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# Statistical analysis on predictors of women performance in micro and small enterprises in morogoro municipal in Tanzania

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**Abstract**
Key objective of this study was to examine factors that predict performance of Micro and Small enterprises owned by women. The study utilized stratification sampling design where by enterprises were stratified according to their nature of business. Thus a sample of 183 micro and small enterprises was determined and proportionally allocated to each business category. A simple random sampling technique was used to select a list of micro and small enterprises from each category that formed representative sample. Data were collected using questionnaire then analyzed by Statistical Package for Social Sciences (SPSS) software. The study employed Chi-square technique to test hypothesis of no association between variables while binary logistic regression model was employed to examine in depth contribution of each explanatory variable to the performance of enterprises. Findings revealed that business experience, training workshop, marital status, education level and family background contribute to the performance of women in micro and small enterprises unlike age which was found insignificant.

**Keywords:** Business enterprises, Women entrepreneurs

## 1. Introduction

Micro and Small enterprises have significant contribution to the social and economic development at individual and national level. According to Tanzania definition, Micro enterprises are those characterized with a range of one to four employees with a capital investment of up to Tshs 5 million while small enterprises are those with labour force from five to 49 employees with capital investment of 5 to 200 millions [1].These enterprises provide job opportunity and hence minimize poverty at the same time improve individual income[2].Based on its potentiality, many nations have been facilitating their economic development through providing suitable environment for growth of Micro and Small enterprises[3].Cook [4] evidenced that this sector influences the succession of development objectives such as production of goods and services as demanded by customers. In recent years, it has been observed that population of women entrepreneurs in the world have been growing with the high rate that influence the sustainability of economy [5].

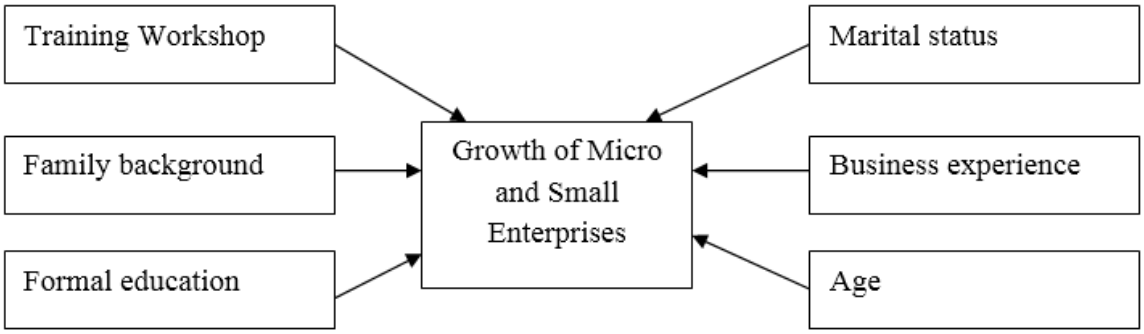
Results from Study by Sarwoko, Armanu and Hadiwidjojo [6] on determinants of business performance of enterprises in Indonesia indicated that the entrepreneurial psychology and experience have significant influence on business performance. Similarly, the study done by Koech [7] in Kenya on factors influencing performance of women entrepreneurs concluded that age, education and business experience have influence on the business achievement. On the other hand, entrepreneurs come from an entrepreneurs family have great chance of attaining business success since they have an opportunity of being guided by their parents or relatives on business administration matters [8].

Tanzania is among East Africa countries having a total population of about 44.9 million, with annual population growth rate of 2.7 percent [9]. Women as part of society, have a lot of contribution to the economic development by their engagement in small business activities as either owners or managers. Despite of their participation, few have managed to survive and expand, while the majorities have declined and other remains constant. Women failed to achieve their objectives due to lack of marketing skills, financial resource, managerial experience, capital, accessibility to information and knowledge [10].Major obstacle to women is their traditional roles of reproduction as perceived by society that hinder the management of enterprises [11]. Women manage their time to accomplish both traditional family and community roles and operating the enterprises and therefore they have less time to spend than men on their business.

Among the existing studies in Tanzania which concentrated on the area of factors influencing business growth are those of Satta [12] and Kimeme [13]. The existing studies covered several factors such as access to finance, corruption, and access to market, while employed a descriptive statistics as analytical tool and focusing only on one sector or business type. That's why an effort has made in this study to consider using advanced techniques namely Chi- square and Logistic regression to analyse predictors of women performance by including different business activities namely retailing shops, milling machines and agricultural products dealers,, oil mills machines, grocery and restaurants, saloon, Pharmacy, stationery and electrical equipment, construction material and spare parts.

Relationship between variables affecting women engaged in small and micro enterprises in Tanzania and the business performance was demonstrated by conceptual framework. The independent variables include, age, business experience, family background, marital status, training workshop and educational level. The side of dependent variable was presented by the growth of Micro and Small enterprises.

**Conceptual framework**




***Source*:** Researchers' construction (2016)

## 2. Materials and methods

### 2.1 Area of the study and target population

The study was conducted in Morogoro Municipal targeting the women possessing Micro and Small entrepreneurs such as, retailing shops, milling machines and agricultural products dealers, wholesaling shops, oil mills machines, grocery and restaurants, saloon, Pharmacy, stationery and electrical equipment, construction material and spare parts.

### 2.2 Sample size and Sampling techniques

#### 2.2.1 Sample size

According to Catherine [14], a correct sample size in a study is mainly depends on some aspects like nature and purpose of the study. In selecting sample size, list of registered Micro and Small enterprises was obtained from Morogoro municipal office with the cooperation from Kilakala and Msamvu ward offices and Tanzania Revenue of Authority (TRA). Sample size was obtained using the following formula by Yamane [15];

$$n = \frac{N}{1+N(e)^2} = \frac{340}{1+340(0.05)^2} = 183$$

Where; 'n' is the sample size, 'N' is the population size and 'e' is the level of precision

#### 2.2.2 Sampling technique

Stratified random sampling design was utilized where by population of Micro and Small enterprises was divided into several groups including retailing shops, whole sale shops, pharmacy, restaurants, constructions material and spare parts, agriculture and product dealers, saloon and oil milling machines. A determined sample of 183 enterprises, was proportionally allocated to each stratum to ensure representative sample as shown in table 1

**Table 1:** Stratum, number of enterprises from each stratum and the sample size from each stratum

| Business type (Stratum) | Number of enterprises from each stratum | Sample size from each Stratum $n_i = n\left(N_i/N\right)$ |
|---|---|---|
| Saloon | 20 | 11 |
| Oil mills | 10 | 5 |
| Pharmacy | 15 | 8 |
| Restaurants | 45 | 24 |
| Construction material and spare parts | 40 | 22 |
| Agriculture Products dealers | 35 | 19 |
| Wholesale shops | 85 | 46 |
| Retailing shops | 90 | 48 |
| Total | 340 | 183 |

### 2.3 Data collection, processing and analysis

Primary data were used in this study and collected using self-administered questionnaires which composed of questions on profile of business and entrepreneurs. The questionnaires were completed by the owners or operators or employees of micro and small enterprises. The data analysis was made possible with the use of Statistical Package for Social Science (SPSS).Chi-square test was used to test six variables to determine relationship between each independent variable and dichotomous dependent variable. Binary logistic regression model was used for further analysis on how the significant explanatory variables contribute to the performance of women in Micro and Small enterprises. Statistically, logistic regression model can be presented as follows:

$$Logit(\pi_i) = \ln\left(\pi_i / 1-\pi_i\right) = \beta_0 + \sum_{j=1}^{5} \beta_j X_{ij} \qquad i = 1,2,....,183 \quad j = 1,2..5$$

Where: $\pi_i$ is the probability of respondent $i$, $X_{IJ}$ are the factors determining performance for respondent $i$, $\beta_j$ stands for parameter to be estimated, $\beta_0$ is a constant term. Generally, the odds are the ratio of the probability of occurrence of an event to that of non-occurrence.

### 2.4 Operationalization of the study variables

#### 2.4.1 Enterprise growth

Number of employees was used to measure growth of enterprise. Thus the dependent variable was formulated as categorical variable to fit the requirement of logistic regression model. Thus growth of enterprise was treated as dummy variable that takes value of one (1) when employees are more than ten (10) and zero value for number of

employees less than 10. Statistically this was defined as follows:

$$Enteprise \quad growth(y) = 1 \quad if \quad y > 10$$
$$= 0 \quad Other \quad wise$$

### 2.4.2 Profiles of entrepreneurs

A number of variables were used to explore the entrepreneur's profile such as age, education, experience, workshop, family background and marital status. To measure the level of education, the respondents were asked to indicate the formal level of education attained. A part from analysing formal education the following tables shows the way all variables were designed to capture the data as per objectives of the study.

**Table 2:** Measurements of Variables

| Variables | Measurements |
|---|---|
| Age | Entrepreneur's age in category. |
| Education | Maximum level of formal education attained. |
| Workshop attendance | Whether an entrepreneur attend any workshop before startup of business. |
| Business experience in the existing business | If an entrepreneur had the business experience before starting that sector. |
| Family background of an entrepreneur | Whether she comes from an entrepreneur family. |
| Marital status | Whether she is single or otherwise. |
| Business growth | Number of employee. |

## 3. Results and Discussion

### 3.1 Results

### 3.1.1 Relationship between independent variables and dependent variable

Chi-square technique was used to test significant relation between each of independent variable and dependent variable and also was used to decide on which categorical variable to be included in a binary logistic regression analysis. The chi square test results were summarized in table 3 to test the following hypothesis;

***$H_{01}$:*** *There is no significant relationship between age of entrepreneur and growth of Micro and Small enterprise*

**Table 3:** Relationship between Age and growth of Micro and Small enterprise

| Number of employees | 18-28 | 29-33 | 34-42 | Total | $\chi^2$, p value |
|---|---|---|---|---|---|
| <10 | 5 | 9 | 37 | 51 | **0.551** |
| >10 | 5 | 16 | 40 | 61 | |
| Total | 10 | 25 | 77 | 112 | |

The result from table 3, gives p-value of 0.551 which is greater than 0.05 significance level. Since no enough evidence to reject null hypothesis, hence there is no significant relationship between age and performance of Micro and Small enterprises owned by women.

**Table 4:** Relationship between Marital status and growth of Micro and Small enterprise

| Number of employees | single | married | Separated | Total | $\chi^2$ p value |
|---|---|---|---|---|---|
| <10 | 30 | 18 | 3 | 51 | 0.000 |
| >10 | 6 | 37 | 18 | 61 | |
| Total | 36 | 55 | 21 | 112 | |

***$H_{02}$:*** *There is no significant relationship between marital status and growth of Micro and Small enterprises.*

The results from table 4 provides an evidence of concluding that there is significant relationship between marital status and growth of Micro and Small enterprises since its p value(0.000) is less than 0.05 level of significance.

**Table 5:** Relationship between Educational level and growth of Micro and Small enterprise

| Number of employees | at least primary | secondary | University | Total | $\chi^2$p value |
|---|---|---|---|---|---|
| <10 | 27 | 14 | 10 | 51 | 0.000 |
| >10 | 7 | 18 | 36 | 61 | |
| Total | 34 | 32 | 46 | 112 | |

***$H_{03}$:*** *There is no significant relationship between education of entrepreneur and growth of Micro and Small enterprises*

Table 5 shows p- value of 0.000 which is less than 0.05 meaning that educational level of the respondents has significant influence on growth of their enterprises, hence rejection of null hypothesis which stated that, there is no significant relationship between levels of formal education with growth of Micro and Small enterprises.

**Table 6:** Relationship between training workshop and growth of Micro and Small enterprise

| Number of employees | Not attended any training workshop | Attended workshop training | Total | $\chi^2$p value |
|---|---|---|---|---|
| <10 | 37 | 14 | 51 | **0.000** |
| >10 | 7 | 54 | 61 | |
| Total | 44 | 68 | 112 | |

***$H_{04}$:*** *There is no significant relationship between training workshop and growth of Micro and Small enterprises*

Based on the p value (0.000<0.05) located in table 6, null hypotheses of no significant relationship between workshop and growth of Micro and Small enterprises was rejected. This means that entrepreneur who attended a training workshop would contribute a lot to their business growth compared to others. This is because with workshop, an entrepreneur can be equipped with necessary skills and knowledge for running business.

**Table 7:** Relationship between business experience and growth of Micro and Small enterprise

| Number of employees | No | Yes | Total | $\chi^2$ p value |
|---|---|---|---|---|
| <10 | 33 | 18 | 51 | .000 |
| >10 | 20 | 41 | 61 | |
| Total | 53 | 59 | 112 | |

***$H_{05}$:*** *There is no significant relationship between business experience and growth of Micro and Small enterprises*

Similarly, the small p value (0.000<0.05) in table 7 indicates that some one having business experience can significantly contribute to her business growth. That means the entrepreneur who had business experience prior to starting her current business had an advantage of managing well the existing business.

**Table 8:** Relationship between Family background and growth of Micro and Small enterprise

| Number of employees | No | Yes | Total | $\chi^2$ p value |
|---|---|---|---|---|
| <10 | 28 | 23 | 51 | .000 |
| >10 | 6 | 55 | 61 | |
| Total | 34 | 78 | 112 | |

***$H_{06}$:*** *There is no significant influence of family background on growth of Micro and Small enterprises*

P-value of 0.000<0.05 implies that there is significant relationship between family background and growth of Micro and Small enterprises. This means that someone come from family experienced in entrepreneurial activities would have more chance in making her business grow by getting some advice and support from her family

Chi-square test results revealed that, among the independent variables only age shows insignificant influence towards growth of Micro and Small enterprises owned by women. Hence the variables which show significant influence were taken to perform binary logistic model for the purpose of looking the combined influence on growth of Micro and Small enterprises.

### 3.1.2 Logistic regression analysis

A binary logistic regression analysis was performed to determine the factors which are considered to be significant contributors to the performance of Micro and Small enterprises owned by women. The contribution of each variable was indicated by the odds ratio for each variable relative to a reference categorical variable. However, before going to the results, binary logistic model was evaluated making sure that it fit correctly. The following measures of fit were performed:

#### 3.1.2.1 Chi-square Goodness of Fit test

Omnibus Test of model of coefficients indicates whether the inclusion of independent variables contributes significantly to the model. This is to test the null hypothesis that adding a variable to the model does not significantly increase ability to predict the decision made by subjects. Based on the p-value0.000 <0.05 implies that adding a variable to the model significantly increases its prediction ability.

**Table 9:** Omnibus Tests of Model Coefficients

| | Chi - square | Df | Sig. |
|---|---|---|---|
| Model | 80.053 | 7 | .000 |

#### 3.1.2.2 Classification table

The assessment of how good the model was for the prediction of enterprise growth was given by the Classification table. The table 10 shows that 85.2% of occurrence was correctly predicted while 82.4% of non-occurrence was correctly predicted. Overall accuracy of this model to predict business growth was 83.9% which is evidence that the model is adequate.

**Table 10:** Classification table

| Observed | | Predicted | | |
|---|---|---|---|---|
| | | Number of employees | | Percentage Correct |
| | | <10 | >10 | |
| Number of employees | <10 | 42 | 9 | 82.4 |
| | >10 | 9 | 52 | 85.2 |
| Overall Percentage | | | | 83.9 |

#### 3.1.2.3 Logistic Regression results

Table 11 shows the information about the contribution of predictor variables. The contribution of each contributor variable was indicated by the odds ratio for each variable. Odds ratio was used to interpret each of independent variable relative to a reference category for categorical variable. These variables include educational level, marital status, workshop, experience and family background.

**Table 11:** Logistic Regression results

| Variables | B | Sig | Odds ratio |
|---|---|---|---|
| **Education level** | | **0.026** | |
| Primary | RC | | |
| Secondary | 2.361 | 0.210 | 2.822 |
| University | 1.037 | 0.007 | 10.600 |
| **Marital status** | | 0.026 | |
| Separated | RC | | |
| Single | -2.934 | 0.155 | 0.053 |
| Married | -1.327 | 0.007 | 0.265 |
| Workshop | 2.632 | 0.000 | 13.904 |
| Experience | -0.323 | 0.636 | 0.724 |
| Family background | 2.677 | 0.001 | 14.547 |

The result from table 11 shows that education of the entrepreneur was statistically significant related to the performance of their business with p value 0.007 which is less than 0.05. This means that the probability of an entrepreneur to grow tends to increase with an increase in education level. Entrepreneurs who reached university level were 10.600 times more likely to perform well compared to those entrepreneurs who reached primary level of education. To the case of marital status, entrepreneurs who were married were 0.265 less likely to perform well in their business compared to those entrepreneurs who were separated.

The findings revealed that training workshop was statistically significant related to the performance of Micro and Small enterprises with p value 0.000 which is <0.05. This means that, entrepreneurs who attended workshop were 13.904 times more likely to see their enterprise grow than those who did not attend the workshop. The situation is quite different to the business experience which found to have no significant influence on business growth since its p value of 0.636 which is >0.05. Although Chi- square test for business experience was significant, when other variables were controlled in logistic regression model, there was no enough evidence to conclude that the significance influence of business experience on growth of enterprise.

Lastly results showed that, entrepreneurs who comes from an entrepreneur family were 14.547 times more likely to see their business grow than those who did not come from an entrepreneur family, with p value of 0.001<0.05.

### 3.2 Discussion

Explanatory categorical variables were tested in order to test hypotheses using Chi-squared, at 5% level of significance. Independent variables were age, marital status, educational level, business experience, training workshop and family background. Among all the variables, only age did not show statistical significance to the growth of Micro and Small enterprises. Other variables were found to have significant influence on growth of Micro and Small enterprises. This is similar to a study by Chowdhury, Alam and Arif [16] which found that among all other factors tested, age was not correlated with business growth. Variables which were found significant in Chi-square test of association were taken to perform a binary logistic regression model for the purpose of examining the combined influence on growth of Micro and Small enterprises.

The results revealed that, formal education of an entrepreneur is one of the indicators for growth of her enterprises. This implies that education of an entrepreneurs was statistically significant related to the performance of their business with p value of 0.007 which is less than 0.05. This means the probability of an entrepreneur to grow tends to increase with an increase in education level. Results from binary logistic regression shows that entrepreneurs who reached university level were 10.600 times more likely to perform well compared to those entrepreneurs who reached primary level of education. This is supported by findings from Charney and Libecap [17], which suggested that women with higher level of education have higher possibility of achieving business success. However, this is contrary to the study by Johnson, Conway and Kattuman [18] which found that no relationship between education of entrepreneurs and their business performance. Training workshop, gives an odd ratio of 13.904, means those who attended workshop were 13.904 times more likely to see their business grow than those who did not attend the workshop.

Marital status gives an odds ratio of 0.265, which means that, entrepreneurs who were married were 0.265 less likely to perform well in their business compared to those entrepreneurs who were separated. Although chi- square test revealed the significance association between business experience and business performance, the variable was insignificant in binary logistic regression output.

This is consistent with a study by Msoka (2013) [19] which explored the existence of no relationship between business experience and performance of Micro and Small enterprises owned by women. Family background variable has p- value less than 0.05, indicating that entrepreneur who comes from an entrepreneur family were 14.547 more likely to see their business grows than those who did not come from an entrepreneur family. A paper by Mungai and Ramakrishna [20] documented that there exist significance relationship between the business experience of the family of entrepreneur and individual performance in business growth.

### 4. Conclusion

An objective of the study was to analyse the predictors of performance of women in Micro and Small enterprises. Based on different analysis performed, the study concluded that, workshop attendance, family background, formal education, marital status and business experience are the key factors that influence women performance in running their business. Using logistic analysis, the output shows that university level of education has potential influence on business growth. This is because a person who holds at least bachelor degree has necessary skills to become self-employed instead of waiting for employment from a particular organization. Similarly, short course training offered under workshop training was found to be significant factor towards business success. Hence a need for the government to provide leaning environment where people may attend both short course and long course training on entrepreneurship for individual benefit and national development as a whole. In an effort to support women entrepreneurs, the Government should invest resources in research development issues regarding Micro and Small enterprises, explore their problems and came out with remedial solutions.

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