problem which accounted for 36 percent and 45.4 percent nationwide and in Lilongwe district respectively.

2.2 Institutional and Policy Framework

Soon after attaining independence in 1964, development policies concentrated on the large scale agriculture and industries leaving out the small scale enterprises (GoM, 1970). However, in the late 1970's and early 1980's government embarked on several initiatives in support of MSEs through establishment of several support institutions. Due to lack of deliberate policy that would have guided the development and promotion of the sector, the potential of the MSE sector was not fully exploited up to late 1990's.

The MSE policy first came into existence in 1997 under the Ministry of Commerce and Industry and was revised in 2007 (GoM, 1997a; 2007). The fundamental objective was to create a conducive environment for MSEs to thrive. Among others, the policy aimed at sensitizing existing and potential small entrepreneurs on the tax

system, ease access to credit facilities, promote establishment of venture capital funds, promote good quality products and services, encourage business registration, establish one stop service centres in all districts, ease access to locally found raw materials, encourage the use of modern technologies in production of goods and provision of services, and improve infrastructure. Under the guidance of the policy, an MSE Unit was established in the Ministry to coordinate all support activities related to MSEs.

Due to some implementation hiccups, some of the activities isolated for action were not implemented. However, headway has been made in other areas such as easing access to microfinance credit, establishment of One Village One Product scheme, and business management skills training. More need to be done in terms of information dissemination, improving infrastructure, and promote quality production of goods and services.

Other policies related to MSEs policy are Cooperative Development Policy and Microfinance Policy. The former aims at enabling cooperatives to become efficient business institutions for mobilizing human, financial and material resources through creation of conducive environment for cooperatives to flourish, mobilizing communities into cooperatives, promote establishment of insurance schemes, and setting arbitration and settlement of disputes machinery. It targets enterprises in agricultural sector, fisheries sector, the industrial sector, handicraft sector, savings and credit facilities, and transport sector (GoM, 1997b). While the latter aim at creating a conducive environment for microfinance institutions to flourish.

2.3 Business Support Services

According to the baseline survey of 2000, the use of business support services is quite limited (ECI and NSO, 2001). Such services include accessing microfinance credit, business management skills, business planning, marketing, designing, technology utilization and insurance schemes.

For microfinance credit, a number of institutions are offering their services both in rural and urban areas. Most of them are private institutions such as Malawi Rural Finance Company, Foundation for International Community Assistance (FINCA),

National Association for Business Women (NABW), Development of Malawian Enterprises Trust (DEMAT), Small Enterprise Development of Malawi (SEDOM), Opportunity International Bank of Malawi (OIBM), Pride Africa and other Non-Governmental Organizations (NGOs). Government also established its own revolving credit fund called MARDEF to cater for the poor in rural and urban areas who wish to start or expand their enterprises. Despite such numerous providers of services, there are still some limitations in accessing such credits. Among them include the high interest rates charged in excess of 50 percent, very short period to repay installments which are due, very small amount of funds allowed to borrow at a time, and most of them are group based services.

Getting business management and technical skills through training is also a big challenge among small scale enterprises. Most owners of such enterprises did not complete formal school. Beyond the formal school, the numbers grossly shrink as very few enterprise proprietors attended enterprise management schools. This can be attributed to existence of few training institutions in the country and higher user fees which the majority of small entrepreneurs can not afford.

Soliciting advice on business planning, marketing strategies, designing and the use of technology is even more limited among MSEs. Very few small scale enterprises seek such advice from experts. This could be due to lack of information, lack of incentives and higher prices paid for the services.

CHAPTER THREE

LITERATURE REVIEW

3.1 Theoretical Literature

There are various theoretical explanations on how firms or enterprises evolve over their life time. Central in all these explanations are the roles of capital, personality of founder or owner, attributes and structure of the firms, their respective strategies, and business environmental conditions. This section will concentrate on theoretical explanations on survival of firms.

3.1.1 Capital

The principal activity of any firm is to turn factors of production or inputs into outputs, be it services or goods (Nicholson, 1998). Capital has long been identified as a factor of production along with land, labour and entrepreneurship⁵. Capital refers to assets, financial or physical, available for use in production of more assets. In microfinance literature, access to capital finance has been singled out as a major determinant in survival and growth of MSE (Green *et al*, 2006; Beck *et al*, 2005). Holtz-Eakin *et al* (1994) developed an analytical framework based on *income opportunities* for self employed individual facing four possible exit choices such as taking retirement, employment as wage earner, continuation of solo entrepreneurship, and participation in a partnership. This paper has only isolated the entrepreneurship aspect to develop an analytical framework for this paper.

Assume that an entrepreneur i has assets A_i which can earn interest r , capital k is the only factor of production with production function $f(.)$ and θ_i is individual's ability as an entrepreneur which varies according to individuals. The entrepreneur's gross receipts R_i will be given as

$$R_i = \theta_i f(k_i) \varepsilon \quad (3.1)$$

where ε is a random component. Since the entrepreneur will establish the enterprise

⁵ See any basic book on microeconomics especially chapters on production.

from his personal assets, after investing in the enterprise, $(A_i - k_i)$ remains to earn capital income. His net income is given as

$$Y_i = \theta_i f(k_i) + r(A_i - k_i) \quad (3.2)$$

If capital finance is borrowed, then the entrepreneur will repay the debt $(k_i - A_i)$ and will reduce his income. The amount borrowed is bounded by the liquidity constraint facing the enterprise generated by financial markets. The size of the constraint depends on individual's net asset $k_i \leq l_k(A_i)$ where $l'_k(A_i) > 0$.

For an entrepreneur who maximizes the expected value of income, the optimal amount of capital is given by k^* . The maximization problem will have three possible solutions. First, the entrepreneur employs capital but the liquidity constraint is not binding and the net rate of return will equal the product of expected marginal product of capital and θ_i such as,

$$\theta_i f'(k^*_i) = r \quad (3.3)$$

The optimal amount of capital k^*_i will rise with entrepreneur ability. Secondly, there is a possibility that the liquidity constraint is not binding again and entrepreneur ability is insufficiently low such that the marginal product of capital is below the net rate of return as

$$\theta_i f'(k^*_i) < r \quad (3.4)$$

where the optimal capital can get as low as $k^* = 0$. Finally, there is the possibility that the liquidity constraint is binding such that $k = l_k(A_i)$.

Holtz-Eakin *et al* (1994) traces the impact on the firm of changing A_i which depends on whether the liquidity constraint is binding or not. If the liquidity constraint of the firm is binding, then the optimal capital change is given as

$$\frac{dk}{dA_i} = l'_k(A) > 0 \quad (3.5)$$

otherwise it is zero. In general, then, k^*_i is function of r, θ_i and A_i just as it is

with total receipts of the firm. Thus, we can express the enterprise receipts at optimal capital level as

$$R_i = \theta_i f(k_i^*)\varepsilon \equiv R(\theta_i, A_i, r) . \quad (3.6)$$

Similarly, entrepreneur income at optimal capital level is given as

$$Y_i = \theta_i f(k_i^*)\varepsilon + r(A_i - k_i) \equiv Y(\theta_i, A_i, r, \varepsilon) \quad (3.7)$$

Entrepreneur income is higher the more assets the individuals have, the more entrepreneur ability the individual has, and if access to borrowed funds is not highly restrictive.

Based on insights from basic theory of a firm, survival can be linked to enterprise performance as measured by level of profits made (Nicholson, 1998). Under this theory, profit is an incentive for an enterprise to continue operation. If the enterprise is making at least normal profits where marginal revenue equals marginal cost, the enterprise will continue operating. Otherwise, there is no incentive for an enterprise to continue existing. Therefore, in the above exposition, if the enterprise receipts or sales are greater or equal to total cost while respective marginal revenue is greater or equal to respective marginal cost, the enterprise will continue existing, otherwise it will exit the market.

In the model above, no explanation was given as to what constitute entrepreneur ability. Entrepreneur ability has not been widely studied in economics as compared to sociology and psychology disciplines (Bates, 1990). Lucas (1978) and Jovanovic (1982) developed some economic theoretical models of entrepreneur whose central focus is managerial ability of owner, how it develops and the impact it has on enterprise performance. However, drawing insights from sociological and psychological literature, ability points towards issues that borders on entrepreneur traits and human capital (Bates, 1990; Brockhaus, 1980; Bruderl *et al*, 1992; Chell *et al*, 1991; McClelland, 1961; Smallbone *et al*, 1991). These have been discussed below using their respective theories.

3.1.2 Industrial Economics Theories

Under these theories, issues of competition, market power and barriers to entry takes center stage (Church, 2000). Chances of survival of new entrants in an industry depends on its ability to loosen all forms of barriers to entry, its ability to compete with incumbent firms in an industry and how good it is in creating niches on the market (Ferguson and Ferguson, 1994). However, weakening of barriers to entry may be insurmountable challenge if incumbent cut market prices below average cost, heavy promotion and advertising costs are incurred to establish its own reputation, and if the new entrants can not exploit economies of scale.

Similarly, ability to compete will depend on structure and conduct of the firms in an industry. If market is a neoclassical perfect competition then the firm will survive as long as it makes normal profits. If it's a monopoly and other firms exist in the market, then new entrants will not survive long as incumbent will deliberately raise the barriers to avoid attracting potential entrants into its niche. For firms that operate in oligopolistic markets, survival will depend on product differentiation, heavy advertisement, and the extent of market concentration of the industry.

New firms have more surviving chances if it is the first of its kind in an industry. Under such circumstances, the new firm utilizes all first mover advantages to create a strong position on the market. For instance, the firm can own patents, pre-empt major factor of production, or establish good reputation that will endure over time. First mover advantage creates a cost asymmetry between the potential entrants and the incumbent (Ferguson and Ferguson, 1994).

3.1.3 Labour Market Theory

Under these theories, there is a symbiotic relationship between enterprise survival and individual owner survival. Establishing an enterprise is considered a form of self-employment (de Wit, 1993). Vandenbeg (2006) observed that self-employment and establishing own enterprises are quite attractive to individuals who have difficulties in finding jobs in the formal employment both in developing and developed countries. However, individuals that establish enterprises due to such push factors are not

always oriented towards growth but survival (Tonge, 2001). Hence, a symbiotic relationship is established where the enterprise will survive as long as it generates some income for the owner to survive. In a situation where the owner finds employment that pays better than the business, the business will fold or will be run to provide additional income to the owner.

3.1.4 Entrepreneur Personality Theories

These theories focus on the traits or personality of an entrepreneur as central to enterprise or firm survival and growth. Such traits include entrepreneur's vision (Chell *et al*, 1991), strong need for higher achievement (McClelland, 1961), desire for personal control or independence (Greenberg and Sexton, 1988), higher risk-taking behavior (Brockhaus, 1980), and commitment of owner of enterprise (Smallbone *et al*, 1991). A highly visionary entrepreneur will set higher goals and commit themselves to achieve the goals. Their strong need for achievement and commitment makes them determined to work towards and achieve the set goals. And higher risk-taking behaviour drives them to exploit new, higher risky but potentially profitable business opportunities.

However, Ray (1993) has argued that although entrepreneur traits are central to business survival and growth, there are no ideal-type traits that guarantee success for the enterprise. There are infinite combinations of attributes and other background and environmental factors that can either lead to business success or failure. In addition, there are personality traits that may work against business survival and growth. For instance, a higher need for control may result in individual refusing to operate the enterprise as a partnership. In a partnership enterprise, individuals pool their resources and share the responsibility of running the entity. Partnership is more likely to raise a larger capital and hence establish a better financed enterprise than sole proprietorship.

3.1.5 Human Capital Theory

Human capital is considered as an important factor of production. Firm growth and survival is heavily dependent on well-developed and able human resources, *ceteris paribus*. A highly educated, motivated and committed workforce is more likely to be more productive than poorly educated human capital (Bates, 1990; Bruderl *et al*,

1992). They can easily process, assimilate and act upon new information. By implication, they are more flexible and well informed on new developments in their fields of expertise.

Under this theory, the survival and growth of a new enterprise is directly linked to its profitability. Profitability is considered as a function of firm or employees productivity. The more productive the enterprise or employees are the more profitable it is. In turn, higher human capital increases the productivity of the entrepreneur and his employees. Besides, the higher productivity implies that the entrepreneur or owner is efficient in organizing resources at his disposal. As a result the entrepreneur will make more profits, hence the enterprise will survive and grow depending on re-investment policy of the owner.

Human capital also influences what happens prior to formation of the enterprises, otherwise called selection effects (Bruderl *et al*, 1992). Such effects are significant in determining eventual survival and growth of such firms. Firstly, higher human capital individuals are more likely to obtain higher and good remuneration package. They are, therefore, in a better position to establish larger and better financed enterprises from their own savings. Secondly, they have a greater knowledge of how to start successful businesses, get relevant information, and process the information. Thirdly, such individuals only choose enterprises that derive higher utility and better results since they can easily secure a higher paying job elsewhere. In addition, they can obtain a loan from banks for expansion since loan evaluation schemes also include the aspect of human capital.

3.1.6 Organization Ecology Theory

Organization ecology deals with how organization evolves within and between population of organizations over a period of time (Singh and Lumsden, 1990). It focus on how organization face the challenge of being new, small and its survival in a diverse environmental conditions (Stinchcombe, 1965; Bruderl *et al*, 1990; Hannan *et al*, 1977; Freeman *et al*, 1983a; Freeman *et al*, 1983b). Many enterprises face their demise in their early years and this theory has attributed such trends to age dependence (Freeman *et al*, 1983b). For instance, younger and new enterprises are

more likely to fail than older enterprises. Enterprises also depend on whether it is a first mover or a follower. Contrary to industrialist view, follower enterprises have a higher chance of survival than first mover as it benefit from previously established and tested routines (Bates, 1990). The same applies to affiliated firms which can use parent firm resources and seek advice from them (Bruderl *et al*, 1992). Finally, large firms have a higher chance of survival than small firms as they have a large pool of financial resources or is able to raise more capital and can better cope with shocks on its operations.

A strategy that a new enterprise uses also plays a role in surviving early years. The strategies that the firm uses to create a position on the market will depend on whether it aims at broader market or a narrow specialized position (Freeman *et al*, 1983a; Hannan *et al*, 1977). Aggressiveness in creating such a position will equally differ as others move in quickly to exploit opportunities while others will take a wait and see approach (Romanelli, 1989). Survival also depends on whether the firms strive to create new products or just thrive by imitating already established products. However, there is no wholesale set of strategies that always work for new firms in all industries.

The final aspect of organization ecology is the business environmental conditions. The business environment includes all factors that the enterprise has limited or no control but affects its operations. Such issues include the macroeconomic environment, political environment, competition in the industry, resource availability, demand or market availability, location, social interaction with members of society and other external forces (Romanelli, 1989). Where such factors are favourable the enterprise is more likely to survive than where it is hostile, *ceteris paribus*.

3.2 Empirical Literature

Owing to the role that small enterprises play in both developing and developed countries, various studies have been undertaken to understand the dynamics of MSEs. One area of interest has been the issue of business mortality or survival chances. These studies have focused on one aspect or another while controlling for other variables that affect chances of survival of small businesses. Most notable differences among the studies are the method of analysis and treatment of data. However, the

results indicates that most newly established business organization do not survive the first five years, save for few exceptions.

Using data from Poughkeepsie, New York, for the period 1843-1936 and using descriptive analysis method, Hutchinson *et al* (1938) found that 30 percent of the business enterprises failed to survive the first year after inception and less than half lasted more than three years. The average life of retail establishments was shorter than those of wholesale and manufacturing but longer than that of craft and service enterprises. The results also showed that larger concerns last longer than small concerns. The results obtained are attributed to general economic conditions, changes in population growth, lack of business training, limited access to financial capital or business entity itself changing from one enterprise to another.

Unlike Hutchinson *et al* (1938), most recent studies have tried to draw their hypotheses from theoretical literature. One such study was carried by Bruderl *et al* (1992) which drew factors that influence the mortality of newly formed businesses from human capital theory and organizational ecology hypothesis. This study used cross section data from Germany and applied duration analysis model. The bivariate analysis results showed that survival rate follows an inverted U shaped distribution i.e. that mortality rate of business entities rises with time to a certain point from which it starts to decline again. Multivariate analysis, which employs proportional hazard model, indicates that organization strategies and characteristics are significant determinants of business survival. Human capital characteristics of founder, especially years of schooling and experience, show a strong direct and indirect effect as well. However, the study did not investigate the impact of interaction of strategies and business environmental conditions as well as the impact of social network on survival of enterprises.

Other studies that equally investigated on the survival of enterprises focused on specific factors while controlling for other variables. Holtz-Eakin *et al* (1994) investigated relationship between liquidity constraints and entrepreneur survival using U.S.A. data of entrepreneurs. The results show that liquidity constraints exert noticeable impact on survival of entrepreneur enterprises.

Romanelli (1989) used data from USA to investigate the impact of environment and organization strategies on early survival of the firm. The results show that specialist and aggressive strategies increase chances of survival and that tailoring strategies to environmental conditions help overcome startup hazards.

Finally, Bates (1990) investigated the role of entrepreneur human capital on small business longevity using data drawn from a national-wide random sample from non-minority male entrepreneurs for the period 1976-1982. The results reveal that highly educated entrepreneurs are most likely to create firms that remained in operation longer than poorly educated individuals. In addition it shows that enterprise owner education background is a major determinant of the financial capital structure of small business startups.

One study that had contrary results from general expectations was undertaken by Monibo (2007) using data from Nigeria for the period 1971 to 1997. This study used a dynamic survival model to investigate small business mortality drawing from experience of privately owned incorporated firms. The results showed that far less closures occurred during infancy as firms had the highest survival value of 1 in the first three years but fell continuously beyond that period. The size of enterprise at inception, education level of the owner, separation of business management from owner, and diversification were found to have a statistically significant correlation with survival of the enterprise. The shocking result was that initial investment which diminishes survival chances as it increases.

CHAPTER FOUR

METHODOLOGY

4.1 Analytical Framework

This study used a hazard model to analyze the chances of firm surviving over specified period of time in months as discussed by Cox (1972) and Keifer (1988). Other applications and discussions of this framework include Bennett (1999), Mackenzie (1986), Lancaster (1979) and Bruderl *et al* (1992). The analytical framework developed in this section is directly linked to the model specified in the next section, hence its inclusion in the methodology.

In economics, some response variables come in the form of duration, which is the time elapsed until a certain event occurs (Woodridge, 2002; Keifer, 1988). In our case, the event is closure of an enterprise at time t having survived up to that time.

Let T be the random variable representing the duration in months that an enterprise survive since its inception and t is the realization of the random variable. The duration analysis begins with specifying the population distribution for the duration $T \geq 0$. The data generating process for T is given by the probability density function (*pdf*) given as $f(\cdot)$. The probability that an enterprise will not survive beyond period t is given by the cumulative distribution function (*cdf*) of T as

$$F(t) = P(T \leq t) = \int_0^t f(s)ds, t \geq 0 \quad (4.1)$$

The survival function, which gives the probability that an enterprise will live beyond t , is then given as

$$S(t) \equiv 1 - F(t) = P(T > t) \quad (4.2)$$

From equation (4.2) and the *pdf*, we can specify the hazard function, which is defined as the instantaneous rate of exiting from the initial state given that the enterprise survived at least until time t . For a small positive change in t , given as $\Delta t > 0$, the hazard rate $\lambda(t)$ can be specified as;

$$\begin{aligned}
\lambda(t) &= \lim_{\Delta t \downarrow 0} \frac{P(t \leq T \leq t + \Delta t \mid T \geq t)}{\Delta t} \\
&= \lim_{\Delta t \downarrow 0} \frac{P(t \leq T \leq t + \Delta t)}{\Delta t} \times \frac{1}{P(T > t)} \quad (4.3) \\
&= \frac{f(t)}{S(t)} = -\frac{d \ln S(t)}{dt}
\end{aligned}$$

The hazard function can be used to specify the *pdf*, *cdf* and survival function. The *cdf* and survival function, therefore, are given as

$$F(t) = 1 - \exp\left[-\int_0^t \lambda(s) ds\right] \quad (4.4)$$

$$S(t) = \exp\left[-\int_0^t \lambda(s) ds\right] \quad (4.5)$$

Another useful function is obtained by integrating the hazard function to give as

$$\Lambda(t) = \int_0^t \lambda(s) ds = -\ln S(t) \quad (4.6)$$

which is considered as a *generalized residual* in duration analysis (Greene, 2002).

In other empirical applications, the shape of the hazard function is of primary interest (Woodridge, 2002). It can assume different distributional forms such as constant function, exponential function, Weibull distribution and log-logistic functions among others (Kiefer, 1988). However, the primary interest in this study was the effect various factors on the survival function or inversely on the hazard function. In view of that, this study used a semi-parametric Cox Proportion Hazard model, which is a category of Proportion Hazard (PH) models (Keifer, 1988). Proportional Hazard model are discussed first before narrowing down to the Cox Proportional Hazard model.

The proportional hazard rate is basically defined as

$$R(t : X) = K(X : \beta) \lambda_0 \quad (4.7)$$

where $R(t : X)$ denotes the proportion hazard rate of a firm at age t in months, λ_0 is the baseline hazard which is common to all units in the population, X is a vector of

explanatory variables, and $K(X : \beta) \geq 0$ is the quantity that differentiates individual hazard functions proportionately based on observed covariates. In the specification of the proportional hazard function (equation 4.7), the effect of covariates is to multiply the baseline hazard by a scale quantity $K(X : \beta)$, which does not depend on the duration t . Note that X is a vector of time invariant explanatory variables in this study since cross sectional data was used. However, it is quite possible to incorporate time varying explanatory variables, and often panel data is suitable for such kind of study (Woodridge, 2002)

The scale quantity $K(X : \beta)$ is generally specified as

$$K(X : \beta) = \exp(X' \beta) \quad (4.8)$$

Substituting equation (4.8) into equation (4.7) we obtain the proportional hazard rate

$$R(t : X) = \exp(X' \beta) \lambda_0 \quad (4.9)$$

Taking natural log of equation (4.9) will give a linear function as

$$\ln R(t : X) = X' \beta + \ln \lambda_0 \quad (4.10)$$

In equation (4.10) the coefficients (parameter vector β) measures the constant proportional effect of X on conditional probability of completing a spell. The proportional hazard rate specified as in equations 4.9 and 4.10 provide a convenient interpretation as a linear model. Keifer (1988) suggest that the specification in equation (4.10) can be estimated using OLS after some transformation to include an error term with some specified distributional assumption. However, that is only possible if the data is not heavily censored and information on baseline intergrated hazard is known.

Cox (1972) suggested a semi-parametric approach to estimation of parameters β in equation (4.10) without specifying the form of the baseline hazard function. Under this approach, the completed spells are ordered as $T_1 < T_2 < \dots < T_n$ and it is assumed that there is no censoring or ties in their distribution. The conditional probability that observetional 1 completes a spell at duration T_1 , on condition that any of the N observations could have completed at the same duration, and is given as

$$\frac{R(t_1, X_1, \beta)}{\sum_{i=1}^n R(t_1, X_i, \beta)} = \frac{K(X_1, \beta)\lambda_0}{\sum_{i=1}^n K(X_i, \beta)\lambda_0} = \frac{K(X_1, \beta)}{\sum_{i=1}^n K(X_i, \beta)} \quad (4.11)$$

where the numerator is the proportional hazard function as given in equation (4.7) for observation 1, while the denominator includes proportional hazards for all observations at duration T_1 . X_1 is as defined before in equation 4.7. The baseline hazard function λ_0 disappears in equation (4.11) as they cancel out. All censored observations do not appear in the numerator but rather in the denominator of Cox proportion hazard function.

The intuition underlying the Cox approach is that in the absence of information on baseline hazard function, the order of duration provide information necessary for estimating unknown parameters.

4.2 Model Specification, Method of Analysis and Diagnostic Tests

Based on the discussion in the previous section, this study adopted the semi-parametric Cox Proportion Hazard model which is non-linear in nature to estimate the empirical model. The formal definition of Cox Proportion Hazard model was given in equation 4.7 and equation 4.9. The hazard function for each observation will be given as

$$R(t : X) = \lambda_0 K(X : \beta) \nu \quad (4.12)$$

where $R(t : X)$, $K(X : \beta)$, X , t and λ_0 are as defined earlier in equation 4.7. ν is random variable taking positive values with the mean normalized to one, for identification purposes, and finite variance σ^2 (Lancaster, 1990; Horowitz, 1999). The scaling factor ν introduces multiplicatively unobserved differences between observations, otherwise called individual frailties (Zorn, 2000). It captures the impact of omitted variables or error in measurements of the covariates on the hazard function. The crucial assumption in this model is that ν is distributed independently of X and t ⁶.

⁶ In estimating the hazard function with frailty component, ν assumes some distribution such as gamma or inverse gaussian among others. In Stata, it is only possible to estimate grouped and not individual frailty models as it is the case here. This was considered as a limitation in this study. For further details on estimating such models see Lancaster (1990), Horowitz (1999) and Zorn (2000).

The empirical model, therefore, was specified as;

$$R_i(t) = \lambda_0 \exp(\beta X_i + \delta Y_i + \varphi Z_i + \eta Q_i + \rho W_i + u) \quad (4.13)$$

where $R(t)$ is the hazard rate at duration t , X is a vector of variables that capture liquidity constraint facing the enterprise, Y is a vector of variables that capture enterprise proprietor characteristics, Z vector of variables that capture characteristics of the firm and strategies used, Q vector of variables that capture business environmental conditions that affect the performance of enterprise, W represent dummy variable HIV-AIDS and u is the error term which captures the impact of unobserved heterogeneity on the log of hazard ratios. The relationship between u and v in equation (4.12) is given as $v = \exp(u)$.

Taking the natural log of equation (4.13) result in

$$\ln R_i(t) = \ln \lambda_0 + \beta X_i + \delta Y_i + \varphi Z_i + \eta Q_i + \rho W_i + u_i \quad (4.14)$$

The study hypotheses were that liquidity constraint, proprietor characteristics, firm characteristics and strategies used, and business environmental condition does not have an impact on survival chance of an enterprises.

The first part of the analysis was descriptive and exploratory. The descriptive analysis used primarily the mean distribution of various explanatory variables. The exploratory part involved producing a list of survival function values at each time period t and plotting graphs of survival function, the hazard function, and cumulative hazard functions which use Kaplan-Meier product limit estimate. It is given as

$$\bar{S} = \prod_{i=1}^j \frac{n_i - h_i}{n_i} \quad (4.15)$$

which gives the probability of completing a spell in time t and n_i and h_i are number of enterprises at risk and number of failures at time t respectively (Keifer, 1988).

The second part involved analysis of the effect of various factors on the hazard rate and 5 models were estimated using a semi-parametric partial maximum likelihood estimation method as proposed by Cox (1972). The partial maximum likelihood estimates of parameters were obtained through maximization of the log-likelihood

function derived from equation (4.11). All right censored observations were included in the denominator and not in numerator of equation (4.11), given that the likelihood function is derived from this equation as the density function⁷. Ties were corrected using Breslow's partial likelihood estimation method where the denominator of the likelihood function is raised by number of subjects tied at any time t . Oakes (1977) shows that the estimates obtained from this method result in efficient estimates of parameters while Tsiatis (1981) shows that under general conditions, the estimates are consistent and asymptotically normal.

Since the underlying estimation method is Cox proportion hazard, the term $\ln \lambda_0$ in equation (4.14) disappear in the partial likelihood estimation. The baseline hazard was estimated non-parametrically after estimating the Cox proportional hazard model.

The models were fitted using the log-likelihood where the larger the value of its associated chi-squared the better the model. Joint hypothesis test were done using Wald statistic and the Z statistics were used to test the significance of individual coefficients. The Cox Proportion model assumes that the hazard function of an individual with a vector of covariates is of proportional form given in equation (4.7) above. Estimation of proportional hazards when the hazards are non-proportional result in biased estimates, incorrect standard errors, and faulty inferences about substantive impact of covariates (Box-Steffensmeier and Zorn, 2001). The Cox proportional hazard assumptions were tested using the Schoenfeld residual approach⁸. Any form of heteroskedasticity present in the model was corrected through the use of robust standard error method. Presence of serious multicollinearity was checked using correlation matrix approach. Model specification was tested using the Link Test method under the null hypothesis that the models were well specified⁹.

⁷ All enterprises that were still operational on the date of interview were considered to be right censored. If in any duration t there are n enterprises that were censored, $n-1$ are lost and are considered as one. For more details on censoring issues in survival analysis see Leung *et al* (1997)

⁸ Schoenfeld residuals for each covariate x are simply the cross-observation sums of the efficient score residuals. It yields a single value for each covariate at each tie point which is used to diagnose violations of the critical proportional hazard assumptions. The null hypothesis is that the assumptions are not violated and it has Chi Squared distribution. For details see Schoenfeld (1980) and Schoenfeld (1982).

⁹ The null hypothesis will be accepted if the p-value associated with hatsquared is greater than 0.05.

4.3 Variable Description, Justification and Expected Results

In this study, the dependent variable is hazard rate, which is primary a function of duration in months of the enterprises as reported by the respondents. All enterprises that were still operational on the date of interview were considered as right censored observations.

The explanatory variables have been categorized into five groups namely; liquidity constraints; characteristics of the entrepreneur; organization characteristics; enterprise environmental conditions; and cross cutting issue. They are all single spell time invariant variables.

4.3.1 Liquidity Constraints

Variables included under this category were Initial Capital invested (CAPITAL) and a dummy variable representing access to credit finance (ACREDIT). They were included to capture the impact of liquidity constraints on enterprise chance of survival (Holtz-Eakin et al, 1994).

Enterprises with larger initial capital have a better chance of surviving and growing in sectors that are more promising and higher value than those with limited initial capital. Bates (1990) indicates that financial capital input levels, irrespective of owner education, are strong determinants of small business survival prospect. Therefore it is expected that the more initial capital invested the more likely that the firm will survive.

In terms of access to credit, Shaw (2004) noted that poor clients face geographical, financial and social-cultural barriers to entry into most promising micro-enterprise occupations, resulting in selecting low-value activities with poor growth and survival prospects. Access to credit assists the poor to remove entry barriers created by financial inadequacy and it also enhances chances of enterprise survival. Therefore, enterprises that have access to credit finance either from family, friends or credit institution have a higher prospect of survival than those without.

4.3.2 Owner Characteristics

The continuous variables included in this category were age of entrepreneur in years (AGE) and the family size of entrepreneur (FAMSIZE). It also included dummy variables MALE which takes the value 1 if owner is male and 0 otherwise, PRIMARY which takes the value 1 if owner completed primary school and 0 otherwise, JCE which takes the value 1 if owner completed JCE level and 0 otherwise, MSCE which takes the value 1 if owner completed MSCE level and 0 otherwise, B_EXP which takes the value 1 if owner had some business experience as defined below and 0 otherwise, and B_TRAIN which takes the value of 1 if owner received some business training and 0 otherwise.

AGE was been included as it is highly correlated with owner's attitude towards risk (Holtz-Eakin *et al*, 1994). Younger entrepreneurs were expected to take more risky investments than older entrepreneurs as they were deemed to have less family responsibilities than the elderly. Hence, it is expected that as age increases the chances of survival should also increase. To allow for non-linearity and as a counter-intuitive variable, a quadratic term of age was included.

FAMSIZE was included to capture the impact of household responsibility of the owner. For most micro and small entrepreneurs, the enterprise is the only source of household income (ECI and NSO, 2001, 2002). Therefore, the bigger the family size the larger the proportion of sales used immediately and hence the higher the chance of a business closing. On the other side, MSEs draw most of its labour from the family at zero cost. The larger the family size the more family labour/assistance was available to the enterprise and hence the more likely that the enterprise would survive. The ultimate expected sign was, therefore, dependent on which among the two forces outweigh the other. We also included a square of family size to capture the quadratic relationship with chances of survival.

Dummy variable MALE was included to capture the impact of gender on the chances of enterprise survival. Based on survey data (ECI and NSO, 2002) enterprises owned by males were more likely to survive longer than those owned by females. The expected sign, therefore, was positive.

Education level completed was included to capture the impact of education on survival chances of enterprise. Bates (1990) indicated that highly educated owners, with a larger financial capital inputs, were more likely to create viable long lasting enterprises than poorly educated cohorts. Those with higher levels of education were expected to perform better than those with lower levels. Therefore, it was expected that those who completed higher levels of education to have a higher chance of survival than those who did not complete any level education.

Experience and training enhances entrepreneurs' business management skills and ability in part through learning by doing and learning best practices through any form of business training. Jovanovic (1982) and Lucas (1978) have indicated in their respective models that learning by doing helps entrepreneurs to be more efficient and therefore less likely to close their businesses. Through experience, entrepreneurs become aware of their managerial ability and hence are more likely to influence the performance of their enterprises positively. However, non-experienced entrepreneurs show relatively more variable behaviour than experience and are more susceptible to external shocks. In our case, all entrepreneurs who had business enterprises before establishing the current enterprise and/or had parents and guardians who had businesses were considered to have experience. Similarly, those that received technical and business management training from institutions or through apprenticeship were considered to have received business training.

4.3.3 Enterprise characteristics and strategies

Variables included under this category included number of workers at the beginning of an enterprise (WORKERS), the ratio of profit estimates to initial capital invested (RORCAP), the percentage of profits that were invested back in the business (PLOWBACK). The dummy variables included were SPE_ENT which take the value of 1 if the enterprise specialized in particular activity and 0 otherwise and M_PLACE which takes the value 1 if the enterprise operates from a designated market place and 0 otherwise.

Number of workers was used specifically to capture the size of the enterprise at the beginning of the business. Workers include the owner, paid and unpaid workers and relatives who run the business on behalf of owner. Other studies prefer to use the market share and capital invested relative to industrial capital requirements. However due to lack of proper records of the latter variables, we considered using the former following ECI and NSO (2001, 2002) and (Steel and Webster, 1992). Organization ecologists, under *liability of smallness* thesis, argue that large new businesses have better survival prospects than small new businesses (Bruderl and Schussler, 1990). Large enterprises have advantage in raising more capital, may face better tax conditions, and are better positioned to recruit qualified labor. Therefore the more workers the enterprise had the higher the chance that it would survive. However, large size of an enterprise is often associated with inefficiencies. To capture the possibility of inefficiencies due to size, square of number of workers (WOKSQR) was included.

RORCAP was chosen as a measure of enterprises performance. Profit is the major incentive to stay in business or exit the market (Ferguson and Ferguson, 1994). Enterprises that were making more profit relative to initial capital invested were less likely to exit or close than those that were making no profits. Hence, there expected relation between profits and the chances of survival was positive. However, enterprises that re-invested a large proportion of their profits were expected to grow more rapidly than those which re-invested less and hence their chance of survival was expected to be high. PLOWBACK was expected to have positive relationship with chance of survival.

The dummy variable SPE_ENT has been included to capture enterprise that either specialized or diversify as a market strategy in production or provision of services (Freeman and Hannan, 1983; Hannan and Freeman, 1977). Specialization has long been associated with efficiency and according to Jovanovic (1982) efficient entrepreneurs are more likely to survive longer than inefficient. However, borrowing from financial market theories, where the market is volatile specialization can be risky to entrepreneur than diversifying. A well diversified enterprise cover-up for losses made by poor performing products by the better performing product when the market is volatile. It was, therefore, quite unpredictable to determine the sign of dummy SPE_ENT a priori.

Place where an enterprise is operating from may have an impact on chances of survival of an enterprise. ECI and NSO (2001, 2002) have indicated that a large proportion of MSEs operate either from home or along the roadside which implies that most of them are quite informal. Those that were operating from a traditional market place were expected to survive long than those operating from home or along the roadside. The expected relation was, therefore, supposed to be positive with chance of survival.

4.3.4 Business Environmental Conditions

Variables in this category included competition intensity captured by the number of enterprises operating similar business within a radius of 300 metres (COMPIT)¹⁰. Dummy variables included URBAN which takes value 1 if the enterprises is based in urban areas and 0 otherwise, M_FEE_TAX which takes the value 1 and 0 otherwise, and V_RELOC which takes the value 1 if the enterprise was adversely affected by the street vendor relocation programme and 0 otherwise.

Enterprises that are based in urban areas were expected to have a higher chance of failure following results of survey which indicated that proportion of enterprises that fail in 5 years is higher in urban than rural areas (ECI and NSO, 2001). This was include as a control variable.

Enterprises that pay tax or market fees are less likely to survive longer than those that do not as the payments eat into the potential profits of the enterprise. Therefore, it was expected that the variable M_FEE_TAX will have a negative relationship with chance of survival.

The street vendor relocation programme (V_RELOC) which was implemented by local government agencies contributed to closure of some enterprises and increased competition in some designated market places due to influx of new enterprises in the

¹⁰ Owing to problems of data on relative market share we have used a simple measure of competition intensity as the number of enterprises operating similar business within a radius of 200 to 500 metres following ECI and NSO (2000).

markets due to relocation. Therefore it was expected that those that reported to have been negatively affected to have a higher chance of closing than those who did not.

4.3.5 HIV-AIDS

This category have only one control dummy variable HIV/AIDS which takes the value of 1 if the owner reported that the enterprise was negatively affected by the HIV/AIDS pandemic and 0 otherwise. The impact was through several channels including the constant sickness of owner or employees, sickness of owner's relative which require the enterprise to make payment for healthcare, sickness and eventual death of usual clients. Enterprises that indicated that they were negatively affected by the pandemic were expected to have a higher chance of closing than non-affected enterprises.

4.4 Source of Data

This study used primary cross-section data of off-farm MSEs that was collected from Lilongwe district. The district was selected for its diversity of enterprises and characteristics of the owners. Eight trading centres were chosen to administer a questionnaire to proprietors of MSEs that employed less than 50 people including the owner, family members, unpaid employees and paid employees for both existing and closed enterprises.

The trading centres were purposively chosen in order to obtain data that represent enterprises from the rural and urban areas as well as five regions of the district namely central, western, eastern, southern and northern. These centres included Area 18 markets, Senti Village, Area 25, Area 23, Mchenzi Trading Centre, Nathenje Trading Centre, and Mpingu Trading Centre. The survey targeted enterprises that were involved in manufacturing, commerce and trade, construction and provision of various services otherwise called off-farm enterprises.

For existing enterprises a list of enterprises was obtained from the chairperson at each trading centre and respondents were chosen at random from the list. However, those that do not operate from the market place were visited in their places of operation such as homes or roadside.

In the case of closed enterprises, two approaches were chosen. First, those operating enterprises on the date of interview were asked if they had an enterprise which is now closed. If their response was positive, another questionnaire for closed enterprise was administered. Secondly, the individual was also asked if they knew any person in the area who had business enterprise but closed in the last three years. An address of the person was collected and enumerators paid them a visit to administer the questionnaire.

Copies of both sets of questionnaires have been appended (see appendix 1 page 58). The questionnaires collected information on duration that enterprise was or has been in operation, entrepreneur characteristics, enterprise characteristics, major constraints and problems, initial capital, source of start-up capital, access to credit facilities, type of activity, family size, experience, estimated number of businesses in the area, and location of enterprises, among others.

The survey was conducted from 18th February 2008 to 1st March 2008. The questionnaire was administered to 162 proprietors of which 135 usable data were obtained.

CHAPTER FIVE

EMPIRICAL RESULTS AND DISCUSSION

5.1 Descriptive Analysis

The descriptive statistics summary has been given in Table 1 below (see page 33). The sample used in this study had 135 enterprises with closed enterprises accounting for 53.3 percent of the total. These enterprises had mean initial capital of K51234.07 but minimum of K500 and maximum of K2, 230,000. The enterprises had a monthly crude profit estimate of K15458.15 with minimum and maximum of K450 and K100, 000 per month respectively. The age range of owners of enterprises was 18 years to 70 years old.

Comparative analysis of the closed and existing enterprises showed that the mean survival duration for the closed was 52 months while that for existing enterprises duration of operation was 59 months. Liquidity constraints were among the major reasons for closure as depicted by differences of mean initial capital invested where the closed enterprises had K26, 770.83 and existing enterprises had K79, 192.06. Credit from family, friends or microfinance institutions was more accessible to closed than existing enterprises as 14 percent of former as compared to 11 percent of the existing. However, based on these statistics alone, we can not conclude that access to credit has a potential of increasing the chance of enterprise closing.

In terms of performance assessment, crude profit estimate was used and existing enterprises had a mean profit of K21, 242.78 while closed enterprises had a mean profit estimate of K10, 396.60. Of these profits, the closed enterprises had a mean re-investment of 30 percent while the existing had a mean re-investment of 37 percent. It is quite tempting to conclude that those that obtained higher profit and reinvested a larger proportion of these profits are less likely to close their enterprises. However, such conclusion should be made with caution as it was not check whether the differences in plowback of existing and closed enterprises were statistically significant.

Table 1: Descriptive Summary Statistics for Lilongwe MSEs

Variable	Combined Summary					Closed Enterprises					Existing Enterprises				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
DURATION	135	55.5704	50.7475	1	216	72	52.1111	48.9437	1	216	63	59.5238	52.8488	2	216
CLOSED ENTERPRISES	135	0.5333	0.5007	0	1	72	1.0000	0.0000	1	1	63	0.0000	0.0000	0	0
AGE	135	30.5111	9.3409	18	70	72	28.2083	7.8667	18	53	63	33.1429	10.2231	20	70
MALE	135	0.7185	0.4514	0	1	72	0.6944	0.4639	0	1	63	0.7460	0.4388	0	1
FAMILY SIZE	135	5.5778	3.1728	1	16	72	5.5278	3.6655	1	16	63	5.6349	2.5228	1	12
PRIMARY	135	0.6444	0.4805	0	1	72	0.7222	0.4510	0	1	63	0.5556	0.5009	0	1
JCE	135	0.2074	0.4070	0	1	72	0.1667	0.3753	0	1	63	0.2381	0.4293	0	1
MSCE	135	0.1407	0.3490	0	1	72	0.0694	0.2560	0	1	63	0.1905	0.3958	0	1
BUSINESS TRAINING	135	0.3333	0.4732	0	1	72	0.2361	0.4277	0	1	63	0.2222	0.4191	0	1
BUSINESS EXPERIENCE	135	0.5481	0.4995	0	1	72	0.5694	0.4986	0	1	63	0.5238	0.5034	0	1
INITIAL CAPITAL	135	51234	194170	500	2230000	72	26771	36571	1000	200000	63	79192	280114	500	2230000
CRUDE PROFIT ESTIMATE	135	15458	19769	450	100000	72	10397	11773	450	75000	63	21243	24944	1000	100000
PLOWBACK	135	33.3704	28.2525	0	100	72	30.0000	27.4165	0	100	63	37.2222	28.9156	0	100
ACCESS TO CREDIT	135	0.1259	0.3330	0	1	72	0.1389	0.3483	0	1	63	0.1111	0.3168	0	1
OWN_SAVING	135	0.7778	0.4173	0	1	72	0.8056	0.3985	0	1	63	0.7460	0.4388	0	1
WORKERS	135	1.3259	0.5964	1	4	72	1.3611	0.5888	1	4	63	1.2857	0.6072	1	4
MARKET FEE/TAX	135	0.5630	0.4979	0	1	72	0.4861	0.5033	0	1	63	0.6508	0.4805	0	1
VENDOR															
RELOCATION	135	0.3333	0.4732	0	1	72	0.3194	0.4695	0	1	63	0.3492	0.4805	0	1
COMPET	135	9.5407	8.0342	1	35	72	9.9583	8.7540	1	35	63	9.0635	7.1637	1	30
URBAN	135	0.5407	0.5002	0	1	72	0.5139	0.5033	0	1	63	0.5714	0.4988	0	1
MARKET PLACE	135	0.7333	0.4439	0	1	72	0.5833	0.4965	0	1	63	0.9048	0.2959	0	1
SPECIALIZING															
ENTERPRISE	135	0.5481	0.4995	0	1	72	0.5694	0.4986	0	1	63	0.5238	0.5034	0	1
HIV_AIDS	135	0.2148	0.4122	0	1	72	0.2361	0.4277	0	1	63	0.1746	0.3827	0	1

Comparison of enterprises based on gender revealed that among the closed enterprises 31.6 percent were owned by females while among the existing enterprises only 25 percent were owned by males. This concurs with observation made by ECI and NSO (2001, 2002) that enterprises owned by females are more likely to close than those owned by their male counterparts.

Another important aspect revealed by the sample data was the number of enterprises that either specialized or diversified. Among the existing enterprises 52 percent specialized in a particular activity while 57 percent specialized among the closed enterprises. Although a direct link cannot be established from this observation alone, it is quite tempting to conclude that enterprises that diversify are more likely to survive long unlike those that specialize. Monibo (2007) obtained similar findings using dynamic analysis of Nigerian enterprises.

HIV/AIDS is one factor that has contributed to closures of MSEs. 24 percent of the closed enterprises reported to have been negatively affected by HIV/AIDS pandemic unlike 17.4 percent among the existing enterprises.

Government policies may have diverse impact on chance of enterprise surviving. This study used the street vendor relocation program and payment, such as tax or market fees, made to government, both at state and local level. The results revealed that 35 percent of existing enterprises were negatively affected by the street vendor relocation program while only 31 percent were negatively affected among the closed enterprises. Similarly, 65 percent of existing enterprises either paid market fee or tax to government compared to 49 percent of closed enterprises. However, these results were expected as 90 percent of existing enterprises operates from a designated (traditional) market place compared to 58 percent among the closed enterprises.

Education is known for playing a positive role in enterprise chance of survival (Bates, 1990). This is depicted by trends revealed by the results. Among the closed enterprises, 72 percent of proprietors completed primary school, 17 percent completed JCE level and only 7 percent completed MSCE level. In contrast, among the existing enterprises, 55 percent of proprietors completed primary school level, 24 percent completed JCE level and 19 percent completed MSCE level. This shows that the

more the proprietor complete a higher level of education the more likely that the firm will survive long.

Business experience and training of proprietor also contributes to an enterprise surviving longer. There are minor differences between the closed and existing enterprises. In terms of business training, 22 percent of existing enterprises' owners received business training from institutions, family or friends compared to 23.6 percent among the closed enterprises. Similarly, 52 percent of existing enterprises proprietors had some business experience prior to establishment of their enterprises compared to 57 percent among the closed enterprises.

5.2 Non-parametric Analysis

The non-parametric analysis involved producing a table of survival function values at each time period t and plotting graphs of survival function, the smoothed hazard function, and cumulative hazard functions which are based on Kaplan-Meier product limit estimates.

Below is a table of the survival function for the sampled enterprises from Lilongwe district (see page 37). The first column (Time) gives the time t in months while the second column (Beg Total) shows the number of enterprises that were at risk of failure at any time t . The third column gives the number of enterprises at risk that actually closed (Fail) while the fourth column gives the number of enterprises censored (Net Lost)¹¹. The estimates of the survivor function are given in the fifth column while the respective standard errors and confidence intervals are given in the remaining three columns.

¹¹ All enterprises that were still operational on the date of interview were considered to be right censored, in a sense that they are yet to finish their life spells. If at any duration t there are n enterprises that were censored, $n-1$ are lost and are considered as one. For more details on censoring issues in survival analysis see Leung *et al* (1997)

Table 2: The Survival Chances of Lilongwe MSEs

Time	Beg. Total	Fail	Net Lost	Survival Function	Std Error	95 % Conf. Interval		Time	Beg. Total	Fail	Net Lost	Survival Function	Std Error	95 % Confidence Interval	
1	135	1	0	0.9926	0.0074	0.9486	0.999	26	81	0	1	0.7581	0.0394	0.6702	0.8256
2	134	0	1	0.9926	0.0074	0.9486	0.999	29	80	1	0	0.7486	0.0401	0.6597	0.8175
3	133	4	4	0.9627	0.0164	0.9128	0.9843	30	79	1	2	0.7391	0.0407	0.6493	0.8093
4	125	1	3	0.955	0.0179	0.9026	0.9795	31	76	1	0	0.7294	0.0413	0.6386	0.8009
5	121	3	3	0.9314	0.0221	0.8722	0.9637	33	75	1	0	0.7197	0.0419	0.628	0.7925
6	115	1	0	0.9233	0.0233	0.862	0.958	34	74	0	1	0.7197	0.0419	0.628	0.7925
7	114	2	0	0.9071	0.0256	0.842	0.9462	36	73	1	0	0.7098	0.0424	0.6173	0.7839
8	112	0	3	0.9071	0.0256	0.842	0.9462	37	72	0	1	0.7098	0.0424	0.6173	0.7839
9	109	1	1	0.8987	0.0267	0.8319	0.94	38	71	1	0	0.6998	0.043	0.6065	0.7751
10	107	2	0	0.8819	0.0287	0.8116	0.9272	40	70	2	0	0.6798	0.044	0.585	0.7575
12	105	2	0	0.8651	0.0305	0.7918	0.914	42	68	1	1	0.6698	0.0445	0.5743	0.7486
13	103	1	2	0.8567	0.0314	0.782	0.9073	43	66	0	1	0.6698	0.0445	0.5743	0.7486
14	100	2	1	0.8396	0.033	0.7622	0.8936	46	65	0	1	0.6698	0.0445	0.5743	0.7486
15	97	0	1	0.8396	0.033	0.7622	0.8936	49	64	0	1	0.6698	0.0445	0.5743	0.7486
16	96	1	0	0.8309	0.0338	0.7521	0.8865	51	63	1	0	0.6592	0.045	0.5629	0.7392
17	95	1	1	0.8221	0.0345	0.7421	0.8793	52	62	1	1	0.6486	0.0456	0.5515	0.7298
20	93	1	0	0.8133	0.0353	0.7321	0.872	53	60	3	0	0.6161	0.047	0.5172	0.7007
21	92	1	0	0.8044	0.036	0.7221	0.8646	56	57	2	0	0.5945	0.0477	0.4947	0.681
22	91	0	2	0.8044	0.036	0.7221	0.8646	60	55	1	0	0.5837	0.0481	0.4835	0.6711
23	89	0	2	0.8044	0.036	0.7221	0.8646	62	54	2	0	0.5621	0.0487	0.4614	0.6511
24	87	4	1	0.7675	0.0388	0.6806	0.8336	63	52	1	0	0.5513	0.0489	0.4505	0.641
25	82	1	0	0.7581	0.0394	0.6702	0.8256	64	51	0	1	0.5513	0.0489	0.4505	0.641

Table 2 : The Survival Function of Lilongwe MSEs at Period t continued

Time	Beg. Total	Fail	Net Lost	Survival Function	Std Error	95 % Conf. Interval		Time	Beg. Total	Fail	Net Lost	Survival Function	Std Error	95 % Confidence Interval	
67	50	1	0	0.5403	0.0492	0.4393	0.6308	103	24	0	2	0.3686	0.051	0.27	0.4674
68	49	2	0	0.5182	0.0496	0.4171	0.61	105	22	0	1	0.3686	0.051	0.27	0.4674
69	47	0	1	0.5182	0.0496	0.4171	0.61	114	21	0	1	0.3686	0.051	0.27	0.4674
70	46	2	0	0.4957	0.0499	0.3947	0.5887	116	20	0	1	0.3686	0.051	0.27	0.4674
71	44	1	1	0.4844	0.05	0.3835	0.578	119	19	0	1	0.3686	0.051	0.27	0.4674
72	42	1	1	0.4729	0.0502	0.3721	0.567	120	18	0	2	0.3686	0.051	0.27	0.4674
73	40	0	1	0.4729	0.0502	0.3721	0.567	121	16	1	0	0.3456	0.0527	0.2446	0.4485
76	39	1	0	0.4608	0.0503	0.3601	0.5555	128	15	0	1	0.3456	0.0527	0.2446	0.4485
77	38	0	1	0.4608	0.0503	0.3601	0.5555	130	14	1	0	0.3209	0.0545	0.2181	0.4281
78	37	1	0	0.4483	0.0505	0.3478	0.5437	138	13	0	1	0.3209	0.0545	0.2181	0.4281
79	36	1	0	0.4359	0.0506	0.3355	0.5318	140	12	0	1	0.3209	0.0545	0.2181	0.4281
80	35	0	1	0.4359	0.0506	0.3355	0.5318	141	11	2	0	0.2626	0.0581	0.1573	0.3803
83	34	1	0	0.423	0.0507	0.3229	0.5196	143	9	0	1	0.2626	0.0581	0.1573	0.3803
85	33	0	1	0.423	0.0507	0.3229	0.5196	144	8	0	1	0.2626	0.0581	0.1573	0.3803
89	32	1	0	0.4098	0.0508	0.31	0.5069	152	7	0	1	0.2626	0.0581	0.1573	0.3803
90	31	2	0	0.3834	0.0508	0.2844	0.4814	160	6	1	0	0.2188	0.0628	0.1108	0.3501
92	29	0	2	0.3834	0.0508	0.2844	0.4814	170	5	0	1	0.2188	0.0628	0.1108	0.3501
94	27	0	1	0.3834	0.0508	0.2844	0.4814	190	4	1	0	0.1641	0.0668	0.0602	0.3128
99	26	1	0	0.3686	0.051	0.27	0.4674	202	3	1	0	0.1094	0.0631	0.025	0.265
101	25	0	1	0.3686	0.051	0.27	0.4674	216	2	1	1	0.0547	0.0499	0.0046	0.2079

The table shows that during the first month, there were 135 enterprises at risk of failure but only 1 enterprise actually failed and none was censored. The estimated probability of a firm surviving the beyond the first two months is 0.9926, which represent a higher chance of survival. The chances of an enterprise surviving start steadily declining in the third month where probability of survivor is 0.9627. By the end of the first year the probability of surviving declines to 0.8651 while end of second year probability declines to 0.7675. For enterprises that survive up to five years, their probability of surviving beyond that point is 0.5837.

Grouping the surviving periods based on five years intervals of enterprise growth, then there will be an infant stage (0-5 years), adolescent stage (5-10 years) and adult stage (10 years and above). The slope of the survival function is higher for the infant stage, followed by the adolescent stage and then the adult stage, in absolute terms. The implication is that the rate of change in survival function decreases as the time period of enterprise operating increases. For instance, in the infancy stage, the probability of surviving declines from 0.9926 at the beginning to 0.5837 by the end of fifth year. In contrast, in adolescent stage, the probability of an enterprise surviving declines from 0.5621 in the 62nd month to 0.3686 by the end of 10th year.

Graphical analysis of survival function equally depicts similar patterns. Figure 1 shows that the survivor function steadily declines from the first month to 70th month beyond which the slope slightly decreases in absolute terms. This implies that the chances of an enterprise surviving declines steadily from the first month to 70th month beyond which the rate of decline in survival chances decreases. The kernel-based smoothed hazard function shown in figure 2 shows that the hazard function first increases in the first five years after inception but decreases from the 70th month to 110th month, giving an inverted U shaped hazard function. However, beyond the 110th month, the hazard rate starts to increase again and more sharply after 160th month.

Figure 1 : Survival Function

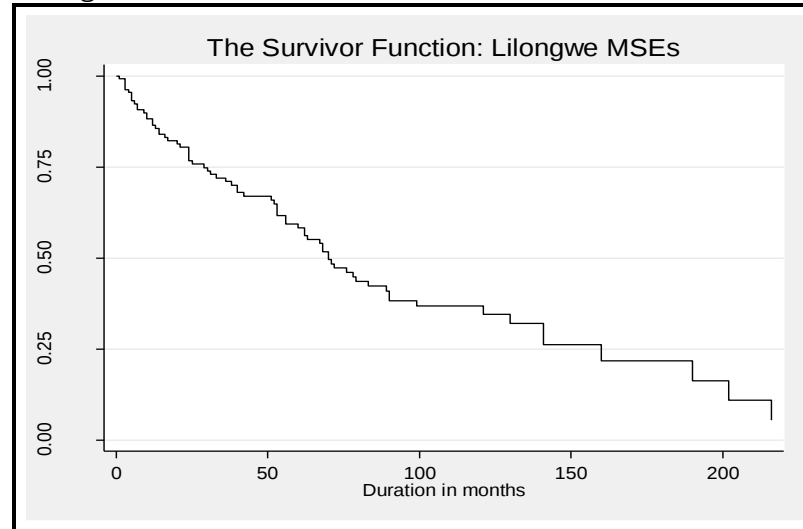
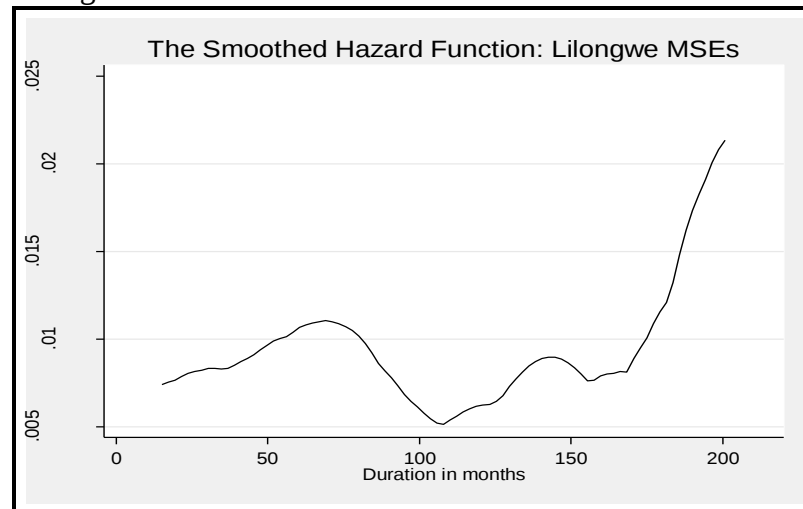


Figure 2: Smoothed Hazard Function



Based on the shape of the smoothed hazard function, MSEs in Lilongwe depicted an inverted U shaped pattern of mortality rate in first 10 years which concurs with *liability of adolescent thesis* as advanced by Bruderl and Schussler (1990). Under this theory the mortality rates are low immediately after starting a business because enterprise can survive on initial resources, however, the mortality rate increases to a maximum after some period and declines afterwards. This is quite contrary to liability of newness thesis as suggested by Stinchcombe (1965) and elaborated by Freeman and Hanan (1983b) which suggest that organizations die mostly in their infancy because they are yet to learn from experience and stabilize its social interaction internally and with the environment.

The rise of the hazard rate from 112th month and beyond concurs with the *liability of aging and bigness* thesis as advanced by Aldrich and Auster (1986) which posit that mature and large organizations are endangered by inertia qualities that impair their ability to adapt to changes in the environment. Among the sampled enterprises, the increase in the hazard rate depicts more on the ageing factor than the size factor.

Different groups, as captured by the dummy variables, have different survival functions, as shown in Figures 3 to 8 below (see pages 42 and 43). Enterprises that operate in the rural areas have a slightly higher chance of survival two years than those operating in urban. In terms of gender, there are slight differences between enterprises owned by males and females in the earlier four years. However, beyond four years enterprises owned by males have a higher chance of survival than those owned by females. Enterprises that operate from a designated market place have a higher chance of survival than those that operates at home or along the roadside. Similarly enterprises that have access to credit have a higher chance of surviving the beginning six years than those without access to any form of credit.

Enterprises whose owners received some business training have a higher chance of survival than those who did not for close to 12 years. However, figure 7 indicates that the trend reverses beyond 160th month where business training is less relevant. Contrary to the expectations, enterprises whose owners have business experience prior to establishing the current enterprise have a higher chance of surviving the first 10 months beyond which those who started without experience will have a higher chance of survival. The implication is that business experience is relevant when the enterprise is just being established.

Figure 3 : Survival Function by Urban Area

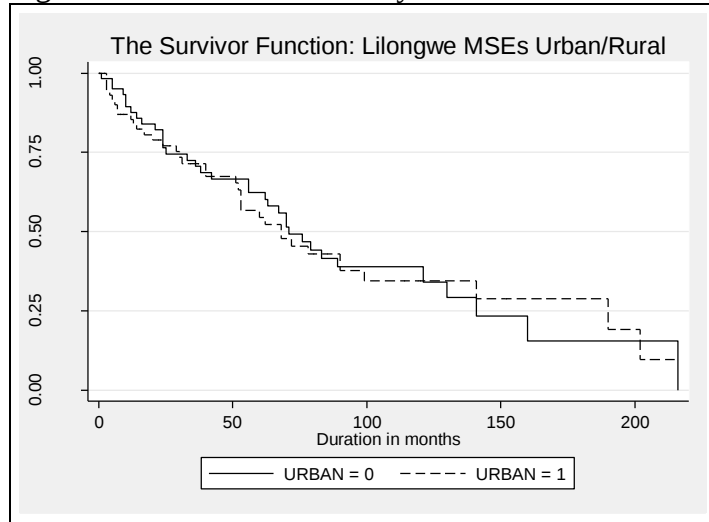


Figure 5: Survival Function by Business Premises

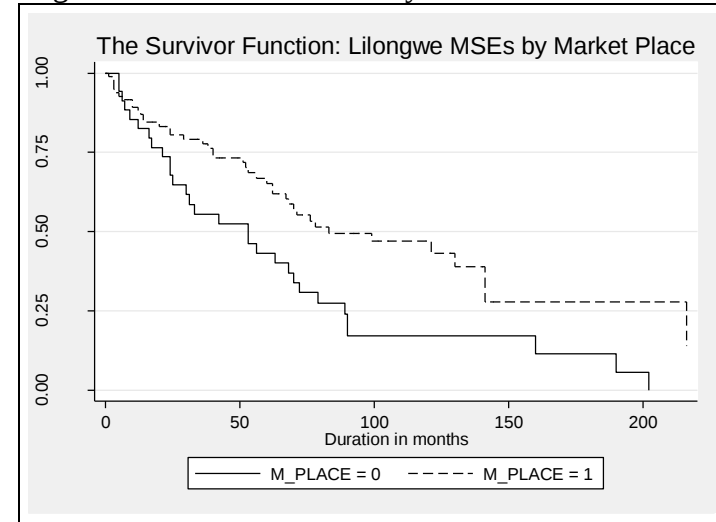


Figure 4: Survival Function by Gender

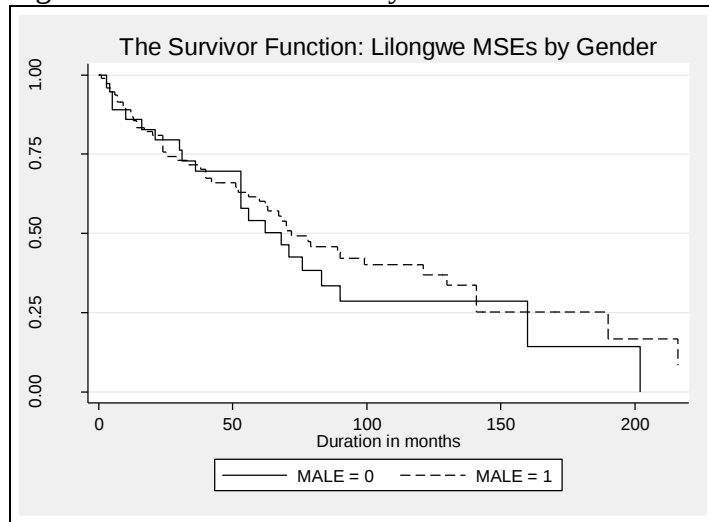


Figure 6: Survival Function by Access to MFI Credit

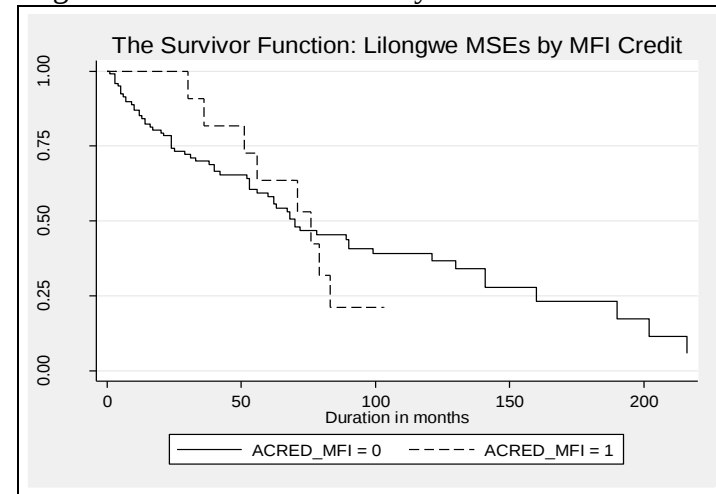


Figure 7: Survival Function by Business Training

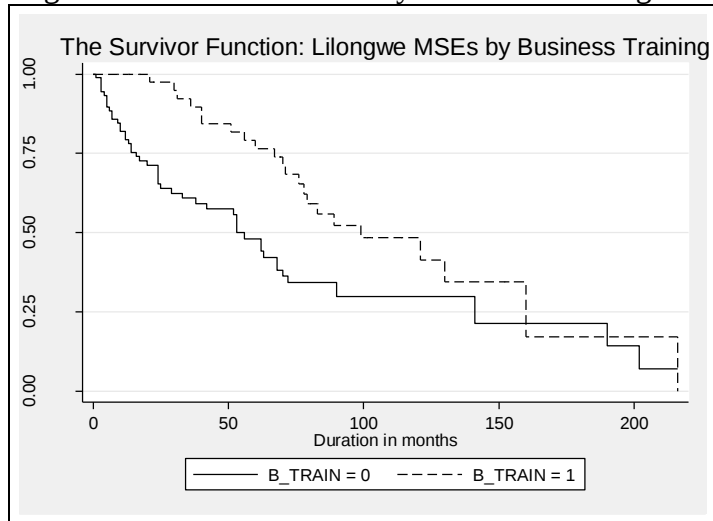
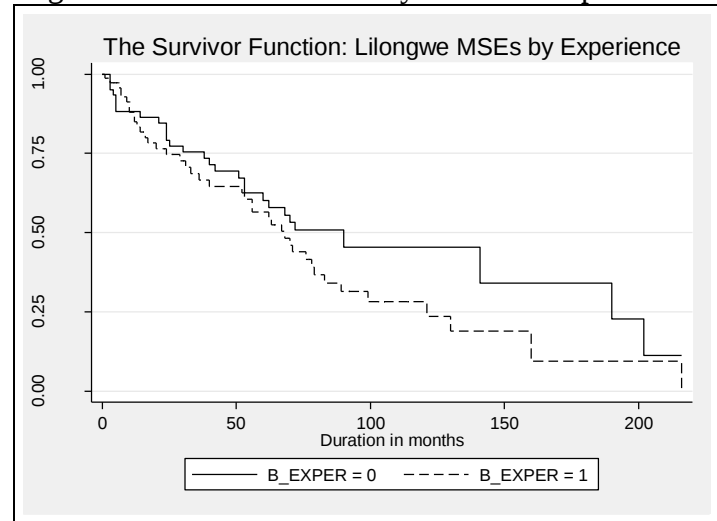


Figure 8: Survival Function by Business Experience



5.3 Multivariate Analysis

Five different models were estimated using the Cox Proportion Hazard model to capture the impact of the various covariates on probability of closing an enterprise at time t given that the enterprise have survived up to that time. Model 1 is a general model which included all variables. Models 2, 3, 4 and 5 are models that include variables only from specific category such as liquidity constraints, owner characteristics, enterprise characteristics, and business environmental conditions respectively.

The results have been presented in hazard ratios which capture the parallel shift of the unspecified baseline hazard such as downwards if the ratio is less than 1 or upwards if the ratio is greater than 1 and is given as $\exp(\beta)$ ¹². The summary statistics for multivariate analysis has been given in Table 2 below (see page 44) while the standard coefficients have been placed in appendix 3 (see page 67).

Using the log-likelihood statistics and its associated probabilities, models 1, 3 and 4 were found to best fit the data. Joint test of coefficients using Wald statistics indicates that variations in the hazard rate are jointly explained by the variations in the covariates in models 1, 3 and 4. Link test method was used to check misspecification of the models and the results shows that all models were correctly specified. Similarly, Schoenfeld residuals global test shows that the model did not violate proportion hazard assumptions in all models. The Schoenfeld residual test results for individual variables also indicate that all variables did not violate proportionality assumption and these results have been placed in appendix 2. Test for heteroskedasticity were not conducted as the estimation specifically used robust standard errors which controls for heteroskedasticity of any form present in the model.

¹² Stata gives results in hazard ratio (RR) which is basically the ratio of the hazard rates defined as in equation 4.7 for both discrete and continuous variables. The hazard ratio in discrete case, where X takes

values 0 or 1, we have $RR(t) = \frac{R(t | X = 1)}{R(t | X = 0)} = \exp(\beta_i)$ and in the case of continuous covariates

$$RR(t) = \frac{R(t | X = x + \Delta x)}{R(t | X = x)} = \frac{\exp(\beta x + \beta \Delta x)}{\exp(\beta x)} = \exp(\beta \Delta x_i)$$

Test for multicollinearity were also conducted using simple correlation matrix and the results indicates that there was no serious correlation among the explanatory variables.

Table 3: Summary Statistics for Multivariate Analysis (Cox PH Models)

_t	Hazard. Ratios				
	1	2	3	4	5
Liquidity Constraints					
CAPITAL	0.763*	0.94			
ACREDIT	1.203	0.935			
Owner Characteristics					
AGE	0.872		0.91		
AGESQR	1.002		1.001		
MALE	0.726		0.635*		
FAMSIZE	0.759*		0.747**		
FAMSQR	5.530*		6.938***		
PRIMARY	0.082*		0.486**		
JCE	0.100		0.536		
MSCE	0.093		0.573		
B_TRAIN	0.353***		0.331***		
B_EXPER	2.866***		2.674***		
Enterprise Characteristics and Strategies					
RORCAP	0.997			0.999	
PLOWBACK	0.997			1	
WORKERS	0.717			0.858	
WORKSQR	1.781			1.540	
M_PLACE	0.711			0.511***	
SPEC_ENT	0.650			0.737	
Business Environmental Conditions					
M_FEE_TAX	1.220				0.852
V_RELOC	0.444**				0.708
URBAN	1.709				1.039
COMPET	1.007				1.001
HIV_AIDS	1.030				
Log Likelihood	-264.18	-288.55	-270.80	-283.82	-287.49
Pro	0.000	0.7486	0.0000	0.069	0.5963
Wald chi-sq	89.140	0.58	42.2	10.23	2.77
Global Test	14.500	1.77	6.86	7.07	1.74
Prob	0.912	0.413	0.738	0.216	0.784
Link Test Statistic	-0.098	-11.404	0.025	0.349	-1.553
Prob	0.426	0.354	0.888	0.545	0.611

Note: *** =significant at 1 %, **=significant at 5%, and *=significant at 10 %. The Z-statistics were calculated based on robust standard error

5.3.1 Liquidity Constraints

The amount of initial capital invested appears to reduce the probability of closing the enterprise as depicted by the negative sign of standard coefficient and it is statically significant in the general model. This implies that enterprises that have larger initial capital invested, *ceteris paribus*, are more likely to survive than those with less initial capital invested. The hazard ratio indicates that risk of closure declines from 1 to 0.76 with a unit increase in log of initial capital invested. Bruderl et al (1992) found similar results using data from Upper Bavaria. These results vindicate the relationship established under descriptive analysis.

Access to credit from microfinance institutions, family and friends is statistically insignificant and the sign indicate that individuals with access to credit increase their chances of closing their enterprises. Shaw (2004) noted that most households are better-off with microfinance credit, however, the income impact varies in magnitude and durability, and a sizable proportion of clients find their post-credit incomes stagnating or falling. However, in our case, this relationship is quite negligible. Based on nonparametric results on figure 7 in the appendix, enterprises with access to credit have a higher chance of survival than those without.

Based on log-likelihood and Wald statistics, liquidity constraints variables were generally found to be negligible in jointly explaining variations in the hazard rate. Similarly, individual variables under this category were found to be statistically insignificant.

5.3.2 Proprietor Characteristics

Under this category, age, age-squared and dummy variable male were found to be statistically insignificant. However, the signs indicate that as entrepreneur age increases the chances of enterprise closing declines. The quadratic relationship between age and the hazard rate was upheld. Similarly, enterprises owned by male entrepreneur are less likely to close than that of female entrepreneurs.

Both family size and the square of family size are statistically significant. Increase in family size is associated with a downward parallel shift of the hazard function. A unit increase of family size will reduce the risk of closure from 1 to 0.76. This contradicts the intuitively appealing results obtained by Holtz-Eakin (1994) which found a negative relationship between chance of surviving as an entrepreneur and number of children in a family. A counter-intuitive variable family size square indicates that there is a quadratic relationship between family size and the hazard rate. The implication drawn is that as family size increases the risk of closure declines to a point where risk of closure will start to rise.

All dummy variables capturing the impact of completing primary, JCE level and MSCE level of formal education on chances of survival of an enterprise have the expected signs. However, only primary school education completion is statistically significant. The hazard ratios indicates that the risk of closure significantly declines to 0.08 for entrepreneurs who completed primary school level compared to 1 for those who did not complete any level. However, the significance of higher education beyond primary level has been downplayed as dummy for JCE and MSCE level completion are statistically insignificant contrary to findings of Bates (1989) that highly educated proprietors are more likely to have enterprises that would survive longer. This can be partly explained by the micro nature of enterprises that were included in the sample of which 64 percent completed primary level, 21 percent completed JCE level and only 14 percent completed MSCE level.

Dummy variable capturing enterprises whose owners received some business training and those with business experience are both highly statistically significant. Enterprises whose owners received some business related training have a downward parallel shift and the enterprise risk of closure declines from 1 to 0.35. These results emphasize the need for business training for potential and existing entrepreneurs. Contrary to the expectations, enterprises whose owners had prior business experience before establishing their enterprise are more likely to close as their enterprise's risk of closure increase to 2.87. Comparing with graphical results obtained earlier, individuals with experience fair better in the first 10 months beyond which those without experience have a higher chance of survival. However, the results on business experience are in agreement with findings of Bruderl *et al* (1994).

Based on the model fitness test, variables under owner characteristics category explain variations in the hazard rate better than any other category. The log-likelihood for model 3 is larger compared to models 2, 4 and 5. The implication is that owner characteristics play a significant role in determining enterprise chances of survival.

5.3.3 Enterprise Characteristics and Strategies

None of the variables under this category are statistically significant in the general model. However, in model 4 the dummy variable M_PLACE was found to be statistically significant at 5 percent. In terms of signs, size of an enterprise, captured by number of workers in an enterprise, appear to reduce the chance of enterprise survival. Similarly, enterprise with a higher ratio of profit to initial capital increase the chance of an enterprise surviving longer at any time t . Enterprises that operate from a traditional market place and/or specialized in a particular product equally reduce the chance of an enterprise closing.

Variables under this category explain variations in the hazard rate. However, this category is less significant in explaining the variations in hazard rate unlike the owner characteristics since the value of log-likelihood and its associated probability shows that the model is statistically significant at 10 percent level. However, these results could be attributed to micro in nature of enterprises and the fact that this sector is characterized by low exit and entry barriers. For medium and large enterprises, enterprise characteristics and strategies are more likely to have a significant impact as the case in Monibo (2007).

5.3.4 Business Environmental Conditions

Similarly, under this category, only the dummy variable for enterprises that were adversely affected by the street vendor relocation programme was found to be statistically significant. Dummy variables M_FEE_TAX, URBAN and continuous variable COMPET are all statistically insignificant. In terms of sign, the results indicate that enterprises that pay tax or market fee, face higher competition on the market and/or are located in urban areas have a higher chance of closing.

Enterprises that were adversely affected by the Street Vendor relocation programme undertaken by government in 2005 appear to have a lower chance of closing their enterprises, contrary to expectations. The hazard ratio indicates that the risk of closure declines from 1 to 0.44 between enterprises that were directly affected than those which were not directly affected. Perhaps the relocation programme improved the resilience of MSEs to shocks and improved enterprises exploitation of external economies of scale by moving to a localized market place.

Variables under this category were found to be statistically insignificant in jointly explaining the variations in the hazard rates. The implication is that the impact of business environmental conditions on the chance of enterprise survival is quite negligible among the enterprises sampled.

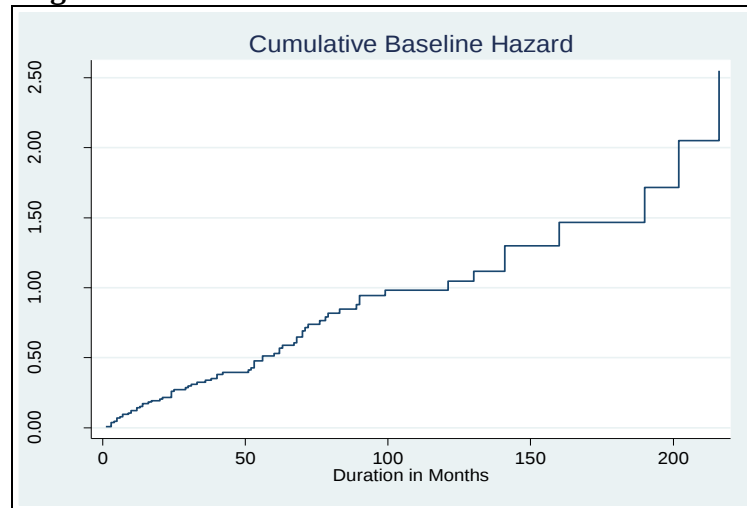
5.3.5 HIV/AIDS

As expected, HIV/AIDS appears to increase the probability of an enterprise closing at any time in point. However, this variable is also not statistically significant hence the results are quite negligible.

5.3.6 The Baseline Hazard

Below is the figure of cumulative baseline hazard which was estimated after the Cox model. The slope of the cumulative hazard function is actually the hazard function itself. Based on the shape of the cumulative hazard function, the hazard function will have a distribution as depicted in figure 2 above. Therefore, the sampled MSEs chance of closing increases with time up to 40th month. However, beyond that point there a U turn in chances of closure.

Figure 9: The Cumumative Hazard Function



CHAPTER SIX

CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Conclusion

This study set out to determine the chances that an off-farm MSE will survive beyond any time period t in months and analyze the effect several factors have on survival chances of such enterprises. The factors under investigation included liquidity constraints, owner characteristics, enterprise attributes and strategies, and environmental factors. The general hypotheses were that these factors have no significant impact on enterprise chances of survival. Data specifically collected for this type of study was obtained by administering a questionnaire to MSE proprietors in Lilongwe district. A usable sample of 135 enterprises was used in the study. The analysis included descriptive, non-parametric, and semi-parametric analysis.

The non-parametric analysis indicated that the survival chances of sampled enterprises declined with time. A newly established enterprise was found to have a probability of surviving the first month of 0.9926 which declines to 0.8651 at the end of the year. The probability of an enterprise surviving the early five years was found to be 0.5837 and 0.3686 in the early ten years. It was also found that the probability of an enterprise closing having survived up to that point in time increased from the first month to 70th month and declined thereafter until the 110th month. Beyond the 120th month the probability of an enterprise closing starts increasing again. The implication drawn from such pattern is that MSEs in Lilongwe chance of closing increase with time starting from the first month until the fifth year beyond which the chance of closing starts to decline. However, beyond the tenth year, ageing process sets in which contribute to an increase in chance of closing again.

The non-parametric graphical analysis for specific groups has given quite interesting results. An enterprise has higher chance of survival if it is based in the rural areas, operates from a designated market place, and is owned by a male proprietor. Similarly, enterprises owned by proprietors with business related training have a higher chance of survival. Surprisingly, enterprises owned by individuals with

experience have a higher chance of survival in the earlier 10 months beyond which those without prior experience have a better chance of survival.

A semi-parametric Cox proportion hazard model was used to determine factors that affect the chances of an enterprise surviving or closing at any point in time. Among the liquidity constraints only initial capital invested was found to reduce the chance of closing the enterprise significantly. Family size of proprietor, business training and completing any level of formal education were also found to significantly reduce the chance of closing an enterprise among personal attributes of proprietor. However, business experience was found to increase the probability of an enterprise closing in this category.

None of the attributes of an enterprise and strategies used was found to be statistically significant despite that all of them reduce the likelihood of closing the enterprise. Among the factors that capture environmental condition, only the street vendor relocation program was found to be statistically significant with unexpected results. Similarly, HIV/AIDS pandemic increases the probability of an enterprise closing, although the effect is quite negligible.

Generally, owner characteristics and enterprise characteristics were found to play a significant role in determining the chance of off-farm MSEs survival.

6.2 Policy Implications

The findings of this study have implications on some policies that directly or indirectly affect the operations of MSEs in Lilongwe district or elsewhere in the country. Firstly, the results have shown that initial capital invested is quite significant in increasing the chance of an enterprise surviving. However, ECI and NSO (2001, 2002) noted that a large proportion of enterprises have capital constraint which restrict investment towards business that require very low capital but less profitable. Effort, therefore, should be made to improve access to capital finance at low cost. Already, there has been a higher proliferation of microfinance institutions in the country. However, there is a need to review the operations of microfinance institutions in the

country and identify weak points to improve access to microfinance for viable enterprises.

Secondly, business training has been found to increase chances of an enterprise surviving. Based on our descriptive statistics, only 33 percent of sampled enterprises received business related training and 55 percent rely on prior experience. There is a higher possibility that lack of technical and business management skills contribute to closing of enterprises in their infancy stage. Therefore, effort should be made to ensure that MSE proprietors are equipped with necessary technical and business management skills. However, there is a need to assess the capacity of existing institutions that offer such trainings to ensure wide access and participation.

Finally, government should intensify its programme of relocating street vending enterprises to localized or designated market places. This study has indicated that those enterprises that were affected by this programme have a higher chance of survival as it promotes exploitation of external economies of scale. In addition, enterprises that operate from a designated market have a wider customer base than those that operate from home or along the roadside.

6.3 Limitations of the Study

Towards this end, several limitations of the study were noted. First, retrogressive data collection method was used in this study. The major problem of this approach is that respondents provide information based on recall. It is therefore more likely that the information given is less accurate than in a case where records are maintained. Therefore, results from this study should be interpreted with caution. Secondly, crude estimates of initial capital invested and profits were used which may also contribute to under or over estimation of these variables. Thirdly, the size of sample used in this study is considered relatively small and may have a bearing on the results obtained. Again interpretation of the results need to done with caution. Finally, the results of this study did not control for unobserved heterogeneity present in the data due to limitations of computer package used for analysis. However, this should not raise much concern as it is a problem in cases where duration dependence is of primary interest. In our case duration dependence was not modelled.

6.4 Direction for Future Study

This study has given a general picture on the survival chances of MSEs and factors that affect chances of enterprise surviving. However, the partial effects of these factors at different levels of enterprise development were not modelled. Future study on the same should focus on age groups based on arguments advanced under *liability of newness thesis*, *liability of adolescence*, and *liability of ageing and big size thesis* (Stinchcombe, 1965 ; Bruderl and Schussler, 1990; and Aldrich and Auster, 1986). Such study will determine factors that determine survival chances of an enterprise at infancy, adolescence, and adult stages. In addition, future studies have to consider the impact of unobserved heterogeneity by using computer packages that incorporates such problems.

REFERENCES

- Aldrich, H. E. and E. Auster (1986) "Even dwarfs started small: liabilities of size and age and their strategic implications.", in B. M. Staw, L. L. Cummings and C.T. Greenwich, (eds) *Research in Organization Behaviour*: JAI Press Vol. 8, pp. 165-98
- Beck T., Demirgüç-Kunt, A., L. Laeven and R. Levine (2005) "Finance, firm size and growth." *World Bank Policy Research Working Paper* No. 3485.
- Bates, T. (1990) "Entrepreneur human capital inputs and small business longevity" *The Review of Economics and Statistics*, Vol. 72, No. pp. 551-559
- Bennett, S. D. (1999) "Parametric models, duration dependence, and time-varying data revisited" *American Journal of Political Science*, Vol. 43, No. 1, pp. 256-270.
- Box-Steffensmeier, J. M. and C.J.W. Zorn (2001) "Duration models and proportional hazards in political science" *American Journal of Political Science*, Vol. 45, No. 4. pp. 972-988.
- Brockhaus, R. H. (1982) "The psychology of the entrepreneur" in C.A. Kent, D.L. Sexton and K.H. Vesper, (eds) *Encyclopedia of Entrepreneurship* Eaglewood Cliffs; Prentice-hall
- Brüderl, J., P. Preisendörfer and R. Ziegler (1992), "Survival chances of newly founded business organizations" *American Sociological Review*, Vol. 57, No. 2. pp. 227-242.
- Bruderl, J. and R. Schussler (1990) 'Organizational mortality: the liabilities of newness and adolescence" *Administrative Science Quarterly*, Vol. 35, No. 3 pp. 530-547.
- Chell, E., J. Haworth and S. Brearly (1991) *The Entrepreneurial Personality: Concepts, Cases and Categories*, London: Routledge.
- Church, J. (2000) *Industrial Organization: A Strategic Approach* Boston, MacGraw-Hill
- Cox, D.R. (1972) "Regression models and life-tables" *Journal of the Royal Statistical Society. Series B (Methodological)*, Vol. 34, No. 2. pp.187-220.
- Daniels, L. (1999) "The role of small enterprises in the household and national economy in Kenya: a significant contribution or a last resort?" *World Development* Vol. 27, No. 1 pp. 55-65
- Daniels, L. and D.C. Mead (1998) "The contribution of small enterprises to household and national income in Kenya" *Economic Development and Cultural Change*, Vol. 47, No. 1. pp. 45-71.

- de Wit, G. (1993) “ Models of self-employment in a competitive market” *Journal of Economic Surveys*, 7 (3) ; pp. 367-397
- DFID (Department for International Development) (2000) *Eliminating World Poverty: Making Globalisation Work for the Poor*. The Department for International Development: London.
- ECI and NSO (Ebony Consulting International and National Statistical Office) (2001) *Malawi National GEMINI MSE Baseline Survey 2000*, DFID
- ECI and NSO (2002) *Malawi District Level GEMINI MSE Baseline Survey: Mangochi and Lilongwe Districts 2002*, DFID
- Ferguson, P. R. and G.J. Ferguson (1994) *Industrial Economics: Issues and Perspectives* NY, New York University Press.
- Freeman, J. and M.T. Hannan (1983a) “Niche width and the dynamics of organizational populations” *The American Journal of Sociology*, Vol. 88, No. 6. pp. 1116-1145.
- Freeman, J., G. R. Carroll and M.T. Hannan (198b) “The liability of newness: age dependence in organizational death rates” *American Sociological Review*, Vol. 48, No. 5. pp. 692-710.
- GoM (Government of Malawi) (1970) *Statement of Development Policy*. Office of President and Cabinet. Zomba, Government Print
- _____ (1997a) *Micro and Small Enterprise Policy Statement*, Lilongwe: Ministry of Commerce and Industry.
- _____ (1997b) *Cooperative Development Policy*, Lilongwe: Ministry of Commerce and Industry.
- _____ (2007) *Micro and Small Enterprise Policy Statement*, Lilongwe: Ministry of Industry and Trade. (Revised Draft)
- _____ (2005) *Millennium Development Goals: Challenges and Successes*
- Green, C.J., C.H. Kirkpatrick and V. Murinde (2006) “Finance for small enterprise growth and poverty reduction in developing countries,” *Journal of International Development*, Vol. 18, pp1017-1030
- Greene, W.H. (2002) *Econometric Analysis*. New Jersey, Pearson Education
- Greenberg, D. B. and D.L. Sexton (1998) “An interactive model for new venture creation” *Journal of Small Business Management* Vol. 26 (3) pp. 103-118
- Hannan, M.T. and J. Freeman (1977) “The population ecology of organizations” *The American Journal of Sociology*, Vol. 82, No. 5 pp. 929-964.

- Holtz-Eakin, D., D. Joulfaian and H.S. Rosen (1994) "Sticking it out: entrepreneurial survival and liquidity constraints" *The Journal of Political Economy*, Vol. 102, No. 1. pp. 53-75.
- Horowitz, J.L. (1999) "Semi-parametric estimation of a proportional hazard model with unobserved heterogeneity" *Econometrica*, Vol. 67, No. 5, pp. 1001-1028
- Hutchinson, R. G., A.R. Hutchinson and M. Newcomer (1938) "A Study in business mortality: length of life of business enterprises in Poughkeepsie, New York, 1843-1936" *The American Economic Review*, Vol. 28, No. 3. pp. 497-514.
- ILO (International Labour Organization) (2003) *Working Out of Poverty* ILO, Geneva.
- Jovanovic, B. (1982) "Selection and the evolution of industry" *Econometrica*, Vol. 50, No. 3. pp. 649-670.
- Kiefer, N. M. (1988) "Economic duration data and hazard functions" *Journal of Economic Literature*, Vol. 26, No. 2, pp. 646-679.
- Lancaster, T. (1979) "Econometric methods for the duration of unemployment" *Econometrica*, Vol. 47, No. 4. pp. 939-956.
- Lancaster, T. (1990) *The Econometric Analysis of Transitional Data* , UK Cambridge University Press.
- Leung, K.M, R.M. Elashoff and D.A. Afifi (1997) " Censoring issues in survival analysis" *Annual Review Public Health* Vol. 18 pp 83-104
- Lucas, R. E. (1978) "On the size distribution of business firms" *The Bell Journal of Economics*, Vol. 9, No. 2. pp. 508-523.
- Mackenzie, G. (1986) "A proportional hazard model for accident data" *Journal of the Royal Statistical Society. Series A (General)*, Vol. 149, No. 4. pp. 366-375.
- McClelland, D. C. (1961). *The Achieving Society*. Princeton, NJ: Van Nostrand.
- Mead, D. C. and C. Liedholm (1998) " The dynamics of Micro and Small Enterprises in developing countries." *World Development* Vol. 26, No. 1 pp. 61-74.
- Monibo, S.A. (2007) " Surviving the years of infancy: longevity among small firms in Nigeria" *International Journal of Development* Vol. 19 , pp.1023-1042
- Nicholson, W (1998) *Microeconomic Theory: Basic Principles and Extensions* NY , The Dryden Press
- Oakes, D. (1977). "The asymptotic information in censored survival data." *Biometrika* Vol. 64, pp. 441 - 448.

- Ray, D.M. (1993). "Understanding the entrepreneur: entrepreneurial attributes, experience and skills," *Entrepreneurship and Regional Development*, 5: pp. 345-357.
- Romanelli, E. (1989) "Environments and strategies of organization start-up: effects on early survival" *Administrative Science Quarterly*, Vol. 34, No. 3. pp. 369-387.
- Schoenfeld, D. (1980) " Chi-squared goodness of fit tests for the proportional hazards regression model" *Biometrika* Vol. 67, pp145-153
- Schoenfeld, D. (1982) " Partial residuals for the proportional hazards regression model" *Biometrika* Vol. 69, No1 pp. 239-241
- Shaw, J. (2004) " Microenterprise occupation and poverty reduction in microfinance programs: evidence from Sri Lanka" *World Development* Vol. 32 No.7 pp 1247-1264
- Singh, J.V., and C.J. Lumsden (1990) "Theory and research in organizational ecology" *Annual Review of Sociology*, Vol. 16. pp. 161-195.
- Smallbone, D. (1991). "Success and failure in new business start-ups," *International Small Business Journal*, 8 (2): pp. 34-45.
- Steel, W.F. and L. M. Webster (1992) " How small enterprises in Ghana have responded to adjustment" *World Bank Economic Review* Vol. 6 pp 423-438
- Stinchcombe, A. L. (1965) "Social Structures and organizations." in J. G. March. (ed) *Handbook of Organizations*, Chicago: Rand McNally. PP 142-193
- Tonge, J. (2001) "A review of small business literature - part 2: birth, growth and death of the small business", *Working Paper Series 026*, Manchester Metropolitan University Business School.
- Tsiatis, A.A. (1981) "The asymptotic joint distribution of the efficient scores test for the proportional hazards model Calculated over time" *Biometrika*, Vol. 68, No. 1 pp. 311-315
- UNCTAD (2000) *Growing Micro and Small Enterprises in LDCs* UNCTAD/ITE/TEB/5
- Vandenberg, P. (2006) "Poverty reduction through small enterprises: emerging consensus, unresolved issues and ILO activities" *SEED Working Paper No. 75* ILO, Geneva.
- Woodridge, J. M. (2002) *Econometric Analysis of Cross Section and Panel Data* Cambridge, MIT Press
- Zorn, C. (2000) " Modelling duration dependence" *Political Analysis* Vol 8 pp367-380

APPENDICES

Appendix 1: Questionnaires used in this study

QUESTIONNAIRE FOR EXISTING ENTERPRISES

Strictly Confidential

NAME OF INTERVIEWEE.	:
NAME OF ENTERPRISE	:
TYPE OF ACTIVITY	:
ENUMERATION AREA	:
DISTRICT	:
DATE OF INTERVIEW	: []/[]/2008
NAME OF ENUMERATOR	:

SECTION A

SECTION A		
A1	Are you the owner of this business enterprises?	☐ Yes ☐ No (Ask to talk to the owner)
A2	Do you have partners that also own this business?	☐ Yes ☐ No (Move to A4)
A3	How many are you in total and how many are actively involved in running the business?	☐ Owners ☐ Actively involved
A4	Gender of Proprietor (Fill by inspection)	☐ Male ☐ Female
A5	Race of Proprietor (Fill by inspection)	☐ Black Malawian ☐ White Malawian ☐ Malawian of Asian Origin ☐ Other Whites ☐ Other African ☐ Other (Explain:)
A6	Nature of business/Enterprise (Fill by inspection)	☐ Crop Production ☐ Livestock Production ☐ Forestry ☐ Fishing ☐ Mining ☐ Manufacturing ☐ Construction ☐ Hospitality Industry ☐ Commerce and Trade ☐ Transport ☐ Other Services
A7	Location of the enterprise/activity. (Fill by inspection)	☐ Home ☐ Tradition market place ☐ Roadside ☐ Commercial district ☐ Industrial Site ☐ Mobile
A8	When did you start your business?	☐ Month ☐ Year

A9	Have you at some point closed your business since the time you started?	[☐] Yes (Move to A9.1 and A9.2) [☐] No
A9.1	Months and Year Closed	[☐] Month [☐] Year
A9.2	Months and Year re-opened	[☐] Month [☐] Year

SECTION B

B.1	What is your age? <i>Proprietor</i>	
B.2	What is your marital status?	[☐] Single [☐] Married [☐] Widow [☐] Divorced [☐] Separated
B.3	How many children do you have?	
B.4	How many other dependants do you have?	
B.5	What level of education did you complete?	[☐] None [☐] Some Primary School [☐] Some Primary [☐] Completed Primary [☐] Some Secondary [☐] JCE [☐] MSCE [☐] Technical College [☐] University
B.6	What kind of business/job training have you had in addition to formal school? <i>Ask if before or after starting the enterprise.</i>	[☐] Free training (Friends/Family) [☐] Apprenticeship [☐] Vocational/technical training [☐] Training program/Seminars [☐] Other: [☐] None
B.7	What are the skills that you learn?	[☐] Technical Skills [☐] Management/ Planning skills [☐] Marketing skills [☐] Product design [☐] Finance management [☐] Other:
B.8	How useful was the training?	[☐] Very useful [☐] useful [☐] Not Very Useful
B.9	Are you working somewhere else apart from running this business?	[☐] Yes (Move to question B10) [☐] No (Move to question 12)
B.10	Is it in the same line of business or not?	[☐] Yes (Move to question A2) [☐] No
B.11	How long have you been working in that type of work?	
B.12	What was your primary occupation before you started the business?	[☐] Unemployed [☐] Civil Service [☐] Private sector the same activity [☐] Private sector different activity [☐] Running business in another line [☐] Other:
B.13	Did your parents/guardian run any enterprise activity?	[☐] Yes (Move to question B14) [☐] No

B.14	Was it in the same line of business or not?	☐ Yes ☐ No
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SECTION C: *Capital and Profit Estimates*

C.1	Did you start business from scratch, purchased it or did you inherit it?	☐ Started from scratch ☐ Bought it ☐ Inherited ☐ Other explain
C.2	What was the principle source of money used to start the business?	☐ Own Savings ☐ Retirement/Retrenchment Money ☐ Borrowed from friends/family ☐ Loan from Lending Institution ☐ Informal Lenders ☐ Others:
C.3	How much money did you spend on equipment and/or buildings to start this business?	☐ Equipment ☐ Building
C.4	How much money did you spend on Transport and inputs	☐ Transport ☐ Inputs
C.5	If source of money was Credit Institution	☐ Bank ☐ DEMAT, SEDOM, MRFC ☐ MUSCCO/SACCO ☐ NABW/FINCA/Women's World Bank ☐ NGO Programme ☐ MARDEF ☐ Others:
C.6	How much do you spent on average per month to keep the business operational?	☐ Transport ☐ Materials ☐ Rent ☐ Labour ☐ Other ☐ Estimated Total Cost
C.7	How much are your sales per month?	☐ Low ☐ Average ☐ High
C.8	What is the estimated profits per month?	☐ Low ☐ Average ☐ High
C.9	What is the most important thing you do with your profits?	☐ Used for household needs ☐ Re-invest in business. ☐ Savings ☐ Medical/Funeral expenses ☐ Other ☐ None

C.10	What percentage of profits are invested back into this enterprise?	
C.11	How many workers did you have when you were opening business?	☐ Paid Employees ☐ Unpaid Employment ☐ Family Members ☐ Apprenticeship ☐ Just Myself ☐ None
C.12	How many workers do you have at the moment?	☐ Paid Employees ☐ Unpaid Employment ☐ Family Members ☐ Apprenticeship ☐ Just Myself ☐ None
C.12	Whats the major problem you face with your workers?	
C.13	Do you pay anything to governemnt such as market fee or tax every month?	☐ Yes ☐ No
C.14	How frequently do you pay?	☐ Daily ☐ Monthly ☐ Once a Year ☐ Every Six Months
C.15	Did the relocation of vendors from the street to a designated market affect your business?	☐ Yes <i>(Move to C.16)</i> ☐ No
C.16	How significant was it affected?	☐ Improved Business ☐ Normal ☐ Worsened Business

SECTION D

D.1	Do you belong to any business association?	☐ Yes <i>(Move to D.2)</i> ☐ No
D.2	What is the name of your association and what is your position in the association	Name Position
D.3	How many similar businesses are there in your locality? <i>(Within a distance of 200 - 500 metres)</i>	Businesses
D.4	Do you feel that HIV/AIDS has had an effect on your business?	☐ Yes <i>(Move to D.5)</i> ☐ No
D.5	What is the most significant effect HIV/AIDS has had on your enterprise? <i>(Ask Interviewe to rate them)</i>	☐ Less Profit ☐ Fewer Customers ☐ Staff turnover ☐ Shortage of skilled labour ☐ Had to downsize the enterprise ☐ Other.

SECTION E

E.1	Are there any other enterprises that you are running at this location?	☐ Yes ☐ No
E.2	Did you have any enterprise that are no longer in operation having closed in the last 3 years?	☐ Yes (Go to closed business interview) ☐ No
E.3	Do you know anyone who had an enterprise but it closed in the last 3 years?	☐ Yes (Go to closed business interview) ☐ No

THANK YOU FOR YOUR TIME

QUESTIONNAIRE FOR CLOSED ENTERPRISES

Strictly Confidential

NAME OF INTERVIEWEE.	:	
NAME OF ENTERPRISE	:	
TYPE OF ACTIVITY	:	
ENUMERATION AREA	:	
DISTRICT	:	
DATE OF INTERVIEW	:	[]/[]/2008
NAME OF ENUMERATOR	:	

SECTION A

A1	Did you have any type of business/enterprise that is now closed?	☐ Yes ☐ No
A2	What was the nature of your business/enterprise?	☐ Crop Production ☐ Livestock Production ☐ Forestry ☐ Fishing ☐ Mining ☐ Manufacturing ☐ Construction ☐ Hospitality Industry ☐ Commerce and Trade ☐ Transport ☐ Other Services
A3	When did you start your business/enterprise?	☐ Month [] Year
A4	Months and Year business/enterprise closed	☐ Month [] Year

SECTION B

B1	Gender of Proprietor (Fill by inspection)	☐ Male ☐ Female
B2	Race of Proprietor (Fill by inspection)	☐ Black Malawian ☐ White Malawian ☐ Malawian of Asian Origin ☐ Other Whites ☐ Other African ☐ Other (Explain:)
B3	Location of the enterprise/activity. (Fill by inspection)	☐ Home ☐ Tradition market place ☐ Roadside ☐ Commercial district ☐ Industrial Site ☐ Mobile
B4	How old were you when you started that enterprise? Proprietor	Years
B5	What was your marital status?	☐ Single ☐ Married ☐ Widow ☐ Divorced ☐ Separated
B6	How many children did you have then?	
B7	How many other dependants did you have?	
B8	What level of education did you complete before establishing your business/enterprise?	☐ None ☐ Some Primary School ☐ Some Primary ☐ Completd Primary ☐ Some Secondary ☐ JCE ☐ MSCE ☐ Technical College ☐ University
B9	What kind of business/job training did you have in addition to formal school before starting your business/enterprise?	☐ Free training (Friends/Family) ☐ Apprenticeship ☐ Vocational/technical training ☐ Training program/Seminars ☐ Other: ☐ None
B10	What were the skills that you learnt?	☐ Technical Skills ☐ Management/ Planning skills ☐ Marketing skills ☐ Product design ☐ Finance management ☐ Other:
B11	How useful was the training?	☐ Very useful ☐ useful ☐ Not Very Useful
B12	Were you working somewhere else apart from running your business?	☐ Yes ☐ No
B13	Was it in the same line of business or not?	☐ Yes ☐ No
B14	How long did you work in this type of business/enterprise?	

B15	What was your primary occupation before you started the business/enterprise?	☐ Unemployed ☐ Civil Service ☐ Private sector the same activity ☐ Private sector different activity ☐ Running business in another line ☐ Other:
B16	Did your parents/guardian run any enterprise activity?	☐ Yes ☐ No
B17	Was it in the same line of business or not?	☐ Yes ☐ No

SECTION C

C.1	Did you start business from scratch, purchased it or did you inherit it?	☐ Started from scratch ☐ Bought it ☐ Inherited ☐ Other explain
C.2	What was the principle source of money used to start the business?	☐ Own Savings ☐ Retirement/Retrenchment Money ☐ Borrowed from friends/family ☐ Loan from Lending Institution ☐ Informal Lenders ☐ Others:
C.3	How much money did you spend on equipment and/or buildings to start this business?	☐ Equipment ☐ Building
C.4	How much money did you spend on Transport and inputs	☐ Transport ☐ Inputs
C.5	If source of money was Credit Institution	☐ Bank ☐ DEMAT, SEDOM, MRFC ☐ MUSCCO/SACCO ☐ NABW/FINCA/Women's World Bank ☐ NGO Programme ☐ MARDEF ☐ Others:
C.6	How much did you spend on average per month to keep the business operational?	☐ Transport ☐ Materials ☐ Rent ☐ Labour ☐ Other ☐ Estimated Total Cost
C.7	How much were your sales per month?	☐ Low ☐ Average ☐ High
C.8	What were the estimated profits per month?	☐ Low ☐ Average ☐ High
C.9	What was the most important thing you	☐ Used for household needs

	did with your profits?	☐ Re-invest in business. ☐ Savings ☐ Medical/Funeral expenses ☐ Other ☐ None
C.10	What percentage of profits were invested back into the business/enterprise?	
C.11	How many workers did you have when you were opening your business/enterprise?	☐ Paid Employees ☐ Unpaid Employment ☐ Family Members ☐ Apprenticeship ☐ Just Myself ☐ None
C.12	How many workers did you have when your were closing your enterprise?	☐ Paid Employees ☐ Unpaid Employment ☐ Family Members ☐ Apprenticeship ☐ Just Myself ☐ None
C.13	What was the major problem you faced with your workers?	
C.14	Were you paying anything to governemnt such as market fee or tax every month?	☐ Yes ☐ No
C.15	How frequently do you pay?	☐ Daily ☐ Monthly ☐ Once a Year ☐ Every Six Months
C.16	Did the relocation of vendors from the street to a designated market affect your business?	☐ Yes <i>(Move to C.17)</i> ☐ No
C.17	How significant was it affected?	☐ Improved Business ☐ Normal ☐ Worsened Business ☐ Had to close business/enterprise

SECTION D

D.1	What were the reasons for closing of the business/enterprise?	☐ Finance Problems ☐ Market Problems ☐ Lack of Machinery/Tools ☐ Government regulation ☐ Input problems ☐ Transport problem ☐ Labour problem ☐ Technical Problems ☐ Lack of operating space
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		[] No problem [] Other:
D2	Did you belong to any business association?	[] Yes (<i>Move to D.3</i>) [] No
D3	What was the name of your association and what is your position in the association	[] Name [] Position
D4	How many similar businesses were there in your locality? (<i>Within a distance of 200 - 500 metres</i>)	[] Businesses
D5	Do you feel that HIV/AIDS did have an effect on your business?	[] Yes (<i>Move to D6</i>) [] No
D6	What is the most significant effect HIV/AIDS has had on your enterprise? (<i>Ask Interviewee to rate them</i>)	[] Less Profit [] Fewer Customers [] Staff turnover [] Shortage of skilled labour [] Had to downsize the enterprise [] Other.
D7	Do you know anyone who had an enterprise but it closed in the last 3 years?	[] Yes (<i>Go directly to closed business interview</i>) [] No
D8	What is his/her name and physical address?	

THANK YOU FOR YOUR TIME

Appendix 2: Test of proportional-hazards assumption

	rho	chi2	df	Prob>chi2
CAPITAL	0.09000	1.24	1	0.2659
ACREDIT	0.05677	0.48	1	0.4894
AGE	0.11901	1.01	1	0.2827
AGESQR	-0.13296	1.87	1	0.1703
MALE	-0.03729	0.42	1	0.5150
FAMSIZE	-0.22429	1.45	1	0.2349
FAMSQR	0.18988	1.93	1	0.1867
PRIMARY	-0.13114	1.79	1	0.1814
JCE	-0.13076	1.56	1	0.2114
MSCE	-0.06415	0.46	1	0.4998
B_TRAIN	0.01170	0.02	1	0.8763
B_EXPER	0.10914	2.23	1	0.1355
M_FEE_TAX	0.01965	0.10	1	0.7545
V_RELOC	0.04526	0.34	1	0.5624
URBAN	0.07150	1.45	1	0.2282
COMPET	-0.03517	0.21	1	0.6483
HIV_AIDS	-0.01834	0.08	1	0.7831
SPEC_ENT	-0.05820	0.38	1	0.5357
global test		11.82	18	0.8566

Appendix 3: Summary Statistics for Multivariate Analysis (Cox PH Models)

_t	Standard Coefficients				
	1	2	3	4	5
Liquidity Constraints					
CAPITAL	-0.271*	-0.062			
ACREDIT	0.185	-0.067			
Owner Characteristics					
AGE	-0.137		-0.094		
AGESQR	0.002		0.001		
MALE	-0.320		-0.455*		
FAMSIZE	-0.276*		-0.292**		
FAMSQR	1.710*		1.937***		
PRIMARY	-2.498*		-0.721**		
JCE	-2.300		-0.624		
MSCE	-2.380		-0.557		
B_TRAIN	-1.04***		-1.105***		
B_EXPER	1.053***		0.983***		
Enterprise Characteristics and Strategies					
RORCAP	-0.003			-0.003	
PLOWBACK	-0.003			-0.003	
WORKERS	-0.332			-0.0343	
WORKSQR	0.577			0.563	
M_PLACE	0.711			0.611***	
SPEC_ENT	-0.342			-0.292	
Business Environmental Conditions					
M_FEE_TAX	0.199				-0.160
V_RELOC	-0.813**				-0.346
URBAN	0.536				0.039
COMPET	0.007				0.001
HIV_AIDS	0.030				
Log Likelihood	-264.18	-288.55	-270.80	-283.82	-287.49
Pro	0.000	0.7486	0.0000	0.069	0.5963
Wald chi-sq	89.140	0.58	42.2	10.23	2.77
Global Test	14.500	1.77	6.86	7.07	1.74
Prob	0.912	0.413	0.738	0.216	0.784
Link Test Statistic	-0.098	-11.404	0.025	0.349	-1.553
Prob	0.426	0.354	0.888	0.545	0.611

Note: *** =significant at 1 %, **=significant at 5%, and *=significant at 10 %. Values in brackets are Z-statistic calculated based on robust standard error