RISK FACTORS FOR FAILURE IN SMALL BUSINESSES IN THE FOOTWEAR AND TEXTILE INDUSTRY OF GAUTENG PROVINCE, SOUTH AFRICA

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Abstract

The study was based on the 5-yearlong study (2007 to 2012) of Small, Micro and Medium-sized Enterprises (SMMEs) that conduct business in Gauteng Province, South Africa conducted by Marivate (2014) from 2007 to 2012. The sample consisted of 187 businesses (36.52%) that utilized financial services routinely provided by the South African Small Enterprises Development Agency (SEDA), and 325 businesses (63.48%) that utilized non-financial services provided by SEDA. Out of the 187 businesses that utilized financial services, 85.42% of them were viable, whereas 14.58% of them were not viable. Out of the 325 businesses that utilized non-financial services, 43.25% of them were viable, whereas 56.75% of them were not viable. The degree of entrepreneurial skills in each of the 512 businesses that were selected for the study was measured by using a composite index defined by Le Brasseur, Zannibbi & Zinger (2013). The multilevel logistic regression model (Hosmer and Lemeshow) was used for identifying and quantifying predictors of utilization of financial and non-financial services provided by SEDA to SMMEs. Predictors of long-term survival were estimated by using the Cox Proportional Hazards Model (Cleves, Gould & Gutierrez, 2004). The results showed that the 187 businesses that utilized financial services (36.52%) were relatively more viable in comparison with businesses that utilized non-financial services (63.48%). Results obtained from the Cox Proportional Hazards Model showed that long-term viability in the 512 businesses that were selected for the study was significantly influenced by utilization of financial services, degree of entrepreneurial skills, and the ability to order large volumes of stock in bulk, in a decreasing order of strength. The top 3 predictors of utilization of financial services in the 187 businesses that utilized financial services were degree of entrepreneurial skills, the ability to order large volumes of stock in bulk, and access to training opportunities on entrepreneurial or vocational skills, in a decreasing order of strength. The top 3 predictors of utilization of non-financial services in the 325 businesses that utilized non-financial services were the age of business, past history of bankruptcy, and the practice of selling on credit, in a decreasing order of strength.

Keywords: SMME, Gauteng Province, Footwear and Textile Industry, Semi-parametric Models for Survival Analysis

JEL Classification: C5, M21

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1 Introduction

The South African Small Enterprise Development Agency (SEDA, 2015) was established in December 2004, through the National Small Business Amendment Act (Act 29 of 2004) in order to provide financial and non-financial assistance to newly established and existing Small, Micro and Medium-sized Enterprises (SMMEs) in all parts of South Africa.

The study was based on the 5-yearlong study (2007 to 2012) of Small, Micro and Medium-sized Enterprises (SMMEs) that conduct business in Gauteng Province, South Africa conducted by Marivate (2014). The purpose of study was to assess the benefits of government-initiated support programmes for promoting the growth and development of Small, Micro and Medium-Sized Enterprises (SMMEs) in South Africa. The study was based on a survey of 512 SMMEs conducting business in the footwear and textile industry in Gauteng Province in South Africa. The objective of study was to assess the benefits of government-initiated support programmes for promoting the growth and development of Small, Micro and Medium-Sized Enterprises (SMMEs) in South Africa.

The key objective of study was to identify and quantify key predictors of viability and long-term survival in SMMEs in the footwear and textile industry of Gauteng Province in South Africa. The secondary objective of study was to identify and quantify key predictors of utilization of financial and non-financial services that are routinely provided to SMMEs by the South African Small Enterprises Development Agency (SEDA). The Small Enterprise Finance Agency (SEFA, 2015) was established in 2012 as a result of the merger of the South African Micro Apex Fund, KHULA Enterprise Finance Ltd and the small business activities of the South African Industrial Development Corporation (IDC).

1.1 Objective of study

The overall objective of this study was to identify and quantify factors that affect long-term viability in Small, Micro and Medium-sized Enterprises (SMMEs) operating in the footwear and textile industry of Gauteng Province in South Africa, and to propose feasible remedial actions so that support could be provided to struggling SMMEs. The study had the following specific objectives:

- To describe the characteristics of SMMEs in the footwear and textile industry of Gauteng Province in South Africa;
- To identify and quantify risk factors that are responsible for early failure in SMMEs in the footwear and textile industry of Tshwane;
- To identify and quantify key predictors of utilization of financial and non-financial services that are routinely provided to SMMEs by the South African Small Enterprises Development Agency (SEDA); and
- To propose suitable and feasible remedial actions that could assist SMMEs in the footwear and textile industry of Tshwane.

1.2 Research questions

This study aims to provide adequate answers to the following research questions:

- What are the socioeconomic characteristics of SMMEs operating in the footwear and textile industry of Tshwane?
- What are the key factors that adversely affect long-term viability in newly established SMMEs in the footwear and textile industry of Tshwane?
- What are the key predictors of utilization of financial and non-financial services that are routinely provided to SMMEs by the South African Small Enterprises Development Agency (SEDA)?

2 Literature review

According to the South African Small Enterprise Finance Agency (2015), although the South African Government promotes the growth and development of SMMEs by massively investing in local institutions such as the South African Centre for Small Business Promotion (CSBP), Ntsika Enterprise Promotion Agency and Khula Enterprise Finance, the failure rate in newly established South African small, micro and medium-sized enterprises is as high as 60%. Studies conducted by Ladzani & Netswera (2009) and Buckley & Ghauri (2012) have found that small and medium-sized enterprises often fail due to lack of access to finance and lack of entrepreneurial skills. At the national level, South African small and medium-sized enterprises in all economic sectors are characterized by an acute shortage of entrepreneurial and technical skills and difficulty in raising finance from micro-lending institutions at favourable rates (South African Small Enterprise Finance Agency, 2015). According to research conducted by the South African Chamber of Commerce and Industry (2015), the situation at the Pretoria region is not different from the situation at the national level. The purpose of the study is to identify and quantify key factors that are responsible for failure in small and medium-sized enterprises operating in the Pretoria region.

According to Rogerson (2013), micro and medium-sized enterprises are defined as an enterprise with a maximum asset base of about 10 million Rand excluding land and working capital in which between 10 and 300 employees work. According to Urban & Naidoo (2012), small, micro and medium-sized enterprises are defined as an enterprise that has an asset of between 2, 500 and 20 million Rand excluding the cost of land and working capital. According to the National Small Business Act of South Africa (the South African Department of Trade and Industry, 2015), micro enterprises are defined as businesses with a growth potential that involves the owner and family members or at most four employees, and have a turnover of less than 150, 000 Rand (the threshold for VAT registration). Small enterprises are defined as businesses with 5 to 100 employees that are managed by the owner and fulfil all relevant regulations. Medium-sized enterprises are defined as businesses that employ between 100 and 200 employees, are managed by their owners, and fulfil all relevant regulations. Small, Micro, Medium-scale Enterprises (SMMEs) are also defined as enterprises with a minimum asset base of 25 million Rand excluding the cost of land and working capital by the South African Department of Trade and Industry (2015).

Based on findings reported by Qian, Theodore, Peng & Zeming (2010), Chen, Papazafeiropoulou & Dwivedi (2010) and Chetty & Stangl (2010), the survival of newly established SMMEs depends on equity and debt. Equity is often not available for newly established SMMEs in the form of venture capital or stock exchange due to relatively small levels of financing preferred by newly established SMMEs. As such, newly established SMMEs often depend upon bank loans, overdrafts and credit for

early stage financing. The authors have found that SMMEs in Taiwan enjoy the benefit of integration with well-established supply chains and the manufacturing sector of the national economy in Taiwan. A report published by the World Bank (2014) shows that the viability and profitability of small businesses operating in developing nations is hampered by lack of efficiency in resolving bureaucratic matters, lack of good governance, accountability, transparency and good leadership, as well as the practice of rampant corruption. A similar finding was reported previously by Rogerson (2013) and Worku (2013). According to Marivate (2014) and Kelley, Singer & Herrington (2015), bureaucracy, red tape and corruption are well known factors that stifle growth in the SMME sectors of the economies of Sub-Saharan African countries. The author has found that the various programmes of support designed for promoting SMMEs have not been fully utilized optimally by SMMEs who could benefit from the programmes.

3 Methods and materials of study

The design of the 5-yearlong study (2007 to 2012) was descriptive and longitudinal. The study was based on a stratified random sample of 512 SMMEs conducting business in the footwear and textile industry of Gauteng Province in South Africa. Geographical zones (central, east, west, north and south of Gauteng Province) were used as strata. The 5-yearlong study was conducted in order to assess the benefits of government-initiated support programmes for promoting the growth and development of Small, Micro and Medium-Sized Enterprises (SMMEs) in South Africa.

The study had 2 dependent or explanatory variables of study. These were utilization of financial services (Y_1) and utilization of non-financial services (Y_2). Data was collected from each of the 512 businesses selected for the study on a large number of socioeconomic variables of study denoted by $X_1, X_2, ..., X_r$

The degree of entrepreneurial skills in each of the 512 businesses that were selected for the study was measured by using a composite index defined by Le Brasseur, Zannibbi & Zinger (2013). The multilevel logistic regression model (Hosmer and Lemeshow) was used for identifying and quantifying predictors of utilization of financial and non-financial services provided by SEDA to SMMEs. Predictors of long-term survival were estimated by using the Cox Proportional Hazards Model (Cleves, Gould & Gutierrez, 2004).

3.1 The Cox Proportional Hazards Model

The design of the study was descriptive and longitudinal (01 January 2007 to 31 December 2012) and descriptive. Data was gathered on a monthly basis from each of the 512 businesses that were selected for the study (Marivate, 2014). The Cox Proportional Hazards Model (Cleves, Gould & Gutierrez, 2004) was used for estimating hazard ratios for key predictors of viability. Some of the 512 businesses in the study were right censored. The adequacy of the fitted Cox regression model was assessed using the likelihood ratio test and Akaike's information criterion (AIC) statistic. The fulfilment of the proportional hazards assumption was tested by use of log-minus-log plots. The duration of survival of businesses was measured for each of the 512 enterprises in the study by using 01 January 2007 as the starting point. Enterprises that were still operational at the end of the study period (31 December 2012) were considered right-censored observations as their exact durations of survival could not be measured due to administrative censoring (inability to measure the survival times of businesses beyond the date at which the study came to an end) at the end of the study period. For enterprises that ceased operation prior to 31 December 2012, survival time was defined as the number of days of operation between 01 January 2007 and the date of closure.

The Cox Proportional Hazards Model takes censored observations into account, and this property of the model makes it quite attractive in comparison with other models used for panel data analysis in economic studies. Hazard ratios were used as an econometric measure of effect. Key predictors of survival are identified and estimated based on hazard ratios. Kaplan-Meier survival probability curves were used for comparing businesses that survived the 5-year study period (viable businesses) with businesses that did not survive the study period (non-viable businesses) with regards to key predictors of survival. Kaplan-Meier survival probability curves were used for comparing viable businesses with non-viable businesses graphically. At the 5% level of significance, influential predictors of survival are characterized by hazard ratios that differ from 1 significantly, 95% confidence intervals of hazard ratios that do not contain 1, and P-values that are smaller than 0.05.

3.2 The binary logistic regression model

$$Y_1 = \begin{cases} 1 \ \ if \ \ financial\ services\ are\ used \\ 0 \ \ otherwise \end{cases}$$

$$Y_2 = \begin{cases} 1 \ \ if \ \ non-financial\ services\ are\ used \\ 0 \ \ otherwise \end{cases}$$

Y_1 and Y_2 are each regressed on the predictor variables $X_1, X_2, ..., X_r$

$X_1, X_2, ..., X_r$ are a combination of r discrete and continuous explanatory variables that affect the outcome variables Y_1 and Y_2.

Let $Y_{n\times 1}$ denote a dichotomous dependent variable with possible values of 0 and 1.

Let $X_{n\times(r+1)}$ denote a collection of p predictor variables.

Then, the conditional probability that an SMME utilizes financial or non-financial services is denoted by $p_i = \Pr ob(Y_i = 1 | X)$ where $i = 1, ..., n$

p_i denotes the probability that an SMME utilizes financial or non-financial services. The possible values of Y_1 (utilization of financial services) are 1 if yes, and 0 otherwise. Likewise, the possible values of Y_2 (utilization of non-financial services) are 1 if yes, and 0 otherwise. Y_i denotes the utilization status of the i^{th} SMME in the study where $i = 1, ..., n$

$$p_i = \frac{\exp[\beta_0 + \beta_1 x_1 + ... + \beta_r x_r]}{1 + \exp[\beta_0 + \beta_1 x_1 + ... + \beta_r x_r]} = \frac{\exp(X\beta)}{1 + \exp(X\beta)} \qquad (1)$$

The non-linear model shown above for p_i can be transformed into a multiple linear regression model by applying the logarithmic transformation as shown below:

$$\log it(p_i) = \log\left(\frac{p_i}{1 - p_i}\right) = \hat{\beta}_0 + \hat{\beta}_1 X_1 + ... + \hat{\beta}_r X_r \qquad (2)$$

The statistical models for Y_1 and Y_2 have analogous expressions.

3.3 The multilevel logistic regression model

Two-stage cluster sampling was used for identifying eligible businesses from 5 geographical zones of Gauteng Province (central, east, west, north and south). Conventional logistic regression models assume that all experimental units are independent in the sense that any variable that affects utilization of financial services has the same effect in all geographical zones. By contrast, multilevel logistic regression models are capable of assessing whether the effect of predictors varies from one zone to another. The binary multilevel logistic regression model has a binary outcome (use and non-use of financial or non-financial services). In this study the basic data structure of the two-level logistic regression is a collection of N geographical zones and within-group j $(j = 1, ..., N)$ a random sample n_j of level-one units (business operators). The following notations are used for describing values of the dependent variables Y_1 and Y_2.

Let $Y_{ij} = 1$ if the i^{th} business in the j^{th} zone uses financial services.

Let $Y_{ij} = 0$ if the i^{th} business in the j^{th} zone does not financial services.

$P_{ij} = P(y_{ij} = 1 | X_{ij}, u_j)$ is the probability that the i^{th} business in the j^{th} zone uses financial services.

$u_j \sim N(0, \sigma_u^2)$ is a random cluster effect.

Analogous expressions are used for utilization of non-financial services by SMMEs.

Let P_{ij} be modelled by using the logit link function. The two-level model is given by the following expression:

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1 - p_{ij}}\right) = \beta_{0j} + \sum_{i=1}^{k} \beta_{lj} x_{lij} \qquad (3)$$

$l = 1, ..., k$

$\beta_{0j} = \beta_0 + U_{0j}$, $\beta_{1j} = \beta_1 + U_{1j}$, ….. , $\beta_{kj} = \beta_k + U_{kj}$

Thus, the two-level model can be re-written as follows:

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1 - p_{ij}}\right) = \beta_0 + \sum_{i=1}^{k} \beta_l x_{lij} + U_{0j} + \sum_{l=1}^{k} U_{lj} x_{lij} \qquad (4)$$

$x_{ij} = (X_{1ij}, X_{2ij}, ..., X_{rij})$ denote the first and second level covariates,

$\beta = (\beta_0, \beta_1, ..., \beta_r)$ denote regression coefficients,

$U_{0j}, U_{1j}, ..., U_{rj}$ are distributed normally with mean 0 and variance σ_u^2

The empty two-level model for a dichotomous outcome variable refers to a population of groups of level-two units and specifies the probability

distribution for group-dependent probabilities p_j in $Y_{ij} = p_j + \varepsilon_{ij}$ without taking further explanatory variables into account. The transformed probabilities are denoted by $f(p_j)$, and are assumed to be distributed normally. The general link function for $f(p)$ is given by $g(p_j) = \beta_0 + U_{0j}$ where β_0 is the population average of the transformed probabilities and U_{0j} is the random deviation from the average value for group j. If $f(p)$ is the logit function, then $g(p_j)$ are just the log-odds for group j. Thus, for the logit link function, the log-odds have a normal distribution in the population groups, which is expressed by: $\log it(p_j) = \beta_0 + U_{0j}$. It is assumed that the deviations U_{0j} are independent random variables with a normal distribution with mean 0 and variance σ_0^2.

This model does not include a separate parameter for the level-one variance. This is because the level-one residual variance of the dichotomous outcome variable follows directly from the success probability which is given by: $Var(\varepsilon_i) = P_j(1-P_j)$

Let π_0 denote the probability corresponding to the average value β_0 as defined by $f(\pi_0) = \beta_0$. For the logit function, the logistic transformation of β_0 is given by

$$\pi_0 = \log c(\beta_0) = \frac{\exp(\beta_0)}{1+\exp(\beta_0)} \qquad (5)$$

Due to the non-linear nature of the logit link function, there is no simple relationship between the variance of probabilities and the variance of the deviations U_{0j}

An approximate variance of the probability is given by:

$$Var(P_j) \approx [\pi_0(1-)]\pi_0 P_j(1-P_j) \qquad (6)$$

Note that an estimate of the population variance $Var(P_j)$ can be obtained by replacing sample estimates of π_0 and σ_0^2

3.4 The random intercept model

In the random intercept model, the intercept is the only random effect in which the groups differ with respect to the average value of the dependent variable. The relationship between the explanatory and dependent variables does not vary by group. It is assumed that the variables of study have the potential for explaining observed success or failure in SMMEs. These variables are denoted by $X_h, (h = 1, ... k)$ with their values indicated by X_{hil}

Since some or all of those variables could be level-one variables, the success probability is not necessarily the same for all individual SMMEs in a given group. Thus, the probability of success depends on the individual as well as the group, and is denoted by P_{ij}. As such, Y_{ij} can be split into an expected value P_{ij} and residual R_{ij}. That is, $Y_{ij} = P_{ij} + R_{ij}$.

The random intercept model expresses the log-odds as a sum of a linear function of the explanatory variables. That is,

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_{0j} + \beta_1 x_{1ij} + \beta_2 x_{2ij} + ... + \beta_k x_{kij} = \beta_{0j} + \sum_{h=1}^{k} \beta_h x_{hij} \qquad (7)$$

Where the intercept term β_{0j} is assumed to vary randomly and is given by the sum of an average intercept β_0 and group-dependent deviations U_{0j}

That is, $\beta_{0j} = \beta_0 + U_{0j}$

Thus, $\log it(p_{ij}) = \beta_0 + \sum_{h=1}^{k} \beta_h x_{hij} + U_{0j}$

It follows that

$$P_{ij} = \frac{\exp\left(\beta_0 + \sum_{h=1}^{k} \beta_h X_{hij} + U_{0j}\right)}{1+\exp\left(\beta_0 + \sum_{h=1}^{k} \beta_h X_{hij} + U_{0j}\right)} \qquad (8)$$

Thus, a unit difference between the X_h values of two businesses in the same zone is associated with

a difference of β_h in their log-odds, or equivalently, a ratio of $\exp(\beta_h)$ in their odds.

In the expression

$$\log it(p_{ij}) = \beta_0 + \sum_{h=1}^{k} \beta_h x_{hij} + U_{0j} \quad (9)$$

$\beta_0 + \sum_{h=1}^{k} \beta_h x_{hij}$ is the fixed part of the model, whereas U_{0j} is the random part of the model.

3.5 The random coefficient multilevel logistic regression model

In logistic regression analysis, linear models are constructed for the log-odds. The multilevel analogue, or the random coefficient logistic regression model, is based on a linear model consisting of log-odds that include random effects for the groups or other higher level units.

Consider the explanatory variables $X_1, X_2, \ldots, X_r$. The values of the variables $X_h (h = 1, \ldots, r)$ are denoted by X_{hij}

Since some or all of these variables could be level-one variables, the probability of success is not necessarily the same for all businesses in a given zone. Therefore, the probability of success depends on the individual business as well as the zone, and is denoted by p_{ij}

$\log it(p_{ij})$ measures the probability of success on a single level one explanatory variable X

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_{0j} + \beta_1 x_{1ij} \quad (10)$$

The intercepts β_{0j} and the regression coefficients β_{1j} are group-dependent. These group-dependent coefficients can be split into an average coefficient and a group-dependent deviation. That is,

$$\beta_{0j} = \beta_0 + U_{0j} \text{ and } \beta_{1j} = \beta_1 + U_{1j} \quad (11)$$

It follows that,

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1-p_{ij}}\right) = (\beta_0 + U_{0j}) + (\beta_1 + U_{1j}) x_{1ij} = \beta_0 + \beta_1 x_{1ij} + U_{0j} + U_{1j} x_{1ij} \quad (12)$$

There are two random group effects, the random intercept U_{0j} and the random slope U_{1j}

It is assumed that the level two residuals U_{0j} and U_{1j} have both zero mean given the value of the explanatory variable X

Thus, β_1 is the average regression coefficient, and β_0 is the average intercept.

The expression $\beta_0 + \beta_1 x_{1ij}$ is called the fixed part of the model, whereas $U_{0j} + U_{1j} x_{1ij}$ is called the random part of the model.

The term $U_{0j} + U_{1j} x_{1ij}$ can be regarded as a random interaction between group membership and the predictor variables X

This shows that the groups are characterized by two random effects (the intercept and the slope). Note that U_{0j} and U_{1j} are group effects, and are not independent. Further, it is assumed that, for different groups, the pairs of random effects (U_{0j}, U_{1j}) are denoted by

$$Var(U_{0j}) = \sigma_{00} = \sigma_0^2 \text{ and}$$
$$Var(U_{1j}) = \sigma_{11} = \sigma_1^2$$

The model for a single explanatory variable can be extended by including more variables that have random effects. Let $X_1, \ldots, X_k$ denote k level-one predictor variables. Consider the model in which all predictor variables have varying slopes and a random intercept. That is,

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_{0j} + \beta_{1j} x_{1ij} + \beta_{2j} x_{2ij} + \ldots.. + \beta_{kj} x_{ij} \quad (13)$$

Let $\beta_{0j} = \beta_0 + U_{0j}$ and $\beta_{hj} = \beta_h + U_{hj}$ where $h = 1, \ldots, k$

It follows that,

$$\log it(p_{ij}) = \log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \sum_{h=1}^{k}\beta_h x_{ij} + U_{0j} + \sum_{h=1}^{k} U_{hj}x_{ij} \quad (14)$$

In the above expression,

$\beta_0 + \sum_{h=1}^{k}\beta_h x_{ij}$ is called the fixed part of the model;

$U_{0j} + \sum_{h=1}^{k} U_{hj}x_{ij}$ is called the random part of the model.

The random variables or effects $U_{0j}, U_{1j}, ..., U_{kj}$ are assumed to be independent between groups, but may be correlated within groups. Thus, the components of the vector $(U_{0j}, U_{1j}, ..., U_{kj})$ are independently distributed as a multivariate normal distribution with a zero mean vector and variances and covariances Ω where

$$\Omega = \begin{pmatrix} \sigma_0^2 & . & .... & . \\ \sigma_{01} & \sigma_1^2 & .... & . \\ . & & ..... & . \\ . & & & \\ . & & & \\ \sigma_{0k} & \sigma_{1k}^2 & ..... & \sigma_k^2 \end{pmatrix} \quad (15)$$

Maximum Likelihood estimators were used for estimating parameters. The statistical package STATA version 13 (STATA Corporation, 2012) was used for data entry and analyses.

4 Results of data analyses

During the 5-year study period (2007 to 2012), 187 of the 512 SMMEs selected for the study (36.52%) utilized financial services at least once in the course of study, whereas 325 of the 512 SMMEs in the study (63.48%) utilized non-financial services at least once in the course of study. Out of the 187 businesses that utilized financial services, 85.42% of them were viable, whereas 14.58% of them were not viable. Out of the 325 businesses that utilized non-financial services, 43.25% of them were viable, whereas 56.75% of them were not viable. These findings suggest that the 187 businesses that utilized financial services (36.52%) were relatively more viable in comparison with businesses that utilized non-financial services (63.48%).

Table 1 shows a comparison between businesses that utilized financial services and businesses that did not utilize financial services with regards to general characteristics, as observed at the end of the 5-year study period. It can be seen from the table that businesses that utilized financial services were more viable and skilled in comparison with businesses that did not utilize financial services. Businesses that utilized financial services were characterized by more viability, relatively better entrepreneurial skills, relatively larger initial and current capital, relatively older duration of operation, the ability to secure loan from money lending institutions such as commercial banks, relatively low prevalence of past failure and bankruptcy, relatively better formal education, and the ability to pay tax to the South African Receiver of Revenue (SARS). The table shows that businesses that utilized financial services from Government support agencies managed to increase their current capital much better in comparison with businesses that did not utilize financial services from Government support agencies.

Table 2 shows a comparison between businesses that utilized financial services and businesses that did not utilize financial services with regards to well-known indicators of viability and long-term survival in SMMEs operating in Sub-Saharan African countries including South Africa, as observed at the end of the 5-year study period. It can be seen from the table that businesses that utilized financial services were characterized by easy access to loans, ownership of premises used for conducting business, the ability to draw up business plans, the ability to conduct bookkeeping, participation in social capital, the ability to order large volumes of stock in bulk on credit, and easy access to skills-related and vocational skills.

Table 3 shows adjusted odds ratios that were estimated from logistic regression analysis. The table shows that utilization of financial services was significantly influenced by the degree of entrepreneurial skills, the ability to order large volumes of stock in bulk on credit, and access to training opportunities on entrepreneurial or vocational skills, in a decreasing order of strength. Adjustment was done for geographical location, age of business operator and gender.

Table 4 shows adjusted odds ratios that were estimated from logistic regression analysis. The table shows that utilization of non-financial services was significantly influenced by the age of business, past history of bankruptcy, and the practice of selling on credit, in a decreasing order of strength. Adjustment was done for geographical location, age of business operator and gender.

Table 1. Comparison with regards to general characteristics

Characteristic	Businesses that utilized financial services (n=187)	Businesses that did not utilize financial services (n=325)
Viability	Yes: 85.42% No: 14.58%	Yes: 43.25% No: 56.75%
Entrepreneurial skills	Adequate: 82.29% Poor: 17.71%	Adequate: 29.17% Poor: 70.83%
Initial capital	≤ 100, 000 Rand: 17.04% > 100, 000 Rand: 82.96%	≤ 100, 000 Rand: 54.17% > 100, 000 Rand: 45.83%
Current capital	≤ 300, 000 Rand: 34.74% > 300, 000 Rand: 65.26%	≤ 300, 000 Rand: 76.15% > 300, 000 Rand: 23.85%
Age of businesses in years	1 year or less: 12.48% 2 to 5 years: 32.15% More than 5 years: 55.37%	1 year or less: 34.26% 2 to 5 years: 36.66% More than 5 years: 29.08%
Labour cost	Fair: 84.38% High: 15.63%	Fair: 25.00% High: 75.00%
Source of initial capital	Loan: 55.25% Family or friends: 21.58% Own savings: 23.17%	Loan: 17.45% Family or friends: 49.08% Own savings: 33.47%
Past failure in loan repayment ever	Yes: 11.56% No: 88.44%	Yes: 66.35% No: 33.65%
Highest level of education	≤ Matric level: 12.25% Certificate: 10.05% Diploma: 32.15% Degree of above: 45.55%	≤ Matric level: 39.75% Certificate: 18.36% Diploma: 24.33% Degree of above: 17.56%
Gender of business operator	Male: 75.00% Female: 25.00%	Male: 87.50% Female: 12.50%
Paying tax to SARS	Yes: 85.42% No: 14.58%	Yes: 61.09% No: 38.91%

Table 2. Comparison with regards to indicators of viability in SMMEs

Characteristic	Businesses that utilized financial services (n=187)	Businesses that did not utilize financial services (n=325)
Access to loan	Yes: 86.46% No: 13.54%	Yes: 33.33% No: 66.67%
Business premises	Own: 46.88% Rent: 53.13%	Own: 25.00% Rent: 75.00%
Business plan	Available: 77.08% Not available: 22.92%	Available: 54.17% Not available: 45.83%
Book-keeping skills	Yes: 75.00% No: 25.00%	Yes: 15.00% No: 85.00%
Selling on credit	Yes: 1.04% No: 98.96%	Yes: 54.17% No: 45.83%
Use of social capital	Yes: 9.38% No: 90.63%	Yes: 4.17% No: 95.83%
Ability to order bulk stock on credit	Yes: 9.38% No: 90.63%	Yes: 4.17% No: 95.83%
Training opportunities on entrepreneurial or vocational skills	Yes: 9.38% No: 90.63%	Yes: 4.17% No: 95.83%

Table 3. Key predictors of financial services (n=187)

Factors that affect utilization of financial services	Adjusted Odds Ratio	95% Confidence Interval	P-value
Degree of entrepreneurial skills	2.86	[1.24, 4.88]	0.0000***
Ability to order large volumes of stock in bulk on credit	2.59	[1.21, 4.73]	0.0000***
Access to training opportunities on entrepreneurial or vocational skills	2.47	[1.17, 4.63]	0.0000***

Note: Significance at * P<0.05; ** P<0.01; *** P<0.001 levels

Table 4. Key predictors of utilization of non-financial services (n=325)

Factors that affect utilization of non-financial services	Adjusted Odds Ratio	95% Confidence Interval	P-value
Age of business	2.59	[1.23, 4.84]	0.0000***
Past history of bankruptcy	2.52	[1.20, 4.71]	0.0000***
Practice of selling on credit	2.41	[1.14, 4.39]	0.0000***

Note: Significance at * P<0.05; ** P<0.01; *** P<0.001 levels

Table 5 shows adjusted hazard ratios estimated from the Cox Proportional Hazards Model (Cleves, Gould & Gutierrez, 2004) in which hazard ratios were estimated for the top 3 influential factors that significantly influenced long-term survival and viability in the 512 businesses that were selected for the study. Adjustment was done for geographical location, age of business operator and gender. It can be seen from the table that long-term viability in all businesses was significantly influenced by utilization of financial services, degree of entrepreneurial skills, and the ability to order large volumes of stock in bulk, in a decreasing order of strength.

Table 5. Key predictors of long-term viability (n=512)

Factors that affect long-term viability and survival of businesses	Adjusted Hazard Ratio	95% Confidence Interval	P-value
Utilization of financial services	5.08	[2.12, 7.89]	0.0000***
Entrepreneurial skills	4.65	[2.01, 6.68]	0.0000***
Ability to order bulk stock on credit	3.83	[1.89, 5.46]	0.0000***

Note: Significance at * P<0.05; ** P<0.01; *** P<0.001 levels

The hazard ratios estimated from the Cox Proportional Hazards Model in Table 5 are fairly similar to the odds ratios estimated from logistic regression analysis in Tables 3 and 4. In view of the fact that the design of the study is longitudinal, and not cross-sectional, hazard ratios estimated from the Cox Proportional Hazards Model carry more weight theoretically in comparison with odds ratios estimated from logistic regression model. As such, interpretation of results will be made based on hazard ratios.

The adequacy of the fitted Cox model was assessed using log-minus-log plots, the likelihood ratio test and the AIC (Akaike's Information Criterion) as diagnostic procedures. All log-minus-log plots were parallel, showing that the assumption of proportional hazards was satisfied. The P-value from the likelihood ratio test was small (0.0001 < 0.01), thereby showing that the 3 variables constituting the fitted Cox model were jointly efficient in explaining variability in long term survival at the 1% level of significance. The estimated value of the AIC statistic was also small (6.09), thereby showing that the discrepancy between the fitted and true models was insignificant (Verbeek, 2008).

Figure 1 shows a Kaplan-Meier survival probability curve (Kleinbaum & Mitchel, 2012) that compares the survival probability of businesses that utilized financial services with the survival probability of businesses that did not utilize financial services. The mathematical expression for the Kaplan-Meier estimator is denoted by $S(t) = P(T \geq t)$, and is provided by:

$$\hat{S}(t) = \prod_{t_j < t} \left(\frac{n_j - d_j}{n_j} \right) \quad (1)$$

where d_j denotes the number of businesses that fail at time t_j; n_j is the number of businesses that are viable at the time; and $j = 1, \ldots, 512$.

Similar hazard ratios were estimated from the Weibull, log-normal and log-logistic models.

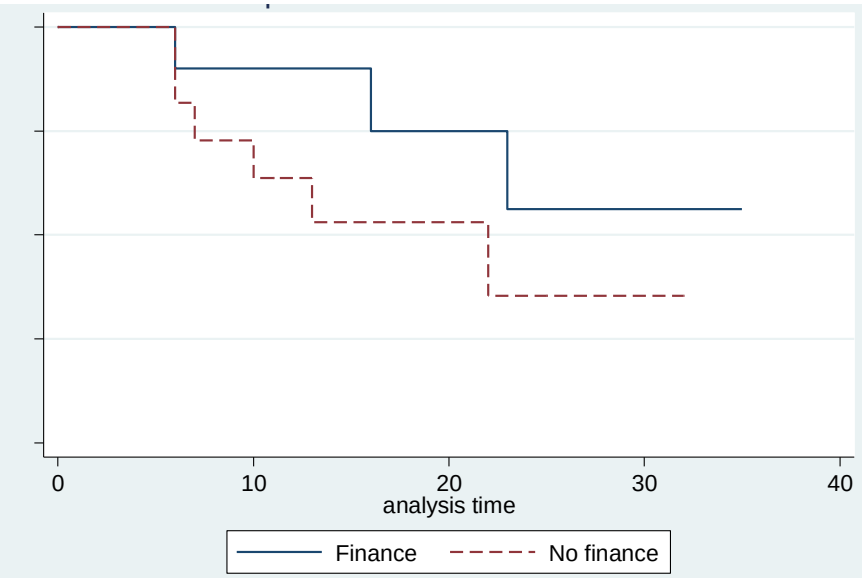
It can be seen from the figure that the survival probabilities of businesses that utilized financial services were relatively better throughout the 5-year duration of study.

5 Discussions of results

According to Rogerson (2004, 2013), the financial as well as the non-financial needs of small businesses in Gauteng Province have not been made adequately due to lack of access to finance, shortage of entrepreneurial and vocational skills, lack of support from local municipalities, administrative inefficiency, poor infrastructural development, and lack of tailor-made training programmes to potential entrepreneurs. The study conducted by Everatt (2008) has shown that viability in newly established businesses is hampered by poor municipal services. According to findings reported by Amorós, Bosma and Levie (2013), poor municipal services and heavy bureaucracy undermine the growth and development of newly established businesses in Gauteng Province. Marivate (2014) has pointed out that training programmes that are

provided to SMMEs in Gauteng Province must be tailor-made to the needs of newly established businesses in order to promote viability and long-term survival in SMMEs.

Figure 1. Kaplan-Meier survival probabilities by utilization of financial services



The study conducted by Worku (2013) has shown that newly established SMMEs in the Tshwane region of Gauteng Province are adversely affected by lack of entrepreneurial skills such as drawing up business plans, bookkeeping, accounting, report-writing, preparing audit reports and financial statements, preparing and summarizing progress reports, making sound business presentations to stakeholders, conducting inventory, and maintaining good customer relationships on a sustainable basis.

Findings obtained from the study are consistent with similar findings reported by Marivate (2014). During the study period, 187 of the 512 SMMEs selected for the study (36.52%) utilized financial services at least once in the course of study, whereas 325 of the 512 SMMEs in the study (63.48%) utilized non-financial services at least once in the course of study. Out of the 187 businesses that utilized financial services, 85.42% of them were viable, whereas 14.58% of them were not viable. Out of the 325 businesses that utilized non-financial services, 43.25% of them were viable, whereas 56.75% of them were not viable. These findings suggest that the 187 businesses that utilized financial services (36.52%) were relatively more viable in comparison with businesses that utilized non-financial services (63.48%).

A comparison was made between businesses that utilized financial services and businesses that did not utilize financial services with regards to general characteristics. The results showed that businesses that utilized financial services were more viable and skilled in comparison with businesses that did not utilize financial services. Businesses that utilized financial services were characterized by more viability, relatively better entrepreneurial skills, relatively larger initial and current capital, relatively older duration of operation, the ability to secure loan from money lending institutions such as commercial banks, relatively low prevalence of past failure and bankruptcy, relatively better formal education, and the ability to pay tax to the South African Receiver of Revenue (SARS). The results showed that businesses that utilized financial services from Government support agencies managed to increase their current capital much better in comparison with businesses that did not utilize financial services from Government support agencies.

Results obtained from the study showed that businesses that utilized financial services were characterized by easy access to loans, ownership of premises used for conducting business, the ability to draw up business plans, the ability to conduct bookkeeping, participation in social capital, the ability to order large volumes of stock in bulk on credit, and easy access to skills-related and vocational skills. The study has shown that viability in the 512 businesses that were selected for the study was significantly influenced by utilization of financial services, degree of entrepreneurial skills, and the ability to order large volumes of stock in bulk, in a decreasing order of strength. The top 3 predictors of utilization of financial services in the 187 businesses that utilized financial services were degree of entrepreneurial skills, the ability to order large volumes of stock in bulk, and access to training opportunities on entrepreneurial or vocational skills, in a decreasing order of strength. The top 3 predictors of utilization of non-financial services in the 325 businesses that utilized non-financial services were

the age of business, past history of bankruptcy, and the practice of selling on credit, in a decreasing order of strength.

6 Recommendations

The key findings of study are consistent with findings reported in the past by Marivate (2014) and Amorós, Bosma & Levie (2013). Based on findings obtained from the study, feasible recommendations are made to the South African Small Enterprises Development Agency (SEDA), the South African National Department of Trade and Industry, the South African Department of Higher Education and Training, and the South African Chamber of Commerce and Industry with a view to improve viability in small and medium-sized enterprises operating in the Pretoria region of Gauteng Province. The recommendations have the potential for improving the plight of struggling small and medium-sized enterprises in the footwear and textile sector of Gauteng Province in South Africa.

- It is necessary to establish a comprehensive database of SMMEs operating in the footwear and textile sector of Gauteng Province so that proper assistance could be provided to newly established businesses. The database is also vital for monitoring and evaluating viability and long-term survival in newly established businesses.
- It is necessary to design relevant and tailor-made skills based training programmes on vocational and entrepreneurial activities in which young matric graduates can be equipped with the skills they need to run businesses successfully.
- It is necessary to provide mentorship and supervisory assistance to newly established small and medium-sized enterprises for a period of at least three years or more.
- It is vital to encourage academic and research institutions to create academic programmes in which trainees can acquire experiential training by working for businesses and industries as part of their academic training in South African institutions of higher learning.
- It is strategically important to monitor and evaluate the viability of newly established small businesses on a monthly basis. Doing so is the responsibility of the South African Small Enterprises Development Agency (SEDA). Doing so is vital for minimizing the failure rate of newly established small businesses in the footwear and textile industry of Gauteng Province in South Africa.

7 Limitation of study

The study was conducted in the Gauteng Province only due to shortage of resources. As such, findings obtained from this particular study may not be generalized to businesses that operate outside Gauteng Province.

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