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QUANTITATIVE METHODOLOGICAL APPROACH IN MEASURING ENTREPRENEURIAL CAPABILITIES

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ABSTRACT

Purpose: The paper seeks to develop and validate a comprehensive framework for measuring entrepreneurial capabilities across business contexts and organisational scales.

Design/Methodology/Approach: Cross-sectional research involved 254 owners of SMEs from Sukuma and Chagga ethnic groups. The snowball sampling procedure was first adopted to obtain the list of the Sukuma and Chagga owners of SMEs. Then, proportionate stratified sampling was adopted to select a final subject. Data were gathered using a questionnaire, where factor analysis was performed to reduce the number of predictors. A logit model was thereafter performed to establish the influence of predictors on entrepreneurial capabilities. Further, using the Whitney U test, a comparison of ways to preserve drivers of entrepreneurial capabilities between the Sukuma and Chagga owners of SMEs was performed.

Findings: Factor analysis reduced 52 predictors into six variables, which were further subjected to a logit model. The findings indicated that social factors, beliefs, norms, attitudes, and values were statistically significant while perception was insignificant. The difference in ways to preserve socio-cultural determinants between the Sukuma and Chagga was statistically significant, and the effect size was very high.

Research Limitation: The research was limited by the use of the logit model and the Man Whitney U test. Other econometric models, such as multiple linear regression, Tobit, Probit, etc., should be considered in the future.

Practical implications: The approach will help researchers and academicians to quantify socio-cultural studies and perform factor analysis step by step to reduce variables for further analysis using econometric models.

Social Implication: This approach will have social implications. Social scientists will be able to forecast the effect of social variables on certain variables under study, thus enabling the setting of priorities during intervention.

Originality: This research fills a significant gap in entrepreneurship literature by providing a validated, comprehensive framework for measuring entrepreneurial capabilities across different contexts and scales.

Keywords: *Capabilities. cultural. econometric. entrepreneurial. Tanzania*

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INTRODUCTION

Studies measuring entrepreneurial capabilities worldwide have helped ensure that entrepreneurship development is enhanced. Al-Shammari and Aziz (2024) systematically reviewed 46 books and articles published in reputable databases, including Web of Science, Scopus, and others. Data analysis was performed using exploratory analysis of factors.

In contrast, the study's results were the proposed framework for measuring how various factors influence innovation, entrepreneurship and economic growth model (IEEG). The study exhibited limitations as ii only proposed a framework without detailing how such factors affect the model on IEEG. Further, Boldureanu et al. (2024) in the European Union adopted a binary logistic regression model when investigating the development of entrepreneurship and its associated opportunities and challenges; the model projected the results that indicate how predictor variables affect the development of entrepreneurship. However, the study fell short of detailing the step-by-step data processing process to arrive at the results through the selected model.

The survey of Koomson et al. (2024) in China, which forecasts how entrepreneurship subjectively influences entrepreneurs' well-being, uses data from a longitudinal survey analysed using multiple linear regression and logit. It establishes that entrepreneurs have better well-being than non-entrepreneurs. Though this study adopted logit procedurally, it did not provide instructions on how to arrive at the results.

In China, Lerner et al. (2024) established how emerging entrepreneurship has contributed to China's rise and worldwide development; using a regression model, the results indicated that China's rise is associated with entrepreneurs investing locally, and the emerging markets positively affected China's rise. Again, this study did not consider detaining step-by-step instructions that researchers can follow when conducting similar case analyses.

In Africa, Weldehawartiat et al. (2024) adopted descriptive statistics, including a t-test, in analysing data on measuring entrepreneurial orientation in Ethiopian university students at Bahir Dar University. Methodologically, the findings from this study were limited as one cannot rely on this study if the relationship between variables is sought to be determined. Such shortfalls must be addressed by coming up with new contributions to the emerging gap. Kim and Davidson (2024), in South Africa, used qualitative research methods to raise the concern that the majority of entrepreneurship comes from townships; the study failed to detail how contributing factors for township entrepreneurs influence the undertaking of entrepreneurship.

While appraising the legal framework that protects innovative entrepreneurs using a qualitative approach, Akanle and Akanle (2024) came up with the results pinpointing the need for a suitable legal framework to safeguard the interest of protecting innovating entrepreneurs. However, the study was limited to qualitative data and did not further establish how the identified factors hinder innovative entrepreneurs from benefiting from their innovations.

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In Ghana, Musah Donkoh et al. (2021), using quantitative data with descriptive statistics and OLS regression analysis, found that entrepreneurs with proactive and innovative initiatives increased their business profits. However, this study ignored the inclusion of detailed procedures for data processing for further analysis. A similar study by Wachira (2024) on how entrepreneurial capability and business performance are related, using quantitative and qualitative data analysed thematically, descriptively and regression, exposed that entrepreneurial capability was positively and significantly related to business performance. Nevertheless, this study ignored the inclusion of step-by-step steps in determining the relationship between the two variables. It adopted a t-test instead of the alternative to the t-test.

In the context of Tanzania, Majenga et al. (2024), when carrying out an analysis of various factors related to voluntary savings, have contributed to promoting the growth of Tanzanian rural enterprises, using quantitative and qualitative data descriptively analysed, and the use of content analysis found that limited enterprise management training was the hindrance factor.

In its critique, this study did not consider further analysis to use relevant econometric models stepwise to predict how variables are related. In another related study, Majenga et al. (2024) performed an analysis of the growth of enterprises while comparing the growth of enterprises between two Tanzanian rural districts using both quantitative and qualitative data, where t-test and Chi-square were applicable for determining differences and associations among variables, respectively. This study was limited to the adoption of t-test and Chi-square without consideration of econometric models to measure various contributing factors that affect enterprise growth procedurally.

In another study by Haule (2023) in Tanzania adopting qualitative and quantitative data that were thematically and descriptively analysed, the results indicated that practical-oriented teaching and experimental-oriented learning methods helped equip undergraduates for self-motivated employment. This study ignored consideration for further analysis by adopting econometric models applicable for predicting the effect of such learning methods on equipping learners with self-motivated employment. In another case, using multiple regression, Makuya and Mfumbilwa (2024) disclosed that entrepreneurship education and support services for business development positively and significantly influenced Tanzania university graduates' intention to become entrepreneurs. However, this study did not stepwise demonstrate how researchers detail data analysis.

In a closely related study, Mashenene (2019) compared entrepreneurial capabilities between the Sukuma and Chagga operating SMEs, adopting t-test, the results indicated that the Sukuma SMEs were underperforming compared to the Chagga operated SMEs. Nevertheless, this study put aside the econometric models that would better establish how underlying factors predict entrepreneurial capability. In other studies with a similar focus, the adoption of quantitative methods has shown a departure from this study in numerous ways. For example, Mashenene et al. (2014) 's study on Sukuma and Chagga's entrepreneurial capability mixed qualitative and

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quantitative data by adopting a logit model to predict how variables are related. Like many previous studies, this study also used logit with simplicity without analytical, detailed steps.

Generally, differences emerge in approaches where some research use both qualitative and quantitative data (Wachira, 2024; Lerner et al., 2024; Majenga, 2024; Majenga, 2024; Mashenene, 2019) while some adopt one of the two approaches independently (Boldureanu et al., 2024; Kim & Davidson, 2024). In another differing focus, the majority of research that adopts quantitative methods, either data are only descriptively analysed (Weldehawartiat et al., 2024; Haule, 2023) or econometrically analysed but procedurally, the steps are not detailed to equip researchers with a broad analytical scope (Koomson et al., 2024; Boldureanu et al., 2024; Mashenene et al., 2014). Such emerging methodological approaches formed the basis for inquiring about this discrepancy academically. This study thus performed methodological step-by-step analysis using a quantitative approach. The results from this research will provide a methodological contribution, particularly for researchers intending to measure the relationship among variables using logit and carrying out a comparative analysis between variables using the Whitney U test.

LITERATURE REVIEW

The Sukuma and Chagga Entrepreneurial Capabilities

The term entrepreneurial capability (EC) is fundamentally conceptualised in various ways. Chen et al. (2002) conceptualised EC as knowledge, experience and skills applied in identifying and capitalising business opportunities. This means entrepreneurial opportunity sensing and exploitation results from knowledge, experience and skills.

In another concept, EC is associated with innovation (Garud et al., 2014; Schumpeter, 1943), suggesting that innovation is crucial for EC to be pronounced since it enables entrepreneurs to think profoundly and develop better solutions for exploiting sensed opportunities. Somwethee and Aujirapongpan (2023) domesticated that EC is embedded in management and leadership, the ability to learn actively, the spirit of self-achievement and passion for something being undertaken.

In the context of the current study, EC is figured out on the ability of the enterprise to raise capital as the performance indicator (Mashenene, 2016); this means that enterprises that raise investment capital in a prescribed period demonstrate higher EC than those whose capital investment is defined otherwise under the prescribed period. The study of Mashenene et al. (2014) pinpointed that the EC of the Chagga and Sukuma is routed from socio-cultural drivers. In contrast, comparatively, the Chagga socio-cultural factors were more inclined towards undertaking entrepreneurial ventures aggressively; as a result, they demonstrated higher EC than the Sukuma (Mashenene, 2019). These results infer that the Chagga exhibited higher EC

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than the Sukuma whereas the reason for this discrepancy in EC is differences in drivers for socio-culture between the two ethnic groups

Logit Model, Principal Component Analysis and Man U Whitney Test

The study of Saab et al. (2024) used the logit model to predict economic events in the future while using quantitative variables, which revealed that the logit model was the right model for predicting the intended events. However, this model adopted only quantitative data that needed no quantification from qualitative data, unlike this study, which was intended to measure ethnic entrepreneurial capabilities, which are qualitative but required data quantification to suit the adoption of econometric models such as the logit model. Similarly, Grzelak et al. (2024), while adopting the logit model in the analysis of an enterprise's economic efficiency using quantitative data, found that the model appropriately performed the intended purpose. However, the model captured only quantitative data that required a detailed pathway, like the case in this study, where, initially, data were qualitative but were manipulated into quantitative data.

The study of Nkegbe (2024) forecasted customers' willingness to pay in Ghana and revealed that the model suitably forecasted willingness to pay. This study has data similar to the current study, which was qualitative and required detailed steps to arrive at quantitative data to be run in the model. However, the study of Nkegbe (2024) did not incorporate the Principal Component Analysis (PCA) as one of the steps but arrived at the final outputs. Such discrepancies in the analytical method produced a concern about including PCA to reduce variables. In the other scenario, Li and Qin (2024) applied PCA in processing big data; the results inferred that PCA appropriately reduced many variables into a few. However, after the variables were reduced using PCA, the outcome variables were not regressed using a logit model, as in the case of the current study.

Similarly to the previous cases, the absence of the linkage between reduced variables using PCA and the logit model posed an academic concern that needs to be answered in the research. Similarly, Mehrabinezhad et al. (2024) applied PCA to reduce variables, and the output specified that PCA successfully reduced variables. However, further analysis using the logit model was performed in the study to regress the reduced variables using PCA with the dependent variable. Such a shortfall necessitated this research to fill the emerging gap.

In comparative studies, the t-test is a popular statistical test if conditions for normal distribution are honoured under the concept that scores are centrally concentrated in a curve, proposing the application of the t-test (Emerson, 2023). The same study pointed out that a nonparametric test suitably applies if the normal distribution condition is dishonoured; in the case of the current research, the Whitney U test was suitably applied. Okoye and Hosseini (2024) narrated that the appropriateness of the Mann Whitney U test comes when one intends to compare differences between two comparable groups using medians, unlike a t-test that uses means and standard

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deviation. The results from this study inform that computation of medians when using the Man Whitney U test is mandatory as opposed to computations of means and standard deviations for the case of t-test. The study of Pallant (2016) further informs that for the case of significant results in the Mann Whitney U test, computation of the size of effect represented by r is recommended, while eta squared for the t-test is recommended. This means that for results to be significant, it is not enough to conclude that the differences exist between groups; however, how big or small the difference is is also important.

METHODOLOGY

This research was undertaken in the Mwanza and Kilimanjaro Mwanza regions because ethnic groups with leading populations inhabit these regions, whereas the Sukuma is the leading largest ethnic group, and the Chagga are the second largest ethnic group (Mashenene, 2019; Mashenene, 2016). Exploring the entrepreneurial capabilities of entrepreneurs from such large ethnic groups will help disseminate valuable factors fueling such capabilities. For the Kilimanjaro region, Hai and Moshi districts and the Mwanza region, Nyamagana and Kwimba districts were selected purposively based on the fact that these districts had a large number of businesses and owners of businesses mostly were natives of the respective ethnic groups (Mashenene, 2019). The locations for the Hai and Moshi districts from the Kilimanjaro region and the Kwimba and Nyamagana districts from the Mwanza region are presented in Figures 1 and 2.

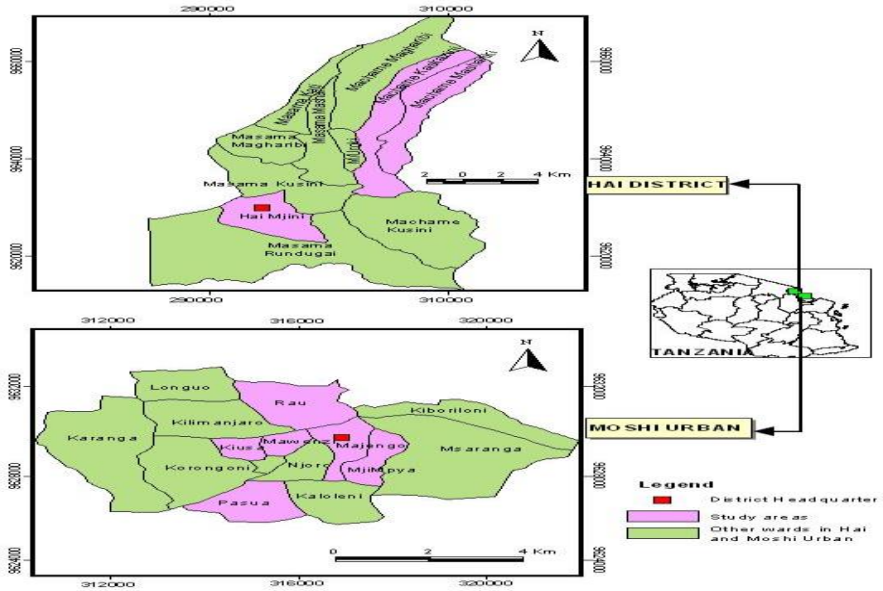

Figure 1: Locational Maps of Moshi Urban and Hai Districts
(*Source: Own Drawing*)

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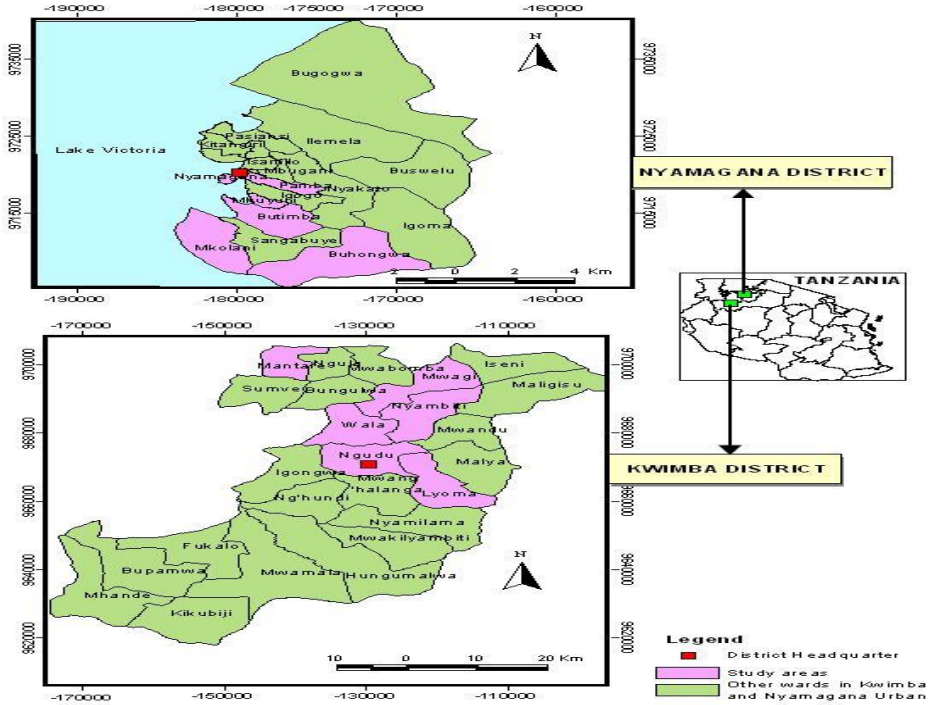

Figure 2: Locational Maps of Nyamagana and Kwimba Districts
(*Source: Own Drawing*)

The design for the research adopted was a cross-sectional questionnaire survey conducted due to limitations of resources, including finances and time (Kothari, 2009). The study population was 18,294, grouped into 13,200 from the Mwanza region, 12,000 from the Nyamagana district, 1,200 from the Kwimba district and 5,094 from the Kilimanjaro region 3,494 from the Moshi urban district and 1,600 from Hai district. All SME owners were aged from 18 years, both male and female. The researcher first adopted snowball sampling to obtain the list of the Chagga and Sukuma owners of SMEs since it was hard to get them from the councils' database of business owners. Mashenene (2019) and Tundui (2012) used the same sampling technique in a similar situation. Using the lists of owners of SMEs established using the snowball sampling technique, the final list for the survey was obtained using proportionate stratified sampling from the list established using snowball sampling, whereas a sample of 82 was selected from Moshi urban, 45 from Hai district, 80 from Nyamagana district and 47 from Kwimba district. Sample size estimation was achieved using the Cochran (1997) formula as represented in equation 1.

$$n = \frac{Z^2}{e^2} * \frac{pq}{} \quad \text{..... (1)}$$

Whereby:
n = size of the sample
Z = chosen critical value for a chosen level of confidence equal to 1.96 at 95% level of confidence

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p = proportion for the greatest population equal to 50%
q = 1-p and e = the acceptable degree for margin of error = 0.05.
Thus, $n = \frac{1.96^2}{0.05^2} * \frac{0.5 * 0.5}{} = 384$

Though the sample established before data collection was 384, the actual sample size during data collection became 254 as benchmarked from the rule of thumb, whereas 30 size of the sample is justifiable for statistical analysis (Saunders *et al.*, 2007). In research, during data collection, adjusting the sample size that was determined before data collection is common; for instance, a sample of 300 was adopted instead of 384 as determined before using the Cochran formula (1997) (Namwata *et al.*, 2015). In similar circumstances, Mungai (2013) adjusted a sample from 2,192 to 2,140, and Tundui (2012) adjusted a sample from 300 to 310.

Since there were six independent variables, the literature holds that the number of independent variables is multiplied by 50 to obtain the required sample size. Before the commencement of data collection, the sample size of 300 owners of SMEs was established. Still, during data collection, the actual sample size changed to 254 (84.7%) due to some questionnaires administered remaining unreturned.

Primary data were collected using 7-point Likert scale questions for predictors/socio-cultural determinants. In contrast, one represents strongly disagree, and seven represents strongly agree and continuous data in the form of Tanzanian shillings (TZS). The design of the questionnaire was guided by the literature reviewed, and pre-testing of the questionnaire was undertaken to increase reliability and validity.

Analytical Models

Logit Model

Inferential statistics included analyses such as factor analysis, Mann Whitney U test and binary logistic regression model (logit). Factor analysis was adopted to reduce independent variables from 52 to six: norms, values, attitudes, perceptions, beliefs and social factors. After the reduction of variables using factor analysis, the logit model was adopted to determine how six variables resulting from factor analysis affected the entrepreneurial capabilities of the Sukum and Chagga-owned SMEs. Capital as the dependent variable was under the treatment of binary responses defining whether SMEs had increased capital or otherwise. During the analysis, a dummy variable was created: 1= "SMEs increased capital above TZS 5 million in five years from which data were collected", and 0= "SMEs with capital that remained below TSZ 5 million within five years under the study". The decision to treat the capital increase in binary responses was interpreted from the URT (2003). The logit model was presented in equation 2.

$$Logit(Y=1) = \beta_0 + \beta_1 + \beta_2 Va\ \beta_2 SF\ + \beta_3 At\ + \beta_4 Be\ + \beta_5 No\ + \beta_6 Pe\ + \varepsilon \text{.....(2)}$$

Whereby:

Y represents entrepreneurial capabilities

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Va represents values
SF represents social factors
At represents attitude
Be represents beliefs
No represents norms
Pe represents perceptions
$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = estimated coefficients from the model

Further, both the null hypothesis (H_0) and alternative (H_a) testing the influence of socio-cultural of determinants (SCDs) of entrepreneurial capabilities (EC) were stated as follows:
H_0: SCDs have no influence on the EC of owners of SMEs among the Sukuma and Chagga.
H_a: SCDs have an effect on the EC of owners of SMEs in Sukuma and Chagga.

Since independent variables (sociocultural determinants) were classified into six variables to establish the relationship between every independent variable and entrepreneurial capability, the articulation of six hypotheses was:
Null hypothesis 1 (H_{01}): Values have no effect on EC among the Chagga and Sukuma-owned SMEs.
Alternative hypothesis 1 (H_{a1}): Values have effect on EC among the Chagga and Sukuma owned SMEs.
Null hypothesis 2 (H_{02}): Social factors have no effect on EC among the Chagga and Sukuma owned SMEs.
Alternative hypothesis 2 (H_{a2}): Social factors have effect on EC among the Chagga and Sukuma owned SMEs.
Null hypothesis 3 (H_{03}): Attitudes have no effect on EC among the Chagga and Sukuma owned SMEs.
Alternative hypothesis 3 (H_{a3}): Attitudes have effect on EC among the Chagga and Sukuma owned SMEs.
Null hypothesis 4 (H_{04}): Beliefs have no effect on EC among the Chagga and Sukuma owned SMEs.
Alternative hypothesis 4 (H_{a4}): Beliefs have effect EC among the Chagga and Sukuma owned SMEs.
Null hypothesis 5 (H_{05}): Norms have no effect on EC among the Chagga and Sukuma owned SMEs.
Alternative hypothesis 5 (H_{a5}): Norms have effect on EC among the Chagga and Sukuma owned SMEs.
Null hypothesis 6 (H_{06}): Perceptions have no effect on EC among the Chagga and Sukuma owned SMEs.
Alternative hypothesis 6 (H_{a6}): Perceptions have effect on EC among the Chagga and Sukuma owned SMEs.
Statistically,
H_0: $\beta_i = 0$ ……. (3)

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H_a: $\beta_i \neq 0$ ……. (4)
Where: β_i = coefficients and odds ratio of predictors defined as values, social factors, attitudes, beliefs, norms and perceptions.

Testing for hypotheses $H_{a1\text{-}6}$, the researcher applied the logit model and the outputs were presented in Table 10.

Mann-Whitney U Test
Further, as a non-parametric test, Mann Whitney U was undertaken to compare ways of preserving SCDs for EC between owners of the Sukuma and Chagga SMEs. The null hypothesis ((H_0) and alternative hypothesis (H_a) were articulated as:
H_0: The median of the ways of preserving SCDs of EC is the same between the SMEs owned by the Sukuma and Chagga at $p < .05$.
H_a: The median of the ways of preserving SCDs of EC is different between the SMEs owned by the Sukuma and Chagga at $p < .05$.
Statistically,
H_0: $Md_1 = Md_2$……..…… (5)
H_a: $Md_1 \neq Md_2$ ……. (6)
Where: Md_1 is the median of ways of preserving SCDs of EC among SMEs owned by the Chagga, and Md2 is the median of preserving SCDs of EC among SMEs owned by the Sukuma. For this analysis, the significance level was .05.

Mann-Whitney U test stipulates comparison between medians of two independently existing groups. Pallant (2016) reasoned that the test interprets the outputs of the continuous variables to rank crosswise. Afterwards, it gauges to establish if the ranks for the two independently existing groups significantly vary.

During the analysis, responses on 7 points Likert scale, 1 representing strongly disagree and seven standing for strongly agree, transformed three (3) levels represented by 1 for disagree, 2 for neutral and 3 for agree and subsequently, the levels that emerged from transformation aided computation of total score using a spreadsheet computer programme (Nyange *et al.*, 2016). Thereafter, further computation of responses from the mean score was carried out to enable segregation and ranking of the outputs into 1 for low rank, 2 for moderate rank and 3 for high rank.

Testing for assumptions governing Mann-Whitney U was undertaken following Pallant (2016); the dependent variable resulted from the computation of ranks formed a continuous variable as one of the assumptions and dummy variables as predictors defined as ethnic groups, 1 = the Chagga, 2 = the Sukuma) were also formulated. Also, the choice of the Mann-Whitney U test originated from the concept that the test alternatively performs equally to the independent-samples t-test. The application of this test suits random samples and observations independently captured, meaning that every case or person can be considered at a one-time

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point. No repetition is anticipated to recur for the group or category, and the influence of data from one group should not affect another group (Pallant, 2016).

Since the Mann-Whitney U test's outputs were statistically different, the median values for each group were further computed to illustrate the differential direction to portray the group with a larger output. Consequently, the effect size was calculated to be in a position to explain the comparative greatness of differences between medians of ethnic groups on the existing ways for preserving SCDs of entrepreneurial capability between the SMEs owned by the Sukuma and Chagga. The effect size was calculated using equation 3 (Pallant, 2016).

$r = \frac{Z}{\sqrt{N}}$ ……..……. (3)

Where:

r = effect size, z = approximation test, N = total number of cases (sample size).

KMO and Bartlett's Test

Table 1 summarises the Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The statistic coefficients for KMO are presented in an assortment ranging from 0 to 1. The coefficient of 0 shows that the summation of incomplete associations is excellent compared to the totality of association, signifying that distribution in the patterns of associations (henceforth, factor analysis is probably unsuitable). The coefficients near 1 show that the patterns of associations comparatively are compacted, suggesting that factor analysis yielded distinct and consistent factors (Field, 2013). Kaiser (1974) recommended that the coefficients larger than 5 are suitable. In contrast, coefficients less than this coefficient guide researchers to opt for either collecting more data or rethinking the variables to be included. Further, coefficients ranging from 0.5 to 0.7 are ordinary, whereas those ranging from 0.7 to 0.8 are interpreted as good.

Finally, the coefficients ranging from 0.8 to 0.9 are tremendous, and those with coefficients higher than 0.9 are outstanding. The KMO coefficient from this study was 0.904, falling under the interpretation of being exceptional, and the data were suitable for factor analysis (Field, 2013). Bartlett's measure tests the null hypothesis that the matrix for the original association is the matrix with identity. Acceptability of factor analysis depends on the ability of the researcher to establish some associations between constructs and, in case the R-matrix is interpreted as the matrix for identity.

The output of all coefficients for the associations would be equivalent to zero. Consequently, this value is essential to be significant with p-value < 0.05. As a result, a significant output implies dissimilarity between the R-matrix and an identity matrix; consequently, constructs under the analysis exhibited some associations. Thus, Bartlett's test with the available data was exceedingly significant, with p < 0.01, implying that factor analysis was proper (Nyange, 2016).

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Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.904
Bartlett's Test of Sphericity	Approx. Chi-Square	9648.565
	df	1326
	Sig.	0.000

FINDINGS AND DISCUSSION

Testing for binary logistic regression assumptions

Testing for appropriateness of the logit model was undertaken before data analysis. The tested assumptions included sample size, outlier and influential cases, multicollinearity, accuracy percentage and independence of residuals.

Multi-collinearity

Standard error (S.E) as logit output (Table 2) was used as a measure for multi-collinearity (Table 2). Since the outputs for S.E. were below 2.0, this suggests that the data had no multi-collinearity. Furthermore, a correlation matrix (Table 2) was used to measure multi-collinearity. The correlation matrix results show that the correlations were very small among variables, implying no multi-collinearity existed. As Pallant (2016) argued, testing for multi-collinearity is aimed at ensuring that the correlation matrix of predictors is inadequately interrelated with others (< 0.90). As the result of this test, this assumption was not violated, thus necessitated to continue with logit model as further analysis. Pallant (2016) recommended a test on multi-collinearity for a logit model, though it is not common in most cases.

Table 2: Correlation Matrix

	Constant	**Values**	**Beliefs**	**Social**	**Attitudes**	**Norms**	**Perceptions**
Constant	1.000						
Values	-0.195	1.000					
Beliefs	-0.033	-0.062	1.000				
Social	0.087	-0.149	-0.011	1.000			
Attitudes	-0.048	0.120	-0.025	-0.049	1.000		
Norms	-0.019	0.142	0.001	-0.011	0.029	1.000	
Perceptions	0.109	-0.235	0.034	0.116	-0.001	-0.023	1.000

Independence of residuals

The residuals and lag (residuals) were performed in SPSS, and then the outputs were used to plot a graph with the aid of an Excel programme. The plotted graph (Figure 3) illustrates no well-established patterns, implying that patterns are independent.

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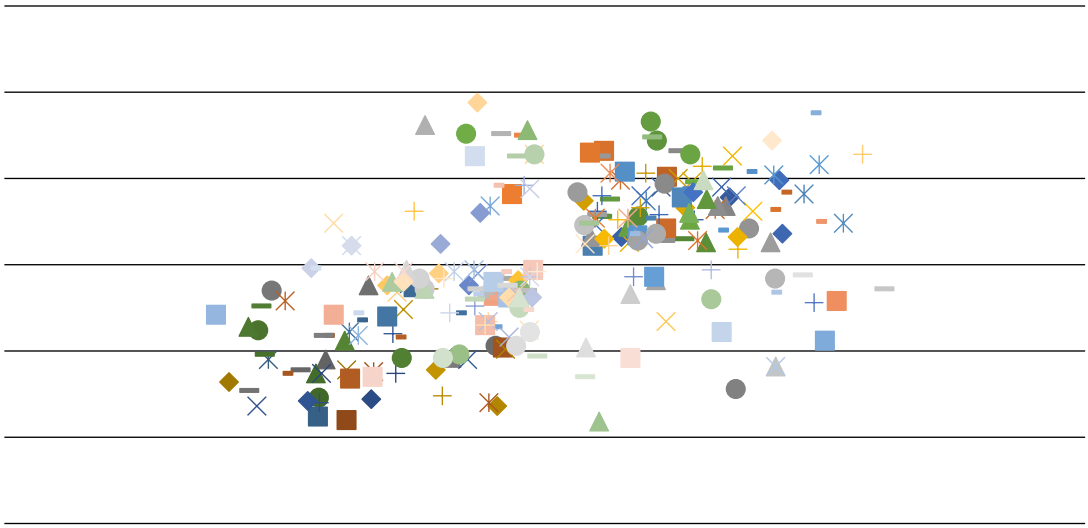

Figure 3: Independence of Residuals

Outlier and Influential Cases

Cook measures were carried out to measure data influential cases. The SPSS Cooks measure values were below 1.0, denoting the absence of data influential cases. Furthermore, the SPSS was tested for outliers by performing standardised residuals (normalised residuals). It is recommended that the data without outliers possess normalised residuals ranging from -3 to 3 (Anderson, 1982). The outputs indicated all values of the normalised residual below -3 and 3 except for two cases excluded in the analysis, as they had normalised residuals with values of -3.23 and 4.07.

Accuracy percentage (overall model evaluation)

A logit model stipulates an improved data fitting if it indicates perfection when the model is operated without predictors (Field, 2013). The outputs indicate that the model produced a -2Log likelihood of 350.542 as an intercept, though after entering all predictors into the model, the -2Log likelihood diminished to 269.314. The diminished -2 log-likelihood value proves an advancement comparing when the model runs without predictors, signifying that the model fits the data accordingly (Mashenene, 2016).

Further, after all predictors were entered into the model, a substantial quantity of the original changeability was explained with $\chi 2$ (6) of 81.22, and it was significantly noted ($p < 0.01$), inferring the fitness of data into the model. Another measure used to test the model's goodness-of-fit was percentage perfection. The argument is that when performing the model with the inclusion of variables, its percentage perfection as output is more significant than when performing the model while excluding variables (Anderson, 1982).

The results show that at the initial stage of the block, the percentage correct was 53.9, and after the inclusion of variables, the percentage correct improved to 72.8, denoting improvement in

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data accuracy and model fitness. Another measure that was used to test the model's goodness-of-fit was Hosmer and Lemeshow. The output of the model was a $\chi 2$ (8) of 3.842. When the model was operated together with all predictors, the output was insignificant (p = .871), implying data fitting accordingly in the model. According to the Hosmer and Lemeshow test, data demonstrating undesirable fitness in the model always yields significant output (Pallant, 2016).

Factor analysis

Data appropriateness for factor analysis

Factor analysis tools were used for various purposes, such as data reduction, removing unrequired or replication from a group of associated variables, and presenting associated variables together with a reduced group of resulting variables (Tundui, 2012). Specifically, factor analysis is adopted to discover data patterns or condense numerous variables into small numbers that are easy to manage. As Pallant (2016) observes, two main approaches for factor analysis exist in the literature: confirmatory and exploratory.

An exploratory factor analysis (EFA) is applied to explore the interrelationship among a group of variables. Still, confirmatory factor analysis (CFA) is adopted in testing definite theories or hypotheses concerning important hidden variables. Under the study, the application of EFA in exploring interrelationships among variables and reducing them from 52 to six factors: norms, values, attitudes, social factors, beliefs and perceptions that were easily managed. Data fitness to suit factor analysis was performed using KMO, a measure of sampling adequacy Bartlett's test and strength of correlation among variables. The KMO coefficient (Table 1) was 0.904, designating extraordinary appropriateness in sampling and fitting for factor analysis because the coefficient for KMO exceeded 0.5, which is defined as the cut-off point (Kaiser, 1974). Bartlett's test of sphericity shows a significant output ($p < 0.01$), inferring that the identity matrix and original R-matrix significantly differ.

Communalities after Extraction

Table 6 shows that after extraction, commonalities exhibited a range between 0.325 and 0.894 after subjecting 52 variables to factor analysis; all scores were greater than 0.3, which is the defined cut-off point. Commonalities always provide evidence on how considerably variables in every item are clarified, and all values showing scores under 0.3 signify that the corresponding item does not fit well with the rest of the items in a particular constituent. In this study, the values of commonalities were greater than 0.3, implying that items under testing displayed a good fit with other corresponding factors.

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Table 3: Communalities after Extraction

Items	Initial	Extraction
It is a short-term and not life-time relationships with people that is important in business life	1.000	0.859
Tolerance for business uncertainty and ambiguity is important to me	1.000	0.707
Managers should not delegate important tasks to employees	1.000	0.795
The influence of ethnicity has helped me to establish and grow my business	1.000	0.796
Enjoyable and comfortable life, like possession of valuable assets via business	1.000	0.863
Mobility of people for business opportunities	1.000	0.855
Daring to start a business/imaginative (daring, creativity, product innovation etc)	1.000	0.894
Social recognition and prestige (respect, dominance of resources) via business	1.000	0.870
Self-controlled/disciplined on business financial spending	1.000	0.834
Responsible in business undertaking (dependable, reliable)	1.000	0.701
Helpful to support others to grow up in business (e.g. family members)	1.000	0.753
Ambitious to achievement via business (hardworking, aspiring)	1.000	0.689
A sense of accomplishment in business (I finish what I start)	1.000	0.570
Traditionally, my ethnic group is more capable than others in Tanzania in doing business	1.000	0.547
Time commitment in business is an objective that must be achieved at any rate	1.000	0.641
My level of education has been beneficial in my business operations	1.000	0.439
The influence of my religion has supported me in growing my business	1.000	0.694
My family background in business has made a significant contribution to shaping my entrepreneurial capabilities	1.000	0.559
The presence of role models in the community has contributed in the success of my business	1.000	0.778
Business training I have received from mentors has helped me grow my business	1.000	0.559
The presence of peers/friends owning businesses has influenced me positively to start and grow my business	1.000	0.678
My family background in business helped me to establish business networks	1.000	0.582
The availability of business information has helped me very much to grow my business	1.000	0.515
Sharing information with other business owners is very important to me	1.000	0.408
Entrepreneurs are born, not made/learned is true for me	1.000	0.602
Among various options, being an entrepreneur is the best of all for me	1.000	0.571
It is frequently necessary for managers to tolerate low-profit-generating businesses	1.000	0.588
Group success is more important than individual reward	1.000	0.588
It is more important for men to have a professional career than it is for women	1.000	0.438
Society members mainly emphasise the business career path	1.000	0.720
Regarding more successful people in business	1.000	0.508
Being an entrepreneur is more advantageous than disadvantageous to me	1.000	0.629
Success in life is the function of business	1.000	0.552
There is no little money in business	1.000	0.543
Innovation and creativity is essential for entrepreneurial performance	1.000	0.669
Children are allowed to engage in business	1.000	0.592
It is common to sell family assets such as houses to finance the business	1.000	0.681
Borrowing money from money lenders for business is common	1.000	0.434
It is common for people to leave other economic activities and start a business	1.000	0.547
Making savings from business profits and reinvesting earnings	1.000	0.526

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Decision to start a new venture	1.000	0.550
Saving money for start-up capital	1.000	0.502

Extraction Method: Principal Component Analysis

Strength of Correlations among Variables

Table 4 presents omitted variables from factor analysis. The associations concerning variables underwent performance via examining correlation matrix termed as "R-Matrix" According to Nyange *et al.* (2016) and Bengesi (2013), variables whose correlations were under 0.3 in comparison with extra variables qualified for exclusion from factor analysis. However, Nyange *et al.* (2016) asserted that a higher loading factor above 0.3 would be recommended to strengthen the correlations among variables. On this basis, variables whose associations scored lower than 0.4 compared to the rest qualified for exclusion from factor analysis to increase the strength of correlations among variables in this study.

Table 4: Omitted Variables from Factor Analysis

Description of Variables	Extraction/Correlations
It is vital to work willingly for long hours even if at little immediate compensation	0.329
Managers should seldom ask for the opinion of employees	0.268
It is preferable to have a man in higher-level position in business rather than a woman	0.382
Managers should make most decisions without consulting subordinates	0.325
It is common to employ relatives in our businesses	0.367
Owning more than one business is important for entrepreneurial growth	0.294
The presence of partners in business, including the government, has supported me in growing my business	0.143
Marginalised individuals from resources are most likely to become entrepreneurs	0.331

Factor extraction

Some approaches for factor extractions exist: unweighted least squares, principal factors, image factoring, principal component factor analysis, alpha factoring, generalised least squares and maximum likelihood (Bengesi, 2013). The principal component analysis was adopted in this study since several authors provided positive recommendations for the method (Nyange *et al.*, 2016; Pallant, 2016; Bengesi, 2013).

Eigenvalues from a principal components analysis were considered to select how many factors to adopt in an analytical process (WHO, 2005). Table 8 presents eigenvalues connected with every factor before extraction, after extraction and after rotation. Beforehand extraction, the analytical process recognised 52 components of the dataset linearly. Eigenvalue represents the quantity of adjustment in the data defined by factors or corresponding variables, which the aspect denotes (WHO, 2005). Furthermore, the analytical process made the extraction of all factors whose eigenvalues were greater than 1.0 per Kaiser's argument (Pallant, 2016; Bengesi, 2013), the outcome for un-rotated factor maintained six (6) factors with 58.11% of the proportion of total adjustment. The main percentage of the adjustment before rotation is

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described by the first factor (29.45%), the factor that demonstrated a moderately higher score in comparison to the remaining five factors. The eigenvalues connected to the proportion of adjustment are clarified in the column named "extraction sums of squared loadings". The scores are equivalent to the score's beforehand extraction, except the scores for the remaining aspects with eigenvalues lower than 1.0 were disregarded. As a result, Table 5 is plain after the factor labelled number 6.

Table 5: Total Variance Explained By Extracted Factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.313	29.449	29.449	15.313	29.449	29.449	9.269	17.826	17.826
2	4.190	8.059	37.507	4.190	8.059	37.507	6.328	12.170	29.996
3	4.035	7.760	45.267	4.035	7.760	45.267	4.706	9.051	39.047
4	2.584	4.968	50.236	2.584	4.968	50.236	4.231	8.136	47.183
5	2.152	4.139	54.375	2.152	4.139	54.375	3.066	5.895	53.078
6	1.942	3.736	58.111	1.942	3.736	58.111	2.617	5.032	58.111
7	1.521	2.926	61.036						
8	1.437	2.764	63.800						
9	1.178	2.264	66.065						
10	1.058	2.034	68.099						
11	.987	1.898	69.997						
12	.944	1.815	71.812						
13	.895	1.722	73.533						
14	.843	1.621	75.155						
15	.785	1.510	76.664						
16	.763	1.467	78.131						
17	.740	1.423	79.554						
18	.710	1.365	80.919						
19	.674	1.297	82.215						
20	.626	1.203	83.418						
21	.574	1.103	84.521						
22	.542	1.041	85.563						
23	.524	1.009	86.571						
24	.480	.923	87.494						
25	.453	.872	88.366						
26	.432	.831	89.197						
27	.426	.819	90.017						
28	.382	.735	90.752						
29	.373	.717	91.469						
30	.336	.647	92.116						
31	.334	.643	92.758						
32	.317	.609	93.367						
33	.302	.581	93.948						
34	.293	.564	94.512						
35	.271	.522	95.034						
36	.245	.472	95.506						
37	.236	.454	95.960						
38	.221	.424	96.384						

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39	.199	.383	96.767
40	.191	.368	97.135
41	.187	.359	97.493
42	.174	.335	97.829
43	.163	.314	98.143
44	.162	.311	98.454
45	.153	.294	98.749
46	.149	.287	99.035
47	.114	.218	99.254
48	.108	.208	99.462
49	.089	.170	99.632
50	.080	.153	99.785
51	.063	.121	99.907
52	.049	.093	100.000

Extraction Method: Principal Component Analysis

Rotation of Factors

Table 5 displays "Rotation Sums of Squared Loadings" Eigenvalues of aspects after oblique rotation. The oblique rotation was carefully preferred with the postulation that the obtained features are interrelated (Bengesi, 2013). The rotation influences boosting the structure of factors, and one moment for the dataset is that the comparative reputation of all six factors is aligned. Beforehand rotation, the first described for considerably higher adjustment (29.449%) in comparison to 8.059%, 7.760%, 4.968%, 4.139% and 3.736% of the remaining five factors. Nevertheless, subsequently, rotation, the first factor described for only 17.826% of adjustment in comparison to 12.170%, 9.051%, 8.136%, 5.895% and 5.032% of the remaining five factors.

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Table 6: Pattern Matrix for Exploratory Factor Analysis after Oblique Rotation

Variables	**Factors**					
	1	**2**	**3**	**4**	**5**	**6**
It is a short-term and not life-time relationships with people that is important to success in business life	.733					
Tolerance for business uncertainty and ambiguity is important to me	.653					
Managers should not delegate important tasks to employees	.834					
The influence of ethnicity has helped me to establish and grow my business	.695					
Enjoyable and comfortable life like possession of valuable assets via business	.747					
Mobility of people for business opportunities	.675					
Daring to start a business/imaginative (daring, creativity, product innovation etc)	.549					
Social recognition and prestige (respect, dominance of resources) via business	.572					
Self-controlled/disciplined on business financial spending	.687					
Responsible in business undertaking (dependable, reliable)	.596					
Helpful to support others to grow-up in business (e.g. family members)	.806					
Ambitious to achievement via business (hardworking, aspiring)	.736					
A sense of accomplishment in business (I finish what I start)	.700					
Traditionally, my ethnic group is more capable than others in Tanzania in doing business	.622					
Time commitment in business is an objective that must be achieved at any rate	.765					
My level of education has been very much helpful in my business operations		.736				
The influence from my religion has supported me to grow my business		.819				
My family background in business has a great contribution in shaping my entrepreneurial capabilities		.519				
Presence of role models in the community has contribution in success of my business		.691				
Business training I have received from mentors has helped me grow my business		.678				
The presence of peers/friends owning businesses has influenced me positively to start and grow my business		.734				
My family background in business helped me to establish business networks		.501				
Availability of business information has helped me very much to grow my business		.618				
Sharing information with other business owners is very important to me			.811			
Entrepreneurs are born, not made/learned is true to me			.842			
Among various options, being an entrepreneur is the best of all to me			.806			
It is frequently necessary for managers to tolerate low-profit generating businesses			.850			
Group success is more important than individual reward			.805			
It is more important for men to have a professional career than it is for women			.793			

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Business career path is mostly emphasized by society members	.822		
Regarding higher successful people in business	.844		
Being an entrepreneur is more advantageous than disadvantageous to me	.782		
Success in life is the function of business	.715		
There is no little money in business	.720		
Innovation and creativity is important for entrepreneurial performance	.766		
Children are allowed to engage in business		606	
It is common to sell family assets such as house in order to finance the business		.528	
Borrowing money from money lenders for business is common		.672	
It is common for people to leave other economic activities and start business		.629	
Making savings from business profits and reinvesting earnings			.825
Decision to start a new venture			.838
Saving money for start-up capital			.822

Extraction Method: Principal Component Analysis

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Table 7 summarizes matrix patterns for explanatory factor analysis (n=254). The themes of the factors were developed grounded on the factors highly loaded for every factor. Therefore, after rotation, the obtained factors were termed the 1st factor (values), 2nd factor (social factors), 3rd factor (attitudes), 4th factor (beliefs), 5th factor (norms), and 6th factor (perceptions), and these factors were further treated as predictors in the logit model.

Logit Results

Table 7 summarises the whole fitness of the model, which was significant statistically (sig. < .05), representing that the model had the ability to forecast the influence of SCDs on EC. The results further indicate that the value of Nagelkerke R^2 was 0.181, suggesting that predictors in the model described 18.1% of adjustment in entrepreneurial capabilities. Nagelkerke R^2 value stipulates a sign of the quantity of disparity in the entrepreneurial capabilities described in the model (0 for small value and 1 for extremely large value). Such values are false R^2 statistics instead of the actual R^2 value in multiple linear regression (Pallant, 2016).

Table 7: Logit results

Socio-cultural Determinants	**B**	**S.E.**	**Exp(B)**
Values	0.516***	0.140	1.675
Social factors	0.361**	0.141	1.434
Attitudes	-0.250*	0.139	0.779
Beliefs	0.404**	0.142	1.110
Norms	0.686***	0.158	1.986
Perceptions	0.201	0.136	1.223
Constant	-0.236*	0.141	0.790
Chi-square	36.779***		
Hosmer and Lemeshow -χ2	3.842(8) (p=0.871)		
Cox & Snell R^2	0.135		
Nagelkerke R^2	0.181		
-2 Log Likelihood	254.507		

Dependent variable = Entrepreneurial capabilities (Capital increased > TZS 5 million = 1, capital ≤ TZS 5 million = 0), ***, ** & * signify significance level at 1%, 5% & 10% correspondingly.

Table 7 presents values with a significant ($p < 0.05$) and positive coefficient of 0.516 about entrepreneurial capabilities, signifying that any change of unit for values will necessitate a 51.6% rise in entrepreneurial capabilities. These results are reinforced by the odds ratio of 1.675, defined as values demonstrating the likelihood of changing entrepreneurial capabilities by 1.7 times.

The findings indicate social factors with a significant ($p < 0.05$) and positive coefficient of 0.361, informing that any change in the unit of social factors will produce a 36.1% rise in entrepreneurial capabilities. The odds ratio of 1.434 further supports these results by implying that social factors exhibited the likelihood of changing entrepreneurial capabilities by 1.4 times.

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Further, Table 7 presents attitude with a significant ($p < 0.1$) and negative coefficient of -0.250 to entrepreneurial capabilities, inferring that any attempt to change a unit of attitude will decrease entrepreneurial capability by 25% due to negative contribution.

Table 7 presents beliefs with a significant ($p < 0.05$) and positive coefficient of 0.404 in influencing entrepreneurial capabilities, inferring that any attempt to change a unit of belief will lead to a capital rise by 40.4%. These findings are further improved by the odds ratio of 1.110, which implies that beliefs demonstrate a 1.1 times likelihood of influencing entrepreneurial capabilities.

Table 7 presents norms with a significant ($p < 0.05$) and positive coefficient of 0.686 in influencing entrepreneurial capabilities, denoting that any effort undertaken in changing a unit of norms will cause a rise of 68.6% in entrepreneurial capabilities. These findings are further reinforced by an odds ratio of 1.986, implying that the likelihood of norms influencing entrepreneurial capabilities was 2.0 times.

Table 7 further summarises insignificant perceptions with a coefficient of 0.201 for affecting entrepreneurial capabilities. This indicates that any effort to change a unit of perceptions will lead to 20.1% in influencing entrepreneurial capabilities. Though perception exhibited an insignificant coefficient, its odds ratio demonstrated 1.2 times likelihood of changing capital.

Summary of Binary Logistic Regression Results

Table 8 presents a summary of logit results and the acceptance or rejection of hypotheses. The logit results have shown that values, social factors, beliefs, and norms significantly affect entrepreneurial capabilities. Further, attitudes have a less significant effect, while perceptions have an insignificant effect.

Table 8: Summary of logit results

S/No.	Hypotheses	Results
H_{a1}	Values have effect on the EC of the Sukuma and Chagga-owned SMEs	Accepted
H_{a2}	Social factors have an effect on the EC of the Sukuma and Chagga-owned SMEs	Accepted
H_{a3}	Attitudes have an effect on EC of the Sukuma and Chagga-owned SMEs	Accepted
H_{a4}	Beliefs have an effect on the EC of the Sukuma and Chagga-owned SMEs.	Accepted
H_{a5}	Norms have an effect on the EC of the Sukuma and Chagga-owned SMEs	Accepted
H_{a6}	Perceptions have an effect on the EC of the Sukuma and Chagga-owned SMEs	Rejected

Mann Whitney U test results

Following the presence of some ways for preserving SCDs of EC practised by both the Chagga and Sukuma, the study further compared the extent of the difference in practising such ways between the two ethnic groups. The ways for preserving SCDs of EC, which are practised by both Chagga and Sukuma, are mobility for business opportunities, hedonism, higher regard for entrepreneurial activities, children's involvement in business, women's involvement in business, employment of friends and/ or relatives, frequent sharing of business information and

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membership in business associations. Mann-Whitney U test outputs (Table 12) indicate statistical differences in the ways of preserving SCDs of EC between the Sukuma and Chagga-owning SMEs.

In this view, the decision was made to reject the null hypothesis and accept the alternative hypothesis. The statistical results show a significant difference ($p < .05$) for the scores of medians 3 and 1 for the Chagga and Sukuma SMEs, respectively, inferring that the ways of preserving SCDs of EC practised by the Chagga are 3 times better than in the Sukuma SMEs. As a result, the Chagga demonstrated advanced EC compared to the Sukuma.

Moreover, the r-value of 0.88 is interpreted as a very high-size effect using Cohen (1998), which provides interpretations as 0.5 for the large effect, 0.3 for the medium effect and 0.1 for the miniature effect. These findings imply that preserved socio-cultural determinants have a high effect size on entrepreneurial capability. These results favour those of Mashenene (2019), which indicates that the Chagga ethnic group is amongst the most entrepreneurial groups in Tanzania; the reason for such entrepreneurial capability is due to the role of ethnicity.

Table 9: Mann-Whitney U Test Results

Ethnic Group	n	Median	Mann-Whitney U	Wilcoxon	Z	r	P – value
Chagga	127	3.00	863.5	8991.5	-14.017	0.88	.000
Sukuma	127	1.00					

CONCLUSION AND RECOMMENDATIONS

Step-by-step factor analysis reduced several variables into fewer, which are easily managed. This means starting with many independent variables and reducing them before further analysis using econometric models is possible. Further, KMO was performed to ascertain the appropriateness of factor analysis with the collected data.

In the current study, predictors were reduced step by step from 52 to six (6) variables. Before the logit model was performed, several tests were performed to determine its suitability with the available data. After testing model fitness, the logit model was used to establish predictors' influence on capital change as a measure of entrepreneurial capabilities.

The findings indicated that values, norms, attitudes, beliefs and social factors positively and significantly affected entrepreneurial capabilities, while perceptions exhibited insignificant effects. Further, Mann Whitney U test outputs confirmed differences in ways to preserve socio-cultural determinants between the Sukuma and Chagga statistically exist, and the size of the effect was very large.

The recommendation made from the findings includes scholars and researchers making use of step-by-step procedures in data analysis of the studies concerning socio-cultural issues and their influence on the dependent variables, meaning that performing factor analysis and using

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KMO to test its suitability and further performance of logit model after testing the fundamental assumptions. It is further recommended that future research areas adopt other econometric models, such as multiple linear regression, Tobit, Probit, etc, after factor analysis.

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