Analysis of Competitiveness of Textile Industries in Morogoro and Dar Es Salaam Regions, Tanzania

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Abstract

Tanzania is promoting industrialization with a motive to attain the middle economy status and broaden employment opportunities to the country's population. This study analysed the competitiveness of textile industries in Morogoro and Dar es Salaam regions, Tanzania. More specifically, the overview of textile industries, their Strengths, Weaknesses, Opportunities and Threats (SWOC). Furthermore, were analysed by examining the competitiveness score among the firms in the area of study. The study used both primary and secondary data, secondary data were collected from official publications and records provided from the respective firms, while and primary data were collected from seven operating textile industries in the study area. The data were collected through questionnaires, interviews and observation. Descriptive analysis was used to examine the firm's performance, SWOC analysis was used to identify the strengths and weaknesses and the GEM Model was used to examine the competitiveness score. The results showed that, privately owned firms had a competitive advantage as opposed to public owned firms. Furthermore, the overall average GEM scores for competitiveness of the textile industries was 178 and industries with below 178 were considered as having competitive disadvantage. On the other hand, industries above 178 were considered as having a competitive advantage of above the national level. Hence, such textile industries were more competitive than was the case with the rest of textile industries and possesses the nationwide competitive advantage. Privately owned firms had a higher GEM competitive score than public owned firms. From the study, it is recommended that the textile and apparel firms need to consider adopting competitive strategies to enable them compete in a sustainable manner. Thereby, firms need to take into consideration the dimensions of diamond conditions in preparing for the corporate strategies that aim at attaining sustainable competitive advantage.

Key words: Textile, Competitiveness, Competitive Advantage

Background Information

Textile industry had been one of the foundations of today's industrialization in many countries in the world (Rodrik, 2013). Textile industry supported the industrialization in Europe, America and Asia (Allen, 2006; Rodrik, 2013). The trend of textile industrialisation seems to be emerging in Africa (Galindo and Mendez, 2014). The textile sub-sector is a highly labour-intensive industry, with a long value chain and a huge value addition potential (Keane and Velde, 2008). Hence, it is considered as of the most suitable industries for cotton producing countries, such as Tanzania (URT, 2011). Currently, Tanzania envisions to be industrialized (including textile industry)

through utilization of raw materials from the agricultural sector, one of which is cotton that feeds textile industries (URT, 2011).

As reported by Coulson in 2016, Tanzania had 21 large operational textile industries and apparel manufacturing firms altogether employing about 16 540 workers. Despite the potential of raw materials availability from cotton and the existence of textile industries, the range of textile manufactured products is very limited to mostly khanga and Vitenge whose qualities are generally quite low (Dinh and Monga, 2013).

Furthermore, comparing to other African export competitors, Tanzania's garment manufacturing industry is very weak and small with annual average exports worth 17 million dollars as opposed to Mauritius, Madagascar and South Africa, whose exports worth are $545m, $274m and $203m respectively (TCB, 2010; Kabissa, 2014).

With the growth and development from the textile industry and the potentials that exists, there was a need to carry out a comparative analysis of textile firms that operate between Morogoro and Dar es salaam, so that the findings from the study would be used to identify areas of strengths between the two areas as well as identifying those that seem to be weak so that appropriate strategic interventions would be taken to improve them.

Literature Review

Competitiveness

At the level of individual firms, competitiveness is the ability of a firm to survive and prosper, given the competition of other firms for the same profits. The competitiveness of a firm is the result of a competitive advantage relative to other firms (Porter, 1985). Porter defines competitive advantage as the ability of a company to make products that provide more value to the customer than rival products do, leading to higher sales and higher profits for that company (Porter, 1985; Porter, 1996).

Textile industries

Textile is a fabric that is made from yarn and is knitted or woven. Thus, the textile industry is the industry, which is responsible for taking a raw material such as cotton or wool and spinning it into yarn that is later used to create the fabric. All of the processes involved in the converting of the raw material into a finished product, including developing, producing, manufacturing and distributing textiles are included in the industry (Majeed, 2009).

The textile industry utilizes many different types of fabrics but all of them can be broken down into two major categories, natural and synthetic. Natural fabrics are those that occur naturally from things like animals (sheep, silkworms, alpacas) and plants (cotton and flax). Synthetic fabrics are those that are created in a lab and are man-made. Some examples of synthetic fabrics include rayon, spandex, polyester and nylon (Majeed, 2009).

Theoretical Framework

Michael Porter's theory of competitive advantage

This study is also guided by Porter's theory of competitive advantage, which contributes, to understanding the competitive advantage of nations in international trade and production. Its core, however, focuses upon individual industries, or clusters of industries, in which the principles of competitive advantage are applied. This theory begins from individual industries and builds up to the economy as a whole (Porter, 1990). Since firms, not nations compete in international markets, understanding the way firms create and sustain competitive advantage is the key to explaining what role the nation plays in the process (Porter, 2006; Porter 2008). Therefore, the essence of Michael Porter's argument is that "the home nation influences the ability of its firms to succeed in particular industries". This is possible due to the home nations geographical location, resources, infrastructure, policies, towards these industries that can give an edge to its domestic firms to succeed compared to foreign firms in that particular country. Given this interdependence, it appears that in order to draw conclusions on the competitiveness of the particular industry, consideration of the different facets of the competitive diamond of the whole nation is needed (Porter, 2006). Michael Porter considers the competitiveness of a country as a function

of four major determinants factor conditions, demand conditions, related and supporting industries and firm strategy, structure and rivalry (Porter, 2008).

Even though these determinants influence the existence of competitive advantage of the entire nation, their nature suggests that, they are more specific to a particular industry rather than being typical to a country. This is because in Porter's theory, the basic unit of analysis for understanding competition is the industry. "The industry is the arena in which the competitive advantage is won or lost." Therefore, seeking to isolate the competitive advantage of a nation means to explain the role played by national attributes such as a nation's economic environment, institutions, and policies for promoting the firms' ability to compete in a particular industry.

Groundings enterprises markets (GEM) model

In 1998, Canadian scholars Tim Padmore and Hervey Gibson improved the Porter's diamond model by creating a new model, which can describe and assess the competitiveness of clusters from a regional perspective. The GEM model established the six categories of determinants affecting the competitiveness of industrial cluster, which include: resources, infrastructures, suppliers and related industries, enterprise structure, strategy and rivalry, local market and external market. The six categories compose three parts: Groundings resource and infrastructure, Enterprises suppliers and related industries, enterprise's structure strategy rivalry markets, local market and external market. The GEM model is a tool of studying competitiveness of industrial cluster based on the PDM. Furthermore, the GEM model can quantify the level of competitiveness mathematically, which makes it more direct and convenient than other models do in analysing competitiveness (Padmore,1998).

Methodology

Study Area

The study was conducted in Morogoro and Dar es Salaam regions targeting textile industries. The study area was selected because of the presence of majority of textile industries in the country.

Research Design

This study followed cross sectional research, in which data were collected at a single point in time from a sample that represents a large population (Kothari, 2004).

Sampling Procedures and Sample Size

This study used a multistage sampling technique where three stages were involved. In the first stage, Dar es Salaam and Morogoro regions were purposively selected from the list of regions that constitute textile industries in Tanzania. In the second stage, seven (7) out of 15 textile industries in the study area were purposively selected based on their active operational activities within the study area. The third stage was the selection of respondents whose sampling frame was obtained from each textile industry and this included, the list of General Managers, Production Managers, Marketing Managers, Human Resource Managers, Accounting Managers, Procurement Managers and other competent and skilled officers in industrial dynamics. The simple random sampling method was used to draw the sample from the sampling frames.

Sample size

One hundred and thirty-nine (139) respondents were chosen randomly from a list of officials. However, 59 respondents were dropped due to problems of missing data and this reduced the sample size to 80 respondents for the meaningful analysis.

Data Collection and Sources

Data were collected from respondents through observation and formal interviews using structured questionnaires. Questionnaires were composed of both open and closed ended questions, which were administered to managers and other competent and skilled officers in industrial dynamics. Open-ended questions were used to get in depth information from key informants, which consist of managers of the respective textile industries. The questions focused on competitiveness of textile industries

using the Porters' Diamond Model (PDM) determinants.

Data Analysis

Descriptive analysis of Porters diamond model was done. Computation of key preliminary statistics such as mean, median and standard deviation were carried out (Maher, 2008; Jones, 2013). Descriptive statistics involve variables of Michael Porter competitiveness conditions, which include factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry and the role of the government. Moreover, SWOT analysis was used to identify the underlying strengths, opportunities, weaknesses and threats in each aspect of the PDM. In addition, the researcher assessed and analysed the textile industries quantitatively through developing a competitiveness evaluation model of the textile industries based on the GEM model, which has been applied in the United Kingdom, principally in a consulting context. In this regard, the determinants of the six scores will be analysed by the following formula: $D_{ij}=\sum(Score)_{ik} \times(Weight)_{ik}$ and the linear cluster score" was by (Linear cluster score) = ∏i=1, 3 (PAIR SCORE).

Reliability and Validity Analysis

To check for the reliability and validity of the scale, Crobach's alpha (α) was used. Crobach's alpha (α) developed by Lee Cronbach in 1951, measures reliability, or internal consistency (Cronbach, 1951). It tests the reliability of Likert scale. The measure of scale reliability ranges from 0 to 1.0 whereby a score of more than 0.7 is generally considered acceptable, less than 0.7 is always questionable and sometimes unacceptable while a score of 0.9 and above is excellent (Field, 2005).

Findings and discussion

Reliability and validity analysis

The Crobach's alpha (α), a measure of scale reliability, was used to check for the content validity of the constructs and internal consistency of the items measuring the constructs. All the constructs had excellent average internal consistency of 0.8 indicating that the constructs are a good measure of competitive advantage. In addition, all variables were subjected to reliability analysis of checking for internal consistency, all variables had excellent internal consistency (Table 1).

Table 1: Construct validity

Porters Condition	Cronbach's	Cronbach's Alpha Based on	Number
Factor Conditions	0.81	0.81	7
Demand Conditions	0.82	0.82	3
Related Industries	0.77	0.77	1
Firm Strategy	0.84	0.84	4
The Role of Government	0.76	0.74	1

Overview of the Textile Industries

Application of the Porter's diamond model

The four determinants put forward by Michael E. Porter, which influence an industry, are factors condition, demand condition, related and supporting industries and firm strategy, structure and rivalry. These affect each other and the weaknesses of every determinant will impede industrial upgrading and the potential of innovation. Meanwhile, Porter also emphasizes on the functions of government and chance. It is argued that, the government should avoid intervening in the market extensively. Chance events, which are fortuitous, can alter the original conditions and create discontinuities that allow shifts in competitive position. Chance events can also influence and change key determinants in the diamond system. In the following sections, descriptive analysis and assess of the four determinants was done in details one by one based on the present situation of each textile industry (Porter, 1990).

Table 2: Analysis of the textile industries using strengths, weakness, opportunities and threats (SWOT)

No.	Textile Industry	Strengths	Weaknesses	Opportunities	Threats
1.	21st Century Textile Ltd	1. The only producer of army uniforms in the country and government medical stores. 2. Exports strings to china and India 3. First class machines are available 4. Exports products to Asian countries such as China and India	1. Average Products quality. 2. Products prices are high.	1. Huge domestic demand gap needs to be filled by the suppliers. 2. Government taxes to competitors who avoided tax before has stimulated sales due to fair competition.	1. Electricity costs are high thus affecting production.
2.	Tanzania Packaging Manufactures (1998) Ltd	1. Produces durable bags in the country as opposed to the imported polythene bags. 2. 100% sisal produced goods.	1. Outdated machines 2. Low level of capital invested 3. Labourers lack vocational training 4. Few skilled textile specialists	1. Huge domestic demand for the bags.	1. Too many taxes and charges and thus affecting the conducive environment to operate. 2. Importers of clothing and apparel
3.	Nida Textile Mills Ltd	1. Exports products to East African countries, SADC European, as well as American markets.	1. High product prices.	1. Huge domestic demand gap needs to be filled by the suppliers.	1. Importers of clothing and apparel
4.	Tanzania – China Friendship Textile co Ltd (URAFIKI)	1. Produces police uniforms countrywide. 2. 100 % cotton produced goods.	1. Outdated machines 2. Low technology 3. Low production 4. High costs of operation 5. Capital is depleted through machine maintenance 6. Low skilled workers due to low salaries	1. Blending machine to blend fibre and cotton due to its high demand. 2. Huge demand of textile clothing in the market	1. Loss of customer base due to competition.

No.	Textile Industry	Strengths	Weaknesses	Opportunities	Threats
5.	Open Sanit Ltd	1. High product quality 2. High end Machines 3. Research and development is highly practiced. 4. Vocational training is done at international levels.	1. High product prices	1. Huge demand of clothing and apparel in the market	1. Local customers do not purchase locally produced clothing and apparel 2. Lack of clear policies from the government in accordance to the industry. 3. Change in customer preferences and taste.
6.	Blankets and Textile Manufactures (1998) Ltd	1. Favourable prices for the goods produced.	1. Outdated machines 2. Low level of capital invested 3. Labourers lack vocational training 4. Few skilled textile specialist	1. Huge domestic demand gap needs to be filled by the suppliers.	1. Importers of clothing and apparel 2. Loss of customer base due to competition.
7.	Kibo Trade Textile Ltd	1. Exports goods to the international clients	1. Average Products quality. 2. Products prices are high.	1. Huge domestic demand gap needs to be filled by the suppliers.	1. Loss of customer base due to competition on prices.

Quantitative Analysis Results of Competitiveness of Textile Industries using the Application of the Gem Model

(a) 21st century textile Ltd

According to the data in Table 5, the scores of six determinants (D_{ij}) of the industry with the formula:

$$D_{ij} = \Sigma\left(Score\right)_{ik} \times \left(Weight\right)_{ik}$$

were obtained.

Whereby: *i*=1-3, *j*=1-2, *k*=1-*n* and *n* are the number of the subsets

i refers from the GEM Model hierarchy which consists of three components that are Groundings, Enterprises and Markets. Thus, making the values of *i* ranging from 1-3

j refers from the GEM hierarchy six determinants that are resources, infrastructure, supplier and related industry, firm structure, strategy and rivalry, local market, external market. Thus, making the values of *j* range from 1-2 as the determinants are clustered in groups of two in accordance to the Groundings; resources and infrastructure; Enterprises; supplier and related industry, firm structure, strategy and rivalry; Markets; local markets, external markets.

k refers to the GEM hierarchy sub determinants (sub-factors) that are elaborated from each determinant (factor)

n refers to the number of sub determinants (sub-factors)

Therefore,

D11= 5.550	D12= 4.697
D21= 5.147	D22= 6.591
D31= 5.005	D32= 3.501
Average	D_{ij}= 5.082

Then, the scores of factor pairs were calculated following the transformation rule:

(PAIR SCORE) i=(D2i-1+D2i)/2

(PAIR SCORE) 1=5.123

(PAIR SCORE) 2=5.869

(PAIR SCORE) 3=4.253

(LINEAR CLUSTER SCORE) = ∏i=1, 3(PAIR SCORE)i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, GEM score of competitiveness of the textile industry obtained was 258.

(b) Tanzania packaging manufacturers (1998) Ltd

According to data in Table 6, the scores of six determinants (D_{ij}) of the industry with the formula: $D_{ij} = \Sigma\left(Score\right)_{ik} \times \left(Weight\right)_{ik}$ were obtained.

(Whereby *i*=1-3, *j*=1-2, *k*=1-n and *n* is the number of the subsets):

Therefore,

D11=4.484	D12=3.998
D21=4.136	D22=4.233
D31=3.640	D32=1.437
Average	D_{ij}=3.655

Then, the scores of factor pairs were calculated following the transformation rule:

(PAIR SCORE) i=($D2_i$-1+$D2_i$)/2

(PAIR SCORE) 1=4.241

(PAIR SCORE) 2=4.184

(PAIR SCORE) 3= 2.538

Lastly, the "linear cluster score" were calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations

The Formulas are as shown below:

(LINEAR CLUSTER SCORE) = ∏i=1, 3 (PAIR SCORE) i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, the Gem score of competitiveness of the textile industry obtained was 133.

(c) Nida Textile Mills Ltd

According to data in Table 7, the scores of six determinants (D_{ij}) of the industry with the formula: $D_{ij} = \Sigma\left(Score\right)_{ik} \times \left(Weight\right)_{ik}$ were obtained.

(Whereby i=1-3, j=1-2, k=1-n and n is the number of the subsets):

Therefore,

D11=5.480	D12= 4.429

Table 3: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	5.2	0.441	2.2932
	2	Geographical Location	5.7	0.559	3.1863
Infrastructure (D12)					
	1	Transportation and Infrastructure	5.1	0.174	0.8874
	2	Market Infrastructure	3.8	0.174	0.6612
	3	Business Environment	4.6	0.17	0.782
	4	Local Financial Markets	4.5	0.156	0.702
	5	R and D Institution	3.5	0.156	0.546
	6	Vocational Training	5	0.17	0.85
Supplier and Related Industry (D21)					
	1	Raw Material Availability	5.7	0.328	1.8696
	2	The Service Level of Suppliers	5.5	0.32	1.76
	3	The Development Level of Related Industries	5.2	0.352	1.8304
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	5.7	0.198	1.1286
	2	The Level of Value-Added	4.6	0.203	0.9338
	3	The Ability of Brand - Operation	4.5	0.208	0.936
	4	Production Equipment	5.1	0.193	0.9843
	5	Product Quality	5.6	0.198	1.1088
Local Market (D31)					
	1	Domestic Market Share	5.7	0.364	2.0748
	2	Domestic Market Potential	4.7	0.314	1.4758
	3	Domestic Demand Distinctiveness	5	0.322	1.61
External Market (D32)					
	1	Characteristics of Foreign End User	4	0.286	1.144
	2	Export and Trade Barriers	3.2	0.254	0.8128
	3	Foreign Market Relationship	3.6	0.246	0.8856
	4	International Market Share	3.4	0.214	0.7276

D21=5.460 D22=5.092
D31= 5.161 D32= 3.570
Average D_{ij}= 4.865

Then, the scores of factor pairs were calculated following the transformation rule:
(PAIR SCORE) i = $(D2_i\text{-}1+D2_i)/2$
(PAIR SCORE) 1= 4.954
(PAIR SCORE) 2= 5.276
(PAIR SCORE) 3= 4.365

Lastly, the "linear cluster score" was calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations.
The formulas are as shown below:
(LINEAR CLUSTER SCORE) = ∏i=1, 3 (PAIR SCORE)i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, the GEM score of competitiveness of the textile industry obtained was 236.

(d) Tanzania – China Friendship Textile Co. Ltd (URAFIKI)

According to data in Table 8, the scores of six determinants (Dij) of the industry with the formula: $D_{ij} = \Sigma(Score)_{ik} \times (Weight)_{ik}$ were obtained.

Whereby i=1-3, j=1-2, k=1-n and n is the number of the subsets:

Therefore,

D11=5.297 D12=3.463

D21=3.734 D22=5.580

D31=4.124 D32=4.264

Average D_{ij}= 4.410

Then, the scores of factor pairs were calculated

Table 4: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	4.4	0.579	2.5476
	2	Geographical Location	4.6	0.421	1.9366
Infrastructure (D12)					
	1	Transportation and Infrastructure	3.9	0.167	0.6513
	2	Market Infrastructure	4.3	0.186	0.7998
	3	Business Environment	4.0	0.171	0.684
	4	Local Financial Markets	4.5	0.167	0.7515
	5	R and D Institution	3.9	0.148	0.5772
	6	Vocational Training	3.3	0.162	0.5346
Supplier and Related Industry (D21)					
	1	Raw Material Availability	4.4	0.356	1.5664
	2	The Service Level of Suppliers	3.9	0.356	1.3884
	3	The Development Level of Related Industries	4.1	0.288	1.1808
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	3.8	0.217	0.8246
	2	The Level of Value-Added	4.6	0.163	0.7498
	3	The Ability of Brand - Operation	4.2	0.207	0.8694
	4	Production Equipment	4.0	0.185	0.74
	5	Product Quality	4.6	0.228	1.0488
Local Market (D31)					
	1	Domestic Market Share	3.1	0.327	1.0137
	2	Domestic Market Potential	4.0	0.346	1.384
	3	Domestic Demand Distinctiveness	3.8	0.327	1.2426
External Market (D32)					
	1	Characteristics of Foreign End User	1.6	0.273	0.4368
	2	Export and Trade Barriers	1.5	0.273	0.4095
	3	Foreign Market Relationship	1.3	0.227	0.2951
	4	International Market Share	1.3	0.227	0.2951

following the transformation rule: (PAIR SCORE) i=(D2i-1+D2i)/2
(PAIR SCORE) 1=4.380
(PAIR SCORE) 2=4.657
(PAIR SCORE) 3= 4.194

Lastly, the "linear cluster score" was calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations. The formulas are as shown below:

(LINEAR CLUSTER SCORE)=D_i=1, 3 (PAIR SCORE)i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, GEM score of competitiveness of the textile industry obtained was 194.

Table 5: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	5.2	0.517	2.6884
	2	Geographical Location	5.4	0.483	2.6082
Infrastructure (D12)					
	1	Transportation and Infrastructure	3.7	0.162	0.5994
	2	Market Infrastructure	3.4	0.166	0.5644
	3	Business Environment	3.4	0.174	0.5916
	4	Local Financial Markets	3.6	0.17	0.612
	5	R&D Institution	3.1	0.17	0.527
	6	Vocational Training	3.6	0.158	0.5688
Supplier and Related Industry (D21)					
	1	Raw Material Availability	3.2	0.376	1.2032
	2	The Service Level of Suppliers	3.9	0.299	1.1661
	3	The Development Level of Related Industries	4.2	0.325	1.365
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	5.2	0.204	1.0608
	2	The Level of Value-Added	5.3	0.167	0.8851
	3	The Ability of Brand-Operation	5.8	0.204	1.1832
	4	Production Equipment	6.0	0.204	1.224
	5	Product Quality	5.5	0.223	1.2265
Local Market (D31)					
	1	Domestic Market Share	4.5	0.318	1.431
	2	Domestic Market Potential	4.3	0.345	1.4835
	3	Domestic Demand Distinctiveness	3.6	0.336	1.2096
External Market (D32)					
	1	Characteristics of Foreign End User	5.0	0.248	1.24
	2	Export and Trade Barriers	4.6	0.279	1.2834
	3	Foreign Market Relationship	4.4	0.248	1.0912
	4	International Market Share	2.9	0.224	0.6496

(e) Open sanit Ltd

According to data from Table 9, the scores of six determinants (D_{ij}) of the industry with the formula: $D_{ij} = \Sigma\left(Score\right)_{ik} \times \left(Weight\right)_{ik}$ were obtained.

(Whereby i=1-3, j=1-2, k=1-n and n is the number of the subsets):

Therefore,

D11=5.202 D12=5.009
D21=4.902 D22=5.560
D31= 4.402 D32=4.045
Average D_{ij}=4.853

Then, the scores of factor pairs were calculated following the transformation rule: (PAIR SCORE) i=($D2_i$-1+$D2_i$)/2

Table 6: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	4.8	0.5	2.4
	2	Geographical Location	6.3	0.5	3.15
Infrastructure (D12)					
	1	Transportation and Infrastructure	6	0.184	1.104
	2	Market Infrastructure	5.7	0.171	0.9747
	3	Business Environment	4.6	0.184	0.8464
	4	Local Financial Markets	3.9	0.162	0.6318
	5	R and D Institution	4	0.158	0.632
	6	Vocational Training	3.6	0.141	0.5076
Supplier and Related Industry (D21)					
	1	Raw Material Availability	5.7	0.374	2.1318
	2	The Service Level of Suppliers	5.1	0.33	1.683
	3	The Development Level of Related Industries	4.5	0.296	1.332
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	5.1	0.194	0.9894
	2	The Level of Value-Added	6.4	0.184	1.1776
	3	The Ability of Brand - Operation	5.2	0.214	1.1128
	4	Production Equipment	5.7	0.184	1.0488
	5	Product Quality	10.1	0.224	2.2624
Local Market (D31)					
	1	Domestic Market Share	4.8	0.351	1.6848
	2	Domestic Market Potential	4.8	0.316	1.5168
	3	Domestic Demand Distinctiveness	5.4	0.334	1.8036
External Market (D32)					
	1	Characteristics of Foreign End User	4.4	0.231	1.0164
	2	Export and Trade Barriers	3.1	0.265	0.8215
	3	Foreign Market Relationship	3.5	0.252	0.882
	4	International Market Share	3.1	0.252	0.7812

Table 7: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	5.1	0.487	2.4837
	2	Geographical Location	5.3	0.513	2.7189
Infrastructure (D12)					
	1	Transportation and Infrastructure	4.9	0.174	0.8526
	2	Market Infrastructure	5.2	0.16	0.832
	3	Business Environment	4.8	0.156	0.7488
	4	Local Financial Markets	5	0.174	0.87
	5	R and D Institution	4.8	0.183	0.8784
	6	Vocational Training	5.3	0.156	0.8268
Supplier and Related Industry (D21)					
	1	Raw Material Availability	4.8	0.319	1.5312
	2	The Service Level of Suppliers	4.9	0.345	1.6905
	3	The Development Level of Related Industries	5	0.336	1.68
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	5.5	0.188	1.034
	2	The Level of Value-Added	5.4	0.208	1.1232
	3	The Ability of Brand - Operation	5.7	0.208	1.1856
	4	Production Equipment	5.6	0.188	1.0528
	5	Product Quality	5.6	0.208	1.1648
Local Market (D31)					
	1	Domestic Market Share	4.3	0.313	1.3459
	2	Domestic Market Potential	4.4	0.357	1.5708
	3	Domestic Demand Distinctiveness	4.5	0.33	1.485
External Market (D32)					
	1	Characteristics of Foreign End User	4.5	0.243	1.0935
	2	Export and Trade Barriers	4	0.25	1
	3	Foreign Market Relationship	4	0.25	1
	4	International Market Share	3.7	0.257	0.9509

(PAIR SCORE) 1=5.106
(PAIR SCORE) 2=5.231
(PAIR SCORE) 3= 4.223

Lastly, the "linear cluster score" was calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations.
The formulas are as shown below:

(LINEAR CLUSTER SCORE) =D_i=1,3 (PAIR SCORE) i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, the Gem score of competitiveness of the textile industry obtained was 235.

(f) Blankets and textiles manufacturers (1998) Ltd

According to data in Table 10, the scores of six determinants (Dij) of the industry with the formula: $D_{ij} = \Sigma(Score)_{ik} \times (Weight)_{ik}$ were obtained.

(Whereby i=1-3, j=1-2, k=1-n and n is the number of the subsets):

Therefore,

D11=3.100 D12=2.784

D21= 2.872 D22=3.157

D31= 2.734 D32= 2.100

Average D_{ij}=2.791

Then, the scores of factor pairs were calculated following the transformation rule:

(PAIR SCORE) $i=(D2_i\text{-}1+D2_i)/2$

(PAIR SCORE) 1=2.942

Table 8: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	2.8	0.5	1.4
	2	Geographical Location	3.4	0.5	1.7
Infrastructure (D12)					
	1	Transportation and Infrastructure	3	0.173	0.519
	2	Market Infrastructure	3	0.191	0.573
	3	Business Environment	2.8	0.191	0.5348
	4	Local Financial Markets	2.6	0.164	0.4264
	5	R and D Institution	2.6	0.145	0.377
	6	Vocational Training	2.6	0.136	0.3536
Supplier and Related Industry (D21)					
	1	Raw Material Availability	3	0.345	1.035
	2	The Service Level of Suppliers	2.8	0.328	0.9184
	3	The Development Level of Related Industries	2.8	0.328	0.9184
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	3.4	0.196	0.6664
	2	The Level of Value-Added	3.2	0.196	0.6272
	3	The Ability of Brand - Operation	3	0.206	0.618
	4	Production Equipment	3.2	0.196	0.6272
	5	Product Quality	3	0.206	0.618
Local Market (D31)					
	1	Domestic Market Share	2.6	0.328	0.8528
	2	Domestic Market Potential	2.8	0.344	0.9632
	3	Domestic Demand Distinctiveness	2.8	0.328	0.9184
External Market (D32)					
	1	Characteristics of Foreign End User	2.2	0.25	0.55
	2	Export and Trade Barriers	2.2	0.25	0.55
	3	Foreign Market Relationship	2	0.268	0.536
	4	International Market Share	2	0.232	0.464

(PAIR SCORE) 2=3.014
(PAIR SCORE) 3=2.417

Lastly, the linear cluster score was calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations. The formulas are as shown below:

(LINEAR CLUSTER SCORE) = D_i=1, 3 (PAIR SCORE) i

$$GEM = 2.5(D_i = 1,3(D_{2i-1} + D_{2i}))^{2/3}$$

Hence, after the calculations, the Gem score of competitiveness of the textile industry obtained was 77.

(g) Kibo trade textiles Ltd

According to data from Table 11, the scores of six determinants (D_{ij}) of the industry with

Table 9: Results of the quantification and calculation

Factor	No	Sub-Factor	Average Pair Score	Average Weight Score	Final Score
Resources (D11)					
	1	Labour Force Availability	3.8	0.511	1.9418
	2	Geographical Location	3.6	0.489	1.7604
Infrastructure (D12)					
	1	Transportation And Infrastructure	3.4	0.181	0.6154
	2	Market Infrastructure	3.1	0.181	0.5611
	3	Business Environment	3.3	0.167	0.5511
	4	Local Financial Markets	3.2	0.157	0.5024
	5	R&D Institution	2.7	0.148	0.3996
	6	Vocational Training	3.1	0.167	0.5177
Supplier and Related Industry (D21)					
	1	Raw Material Availability	2.7	0.368	0.9936
	2	The Service Level of Suppliers	3.2	0.325	1.04
	3	The Development Level of Related Industries	3.3	0.308	1.0164
Firm Structure, Strategy and Rivalry (D22)					
	1	Managerial Level	4.2	0.229	0.9618
	2	The Level of Value-Added	3.6	0.169	0.6084
	3	The Ability of Brand - Operation	3.4	0.199	0.6766
	4	Production Equipment	3.9	0.174	0.6786
	5	Product Quality	3.5	0.229	0.8015
Local Market (D31)					
	1	Domestic Market Share	3.8	0.318	1.2084
	2	Domestic Market Potential	3.7	0.346	1.2802
	3	Domestic Demand Distinctiveness	3.4	0.336	1.1424
External Market (D32)					
	1	Characteristics of Foreign End User	3.5	0.261	0.9135
	2	Export and Trade Barriers	3.7	0.261	0.9657
	3	Foreign Market Relationship	3.4	0.239	0.8126
	4	International Market Share	3.4	0.239	0.8126

the formula: $D_{ij}=\sum(Score)_{ik} \times (Weight)_{ik}$ were obtained.

(Whereby i=1-3, j=1-2, k=1-n and n is the number of the subsets):

Therefore,

D11=3.702 D12=3.147

D21=3.05 D22=3.727

D31=3.631 D32=3.504

Average D_{ij}=3.460

Then, the scores of factor pairs were calculated following the transformation rule: (PAIR SCORE) i= $(D2_i-1+D2_i)/2$

(PAIR SCORE) 1=3.425

(PAIR SCORE) 2=3.388

(PAIR SCORE) 3=3.568

Lastly, the "linear cluster score" was calculated to get the final score of competitiveness of the Textile industries in terms of the two transformations.

The formulas are as shown below:

(LINEAR CLUSTER SCORE) = D_i=1, 3(PAIR SCORE) i

GEM=2.5 (Di=1,3 $(D2_i-1+D2_i))2/3$

Hence, after the calculations, we got the Gem score of competitiveness of the Textile industry is 119.

Result analysis and implications

The overall average GEM scores of the textile industries is 178, whereby industries below 178 are considered as having the competitive disadvantage in the study area as described by the theory of National Competitive Advantage of Industries by Michael Porter. On the other hand, industries above 178 are considered as having a competitive advantage above the national level and hence are more competitive than is the case with the remaining industries, as these industries possess the nationwide competitive advantage.

Discussion conclusion and recommendation

This study aimed at analysing the competitiveness of textile industries taking a case study of textile industries in Morogoro and Dar es Salaam regions in Tanzania. The study strongly supports the competitiveness framework developed for this study based on PDM and GEM, models. The analysis was done at two models. In analysing textile industries using the GEM model, the determinants were used and tested through questionnaires. The PDM was applied in analysing the competitiveness of the textile industries qualitatively and quantitatively, whereby 23 sub-factors were examined based on related theories of the textile industry and the GEM model.

In the qualitative analysis, it can be concluded that private owned textile industries had more strengths, compared to the public owned textile industries through having the ability to export firms' products, however, public owned textile industries faced weaknesses due having outdated machines and technology, few skilled textile specialists, furthermore, the textile industries recognize huge domestic demand

Table 10: Result analysis and implications

No.	Textile Industry	GEM score	GEM Average Score	Position relative to Average score	Rank
1	21st Century Textile Ltd	258	178	Above	1
2	Tanzania Packaging Manufactures (1998) Ltd	133	178	Below	5
3	Nida Textile Mills Ltd	236	178	Above	2
4	Tanzania – China Friendship Textile Co. Ltd (URAFIKI)	194	178	Above	4
5	Open Sanit Ltd	235	178	Above	3
6	Blankets and Textile Manufactures (1998) Ltd	77	178	Below	7
7	Kibo Trade Textile Ltd	119	178	Below	6

as an opportunity to increase production and maximize their profits and competition being a major threat to their textile industries.

The GEM score of the Textile industries in the study area was found to range from 258 to 77 whereby the average score was 178. Textile industries above the average score meant that these industries are competitive, are above the national average level and possess a nationwide competitive advantage. Although, the maximum GEM score for the top competitive firm was 490, the firms in the study area scored half of the score and below. Hence, all the domestic textile industries in the study area still have a long way to go to become an excellent centre for textile products. After making a comparison between the two results of different ways, the results of analysis obtained from the PDM were found to be the same as those from the GEM model. Both outcomes illustrated that the Textile industries, which portrayed to have strong and full of opportunities in the qualitative SWOT analysis, had competitive advantage on the national level as opposed to textile industries, which were weaker and faced threats from the competitors.

Recommendations

The textile and apparel firms need to upgrade machinery and technology and have modern age machines these will facilitate cost minimization during production process, improving quality of the products and therefore enabling them to have competitive prices domestically and internationally.

The government should impose policies favouring the import substitution industries whereby discouraging importers and thus facilitating domestic textile and apparel firms to have a strong market share. This will foster the growth and prosperity of the textile and apparel firms.

The government should consider introducing higher education courses on the textile and apparel industry due to the fact that most textile and apparel firms struggle due to having less skilled expertise on these fields and thus hindering the overall performance of the textile and apparel firms.

The textile and apparel firms need to consider adopting competitive strategies to enable them compete in a sustainable manner. Specifically, the firms need to take into consideration both internal and external factors in designing of competitive strategies as proposed by this study.

In doing so, firms need to take into consideration the dimensions of diamond conditions in preparation of the corporate strategies that aims at sustainable competitive advantage. If the firms are efficiently managed, they contribute to the overall industry competitiveness.

Moreover, for the firms to be able to manage the outbound and inbound logistics, the government has a role of developing the necessary infrastructure such as access roads for the firms to outsource supplies and deliver products. Specifically, the firms need to improve management of inbound and outbound logistics, which are necessary in delivering the required inputs to the firm and outwards selling of the products and services. The ability to manage marketing of firm's products is core to success, and firms need to have marketing strategies and effective implementation. Research and development for innovation and upgrading are important factors thus, firms need to establish research and development units and empower them with competent staff. There is a need for the firms to undertake research for products developments, new technologies, changing marketing and fashions, customer tastes and other critical aspects, which are necessary for firms upgrading and innovation.

With respect to core competencies, the firms need to enhance firms' internal capabilities to develop human resource plans to attract competent staff with personalities that fit the company, considering partner firms skills in firm activities, developing effective strategic leadership to cope with the technological challenges and strategies for capacity building. With respect to competition, firms need to improve quality, offer better custom services, and scale up promotion campaigns of their products and active product innovation. For the alternative products, the government is in the best position to regulate importation of second-hand clothes and promote buy Tanzania campaign of increasing Tanzanians preferences on local products. As for the barriers to entry,

the government needs to improve conditions as accessing raw materials, scale up efforts of reducing high costs of doing business and invest in specialized technologies and favourable locations.

As regards with the macro model of the study, stakeholders in the public and private sectors are encouraged to use the PDM in the quest for improving competitive advantage for Tanzania. The PDM is an important tool that needs serious consideration by the government and industry policy makers, as it is important in creating and upgrading factors that would create competitive advantage given that the inherited natural resources would not guarantee competitive advantage on their own. In particular, firms need to embark on developing factor conditions by upgrading skills of employees, reducing costs and accessibility of capital resources, adopting latest technology for production of quality textiles and investing in infrastructure development (roads, railways, ports).

There is a need of studying the demand patterns by carefully looking at customer preferences and produce quality products taking into consideration the right approaches of production. More importantly, there is need of investing in critical success factors, such as provision of enabling environment for efficient early rapid and preferential access to the required inputs enhancing linkages for manufacturing, distribution and marketing; development of industry's value chains and strengthening information flow among the industry participants, and efforts in developing the cluster programmes.

The government has an important role as a catalyst and challenger in influencing the industry's competitive advantage by improving regulatory framework and promoting Foreign Direct Investment (FDI). All the determinants of the diamond model should be taken into consideration in the quest for improving competitive advantage at the industry and national levels. Improvement of the national macro-economic conditions as determined by the diamond conditions is very important in making the industry structures favourable for investments.

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