



APPLICATION OF CLUSTER ANALYSIS TO STUDY COMPETITIVE ENVIRONMENT IN THE KNITWEAR MARKET

* *Radjabov Bunyod Abduhalilovich*

* *Student of Tashkent State Economic University, Uzbekistan*

E-mail: radjabov_b@umail.uz

ABSTRACT

The article explores the theories of using cluster analysis in marketing research, based on the importance and necessity of exploring the competitive environment in the knitwear market. Competitive environment in the knitwear market of the Republic of Uzbekistan has been studied using cluster analysis. The effectiveness of cluster analysis of competitive environment in the knitwear market is demonstrated.

[Click here and insert your abstract text.](#)

© 2020 Hosting by Research Parks. All rights reserved.

ARTICLE INFO

Article history:

Received 07 January 2020

Received in revised form 12 January 2020

Accepted 20 January 2020

Keywords:

marketing, marketing research, cluster analysis, knitting market, knitwear export, knitwear import.

1. Introduction

Innovative development strategy of knitwear market allows to assess demand and supply and opportunities of sewing products market, study of domestic and foreign markets, economic evaluation of export potential of the sector. The strategy of sewing products development should be the forecast of supply and demand for knitwear, increasing the volume of processing of natural fibers, production of new types of fabrics on the basis of innovation, and adaptation of new production technologies to local raw materials. Implementation of this strategy requires the formation of a market research system and effective use of marketing research.

Sustainable production and export of knitwear, insufficient production of finished goods with high added value and insufficient formation of national brands that are able to compete internationally on the world market do not allow to increase the competitiveness of enterprises. This is due to the results of the assessment of the competitiveness of the enterprises operating in the industry and the failure to formulate effective competitive strategies. The Strategy of Action on the five priority directions of development of the Republic of Uzbekistan for 2017-2021 sets out the important tasks of "mastering new types of products and technologies in principle, ensuring the competitiveness of national goods in the domestic and

foreign markets"¹. Successful implementation of these tasks will require accelerating efforts to improve the competitiveness of knitwear manufacturers through marketing strategies. These circumstances determine the relevance of the research topic.

2. Literature review

General aspects of increasing the competitiveness of knitwear manufacturers in Uzbekistan based on marketing strategies and using effective marketing research to study the market Ergashkhodjaeva Sh.J. Presented in research papers by AD Adilova, N. Alimkhodjaeva, Z. Khakimov, A. Tilyakhodjaev and others². In spite of the marketing research conducted in this area, the issues of knitwear manufacturing companies operating in a highly competitive environment and the introduction of effective marketing research methods have not been adequately explored.

According to the Russian scientist E.Mazilkina, competition may appear in the market when there are more than one manufacturer and they sell their products. In his view, the competitive market is a part of the market space where the producers of goods and services compete with each other, operating independently and separately³.

In marketing research, cluster analysis is used effectively and is one of the most common methods. The cluster method is also known as the method of clustering. Cluster analysis by Uzbek scientists is generally regarded as a 'static grouping' in the scientific literature.

The grouping method was first introduced in the 18th century in Russia. In implementing and developing this method, A.N. Radishev (1749-1802), D.P. Juravsky (1810-1856), P.P. The great Russian scholars like Semyonov Tien-Shansky (1827-1914) have a great merit. For example, A.N. Radishchev, the founder of forensic statistics, emphasized the importance of dividing criminal cases into groups, while D. P. Juravsky referred to statistics as a discipline that is, in a broader sense, categorized by categories. Well-known geographer and statistician P.P. Semyonov Tian-Shansky divided rural communities into six groups based on the number of batches, land lease and land allocation.

Cluster analysis is a multidimensional statistical procedure that collects data containing information about a sample of objects and then organizes the objects into relatively homogeneous groups⁴. The clustering task relates to statistical processing, as well as to a wide class of teaching tasks without a teacher.

Most researchers⁵ are inclined to believe that for the first time the term "cluster analysis" (English cluster - a bunch, bunch) was proposed by mathematician R. Trion⁶. Subsequently, a number of terms arose that are currently considered synonymous with the term "cluster analysis": automatic classification, botryology.

The range of applications of cluster analysis is very wide: it is used in archeology, medicine, psychology, chemistry, biology, public administration, philology, anthropology, marketing, sociology, geology and other disciplines. However, the universality of the application has led to the emergence of a large number of incompatible terms, methods, and approaches that impede the unambiguous use and consistent interpretation of cluster analysis.

In his research, A. Khmara [9] analyzes the changes made to the legislation governing the public procurement system in Ukraine. In particular, the fact that state-owned enterprises and economic entities with a state share of more than 50% are excluded from their own tender (out-of-budget funds) from tender legislation is a negative fact.

¹ Ўзбекистон Республикаси Президентининг 2017 йил 7 февралдаги «Ўзбекистон Республикасини янада ривожлантириш бўйича ҳаракатлар стратегияси тўғрисида»ги ПФ-4947-сонли фармони 1-илоvasи «2017-2021 йилларда Ўзбекистон Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича ҳаракатлар стратегияси» Lex.uz

² Бекмуродов А.Ш., Янг Сон Бэ. Стратегия развития текстильной промышленности Узбекистана:Кластерныйподход. Монография. – Ташкент: ТГЭУ, 2006. – 112 с.; Болтабаев М.Р. ЎзбекистонРеспубликаси тўқимачилик саноати экспорт имкониятларини ривожлантиришда маркетинг стратегияси:И.ф.д. дисс. автореф. – Тошкент: ТДИУ, 2005.–35 б.; Муратов Р.С. Ўзбекистон қишлоқ аҳолиси истеъмол учуненгил саноат маҳсулотлари ассортиментини шакллантиришнинг регионал аспекти. 08.00.13– «Маркетинг» ихтисослиги. И.ф.н. илмий даражасини олиш учун ёзилган дисс. – Т., 2006. – 200 б.

³ Мазилкина Е.И. «Управление конкурентоспособностью». Учеб. пособие. – М.: Омега-Л, 2009 г. 10-15стр.

⁴ Айвазян С. А., Бухштабер В. М., Енюков И. С., Мешалкин Л. Д. Прикладная статистика: Классификация и снижение размерности. — М.: Финансы и статистика, 1989. — 607 с.

⁵ Мандель И. Д. Кластерный анализ. — М.: Финансы и статистика, 1988. — С. 10.

⁶ Tryon R.C. Cluster analysis. — London: Ann Arbor Edwards Bros, 1939. — 139 p

3. Research Methodology

Since the purpose of clustering involves grouping by particular features, a specific measurement unit should be used to assess how similar or different they are.

The most common method is to use the distance between two objects as such. Intermediate short-range objects are more similar than those at large distances. There are several directions for calculating the distance between two objects.

Euclidean distance (Euclidean distance) - The square root is a way of calculating the values of each variable by summing the squared differences.

There are a number of other ways to measure distance. Block distance between two objects Chebyshev distance (Chebyshev distance) is calculated by calculating the maximum absolute difference for any variable values between two objects.

The next step is to select the cluster method. Hierarchical and non-hierarchical methods of cluster analysis can be used. The hierarchical cluster is characterized by a hierarchical or tree-like structure.

Hierarchical methods can be agglomerative (composite) and calculated on the basis of separation. Cluster method is a method for evaluating a cluster based on the creation of a separate group with each object. Clusters merge into each cluster as objects grow each time. This process will continue until all objects are members of a single cluster.

The selection of clustering methods and the choice of measurement of distance values are interrelated. For example, the squares on the Euclidean side were used by the method "Varda" and centrally. Some of the hierarchical methods are also used square squares.

Based on the above, it is advisable to use the SPSS statistics software package to perform cluster analysis. The Hierarchical clustering method of cluster analysis of competitive environment in the knitwear market of the Republic of Uzbekistan uses the Warda method.

4. Analysis and results

According to the Foreign Economic Activity Classification Nomenclature of the Republic of Uzbekistan knitwear is accepted under the TN code "61". Based on this, we will compile the global knitwear market data for 2015-2018 in foreign currency (USD) in the ITC Trade Map database.

Based on this, the database of ITC Trade Map is formed as the main indicators for the evaluation of international competitive environment in 4 directions: export, import, trade balance, re-export.

This system of indicators shows that countries can be considered as key determinants of participation in the global textile market. A total of 30 key competitors were selected to perform cluster analysis on relevant indicators.

Table 1. 2018 Country participation in the global knitwear market⁷

Exporters	export	import	balanc	Reexport
Worldwide	242929722	219397624	23532098	1155182
China	73525495	47745027	25780468	57826
Bangladesh	19048203	20169720	-1121517	3719
Vet nam	14584730	13750389	834341	2806
Germany	11106575	13008631	-1902056	768
Italy	9530072	11685207	-2155135	1002
Turkey	9052153	8980989	71164	102
Cambodia	8424812	8564179	-139367	1
India	7561110	8496710	-935600	7087
Gon Kong China	6964200	6121725	842475	21231
The Netherlands	6302096	5068661	1233435	76

⁷ <https://www.trademap.org/> - сайти маълумотлари асосида йиғилган.

Spain	5930565	5064866	865699	14806
Belgium	5752651	3865705	1886946	1948
France	5251735	3631354	1620381	7482
Indonesia	4073930	3403748	670182	417
Great Britain	3888211	3387416	500795	6
Poland	2953221	3354841	-401620	8166
USA	2889855	3218921	-329066	73105
Sri Lanka	2884049	3017790	-133741	515
Pakistan	2860768	2864188	-3420	589
Honduras	2642247	2346708	295539	1055
Portugal	2634387	2065560	568827	622
Denmark	2086339	2019908	66431	180607
Mexico	1726831	1699788	27043	79
Thailand	1663954	1636679	27275	5596
Jordan	1657090	1494204	162886	2
Australia	1496949	1466379	30570	27176
Myanmar	1415928	1307396	108532	57
Guatemala	1344358	1277043	67315	5
Nigeria	1336323	1158746	177577	12
Uzbekistan	244128	22272	221856	5512

We use the Warda method of cluster analysis of the competitive environment in the knitwear market of the Republic of Uzbekistan. The results obtained from the software package "SPSS statistics" are shown in the following tables (Table 2).

The agglomeration schedule can be omitted from the plan and shows the number or groups of jobs that need to be combined at each stage. The first line represents the first stage with 29 clusters.

At this stage, the 27th and 16th countries were combined as shown in the columns called "Unified Groups". The coefficients between the points corresponding to these two countries are shown in the "Coefficients" column, the "Cluster first emerging group" column represents the first cluster formation phase.

Table 2. The agglomeration schedule plan⁸

Table of agglomeration						
№	Cluster integration		Coefficients	The first emerging group		Next step
	Group 1	Group 2		Group 1	Group 2	
1	27	28	3871206651,000	0	0	4
2	23	24	7854583712,500	0	0	8
3	16	17	23839910209,000	0	0	12
4	27	29	42355322226,000	1	0	14
5	18	19	62914896167,000	0	0	12
6	25	26	85247556486,000	0	0	8
7	14	15	116972759423,500	0	0	21
8	23	25	171262562429,750	2	6	14
9	20	21	248158810398,250	0	0	15
10	10	11	384907022689,250	0	0	16
11	12	13	573369400008,250	0	0	22
12	16	18	785099051821,000	3	5	19
13	6	7	1090904361092,500	0	0	17

⁸ SPSS statistics" дастурий пакетида хисоб-китоб натижасида олинган муълумот

14	23	27	1404746405169,179	8	4	20
15	20	22	1741713788273,346	9	0	19
16	9	10	2991649598991,012	0	10	22
17	6	8	4508357273254,179	13	0	25
18	4	5	6658788187145,179	0	0	23
19	16	20	9086525928325,977	12	15	21
20	23	30	12272171649647,672	14	0	24
21	14	16	16071734392600,457	7	19	24
22	9	12	21100315560376,790	16	11	26
23	3	4	40012556598653,790	0	18	25
24	14	23	62048197380960,900	21	20	26
25	3	6	105788543507995,890	23	17	27
26	9	14	194444027757377,030	22	24	28
27	2	3	340190916068779,060	0	25	28
28	2	9	1175840933150945,000	27	26	29
29	1	2	8110245302457487,000	0	28	0

For example, the number 1 in clause 7 (cluster entry) indicates that respondent # 1 was first clustered in step 1. In the last line of the next step, another issue (respondent) or cluster of clusters. The first column of the last column is number 7, which means that in the 7 investigations, no country represents a grouped state, that is, groups that can be combined in the verification process. The main result for the cluster analysis is determined by the dendrogram shown in Figure 1

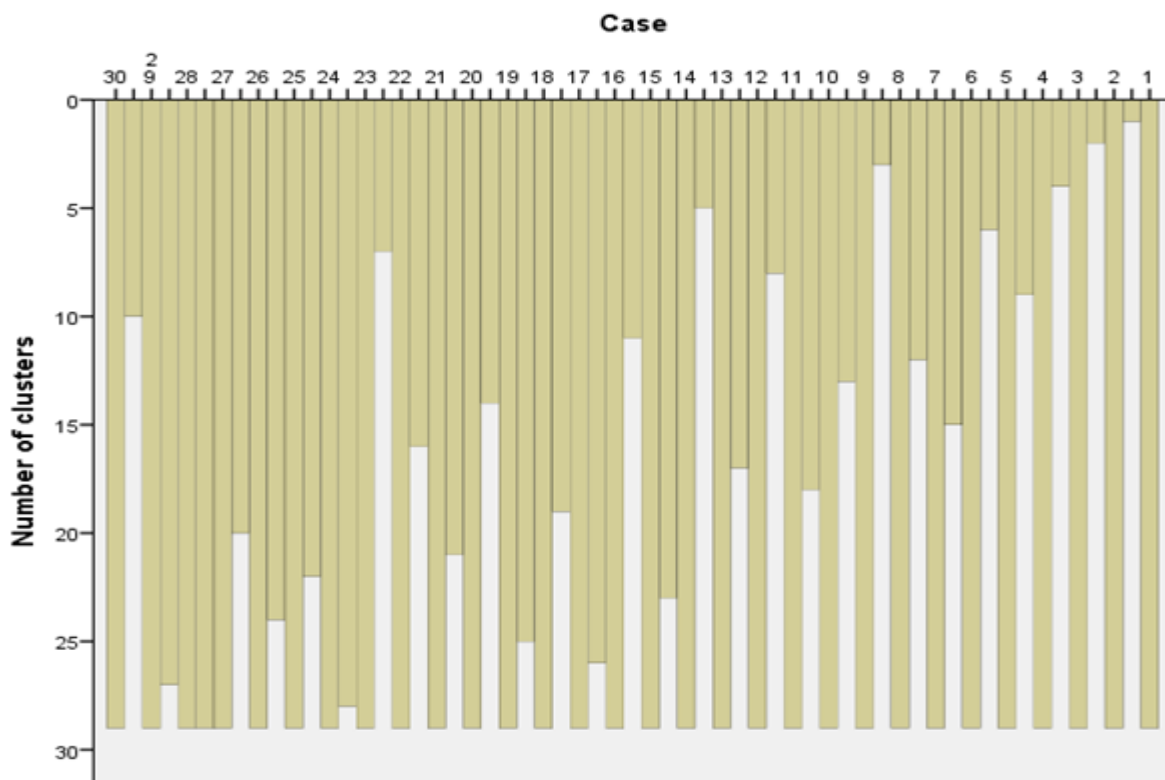


Figure 1. Number of clusters⁹

⁹ SPSS statistics[®] дастурий пакетида хисоб-китоб натижасида олинган муълумот

The top rows represented in Figure 1 correspond to the number of cluster objects, in which case the countries are represented by 30 digits. In our example, 30 countries were selected, which represent grouping in rows 1 through 30 and divided by 5 intervals.

We obtain the main results of the cluster analysis using the dendrogram in Figure 2.

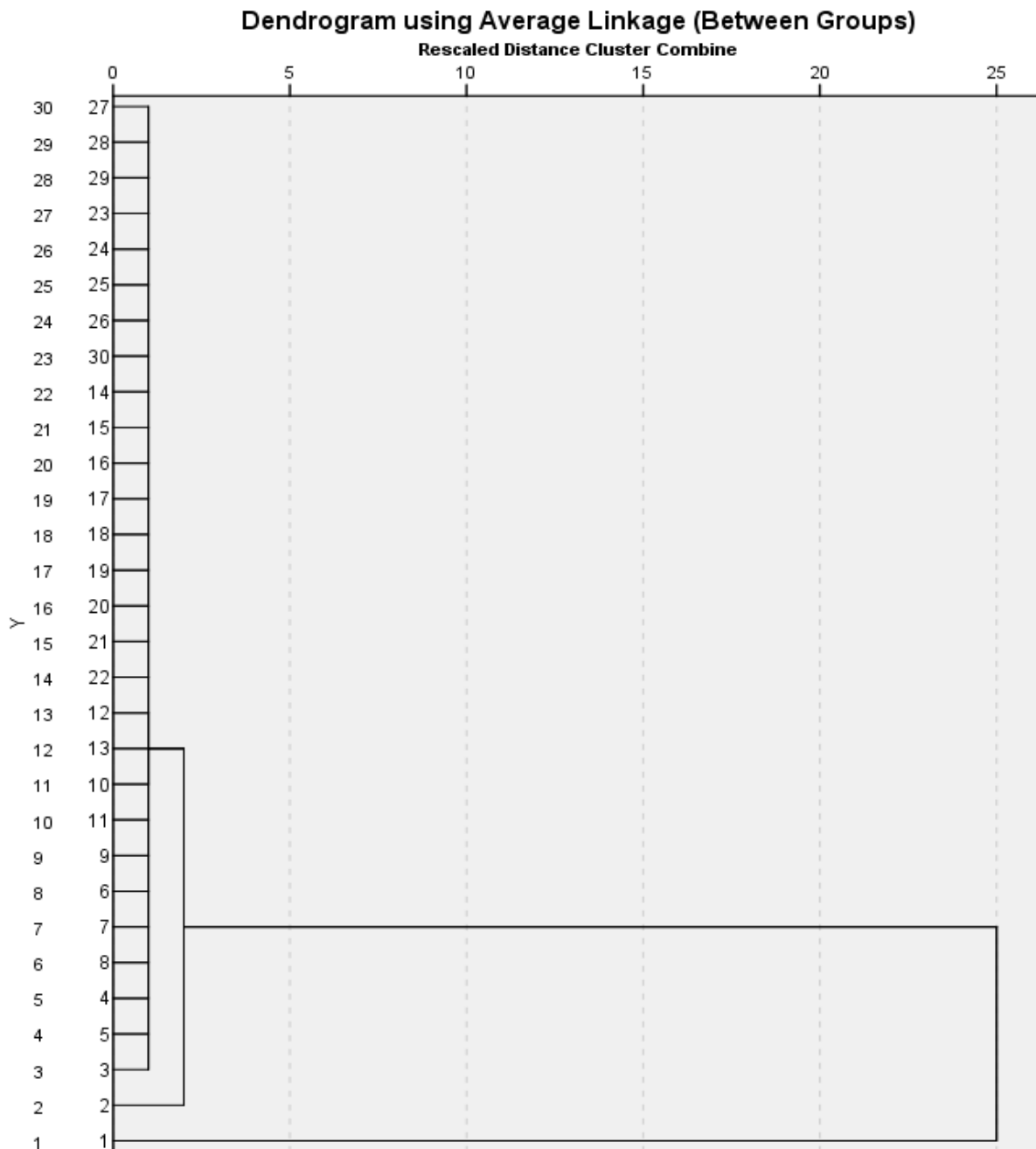


Figure 2. Clustering results dendrogram¹⁰

¹⁰ SPSS statistics” дастурий пакетида ҳисоб-китоб натижасида олинган муълумот

The tree diagram is read from left to right. Vertical lines indicate clusters joining. The ratio of the line to the distance scale indicates the distance from which the clusters are joined. It is difficult to describe the order in which the first clusters are combined, when most distances are approximately the same in the early stages of integration. However, in the last two phases it is clear that the clusters need to be joined together. This information is useful in determining the number of clusters.

Conclusions

The results of the hierarchical cluster analysis of the competitive environment in the knitwear market of the Republic of Uzbekistan indicate that 1-13 countries are the same group, and the countries from 13 to 27 are the second group. The results of the analysis show that the main competitors in the knitwear market are the major groups of 1-13 countries, and their export, import, balance and re-export status are the same. The group of 13-27, which is the next group, is the second group in the international markets, providing a distinctive presence in the global knitwear market.

REFERENCES

- *The European Bank for Reconstruction and Development (2013), "Efficient implementation of Procurement: Centralized Purchasing", "9th Public Procurement Knowledge Exchange Platform", Holiday Inn, Skopje, FYR Macedonia May 28-31*
- *Вохидова М. (2014) "Давлат хариди ҳукукий асосининг жорий ҳолати ва муаммолари", "Иқтисодиётда молиявий барқарорликни таъминлаида давлат харидларининг ролини ошириш" мавзусидаги республика турдош Олий ўқув юртлариаро илмий-амалий конференция материаллари тўплами, Тошкент, ноябр 128 бет*
- *The European Bank for Reconstruction and Development, "Efficient implementation of Procurement: Centralized Purchasing", "9th Public Procurement Knowledge Exchange Platform", Holiday Inn, Skopje, FYR Macedonia May 28-31.*
- *Аллаёров С. "Хорижий мамлакатларда давлат харидини ташиқил этиши", Иқтисодиётда молиявий барқарорликни таъминлаида давлат харидларининг ролини ошириш мавзусидаги республика турдош Олий ўқув юртлариаро илмий-амалий конференция материаллари тўплами. Тошкент, 2014 й. Ноябрь, 177 бет;*
- *Пўлатов Д. (2015) "Электрон каталог орқали давлат харидини ташиқил этиши", Солиқ солиши ва бухгалтерия ҳисоби, Тошкент 2015 й. №5 (107), 22-б;*
- *Колнооченко Е. "Антикоррупционные меры при госзакупках: Опыт Канады", Журнал бюджет, 2015 №1, 92-95 с;*
- *Кикавец В.В. (2010) "Особенности правового регулирования в сфере государственных закупок за рубежом", Госзаказ в вопросах и ответах, №1, 3-5 с;*
- *Гаджиева В.Т. "Государственный заказы как инструмент государственного финансового регулирования экономики", вестник Волгоградского института бизнеса, 2011 № 1(14), 176-183с.*
- *Хмара А. (2013) "Нужны ли бизнесу открытие и честные Государственные закупки", Аукционный вестник, № 151, 1-2 с;*
- *Иванова О.В. "Методика комплексной оценки эффективности государственных закупок Орловской области" Известия Тульского государственного университета. Экономические и юридические науки, 2010, issue 2-2, 183-192*