

# The Impact of Training on SME's Longevity in Mozambique

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## ABSTRACT

*Small and medium enterprises (SMEs) employ more labor-intensive production processes, make income distribution more equitable, provide simple opportunities for value-adding processing activities, making the rationale to support them a will to increase production, and technology transfer. A pertinent question arises when it is asked to what extent we should rely on them in respect to period of operation. Duration analysis, which is here, the study of longevity among SMEs in service and non-service that benefited from outsider-based capacity building (OBCB) in their first to third year of operation in Mozambique. The overriding research backbone guiding this research asks if the life span behavior pattern SMEs in Mozambique track after engaging in OBCB follow traditional literature, whereby outsider-based guidance, company revenue, shareholder funds, net profit have a significant impact on the longevity of the enterprise? And if there is an impact proffered by the number of employees an SME possess? And if SMEs don't endure for longer period, how long is this time for cases in Mozambique?*

**Keywords:** SME, Duration Analysis, Outsider-based Capacity Building

## INTRODUCTION

The problem addressed by this study is to portray some measure of effect that describes the exposure variable OBCB, and outcome, time for an SME to go bankrupt, controlling for extraneous variables namely: Revenue, net Profit, Shareholder Funds, and number of Employees an enterprise possess at the moment they undertook training. In other words, Duration analysis is the study of events involving an element of time, the duration of small enterprises exposed to outsider-based capacity building, controlling for variables mentioned above, to contribute for the establishment of the life span pattern of SMEs in developing countries, and predict the trend and survival behavior, hence realize adequate policies and strategies for their sustainability, growth and development. Entirely based on ready made, the analysis focus on outcome variable time until an event occurs; taking as event SME bankruptcy, the outcome being time measured in every six months interval until SME goes out of business.

To analyze the data, we tested for log-rank and Willcoxon in combination with product limit method, parametric survival and proportional hazard fits, to generate the survival probabilities. The goals of these approaches are to estimate and interpret duration function from duration data; to assess the duration function; and finally to judge the relationship of explanatory variables to duration time.

One output states that training has a positive impact in extending life of SMEs, at the same time it strongly recommends a cross sectional investigation of the same matter including government policy and market growth independent variables; based on the assumption that these factors are major external covariates determining the longevity of an SME. It brings to a close that life span behavior pattern SMEs

track after engaging in OBCB follows traditional literature, whereby outsider-based guidance, SME revenue, shareholder funds, net profit have a significant impact on the longevity of the enterprise, on the other hand, number of employees an SME possess does not determine longevity of an SME. Small enterprises do endure for a considerable period, service sector more favorable than non-service sector, training being predominantly a major condition, in line with related literature which supports SMEs that have been exposed to OBCB having, lower hazard rate.

## BACKGROUND

A large number of manufacturing establishments in a developing country that exist at a point of time typically do not survive very long (Behrman, & Deolalikar, 1989), and only recently enterprise duration has been taken into consideration. Bruderl, Preisendorfer, and Zeigler (1992) in their study "Survival chances of new business Organizations" where they make use of human capital theory and organization ecology to extract factors that influence the mortality of newly formed business organizations, postulate that individual characteristics of the founder are important prerequisites for survival of SMEs. Freeman, Carroll, and Han-nan 1983; Aldrich and Auster 1986; Bruderl and Schumassler (1990) (as cited in Bruderl et al. 1992) performed empirical studies and evidences show that a high proportion of new business organizations fail within a short time despite contribution they make listed bellow, which at the same time are motivation factors behind the study

1. SMEs tend to employ more labor-intensive production processes than large enterprises. Accordingly, they contribute significantly to the provision of productive employment opportunities, generation of income and ultimately, the reduction of poverty.
2. High share of small industrial enterprises can make income distribution (both regionally and functionally) more equitable. Ensuring long-term social stability by alleviating ex-post redistribution pressure and by reducing economic disparities between urban and rural areas.
3. SMEs are key to the transition from agriculture-led to industrial economies as they provide simple opportunities for value-adding processing activities which can generate sustainable livelihoods.
4. SMEs are a seedbed for entrepreneurship development, innovation and risk-taking behavior and provide the foundation for long-term growth dynamics and the transition towards larger enterprises.
5. SMEs contribute to the building up of systemic productive capacities. They help to absorb productive resources at all levels of the economy and contribute to the creation of resilient economic systems in which small and large firms are interlinked.
6. SMEs are the domestic supporting industries in the competition for foreign investors.
7. SMEs, as amply demonstrated in information and communication technologies, are a significant source of innovation, often producing goods in niche markets in a highly flexible and customized manner.

Mozambique is a low income country, though its SME contribution to employment and GDP lie around 31% and 16% respectively. Little emphasis is given to SMEs development; currently constrained by unfavorable legal, political and institutional framework, including: (1) Non-transparent, time-consuming and costly bureaucratic procedures especially with respect to registration, licensing and inspections; (2) Outdated laws and regulations for business transactions; (3) The lack of implementation and enforcement capacities at the provincial level; and (4) The high level of corruption. The main problem of small businesses in Mozambican are that they have some characteristic on which, on one hand, they depend to survive, but which, on the other, make it impossible – or at least difficult – for them to

prosper and grow (Kaufmann, & Parmeyer, 2000). We believe that outsider assistance as a knowledge resource helps ventures obtain a unique blend of tacit and explicit knowledge.

### **SMEs' DURATION**

In the history of management, well before, and when it started to be taken as field of study, the period where efficiency was taken as the only management objective, questions such as “how long will our activity last if we continue use this method?” or “is the new tool more likely to expand our activities for longer period?” remained unanswered for was not major issue for management and scholars then. Recently a technique called Survival Analysis explores a period a certain individual, company or component would live given an exposure variable and independent variables that possibly determine the life of that individual. We can glance at OBCB as a primary condition an SME should follow so the internal factors such as revenue, net profit, shareholder funds, and number of employees could expand the life of the enterprise. Our statistical component uses survival/reliability, parametric survival fit, and proportional hazard fit to find probabilities of survival. The results of hypothesis test are satisfactory; as seen worldwide, the economy is shifting to a service like, and we have SMEs in service sector with higher prospects of lasting longer than operators in non-service.

SME in Taiwan shall refer to an enterprise which has a completed company or business registration and conforms to following criteria: Manufacturing, construction, mining and quarrying with paid-in capital of USD 2,242,242. Agriculture, forestry and fisheries, water, electricity and gas, commercial, warehousing and communications, finance, insurance and real estate, industrial and commercial services in which in the previous year had sales revenue of USD 3,030,303 or less. In the manufacturing, construction, mining and quarrying, the number of regular employees must be less than 200 people. In the other sectors the number of employees should be less than 50 people (White paper on SME in Taiwan, 2007).

The goal of the study is to assess the impact of SME revenue, SME net profit, shareholder funds, and number of employees an SME possessed during training, on the longevity of SMEs after they experience OBCB. We seek to determine whether there is a statistical relation between independent variables and the endpoint; also wish to analyze the probability distribution of the time to the event by means of survival curves. Survival curves give statistics and quartiles for survival times, list the estimated survival time for observation computed within groups and survival times computed from the combined sample. The Product-limit method, proposed by Kaplan and Meier in 1958 is the straightforward technique to estimate survivor functions applied for any survival data set. It gathers the risk set at the time to include the information we have on a censored observation up to the time of censorship. Other methods that we also used are Parametric Survival fit and Proportion Hazard fit.

### **SURVIVAL AND TRAINING**

Although a multitude of outside services are available, most small businesses do not use outside training services. The main reasons why external training is used has been found in most previous analyses to fill gaps in internal staff or management expertise, for specific and one-off tasks, and to develop new internal procedures or processes (Hills, 1988). A key problem in assessing the relationship of external advice and business growth is that of causality: is growth the result of the benefits of taking advice, or are fast growing firms more likely to take advice. Alternatively is advice more associated with

overcoming problems that are associated with SME decline: external advisors being chiefly used when a firm is in trouble? Despite the lack of association of SME growth with the use of external advice and local supports to SMEs found by Garavan and Barra (1994) and some other studies, there are grounds for believing that a wider analysis might yield different results as studies done by (Chrisman & McMullan, 2004); Robinson and McDougall (1989). Chrisman and McMullan (2004) research concerns about SME start up, growth and survival after they received training from Pennsylvania small business development center in years 1992,1994, and 1996; postulating and concluding that ventures started with assistance of training are more likely to survive for at least 4 years.

The ground on which this study is based does not allow the causality to be fully established; its purpose is to establish the nature of the relationships between independent variables such as revenue, net profit, shareholder funds, and number of employees, with SME duration time to go bankruptcy, after these SMEs went trough OBCB. The study develops a model using 104 SMEs that have been under training, all selected on purpose. We test the model using 104 SMEs as well as split them into two groups; SMEs operating in service sector, in a number of 53, and companies operating in non-service sector, in a number of 51. The main external factors impacting on SME development are the industry growth and government policies, nevertheless we rule out both aspects so that we analyze alone the impact of SMEs internal factors. We think of exposure to OBCB and respective independent variables to be of great importance on the duration of SMEs, assuming that there is a gap between the knowledge possessed by entrepreneurs and the knowledge required for successful venturing. Outsider assistance can lead to the creation of knowledge that provides a basis for sustainable competitive advantage, which will, in turn influence venture survival and performance (Chrisman & McMullan, 2004).

Event occurrence is referred as business failure i.e. bankruptcy, which is defined as a situation in which firms cannot meet their liabilities and hence cannot conduct economic activities any more (Honjo, 2000). Bankruptcy trough a legal procedure may be the most typical form of business failure. Duration has a function called survival function denoted by  $S(t)$ . It gives the probability that the random variable "T" exceed the specified time  $t$  that is the probability that an individual endures longer than " $t$ " units of time:  $S(t) = \Pr (T > t)$ . Capital "T" is denoted as the random variable for enterprise duration time. Small " $t$ " is denoted as any specific value of interest for "T". The symbol "P" stands for the probability of occurrence of an event. Putting all observed times at the same makeup entry date ( $t = 0$ ). The time variable is referred as duration time, for it gives the time that SMEs have been in operation over some follow-up period. Censoring occurs when information about individual duration time is not known exactly. The survival time requires three elements: time origin; ending event of interest; and measurement scale for the passage of time. The general formula for a Kaplan and Meier survival probability at failure time "T" gives the probability of surviving past the previous failure time, multiplied by the conditional probability of surviving past time " $t$ ", given survival to at least time " $t$ ". The data shows an increasing Weibull model where the monotonicity of the hazard function is determined by the shape parameter.

Capacity building i.e. exposure variable, is defined as the development of an organization's core skills and capabilities, such as leadership, management, finance and fundraising, programs and evaluation. It is the process of assisting an individual or group to identify and address issues and gain the insights, knowledge and experience needed to solve problems and implement change (Calvin, 1992). Capacity building is facilitated through the provision of technical support activities, including coaching, specific technical assistance, and resource networking.

Studies relevant to present one show various corners the same topic could be study from; some conclude that financial strength represented by paid-up capital has the major effect on business failure of new firms (Honjo, 2000). Audretsch and Mahmood (1994) states that industry growth had a negative effect on the life of SMEs, also the age has a significantly positive effect on business failure (Honjo, 2000). Bates (1990) shows firms in industries that require more human capital has higher profits transcribed to financial stability; financial strength represented by paid-up capital has the major effect on business failure of new firms (Honjo 2000). Based upon the findings of past econometric studies explaining firm longevity, greater owner investments of human and financial capital are expected to be related positively to the survival chances of young small business (Bates, 1998).

Some studies such as the one by Kaufmann, & Parlmeyer, (2000) concludes that small firms will not grow, because if they did, they would not be competitive anymore, losing their advantages (low pay, no social standards, informal finance, family business, flexibility, no bureaucracy). SME sector in Mozambique is highly volatile which is dubious whether there are positive returns from training. Kaufmann and Parlmeyer, (2000) could not find any significant correlation between income (success) and training. Professional training also doesn't seem to have any significant correlation with the number of employees (Kaufmann, & Parlmeyer, (2000). On the other hand, the chances of firm survival seem to be correlated with cutting down costs and remaining informal, leaving training as not important success factor, in either growth or income (Kaufmann, & Parlmeyer, 2000). Kaufmann, & Parlmeyer, (2000) identify barriers SMEs face on their growth process in Mozambique: Inefficient markets, implying high transaction costs, no culture of risk-sharing, inefficient, old fashioned legal system (enforcement problems), red tape, high legal requirements, rigid bureaucratic regulations, corruption, lack of managerial skills, lack of information on the advantages of formality, and lack of transparency and information in the market for sub-contracting. There is a lack of evidence on how learning strategies influence the development of entrepreneurial competence and how these competences transfer into new project/venture formation. There is also a lack of comparative research to identify commonalities and differences in terms of design and structure.

Sexton and Bowman (1984); Hills (1988); McMullan and Long (1983) and Vesper (1982) have found that there is a lack of accepted paradigms or theories of entrepreneurship education and training. The use of external advice has also been found to be strongly associated with successful business growth as stated by Agndal (2005). However, there may be problems in these studies, that it is growing firms that chiefly seek and use external advice, rather than advice being a major determinant of growth. The main reasons why external advice is used has been found in most previous analyses to be to fill gaps in internal staff or management expertise, for specific and one-off tasks, and to develop new internal procedures or processes (Hills, 1988). The lack of positive relation of firm performance with the use of any government-backed agency should be a strong warning to new policy initiatives. Our analysis confirms the view of Porter, that it is primarily competitive conditions that stimulate growth not government supports.

The observation of the duration time has two components which must be unambiguously defined: a beginning point (completion of training program) where  $t=0$  and a cause for the observation of time to end (bankruptcy). The simplest way to conceptualize our data is to assume that continued observation of a subject is controlled by two completely independent time processes. The first is the actual survival time associated with the training program (the length of survival after undergo training). The second is the length of time until a subject is lost to follow up. The SAS software "Jump tool" that analyzes the data, organizes the same in a column fashion that is comprehensive and well ordered: first-name of enterprise,

second-revenue in thousands USD, third-net profit, fourth-shareholder funds, fifth-number of employees, sixth-Training period, seventh- survival period, eighth-censorship, and nine-group.

## RESULTS

The study is providing interaction relationship but not any type of causation relationship; before study start, the initial period  $t \leq 0$  presents a survival of 1; in other words enterprises at this period have 100% probability chances of staying in business, since at the beginning of study all observations were alive. Literature assumes that after a certain period toward infinite, a SME would fail, the probabilities for a SME to be in business is 0. Data collected for 6 years illustrates on the second period the probability of survival falls to 0.9828; chances of survival have decreased to 98.28%. The last half of the six years study, the probability of survival has fallen to 0.7252; probabilities of SMEs to be operating are of 72.52%. At the same time, there is a small association between shareholder funds on the duration of an SME. The model construct with only variable number of employees portrays a similar survival plot structure of survival platform as revenue, net profit and shareholder funds; descending overtime with group service SMEs having higher survival probability than non-service SMEs.

The proportion hazard fit for SMEs on services have a P-value of 0.0104, evident convincing significance. Revenue has a convincing significance whilst shareholder funds has a fairly significance, both with a P-value of 0.0005 and 0.0310 respectively. Net profit and number of employees have P-value of 0.1314 and 0.8563 showing any significance at all. For the group of non-service SMEs, the whole model is convincing significant with its P-value less than 0.0001. The effect likelihood test shows for revenue and number of employees variables, no significance at all, with a P-value of 0.8175 and 0.9566 respectively. Net profit has a P-value of 0.0122 and shareholder funds a P-value of less than 0.0001; the former value is fairly small indicating significance whilst the later is small enough indicating very convincing significance.

SMEs operating in tourism and hospitality, consulting, and transportation sector six months after their training ended have a survival probability 98.38%. The second half of the first year after end of training comprises a probability of survival of 97.52%, which is a decrease in 0.87% chances. SMEs on their first half of the second year after training have a survival probability of 95.23%. The probabilities of an SME to stay in business on the second half of the second year drops drastically to 88.14%, a decline on their chance to endure in 7.44%. The first half of the third year of operation after training of an SME give us a probability to survive of 85.65%; on the second half it is of 84.52%; a decrease of 1.31%. The first six months of the fourth year after training shows a probability of an SME to continue operating of 84.36%; -0.16 percentage change of the second half which has probability of 84.22%. Period nine corresponds to the first half of year five, and SMEs operating on service sector are encountered at this time have a probability to continue in operation of 85.09%. The next six months corresponds to period ten with companies having probability of endure of 83.88%, a negative change in 1.42%. The last year of study is the sixth one; being the period eleven the first six months with 82.08% probability of survival of SMEs that undergo training. The following half a year coincides with period twelve; this is the last period of study which shows a probability of an SME to be in business of 73.75%. From the beginning and end of the sixth year a radical reduction of 10.14% is shown on probabilities of survival.

For the enterprises operating in non service sector; on the first six months after outsider-based training, the potential for an enterprise to survive is still high closer to 100%, in this case 96.75%. The next six months that makes a year after training has an abysmal decrease of 13.05% in probability of

survival to 84.12%. The first half of the second year of study presents a survival probability of 77.62%, on the other hand the second half on the same second year show SMEs survival probability of 73.29%, a decrease of 5.58%. The first half of the third year of SME operation after training has survival probabilities of 68.95%. The second half of the same year shows a SME likelihood of survival of 67.87%, a percentage change of -1.57%. The SME probability of survive in their fourth year of operation after training are: in the first six months 65.34%; in the last six months 63.18%. The whole four year there is a change of -3.31% in the probability of survival of an SME. SMEs on the first half of their fifth year have a probability of survival of 63.18%. The second half of the same year presents SME survival probability of 63.02%; an insignificant reduction of 0.25%. The eleventh period known as the first six months of the year six presents a probability of an SME to survive of 62.99%. The second half of the sixth year shows no change from the first half.

## IMPLICATIONS

The potential users of survival probabilities could be alert when observing that survival prospects of small and medium enterprises operating in service sector, which received training from outsiders within their first and third year of operation, decreased 25.04% in six years after training. Survival probability changes could be taken as advantages by managers and policy makers in cases related to attract investment more appropriate on the first, fourth year after training, for they show a slightly decrease in their survival status smaller than 1%. As for managers the marginal changes affect decision more than total changes. The years two and six are the ones where one risk averse minded should take more precaution because probabilities of an SME to survive in this period reduce drastically in a range of 7.44% to 10.14%. For a policy maker those changes could signal increase in protection to SMEs. The third and fifth periods show a slightly respective reduction of 1.42% and 1.31% on the survival prospects of an SME;

We accept the proposition that training has a positive impact in extending life of SMEs in Mozambique for more than four years of operation, special those with service sector characteristic. On the same thought, SME revenue is strongly associated with duration of the same; that is, if an SME has a higher level of cash in flow, will remain operating longer than an SME with otherwise situation. Net profit is one strong determinant of how long an enterprise endures. An SME capable of making huge profit either in niche market or fast growing industries can extend their life longer than it would be if the profit is meager, no matter if they are service or non service enterprises. Firm size is one determinant of their survival too. This size is observed by shareholder funds when the business is put to start

We are strongly convinced that companies in service sector that undertake outsider based training cross the fourth year key survival period, provided that trainers do not accommodate wide range of deliverables in one single program. Usually not group together managers/owners of SMEs who operate in a diverse range, and not offer a more or less common skills program. A team-based philosophy can assure better results, uniting a sufficient number of entrepreneurs in a team structure where they best exploit opportunities.

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