International Journal of Economics & Management Sciences

Ergashxodjaeva et al., Int J Econ Manag Sci 2018, 7:1
DOI: 10.4172/2162-6359.1000493

Research Article Open Access

Evaluation of Textile and Clothing Industry Clustering Capabilities in Uzbekistan: Based on Model of M.Porter

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Abstract

The light industry of Uzbekistan was stepped to the new stage of innovation development and a clear strategy has been defined. The strategy defines the task of creating textile clusters in all regions of Uzbekistan. Namangan region is considered to be one of the most developed areas of the textile industry in Uzbekistan. The main factors of the development of the region's light industry are crafts, silkworm, breeding and transition of atlas passing from generation to generation. Namangan region's high population density compared to other regions of the country, relatively low fertile farming lands, and limited resources for other industries cause specialization of the light industry.

The article suggests the method of determining the opportunities of using the cluster strategy in the light industry in the example of the Namangan region based on the demo model of M. Porter.

Keywords: Light industry; Competitiveness; Enterprise; Competitive environment; M. Porter's theory

Introduction

The textile and clothing industry has a special role in the Uzbek industry, the availability of its raw materials and labor resources, since the historical experience of our people has distinctive traditions, researching conformity of the development of the market of this sector and suggesting the propose strategies are considered to be important issue.

The article aims to address the issues of improving the socioeconomic efficiency of textile and clothing industry enterprises in Uzbekistan, in full compliance with the competitive environment in the market, through the use of marketing strategies and modern strategies.

In the aids light industry of small businesses and private firms to create effective marketing services, production of competitive products and rapid adaption to the market environment, effective usage of services (engineering, marketing, design centers), the production of cotton, yarn, textile and light industry system integration to provide more opportunities for enterprises and companies with a single technological chain (communication) services, implementation of the "cluster" system which is based on the mutual integration of Research and education sectors through formation of the innovative model of "Namangan textile cluster".

Literature Review

According to M. Porter's theory, the competitive advantage of the enterprise is largely dependent on the competitive environment created in the enterprise. The development of light industry goods' market primarily depends on the competitive environment in the industry and the factors that shape it. The enterprise will have to move beyond the aforementioned and emerging competition environment. As a result the enterprise will have more market advantages. It is a strong domestic competition that forces the enterprise to operate efficiently and gain access to other markets, expanding production capacities and introducing innovations, and ultimately achieving more competitive advantages.

A number of studies have been undertaken to assess the capacity of network clusters and to assess their organizational capacities, which focus on the establishment and capacity of industrial clusters in the regions. In many studies [1,2] it was evaluated According to the industry's integration, localization, geographical proximity, economic status, concentration, enlargement levels [3]. Some methods such as statistical analysis, integral assessment, expert assessment, SWOT and PEST analysis methods and surveys were widely used in assessment. The above methods focus on numerical methods for assessing the potential for clustering but the motivation factors that integrate enterprises into the clusters are not adequately addressed.

For example, by focusing on employment indicators by Ferzer, the focus was on the formation of an added value chain in assessing the clustering capacity of the industrial sector [4]. Bertinelli rated it [5] according to the geographic agglomeration of network companies [6]. Also, the methods of clustering in practice are widely used for factors that determine the competitiveness of enterprises to the competitive environment [7].

Problems of estimation methodology of efficiency of production capacity management at textile enterprises were researched in our previous works, now we are discussing problems of evaluation of textile and clothing industry clustering capabilities in our country. [8-12,13,14].

Scientifically-theoretical aspects of the study of the competitiveness

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Received February 15, 2018; **Accepted** February 26, 2018; **Published** February 28, 2018

Citation: Ergashxodjaeva SJ, Krivyakin KS, Tursunov BO, Ahmadovich HZ (2018) Evaluation of Textile and Clothing Industry Clustering Capabilities in Uzbekistan: Based on Model of M.Porter . Int J Econ Manag Sci 7 493. doi: 10.4172/2162-6359.1000493

of light industry enterprises are the research direction of many foreign scientists. The works of Mayukh D [1], Mboya J, [15] Cline W, Doeringer P, [16] Crean, Dickerson SKG, Nordas HK, [17] Verma S, Xiajun.A, [18] Juyoung Lee, [19] Dorothee H have become classic works. Although the aforementioned researchers have made a significant contribution to the field of economics, they do not take into account the peculiarities of choosing appropriate marketing strategies for enterprise competitiveness, as well as the use of innovative marketing strategies.

Methodology

Even though competitive factors in the nature of light industry, the level of impact, the nature is different than other sectors, the influence of its marketing activities to performance indicators appears as complex state. Therefore, the study of the mechanism of action of factors implies first of all their systematic classification.

According to the scientific research results which was devoted to theoretical basis of ensuring the competitiveness of the enterprises of light industry competition among enterprises operating in this sector at the factors that shape competitiveness, its proposed by the M. Porter "and introduce you try to change the nature of power," according to its intended purpose.

It is recognized in the scientific sources that the competitiveness of the enterprise depends on both the domestic market and the external market, as well as the four major and two additional factors in the grouping of Figure 1.

The main determinants of competitiveness are:

1. Environments of production factors;
2. Demand condition;
3. Enterprise Strategy and Internal Competition;
4. Supporting sectors and infrastructure.

Additional factors:

1. Random Factors or Opportunities;
2. Country.

The model explains the new paradigm shift of competition among firms [11], and attempts to answer the question as to why some industries and nations gain competitive advantage in the international markets while others do not. The model comprises five determinants, namely; factor conditions, demand conditions, related and supporting industries; firm strategy, structure and rivalry and the role of government. These determinates are shown in the Figure 1 below:

F1 - Factor conditions. The demand conditions consists of the supply of factors like land, labour and capital.

F2 - Demand conditions: The demand conditions consists of the nature of home demand for the industry's products and services and sophistication of buyers, and it shapes the rate and character of innovation by the nations' firms.

F3 - Related and supporting industries: 'clusters' of industries in the home based economy which are linked to each other through vertical and horizontal relationships amongst competitive supplying and buying sectors or common customers, distribution channels or technologies.

F4 - Firm's strategy, structure and rivalry: at the firm level, key characteristics includes strategies, structures, goals, managerial practices, individual attitudes, and intensity of rivalry within the business sector [10]. At the national level, the attributes includes attitudes towards authority and management, interpersonal relations, social norms of individuals and professional standards.

F5 - Government. The government has a direct role to influence all the determinants of the PDM. The elements that constitute this role are the subsidies; education policies; actions toward capital markets; the establishment of local product standards and regulations; the purchase of goods and services; tax laws; and [9,11]. Of all these, the government's major role is that of being a catalyst and challenger [11], encouraging or even pushing companies to raise their aspirations and move to higher levels of competitive performance.

F6 - Opportunities. Investment activity of enterprises, vertical integration, horizontal integration, mutual relations, financial status, management structure and others.

The role of the state in the competitive advantages of the industry is analyzed. We believe it is expedient to determine the competitive environment and the flexibility of the enterprises in Namangan region, which are the main focus of the development of the light industry based on the cluster model. This process is unclear environment factors that shape the system account required step berries are required to be in

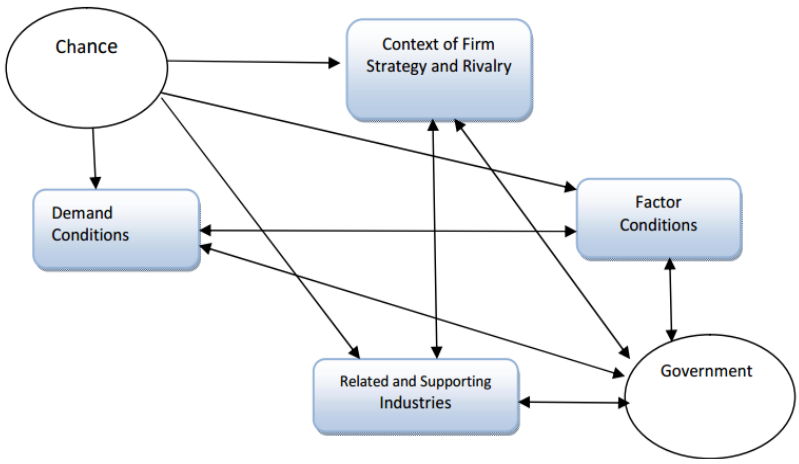


Figure 1: Porters diamond model of competitive advantage.

Defining determinants of competition	Signing	Factors
Production factors (F_1)	P	Manufacture of light industry products
	NE	Number of employees in light industry
	NI	Number of light industries (Code 17000)
	IN	Investments in light industry
	HQS	The number of highly qualified specialists working in the light industry
	INO	The volume of innovative products created by enterprises
Demand mode (F_2)	RT	Retail trade of light industry products
	CC	Consumption costs of light industry products
	EX	Export of light industry products
	IM	Import of light industry products
Public services and infrastructure (F_3)	Q1	The level of utilization of business services
	Q2	Percentage of preferential loans
	Q3	The state of attracting investment
	Q4	The state of utilizing public services
	Q5	The state of tax benefits
	Q6	Using Education Services
	Q7	The state of research conducted by institutions and public education, business training, trade shows and other activities.
	Q8	Logistics infrastructure use
	Q9	The state of using " One window " service
	Q10	The level of using interactive services of government
Geographical proximity and vertical integration (F_4)	Q11	The level of comfortability of company's geographic location
	Q12	Ease of interaction with suppliers
	Q13	Production chain, with the full cycle of interaction
	Q14	The use of market information
	Q15	The state of establishing relations between vendors and suppliers
	Q16	The state of relations with the raw material processers
	Q17	The state of relations with service providers i
Horizontal Integration and Mutual Competitiveness (F_5)	Q18	The state of joint partnership to compete about innovation
	Q19	The state of joint partnership to compete about price
	Q20	Equal competition on marketing channels
	Q21	The state of market development, technology and marketing in compliance with the strategic objectives
The state of partnership between enterprises i_6 (F)	Q22	The level of establishing new enterprises with partners
	Q23	Rate of joint purchases with partner companies
	Q24	The level of mutual acquisition of the same material, technology and parts as partners
	Q25	The level of use of the developer's technological line

Table 1: A system of factors that shapes competition in light industry.

accordance with the objectives of the research. Set of factors involve internal communication system, structural elements subject to the requirements of each other.

The factors selected according to the main determinants that determine the competitiveness of light industry enterprises were systematized and divided into quantitative and qualitative groups:

F1 (production factors) and F2 (factors expressing the state of demand) - the quantitative values of a group of selected factors are formed by statistical sources as secondary information (Table 1).

F3 (the level of use of infrastructure and public services by enterprises), F4 (the geographical concentration of enterprises, the state of vertical integration), F5 (horizontal integration of enterprises and the relationship in competition), F6 (the state of cooperation of enterprises)- the quantitative values of a group of selected factors are formed through questionnaires, conducted at enterprises engaged in the production and sale of light industry products in the Namangan region as primary information (Table 1).

The analysis of the competitive environment created in the market of light industry goods in Namangan region and the factors selected for determining the development of potential of the cluster will be studied.

Finding out the development rate of selected factor and the flexibility of operating enterprises to it helps to identify opportunities of the usage of clustering strategies.

According to the statements mentioned above, in extent of Namangan region, the factors determining the capacity of the cluster formation and interconnected to investigate.In order to use cluster strategy in Namangan region and to achieve competitive advantages of firms it is suggested to operate using factors assessment, according to chosen factors, correlational connection as it is provided like an algorithm in a Figure 1.

We know that methods of correlation-regression are efficient to analize meticulously the link between investigated events (indicators,factors). The first duty of correlation analysis is finding out a correlation function of a certain variable to the reasulting variable.There are also a number of ways to choose how to connect. At the same time, it is also important to choose a proper model of communication through various analytical methods because of the lack of communication between the factors.

The second task of correlation analysis is to determine the density of the relationships between the events. This correlation index and

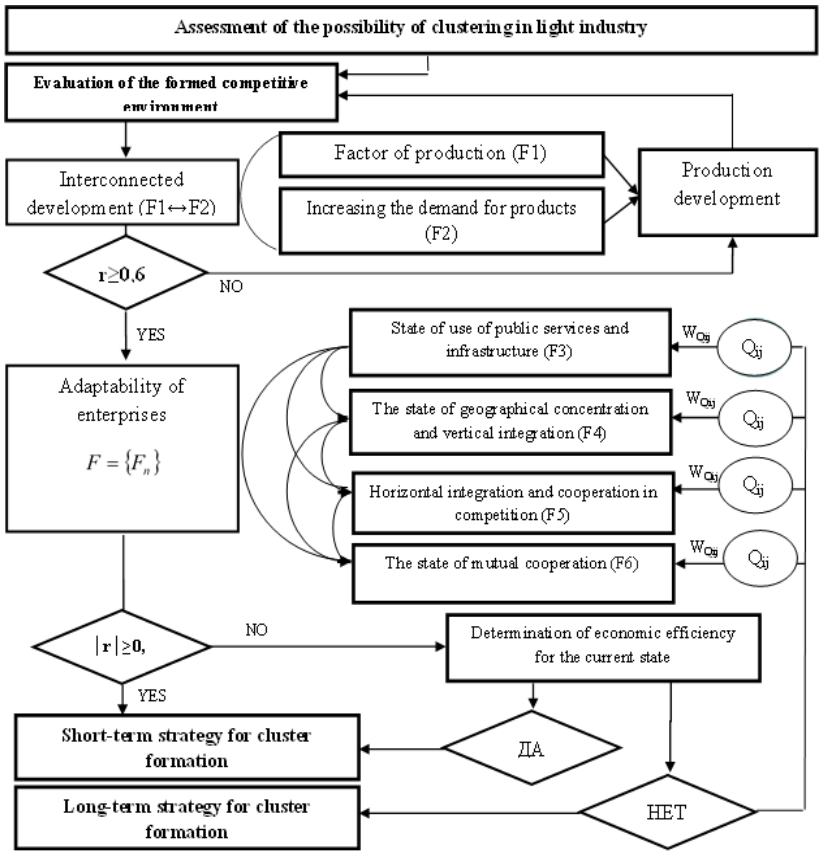


Figure 2: The algorithm for evaluating light industry clustering capabilities.

linear correlation coefficient. The numerical values of the If R=l (r=1), there are functional links between the factors studied. If R=0 (r=0) in this case, the factors are not interconnected.

Relationship density R and r the following conditional classifications apply:

From 0.1 to 0.3 - weak linkages;

0.3 ÷ 0.65 - average intensification;

0.65 ÷ 0.80 - higher concentration than average;

0.80 ÷ 0.99 - intensive contact.

The correlational relationships of factors in light industry production and demand conditions were identified according to ($1 \le r \le 1$). Production factors selected in total five factors and demand conditions in selected 4 factors are densely connected to the network in the opportunity to achieve the formation of a competitive environment. The correlation of selected factors for the formation of the cluster environment ($-1 \le r \le 1$) was also determined.

The average urban cluster environment factors selected for the K planted with high-density $|r(f)| \ge 0.65$ satisfying the agreement confirms the existence of the regional textile industry clustering capabilities.

It is important to note that it is not possible to analyze any economic phenomenon of correlation and regression in the following conditions:

- Selected factors associated with known causes and factors should not be the variable component of variable;
- The character that is taken as a factor is not collinear;
- and the value marks are in the systemized unit;
- They are subject to the normal distribution law;

Based on the information above, it is not possible to analyze the correlation and regression methods we have selected. Therefore, it is desirable to use the econometric equations system. We use the SEM model to fulfill the above conditions (Figure 3).

Data Collection

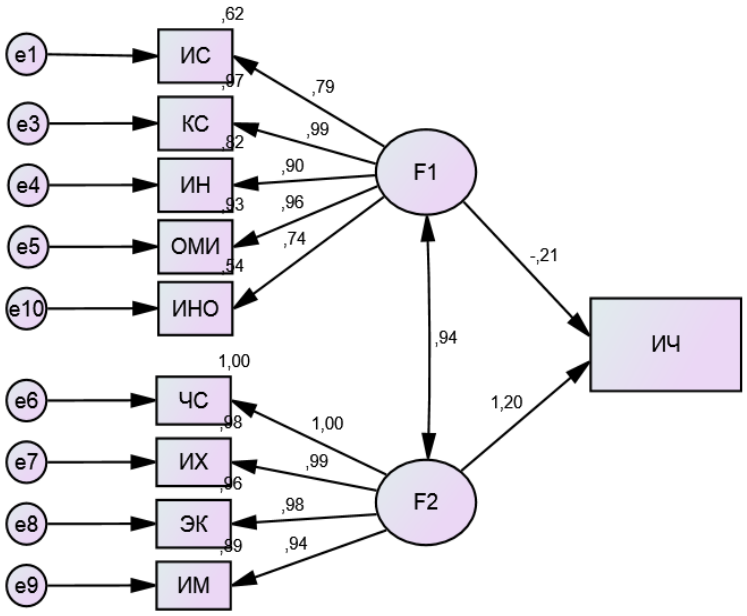
F1 and F2 were used for the analysis of the selected factor group data from the Statistics Committee of the Republic of Uzbekistan (Annex 1).

F3; F4; F5; F6; - Factors selected by factor group.

There is no availability of determining to assess the possibility of clustering factors included in the group (f3-f6) through statistical sources. According to this, survey was conducted, which included 25-questions, among prospective participant of cluster among enterprises. In total 68 companies took part in a survey in Namangan region, 32% of them were exporter enterprises. The online participation in questionnaire comprised respondent arguments, 19 of them were business leaders, 20 of them were marketing, sales specialists, 21 of them were accountant and 4 of them were technologists.

Results and Discussion

According to the assessment of clustering capacity under the



Chi-square=108,350; df=34; CFI=,771; RMSEA=,148

e_n – mistake of endrogenous change;
MP – Manufacture of light industry products
Factors in order to develop demand:
RT-Retail trade of light industry products;
CC-Consumption costs of light industry products;
EX-Export of light industry products;
IM-Import of light industry products;

Production factors:
MP-Manufacture of light industry products;
NE-Number of employees in light industry ;
NI-Number of light industries (Code 17000);
IN-Investments in light industry;
HQS-The number of highly qualified specialists working in the light industry;
INO-The volume of innovative products created by enterprises;

Figure 3: SEM access to the region's light industry clustering model.

terms in table 1, the system creates a complex system of equations and cannot be regarded as an independent equation. Accordingly, in order to determine the correlation between competing factors in the industry and the correlation relationship, SPSS AMOS 23 provides a framework for structural modeling (Structural Equation Modeling[1] - SEM) is recommended [20]. The main feature of SEM is to determine the characteristics of the hidden variables and to interact with them and to influence on other significant indicators. In this system of equation, there are two variables that affect the hidden variables that are endogenous (y) and exogenous (x) variables.

The selected group of factors, the zero hypothesis (estimate means and Interceptor) on the basis of production factors (F1) and the correlation of the hidden values (F2) with the maximum probability (maximum likelihood estimation (MLE)) identification. Figure 2. As a result, r=0.94, and there is a strong link between them. The results of regression of factors related to the production of light industry products show that the standardized version of the model shows the decline in the output of the factor group F1 to a conventional unit-production by -21 units. The results of the regression of factors representing the state of demand, while bringing the F2 factor to a conventional unit according to the standardized model, result in an increase in output to 1.2.

The results of the built-in SEM model indicate that the Namangan region needs to adjust the resource costs for production, reduce its overhead costs, and coordinate resource costs for demanding factors.

The results of the Model Chi-Square (χ^2), approximation ratio (GFI), the balance of the mean squared error (RMSE), squares (RMR), corrected approximation Index (AGFI), normalized approximation Index (NFI) criteria examined (15-publication).

Questions as the determining factor clustering capabilities are accepted as 5 level of Likert[2] scale. The results of a poll according to Likert scale is calculated using SPSS Statistics (Statistical Package for the Social Sciences) software system using descriptive statistical indicators of the relevant factors.

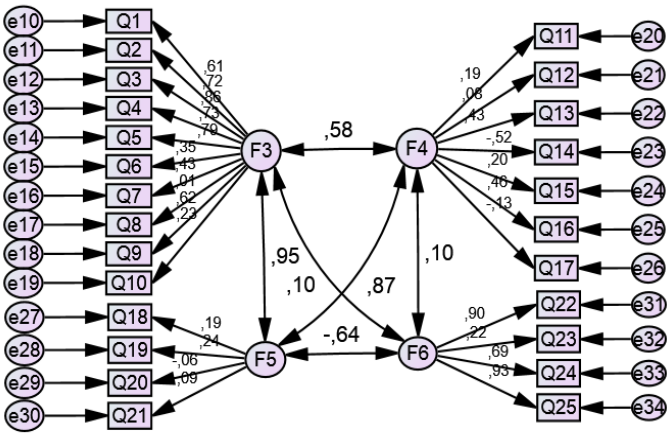
A sample of the survey questions to get the results of the survey are analyzed using the SPSS statistical program,the correctiveness Alfa Crombax (a) is checked based on the module of "KMO and Bartlett's test of sphericity".

Statistical analysis of the results which explain opportunities of selection of questions within polls of enterprises operating in Namangan region, results based on the Likert scale, based on the results of table 3.

To identify the level of the relationship between the two factors that determine the possibility of the formation of clusters SPSS Amos 23

[1]Structural Equation Modeling (SEM) observed in contrast to other econometric and economic models to assess the hidden structures. The typical econometric models to determine on the basis of transfer connections that are difficult to model, which allows to determine the sources.

[2]Likert scale (1-3), (1-5), (1-7) a number of values for the number of factors used to assess the values of the citizens.



Chi-square =443,200; NFI =,443;
PRATIO =,828; NCP = 174,200; RMSEA = ,080;

e_n – mistake of endrogen change;
Q_n – variables chosen according to questionaire (accepted as factor);
F_1- Government services and infrastructure;
F_2 –Geographic closeness and vertical integration;
F_3 –Horizontal integration and doing competition;
F_4 –Cooperation mode.

Figure 4: The light for information of a competitive environment (SEM) model.

The factors selected group	r (correlation)	The factors selected group
The formation of a competitive environment		
Resource c options (F_1)	Intense US (0.94)	Demand conditions (F_2)
clustering options		
Public services and infrastructure (F_3)	The average density (0.57)	Geographical proximity and vertical integration (F_4)
Public services and infrastructure (F_3)	Contact dense (0.95)	Competing on the horizontal integration and interaction (F_5)
Geographical proximity and vertical integration (F_4)	The intense connection (0.87)	Competing on the horizontal integration and interaction (F_5)
Mutual cooperation (F_6)	Weak link (0.09)	Geographical proximity and vertical integration (F_4)
Mutual cooperation (F_6)	The average density of us (-0.6)	Competing on the horizontal integration and interaction (F_5)
Mutual cooperation (F_6)	0.096 weak link	Public services and infrastructure (F_3)

Source: Author's development.

Table 2: Regional textile industry cluster strategy opportunities.

			Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items		
			0.628	0.672	25		
			Summary Item Statistics				
	Mean	Minimum	Maximum	Range	Maximum/Minimum	Variance	N of Items
Item Means	3.208	1.868	4.603	2.735	2.465	0.644	25
Item Variances	1.486	.243	2.338	2.095	9.621	0.272	25
Inter-Item Covariances	0.094	-.699	1.569	2.268	-2.246	0.077	25
Inter-Item Correlations	0.076	-.383	0.834	1.217	-2.179	0.037	25
ANOVA with Friedman's Test and Tukey's Test for Nonadditivity							
			Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig.
Between People			2.50.685	67	3.742		
Within People	Between Items		10.50.579	24	43.774	31.437	0.000
	Residual	Nonadditivity	21.386[a]	1	21.386	15.497	0.000
		Balance	22.17.635	1607	1.380		
		Total	22.39.021	1608	1.392		
	Total		32.89.600	1632	2.016		
Total			35.40.285	1699	2.084		
Grand Mean = 3.2082							
a. Tukey's estimate of power to which observations must be raised to achieve additivity = -.192.							

Table 3: Reliability Statistics.

program is used which is based on structural equation model of the zero hypothesis. Selected factors resulting correlation values that are hidden by maximum likelihood (maximum Likelihood estimation (MLE)) software application on the evidence of results in Figure 4[3]. Model results of the statistical criteria in Annex 17, Chi-Square (χ^2), approximation ratio (GFI), the balance of the mean squared error (RMSE), squares (RMR), corrected approximation Index (AGFI), normal approximation index (n NFI) criteria examined.

Conclusion

Opportuniy was given to display cluster atmosphere and choose appropriate strategies in Namangan region based on the suggested methodology. The results of the analysis of the Namangan region showed that, cluster the extent that the possibility of the formation and the formation of strategic goals and implementation of the conclusions of the components to form clusters and the level of their bilateral relations and the status of the relationship were identified (Table 2).

According to the results from the clustering options, special attention should be paid to the following:

Public services and infrastructure (F3) of the selected group of factors in business education services are demonstrated. The low rate of using innovative development, implementation and training services (W (Q6)=0.35), government research institutes and educational, business trainings, fairs and other activities, placing W (Q7)=0.01), effective logistics infrastructure failure (W (Q8)=0.01) State T interactive services (W lower (Q10)=0.23) revealed'. In turn, these group of factors are limiting the regional textile industry clustering opportunities;

Geographical proximity and vertical integration (F4) of the selected group of the factors do not provide the conditions for relations with suppliers. ($W_{(Q12)}$=0.08), The use of market information is very low ($W_{(Q=14)}$ -0.52), and reverse the effects of development, the availability of effective interaction with vendors and suppliers with launch options ($W_{(Q15)}$=0.20), relationships with raw-materials processing ($W_{(Q17)}$ -0.13) Impairment of TB. In turn, these factors the group limits the opportunities for the regional textile industry clustering.

Competing on the horizontal integration and interaction (F5) of the selected group of all the factors within the target, requires the definition of strategies. including: regional companies competing on the sharing of innovations and mutual ratio ($W_{(Q18)}$=0.08), the price, the level of cooperation and competing on the absence of a partner ($W_{(Q19)}$=0.24), and the formation of joint marketing strategies and the competitive level of cooperation ($W_{(Q20)}$=-0.06). Furthermore, market development, technical Zoology and marketing compliance with the strategic goals of state symbols ($W_{(Q21)}$=0.6) are not nearly developed. In turn, these factors the group limits the opportunities for the regional textile industry clustering.

Cooperation mode (F6) – among selected group of factors the low rate of purchasing together with partner organizations $W_{(Q23)}$=0.22) limiting regional textile industry clustering.

To enhance the Namangan region's light industry clustering on the results of a marketing research identified the need to focus on a number of issues.

[3]SPSS Amos 23 program by author.

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