

WOMEN EDUCATION AND ECONOMIC EMPOWERMENT IN TANZANIA: A WOMEN BUSINESS SURVIVAL MODEL ANALYSIS

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Abstract: This paper examines the survival analysis of credit supported women businesses in Tanzania using various survival models. Survival models have been used in studies of lifetime bonds, labour strikes, market preferences, and business survival. By examining several predictor variables, the analysis demonstrates some variables can be used to business mortality. We use Product limit estimators, life table method, Cox Product Hazard Models to investigate women businesses over 22 years period. The median (half-life) of all businesses is exact 3.6 years. It was found, however, that level training and level of education before credit provision to have an impact on business survival. In this paper, the dataset of women businesses in Kagera region-Tanzania was analyzed by employing Survival models. Through applied non-nested econometric model that was conceptualized in order to determine the women business survival, we have found out that there many variables that can predict women business survival in Tanzania. Two of them were found to be the level of profit and training. The baseline hazard ration was estimated. It was found out that after receiving credits so as to start businesses, the women in Tanzania the median (half-life) survival time of all women business in Kagera region were found to be 3.06 years. The methods used in estimating survival function are no-parametric univariate model (KM), parametric (Weibull distribution), and semi parametric multivariate models. Then the product limit estimator (Kaplan-Meyer), life table method, and Cox proportional hazards model was used. They're several types of Cox hazard models. In this study, Weibull distribution function was used. Weibull distribution is the commonly used in econometric (Greene, 2003).

This paper examines the survival analysis of women businesses in Tanzania, using various survival models. Survival analysis have been used to study life unemployment spell, labor strike, household of durable goods, number of women worked in the labourforce, vocational expenditure (Greene, 2003), market preferences, life time bonds and many other areas (Gregoriou, 2002). During recent years there has been a great deal of interest in the analysis of clustered data. Observations from the same cluster usually share certain unobserved characteristics and as a result tend to be correlated (Hung, et.al. 2004). Data are analyzed based on index function and latent regression function of duration models based on survival and hazard functions.

Key words: Women Business survival, credit provision, women economic empowerment, group collateral system, Women Economic Groups, life table method; Kaplan Meyer Estimator, Cox-proportional hazards model, media residual life time,

1.0.Introduction

Women in Tanzania are in the collectivism culture, they formulate traditional culturally women groups (TCWG). The TCWG are traditionally not intending to start business at all. The groups are voluntary formulated simply for enhancing social bonds (social capital). Any rational woman in Tanzania is expected to belong to a certain TWCG as a social security mechanism, regardless being residing in the rural or urban areas. Traditionally, in the TCWG, women support each other during burial and wedding ceremonies. After independence, in year 1961, women were provided with credits to start their own businesses. They credit provision policies aim at transforming traditional women groups in income generating activities. Also women are encouraged to formulate Women Economic Groups (WEG). The WEGs replace the former TCWGs by being the centers for income generating activities among women, and hence alleviate poverty. In the WEG, women are provided with credit services. Women receive credit services in a group and start a group owned business or receive credit in a group and divide the capital among them. In these groups every group member start her own business or a group investment can also be found. The collateral is to be decided among themselves and the methodologies to repay the interest and principal is done Group-wise. Their small credit leveraged businesses do contribute to their incomes, household level incomes; children school fees and other utilities. They also pay taxes to the government; hence contribute to the national income and economic growth.

1.0. Women And Credits In Tanzania

Most women credit service schemes in Tanzania started between 1961 and 1985 and many more in 1980s (Meghji, 1987). In some cases, these small investors were given loans as a strategy for promoting small-scale activities for poverty alleviation. Such schemes were established through government initiatives (Kashuliza, 1995). Recent evidence suggests that there are some serious limitations to the development influence of such credit facilities (Makombe *et al* 1998). Both studies argue that access to credit is not a guarantee for investors to perform well. In their survey of 12 programs involving seven countries in Africa, Boitumilo *et al* (1996) observes that it is not very usual for credit to trigger a continuous increase in technical sophistication, output or investments. However, in Tanzanian case women do benefit through credit-stimulated businesses.

Based on these arguments, these paper intended to find out the sustainability of the women businesses in Tanzania due to induced credit service by the government and donor community. Sustainability is measured through non-nested non- and parametric survival models. In the research conducted by Orban (2001) found out that women in France had about 30% of business owned by women. However, in Tanzania the literature is still silent on women contribution in business undertakings. Because of past credit discrimination, women earning power, and their traditional economic independence on men are likely to have fewer material resources than men to invest in business (Committee of Small Business 1988). Social differences in socialization experiences (Bowles and Gintis

1976, Maritini & Briton 1984) may result in women lacking the attitudes, such as risk taking and internal locus of control, that are deemed important to small business success.

1.2. Government Incentives and Women Business Survive Inhibitors

According to Narayan (1997), in 1991 the government of Tanzania issued a policy statement on financial sector reform designed to stimulate competition and lessen government interference in private sector. This was proved by the pilot project report on Gender Cluster Researches conducted by Mahigi et. al. (2000) that explains how women groups in Tanzania were encouraged to establish small credit groups. However, majority of women in Tanzania lack business skills, which could enhance survival of women economic groups in businesses. The women in Tanzania have low level of education compared to men. The findings from the research conducted by Narayan (1997) revealed that more girls are pulled out of schools than boys. When parents asked why they were pulling girls out of school, they gave many reasons. Some of them were: girls will get married (25%). According to the respondents, there was no need of investing in them. Others responded that school had risk of pregnancy (24%). About 16% of respondents were indifferent. The need for the boys' education was reported to be that boys bring income (12%), boys are home guardians (8%), educating girls were wastage of money (7%), and others (9%). This situation reduces the chances of girls and women to get sufficient education. Based on women business enabling environment and inhibitors, through suitable research methodologies was sought to analyze data that explains women business sustainability and survival in Tanzania.

The United Republic of Tanzania (2004) provides the other supporting data available at: <http://www.tanzania.go.tz/economicsurvey1/2003/part4/education.htm>. Despite of the efforts that are done by the Government through Primary Education Development Programme (PEDP) and the SEDP the data reveal the decrease of the ratio of number of girls in Secondary School to their male counterparts. Along with an increase of pre-primary schools, the number of children attending reached 774,750 in 2003 from 313,310 in 2002, an increase of 147.3 percent. Gross Enrolment Rate (GER) rose from 98.6 percent in 2002 to 105.3 percent in 2003. The net enrolment rate (NER) increased from 80.7 percent in 2002 to 88.5 percent in 2003. Furthermore, out of these, girls constituted 48.7 percent and boys 51.3 percent. The pupils in forms V-VI decreased from 26,789 in 2002 to 25,954 in 2003. In addition, the proportion of boys and girls in form I-V was 53.4 percent for boys and 46.6 percent for girls. The proportion of boys and girls in form V-VI was 65.5 percent for boys and 34.5 percent for girls. Hence, we are intending to test the following hypothesis:

H1: Women Business survival increase with increase in level of women education.

2.0. Methodology

Kagera region Women Economic Groups (KWEGs) are the unit of analysis in this research-based paper. The sampling frame (list of KWEGs who received credits) was obtained from the Tanzania Revenue Authority (TRA¹). The KWEGs obtained credits from donor community, No-governmental Organisations and the Tanzanian government. The prominent credit providers in Kagera region are Kagera Agricultural and Environmental Management Programme (KAEMP), District Rural Development Programme of both Bukoba urban and Rural Districts (DRDP), Evangelical Church of Tanzania (ELCT)-Kagera Branch, Regional Development Committee, the Central Government (RDC/CG), the Community Development Officer (CDO), and the Maendeleo ya Wakulima (MAYAWA²). Hence, the sampling list (Craig & Duoglas, 2000 : 228) of 253 women who have business premises or hawkers in Bukoba Urban (BKB (U) and Bukoba Rural (BKB (R)) was obtained. Out of 253 women, 196 businesswomen were included in the sample.

2.1. Criteria for Probability Sampling Selection Strategy

Firstly, from each KWEG, one small businesswoman was selected, regardless of whether she was still in business after receiving credit or not. Not all women who started their businesses did so at the same time. Some women businesses started and continued in a good progress, while others drop out due to some hindering factors. So, randomly women businesses were to be included in the sample based on their groups and having received credit from the above-mentioned organisations. The sample included both women who failed in business turbulences and those who were still continuing from the sampling list in a random probabilistic sampling. The survey techniques and the questionnaire administered following the list obtained from TRA Kagera region head office.

2.3. Model Specification

We are studying time till an event of failure to happen among women businesses. This model is basically, event history studies or failure time models. Nonparametric survival analysis model was used which are Kaplan-Meier and life table analysis. Parametric survival analysis model used are Cox-proportional hazards model, media residual life time ((Lemeshow, 1999).

Duration models are the models that take care of time; time is assumed to be a dependent random variable. The $t = x_i$ dependent variable can be normally distributed ($x_i \sim N(\mu, \sigma^2)$) or the data can be truncated at a certain point (Greene, 2003). If x_i stands for time as a dependent variable and the time is truncated, then we have the hazard function and hazard distribution function ($\lambda(t) = -\phi(\alpha) / [1 - \Phi(\alpha)]$ where $x_i > a$, and a is a constant, $\alpha = (a - \mu) / \sigma$, $\phi(\alpha)$ is a standard normal density ((Greene, 2004). In this study of women businesses in Kagera region Tanzania the data were right censored.

¹ TRA is the Tanzania Revenue Authority, which is the government organ, which collects taxes from SMEs and other LMEs investors in Tanzania. So every legal business is supposed to be registered by TRA.

² MAYAWA is a Swahili word for Farmers' Development Organisation.

2.4.Preliminaries and Notation

Censoring occurs when cases are lost. The cases can be lost during observation or be discovered at the time limit in the study. The data was right censoring or Multicensored Data (Censoring Type III), with the following assumptions;

- Single censoring: does not experience event during the study observation period
- A subject is lost to follow-up within the study period.
- Experiences the event after the observation period
- Multiple censoring: May experience event multiple times after study observation ends, when the event in question is not death (or total failure).

In the most general case, every unit observed yields exactly one of the following three types of information:

- a run-time if the unit did not fail while under observation
- an exact failure time
- an interval of time during which the unit failed.

When data are censored, the distribution that applies to the sample data is mixture of discrete and continuous distributions (Greene, 2004:762).

2.4.1.Assumptions of the Women Business Survival Model

- We assume that Women Business Survival duration has a normal distribution.
- Duration of business is given by the symbol T
- T domain is a set of a realized random variable t in years ie t= 1, t=2,t=22 years (maximum time).
- T takes positive values.
- The t values are censored from above (right)

Hence, Survival function of Women Economic Groups is given by,

$$S(t) = 1 - F(t) = 1 - \int_0^t f(s) ds \quad | \text{Pr ob}(T < t_1)$$

Where the random variable t which is the duration of individual groups has a continuous distribution function f(t) where T is the realization of t. The cumulative probability is

$$F(t) = \int_0^t f(s) ds$$

2.4.2. Women Business Hazard Function

The hazard function is given by the following assumptions;

We assume that the duration of women business has lasted until time t_1 then we like to know the probability that women business will last in a short period of time.

$l(t, \Delta t) = P(t < T < t + \Delta t \mid T > t)$, let $\lambda(t)$ denotes the hazard rate function , then

$$\begin{aligned} \lambda(t) &= \lim_{\Delta t \rightarrow 0} \frac{P(t < T < t + \Delta t \mid T > t)}{\Delta t} \\ &= \lim_{\Delta t \rightarrow 0} \frac{P(t < T < t + \Delta t \mid T > t)}{\Delta t S(t)} \quad \text{where } [T > t] \Leftrightarrow \frac{F(t + \Delta t) - F(t)}{S(t)} \quad \text{then} \\ &= \frac{1}{\Delta t} \left(\frac{F(t + \Delta t) - F(t)}{S(t)} \right) \\ &= \frac{1}{\Delta t} [F(t + \Delta t) - F(t)] \frac{1}{S(t)} \\ &= \frac{dF(t)}{dt} \frac{1}{S(t)} \\ &= \frac{f(t)}{S(t)} = \frac{-\ln(S(t))}{dt} \end{aligned}$$

Also $f(t) = \lambda(t)S(t)$

2.4.3. Integrated Women business hazard function gives

$$\Lambda(t) = F(t) = \int_0^t f(s) ds$$

$S(t) = e^{-\Lambda(t)}$ so, $\Lambda(t) = F(t) = \int_0^t f(s) ds = -\ln S(t)$ which is a **generalized residual function**.

Also,

$$\begin{aligned} S(t) &= K e^{-\Lambda t} \\ &= e^{-\ln S(t)} = e^{K - \lambda t} = \frac{e^k}{e^{\lambda t}} \end{aligned}$$

2.4.4. Assumption of Women Business Hazard Model

- Hazard rate doesn't vary overtime

- Hazard rate is characterized with no memory in the process
- The condition probability of “failure” in a given short interval is the same regardless of what observation is made.
- **Hypothesis:** $\ln S(t) = K - \lambda t$ is a solution to the Hazard Model,

Hence, $\lambda(t) = \lambda | \lambda \in R$ while R is a domain of λ as a constant, R stands for risk set

$$= \frac{-d \ln S(t)}{dt} = \frac{-d(K - \lambda t)}{dt} = -\left[\frac{-dK}{dt} - \frac{d\lambda t}{dt} \right] = -[0 - \lambda] = \lambda$$

Thus, $S(t) = \frac{e^k}{e^{\lambda t}} = \lambda$, given that at time $t=0$, $S(0)=1$ This is a condition for any function $S(t)$.

2.4.5. Distribution of Women Business Survival Function

At $t=0$ given that $T > t$ and T is a positive domain of t.

$$S(t) = e^{k-\lambda t} |_{t=0} \\ = e^k = e^k \cdot e^0 = e^k \cdot 1 = K = 1, \quad \text{Whereby } S(t) = e^{-\lambda}.$$

In other words, $S(t) = \Lambda - F(t) = \Lambda - P(T < t) = P(T > t)$ and where K is a constant of integration, at $t=0$, $K=1$.

$$E(t) = \frac{1}{\lambda}, \quad \text{so the Maximum likelihood estimator is the inverse of } \lambda.$$

2.5. Methods of Handling Women Business Censored Data:

Statistical methods used to fit models and estimate women business failure rates, with censored data were Probability Plotting, Hazard Plotting, Graphical Estimation and Maximum Likelihood.

2.5.1. Kaplan-Meier (Kaplan-Meyer) Approach

The Kaplan- Meier (KM) procedure gives us the Cumulative Density Function (CDF) estimates for complete or censored sample data without assuming a particular distribution model. The Kaplan-Meier Product Limit procedure provided a quick, simple estimate of Reliability function or CDF based on failure multicensored women business data in

Kagera Region Tanzania. No underlying model (such as Weibull or lognormal) is assumed; K-M estimation is an empirical (non-parametric) procedure. Exact times of failure are required. However, observations are sorted in ascending order, $t_1 < t_2$ and so on. We assume also that no Kaplan-Meier estimator is a step-wise distribution at each point representing a certain survival probability. If the last observed time corresponds to a censored observation, then the estimate of survivorship function does not go to zero. Its smallest value is that estimated at the last observed survival time. In this assumption the estimate is considered to be undefined beyond the last observed time (Hosmer & Lemeshow, 1999).

According to Greene (2004), Kaplan-Meier product limit estimator is a strictly empirical, nonparametric approach to survival and hazard function estimation. Assume that the observations are censored. Suppose there are also K distinct survival time in the data, denoted by T_k ; K will equal to n unless there are ties. Let K denote the numbers of individuals whose observed duration is at least T_k . The set of individuals whose duration is at least T_k is called the Risk Set, at this duration. Hence, n_k is the size of risk set at time T_k . Let h_k denotes the number of observed spell/process/ women business duration.

The Kaplan-Meier Survival function will be:

$$\hat{S}(T_k) = \prod_{i=1}^k \frac{n_i - h_i}{n_i}$$

The KM hazard Rate is:

$$\hat{\lambda}(T_k) = \frac{h_k}{n_k}$$

Based on Hamilton (2002) Survival Time (st) dataset contain information on individual people or things, with variables indicating the time at which failure or censoring occurred for each individual. Survival time data set differs from count time data set. A different type of data set called count time (ct) contains aggregate data with variables counting numbers of individuals that failed or were censored at time t .

2.5.2. Weibull Distribution

Weibull Distribution function is used to test the reliability of our model, and also to estimate parametric variables. The Weibull distribution gives the distribution of lifetimes of objects (Weisstein, 1999). In the women businesses survival function, the object is the business entities. Organically, Weibull function proposed to quantify fatigue data, but it is also used in analysis of systems involving a "weakest link". We have selected this

model due to the fact that women businesses are assumed to show weak links because of their nature of development. We have argued above that since independence, in 1961 women have been encouraged to receive credit to start their own businesses (Makombe, 1998 and Meighji 1978). However, until year 2002, when this research was conducted, only one out of 196 businesses was indicated to start in 1979. It was seemingly to survive the deluge and siege of factors that inhibits their development, hence, to have a Weibull Distribution function. Therefore Weibull is an appropriate test for reliability of our model. Also according to Greene (2003), Weibull distribution has been advocated to be a popular choice in a cornucopia of choices.

STATA 8 programme gives us output of both Weibull estimates of location parameter, λ and a scale parameter of p . At the same time we know that λ is the hazard function which is a duration dependence t . All three parameters are distributions for non-negative random variables. In Weibull distribution, hazard function hazard function is monotonically increasing or decreasing depending on p .

Hence, Greene (2004:794) gives us the following equivalences of two Weibull distribution functions, applicable to the computer software packages, especially STATA 8.

- Weibull Parametric Hazard Function: $\lambda(t) = \lambda p (\lambda t)^{p-1}$
- Weibull Parametric Survival Function is given by: $S(t) = e^{-(\lambda t)^p}$

Weibull Maximum likelihood estimates the parameters λ and p through the observations $t_1, t_2, t_3, \dots, t_n$ by formulating and maximizing the loglikelihood function of duration taking into consideration of uncensored and censored observations.

$$\ln L(\theta) = \sum_{\substack{\text{Uncensored} \\ \text{observations}}} \ln f(t|\theta) + \sum_{\substack{\text{Censored} \\ \text{Observation}}} \ln S(t|\theta)$$

Where $\theta = (\lambda, p)$

3.0 DATA ANALYSIS AND INTERPRETATION

The data was collected in year 2001 $n_k=n_{22}$ is by 2001-1979 = 22 years time, where 1979= $t_n=0$ at $S(0)=1$ The time intervals are explained by $n-1$. The data was analyzed by STATA 8 programme which gives us the model summary. Time was measured in terms of years since the women group obtained the credits and started business in-group or singles according to the collateral policies. The interest is returned group wise.

Failure in the is coded using 1 for OUT which means out of business. Regardless of the total failure in business or disappeared in follow-ups, we treat that group business

member as a failure. The group members do the follow-ups during interest and capital repayment to the credit providers or never pay annual tax to the Tanzania Revenue Authority (TRA).

The group/individual women business, which was still surviving at each one-year interval, was coded censored. We applied censoring type II, multiple censoring or right censoring because we collected data after the process of failure and survival had already taken place. Thus two dummy variable were used, ie 0 for censored and 1 for failure or OUT of business.

3.1. Women Business Survival By Time

Kaplan-Meyer estimator is used to estimate for $S(t)$ all women businesses and apply the log-rank to test to compare $S(t)$ estimated of all women businesses defined in Table 1.

Figure 1: Graphical Representation of Step-wise unconditional KM estimate of Women Business Survival by Time.

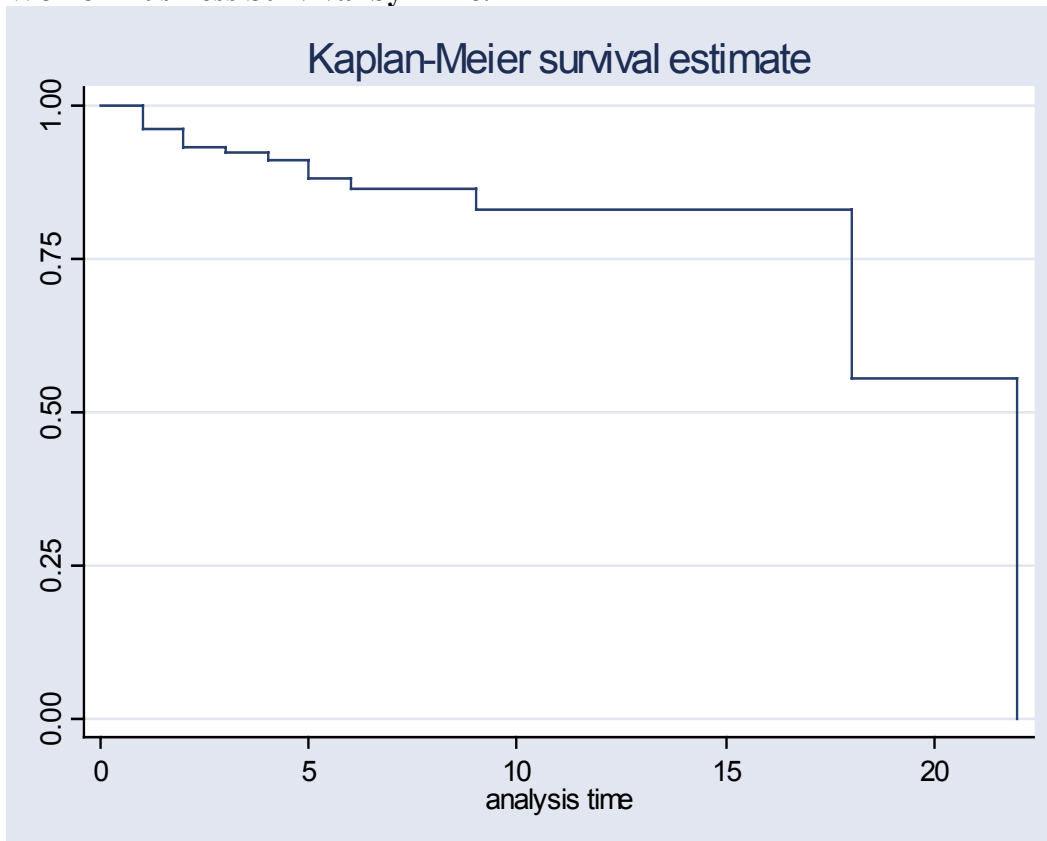
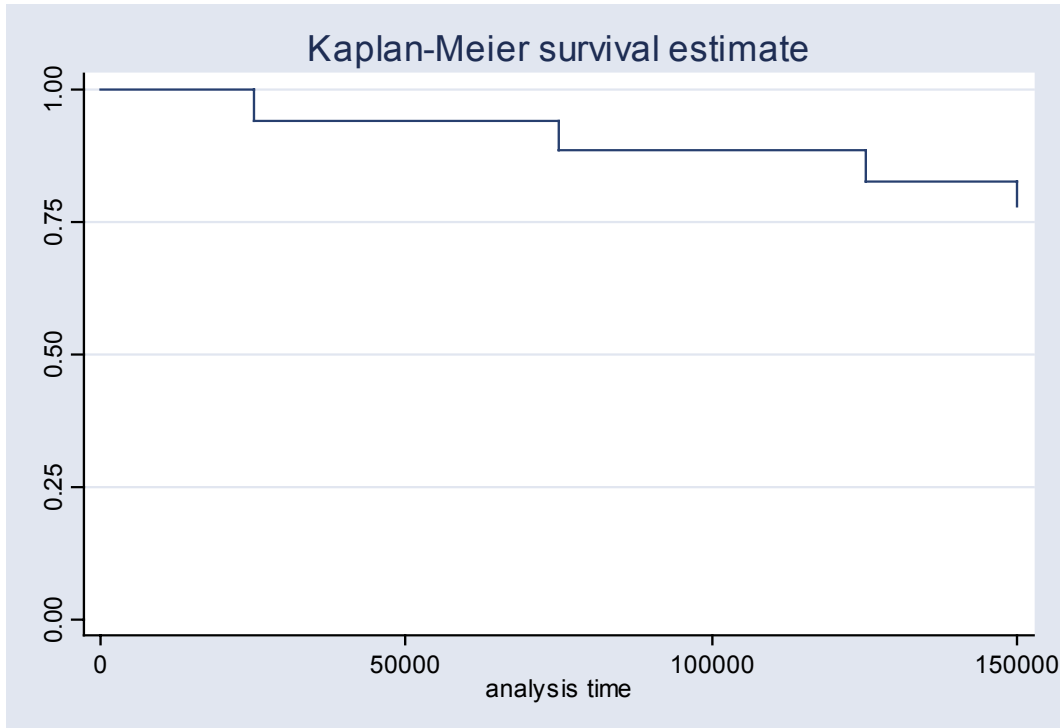


Figure 2: Graphical Representation of Step-wise unconditional KM estimate of Women Business Survival by Profit levels



Both graphical representations of survival function of women businesses depending on time (figure 8) and profit (figure 9) show the stepwise non –equal surviving between the groups of time intervals. The Chi-square distribution in Table 1 also shows significance of different survival time among the groups.

Table 1: Univariate Chi-Squares for Log-Rank Test Kaplan-Meyer

Variable	Chi-Square	Pr>Chi-Square
Time	30.99	0.0405
Profit	26.53	0.1161
Training	31.91	0.0315

3.2. Life Table Method

The second non-parametric univariate method of survival analysis is one based on life table estimates of survival analysis, also known as actuarial method (Gregoriou, 2002, Johnson, 1999).

Table 2: Life-Table Survival Estimate

Lifetime Interval (lower, Upper)	Risk Set	No. Failed	Conditional Probability of Failure	No. Censored	Conditional Probability of survival	Conditional Probability of Error	Standard
0-1	196	4	0.0213	17	0.9787	0.0081	
1-2	175	6	0.059	38	0.941	0.0321	
2-3	131	4	0.0923	36	0.9077	0.0552	
3-4	91	1	0.1036	21	0.8964	0.0627	
4-5	69	1	0.1175	9	0.8825	0.0716	
5-6	59	2	0.1487	5	0.8513	0.0922	
6-7	52	1	0.1663	7	0.8337	0.1041	
7-8	44	0	0.1663	6	0.8337	0.1041	
8-9	38	0	0.1663	10	0.8337	0.1041	
9-10	28	1	0.1989	5	0.8011	0.1209	
10-11	22	0	0.1989	2	0.8011	0.1209	
11-12	20	0	0.1989	6	0.8011	0.1209	
12-13	14	0	0.1989	1	0.8011	0.1209	
13-14	13	0	0.1989	2	0.8011	0.1209	
14-15	11	0	0.1989	1	0.8011	0.1209	
15-16	10	0	0.1989	4	0.8011	0.1209	
16-17	6	0	0.1989	2	0.8011	0.1209	
17-18	4	0	0.1989	1	0.8011	0.1209	
18-19	3	1	0.466	0	0.534	0.1586	
19-20	2	0	0.466	1	0.534	0.1586	
20-23	1	1	1	0	0		

The median survival time for these data is 3.06

This method has been employed because some of women business groups (WEG) were not known if they were still surviving or not. However, based on lifetime survival method we can estimate their lifetime survival. Table 2, illustrated the STATA 8 output for lifetime survival and hazard probabilities. The lifetime survival output gave us the median range of women businesses in Tanzania based on time as a latent independent variable.

Box. I: Stdes, Weight

Failure_D: OUT == 1
 Analysis Time_T: YEARS

Category	Total	----- Per Subject -----			
		Mean	Min	Median	Max
No. Of Subjects	175				
No. Of Records	175	1	1	1	1
(First) Entry Time		0	0	0	0
(Final) Exit Time		4.542857	1	3	22
Subjects With Gap	0				
Time On Gap If Gap	0				
Time At Risk	795	4.542857	1	3	22
Failures	18	.1028571	0	0	1

Box No i. above gives us the information of the number of risk set, number of the observation at time zero that is in the time available year 1979, when women started business in Kagera region based on the registered women at the TRA. Box No i shows that the median exit time is 3 years, that means and the mean survivorship is 4.542857 years.. We have 18 failures out of 792 Women business per year, giving an incidence rate of $18/792 = 10\%$.

Box No i shows the time at risk used in the process and mean years of probable time for women business survival, median and maximum time. Maximum time in this sense is the time when the survey was done, assuming right censoring or multiple censoring. STATA has given us the mean survival year for women businesses, gives conditional probabilities at each interval of time is about four years.

Box No ii: stsum

failure_d: OUT == 1
 analysis time_t: YEARS
 id: ID

	time at risk	incidence rate	no. of subjects	----- Survival time -----		
				25%	50%	75%
total	792	.0227273	174	18	22	22

Kaplan-Meyer function estimates about a 25% chance of going out of business within 18 years after receiving credit, and 55% within 22 years, in Box No ii. Over the observed

range of data there is 75% chances to continue with businesses. The KM curve is illustrated in Figure 1 and 2, above. These percentile of survival time are derived from a Kaplan-Meyer survival function.

According to Greene (2003:782), we need to characterize the probability distribution of observed duration time, however, duration is positive by construction. Therefore, we attribute, the duration of individual woman /WEG business to have Weibull distribution as one of Kaplan Meyer estimate test.

3.3.Weibull Distribution

Box iv :Weibull regression -- log relative-hazard form							
No. of subjects =	174	Number of obs =	175				
No. of failures =	18						
Time at risk =	792	LR chi2(5) =	30.79				
Log likelihood =	-52.179977	Prob > chi2 =	0.0000				

	_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	

	PROFIT	.9999932	6.13e-06	-1.12	0.264	.9999811	1.000005
	INFORMALEUCATION	.5208071	.7595273	-0.45	0.655	.0298754	9.079047
	PRIMARY EDUCATION	.2988854	.3183258	-1.13	0.257	.0370628	2.410299
	SECONDARY EDUCATION	.2858972	.3200938	-1.12	0.263	.0318563	2.565812

	/ln_p	1.041058	.2040776	5.10	0.000	.6410738	1.441043

	p	2.832213	.5779913			1.898518	4.225101
	1/p	.3530808	.0720559			.2366807	.5267265

In Box iv we assume regressing the time against failure (OUT of business), given by Weibull in a likelihood functions state above. The Weibull test shows significance test using Chi-Square probability test at 95% confident.

The Weibull regression obtains a hazard ration estimate of 0.999, which refers to Weibull shape parameter p . The value of $p=0.999$ decreasing hazard ration as women businesses be able to generate high profit. This means the Hazard ratio decreases with increase in profitability of women businesses. However, based on the data STATA 8 output above in Box iv, the women businesses hazard ration decreases with the level of education. This means, Informal Education has the higher hazard ration in comparison with those who have primary education level and the secondary school level. Informal Education, Primary school level and secondary school level have hazard ration of 0.5208071, 0.2988854 and 0.2858972 respectively. Based on these data and the proposed model the hazard ratio ranges from 1.898518 to 4.225101.

Overall hazard ration of women businesses in Tanzania since 1979 to 2002 have increasing hazard ratio with time, based on the shape parameter $p= 2.832213$. Hence, we have to reject the null hypothesis and accept the alternative as educated women has higher chances of surviving in businesses.

Figure 8: Weibull Parametric Cummulative Survival Density Function

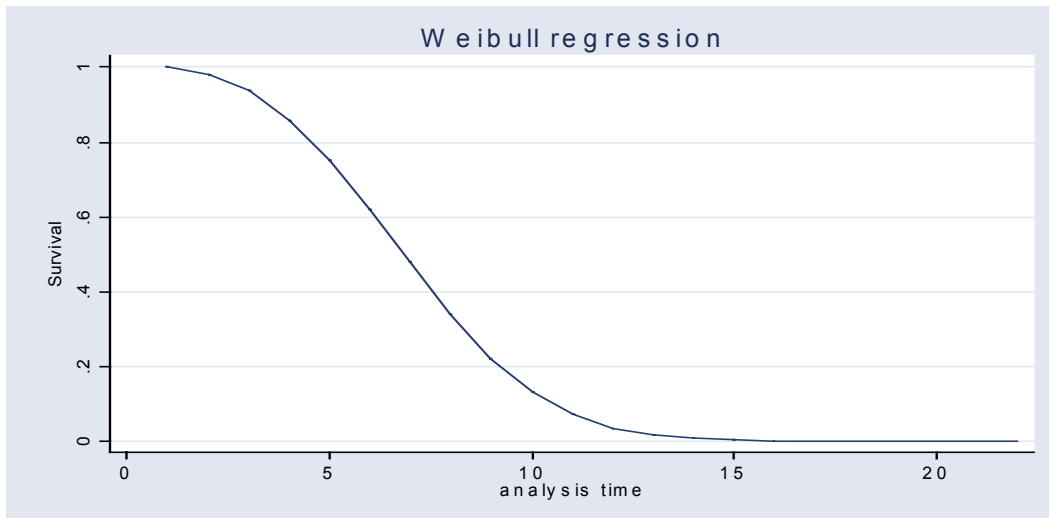
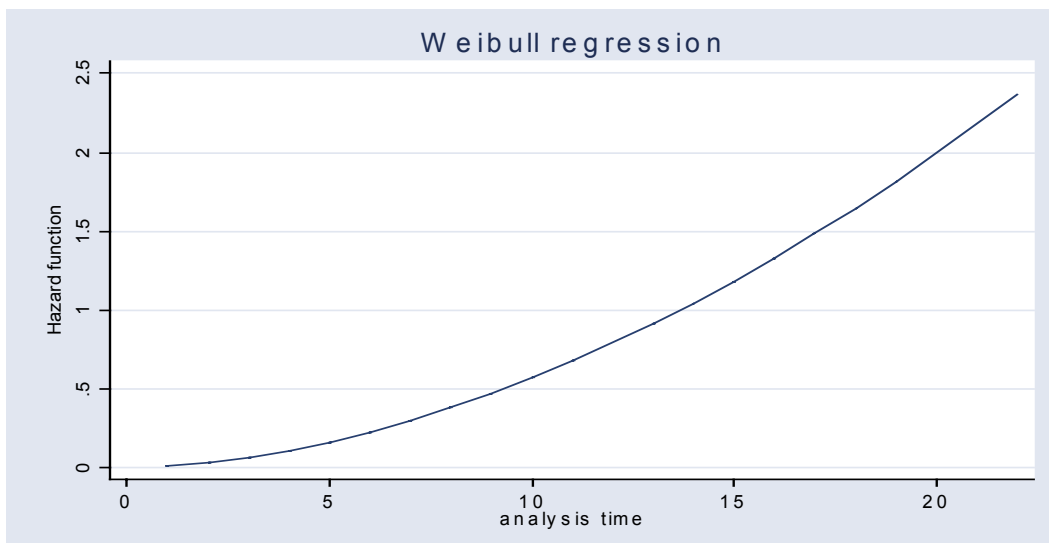


Figure 9: Weibull Increasing Hazard Rate Over Time



Both figures shows the increasing hazard rate over time. Figure 10 illustrates what Greene (2004: 794) calls positive duration dependence. Both figures illustrates Weibull distribution shape parameter, p . However, p value is greater than one in Box No.iv, STATA 8 output, that is $P > 1 = 2.832213 > 1$. According to Hamilton (2002), this indicates that hazard (Women going out of business after credit provision) increases over time.

4.0 CONCLUSION

Based on the dataset from Kagera Region Tanzania, and the Survival models analysis, we can conclude that women businesses has a high going out of business rate after receiving credits. We have applied, women business lifetime table, Kaplan-Meyer stepwise and unconditional and conditional probabilities functions to illustrate the nature of survival of women businesses in Tanzania. The Cox-regression model has been used to test the impact of education level in business survival.

We have found out that the minimum years the women can survive in business given credits is about one years and the maximum years were set at 22 due to the data available at TRA and other credit providers.

We are convinced that the data is reliable since women started to receive credits as a business stimulator since independence and the number of dropouts were not replaced as such, but the government policy was to keep on encouraging them on economic capacity building.

STATA 8 calculated the incidence rate per year to be 23% of going out of business of those who receive credits, and the chance of going out of businesses was estimated to be 25% chance within a year. It was also found out that going out of business is about increasing with time. The mean year of women business survival is 3.06 and medium of 3 years. The levels of education have been found out to have a positive impact on women business survival.

We would like to recommend further researches to be conducted on which factors are more likely to decrease the rate chances of going out of businesses so as to alleviate poverty and economic empowerment among women in Tanzania. The future research will investigate the variables attribution to increasing rate and so advice the stakeholders including the policy makers on what alternative measures to combat the increasing going out of business among women credit receivers in Tanzania, hence to realize their contribution to economic growth since business is the engine of the society.

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