Development of a methodology for assessing the tourism sector competitiveness at the national level

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Abstract

The aim of this study is to develop and adapt the methodology to assess the tourism industry competitiveness at the national level. International tourism as a source of both direct and indirect incomes of the state, encourages the development of different sectors, not specific to the tourism infrastructure, but through the multiplier effect. In this connection it is urgent to develop new methodological approaches to measure and assess the international competitiveness of countries in order to put countries in a better position in the current competition for tourism revenues. The problem of determining the tourist potential of a particular territory with a view to the most efficient use is a difficult research challenge. The Travel & Tourism Competitiveness Index (TTCI) has been put in the proposed methodology. The sub-indices, components and indicators that form the TTCI index are used as the parameters that characterize national economy. The application of factor analysis to the TTCI dimension components for the competitiveness of the twelve-dimensional space is reduced to two factors: socially-economic and resource-ecological factors. A two-step cluster analysis in the area of these factors allowed to group fifty-five countries selected for analysis in three homogeneous clusters. Countries, formed in clusters, have similarities in competitive advantages, factors and quality indicators of tourist resources and infrastructure. The comparative analysis of these clusters, using TTCI indicators, allows to describe the formation model of competitiveness in the tourism sector and to determine the qualitative position of the country not only among the closest countries in terms of tourism destination development, but also to draw conclusions about the preferred tourist specialization.

Keywords: the travel & tourism competitiveness ındex, factor analysis, cluster analysis.

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1. Introduction

International tourism, which is a source of both direct and indirect revenues of the state, encourages the development of various sectors, not specific to the tourism infrastructure, but through a multiplier effect. In this context, it is urgent to develop new methodological approaches to measure and assess the international competitiveness of countries in order to improve their position in today's competition for tourism revenues.

The problem of assessing the tourist attraction, the definition of tourism and tourist potential effectiveness of a territory has always been a very difficult research problem. The most popular scientific method of research for regional tourism is a descriptive method, often accompanied by the use of general statistics. Such studies widely use a method of statistical assessment (definition of functions based on the results of observations), the method of statistical hypothesis testing and so forth. Statistical methods are also used for the analysis of public opinion polls, which allows identifying differences among various socio-cultural systems (Veal, 2006), (Fodness, 1994), (Reid & Andereck, 1989).

2. Research in the area of tourism competitiveness index components

2.1. The travel and tourism competitiveness index

The parameters, characterizing the object under study, uses sub-indices, components and indicators that make up the TTCI index (The Travel and Tourism Competitiveness Index Data Analyzer, 2013). The usage of the rating figures is necessary due to the increasing amount of information that requires systematization and assessment of the authenticity, quality, possibility of using the information for private and strategic objectives of the development of individual companies and businesses. The case studies are an important tool in the ranking. This emphasizes that the rating is an assessment index, compiled by taking into account the opinions of professionals. Thus, the rating is a complex integral index, which includes some of the most important parameters for user in the assessment of the object (Савина, 2006.).

Tourist ratings can be divided into regional, national and international. One of the most important functions of the rating is not only a definition of the region's position in the ranking, but also a stimulating effect on the rating of its promotion in the market through a progressive growth of a set of indicators that characterize tourist and recreational activities. Thus, with the help of the established tourist ratings the development of tourism at the international level and within the country - at the national, regional and municipal levels can be managed (Кружалин, 2011).

There are four main functions ratings in tourism:

- Informative. Rating is a source of information about the object assessment, including a set of parameters, which are interesting for the recipient of information.
- Stimulating. Rating stimulates assessed object to take actions in order to improve its situation.
- Indirect. Rating allows reducing the influence of subjective factors, generally affecting the formation of opinions about the object of assessment.
- Controlling. The object of assessment for the promotion and formation of its own positive image can use rating in order to attract new customers (buyers) and partners for the formation of prices, etc.

The system of tourist rating gives the opportunity to solve a whole range of tasks starting from systematization and receipt of complex information on the subject of assessment to stimulation of the

development of tourism, individual tourism businesses and destinations, establishment of a favorable external and internal environment of tourism development, and hence control of the tourist industry at regional and federal levels. Under the ideal circumstances, the system of regional tourism development rankings must be into correspondence with national and international rankings (Кружалин, Шабалина & Тульская, 2011).

The Travel & Tourism Competitiveness Index (TTCI) was developed in the World Economic Forum (Geneva, Switzerland). Annual rating study was conducted from 2007 to 2009, and from 2010, the study is conducted once in two years. In its preparation, a combination of data from publicly available sources and information from international organizations and experts in the field of travel and tourism is used. Research is conducted in World Economic Forum in close collaboration with a strategic partner – Booz & Company, and with partner, providing data: Deloitte, the International Air Transport Association (IATA), and the International Union for Conservation of Nature (IUCN), the World Tourism Organization (UNWTO), and the World Travel and Tourism Council (WTTC). World Economic Forum in its work on the reports also receives an important feedback from key industry partners: Airbus/EADS, BAE Systems, Bahrain Economic Development Board, Bombardier, Delta, Deutsche Lufthansa/Swiss, Embraer, Etihad Airways, Jet Airways, Hilton, Lockheed Martin, Marriott, Safran, Starwood Hotels & Resorts, VISA (Dupeyras, 2013).

The reports, which contain cross-country analysis on the factors of competitiveness in the travel and tourism sectors, provide information for comparisons, useful for decision-making in business and valuable for the government, seeking to improve the conditions for the travel and tourism sector. Research contains detailed profiles of each of the 140 economies that appear in the studies, including the details of the final position in the ranking and is a guide to the main competitive advantages and disadvantages. The report also includes reports of industry experts; chapters are devoted to visa facilitation and economic growth; the need for policy to use local competitive advantages in the changing environment; the influence of the tourism sector to create working places; influence of the aviation development in economic development.

TTCI allows to provide correct comparisons on the success of countries in the travel and tourism sector development, combining them into five regional groups: Europe, North and South America, the Asia-Pacific region (including Central Asia), the Middle East and North Africa and Africa south of the Sahara. TTCI builds a global ranking of countries according to their attractiveness index for the tourism industry development, and does not measure the attractiveness of the country as a tourist destination. This is not about the preferences of the tourists themselves, but on the attractiveness of the tourism sector in these countries for investors and entrepreneurs.

TTCI varies from 1 to 6 points (from a very low to very high).

This overall index is made up of 3 main sub-indices. Each of the sub-indices is divided in 4-5 basic components: the legal framework of the country (political rules and regulations, environmental safety, the safety of citizens, health and hygiene, the degree of priority for tourism development); business environment and infrastructure (infrastructure of civil aviation, ground transport infrastructure, tourism infrastructure, development of communications and information resources, pricing policy in the tourism sector); human, cultural and natural resources (human resources, the attractiveness of travel and tourism in the country, natural resources, and cultural resources) (Dupeyras, A., 2013).

Analysis of the country position in the plane of GCI and TTCI indices gives the possibility to suggest that there is a link between the levels of global and tourist competitiveness (See Fig.1).
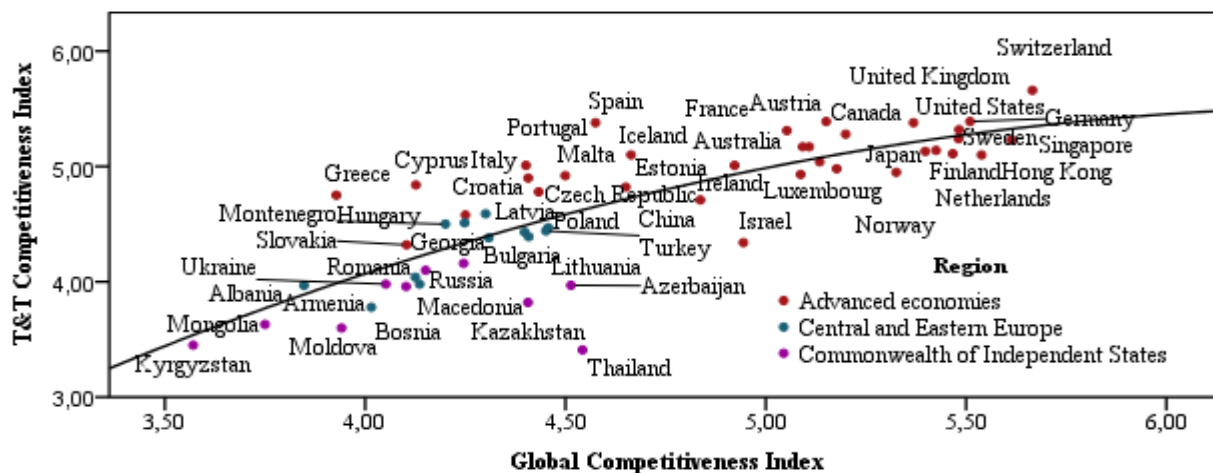
Fig. 1. Diagram showing the relationship between the index of global competitiveness and TTIC

The link between global competitiveness and tourism competitiveness is confirmed statistically. The analysis according to the data of 2013 showed a high degree of correlation between the GCI and TTCI indices – 78.3%.

2.2. Factor analysis of TTCI components

In order to analyze the TTCI factor structure, the factor analysis for the components of competitiveness, characterizing the potential of the tourism industry in the country was carried out. Factor analysis allows reducing the dimension of the phenomena under consideration by passing over from the indicators to the aggregates and the latent variables, characterizing the previously mentioned phenomena.

Factor analysis was carried out by selecting factors of the main components and the subsequent Varimax-rotation (Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization). Varimax: orthogonal rotation, which provides the minimization of the number of variables with a high load factor. This method is the most often used as it facilitates the interpretation of factors. Furthermore, isolated factors thus correlate weakly. The criterion of sampling adequacy Kaiser-Meyer-Olkin is 0.808, which indicates the appropriateness of factor analysis to analyze the index structure.

Factor analysis revealed a two-factor structure of the investigated phenomenon.

The setout factors allow estimating:

- F1 – socio-economic potential of the state;
- F2 – infrastructural and ecological potential of the state.

Factor loadings of indicators, which define the semantics of the selected factors, are displayed in Table 1. The first of the highlighted factors (F1) explains 34.4% of the total variance; factor F2 – 32.6%. The total percentage of the total variance, which is explained by the setout factors, is 67%.

Table 1. Components and their factor loadings in the framework of the two-factor structure of the competitiveness index in travel and tourism

	The components of competitiveness	F1	F2
A01	Legislation and state regulation of the industry	0,831	
A03	Safety	0,816	
C11	Human resources	0,816	0,432
C12	The desire to develop tourism	0,815	
A05	The priority of the sector for country	0,743	
B07	Ground transport infrastructure	0,666	0,547
C14	Cultural heritage		0,830
B10	The price competitiveness of the industry		-0,790
C13	Natural resources		0,735
B08	Tourism infrastructure		0,692
B09	Infrastructure of IT-communications	0,619	0,663
B06	Air transport infrastructure	0,575	0,645
A04	Health care		0,604
A02	Ecology, environment safety	0,482	0,580

2.2. Cluster analysis in TTIC components

Cluster analysis of the identified factors allows classifying regions in relation to the stated phenomena. Work with the setout clusters allows analyzing correlations in a higher qualitative level.

A two-step cluster analysis, taking into consideration the competitiveness factors in the tourism sector of a country, provides three homogeneous groups:

- Cluster 1 contains 25 (45.5%) countries (Greece, Israel, Czech Republic, Slovakia, Slovenia, Croatia, Bosnia, Bulgaria, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Turkey, Thailand, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Mongolia, Russia, Ukraine, Azerbaijan) the average values of the factors in this cluster are lower than the average.

- Cluster 2 contains 18 (32.7%) countries (Cyprus, Hong Kong. Malta, Iceland, Ireland, Luxembourg, New Zealand, Singapore, China, Estonia, Albania, Montenegro), this cluster is characterized in the way the first mean value of the extracted factors in this cluster is higher than the average, but the second one is lower.

- Cluster 3 unites 12 (21.8%) countries (Portugal, Spain, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States), in this cluster the average values of both factors are higher than the average.

The distribution of the different groups on selected clusters shows that the third cluster 100% consists of the advanced economies, the second cluster includes several countries in Central and Eastern Europe, and all the CIS countries are in the first cluster.

Table 2. The correlation coefficients between the sub-indices of competitiveness and the factors identified in the index structure

		A	B	C
A	Regulatory environment in the tourism sector	1	0,840[**]	0,661[**]
B	Environment and infrastructure for businesses	0,840[**]	1	0,845[**]
C	Human, cultural and natural resources	0,661[**]	0,845[**]	1
F1	The socio-economic potential of the state	0,769[**]	0,606[**]	0,409[**]
F2	Infrastructural and ecological potential of the state	0,290[*]	0,610[**]	0,848[**]

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

There is a direct strong, significant link between factors and sub-indices of tourism competitiveness. Moreover, the sub-indices themselves also strongly correlate with each other, which proves the correctness of their aggregation in the calculation of the competitiveness index, but excludes the possibility of using them to perform cluster analysis.

2.3. Cluster analysis in the plane of the TTIC factors

Comparison of selected clusters from the tourism competitiveness components (Fig.1.) provides their better characterization. Countries of the third cluster have the highest rates of all components. Countries from the first cluster differ from the countries of second cluster with more developed infrastructure, but have a similar level of cultural, natural and human resources. Countries of the second cluster the same T&T regulatory framework as it is in the countries third cluster and significantly lower T&T human, cultural and natural resources.
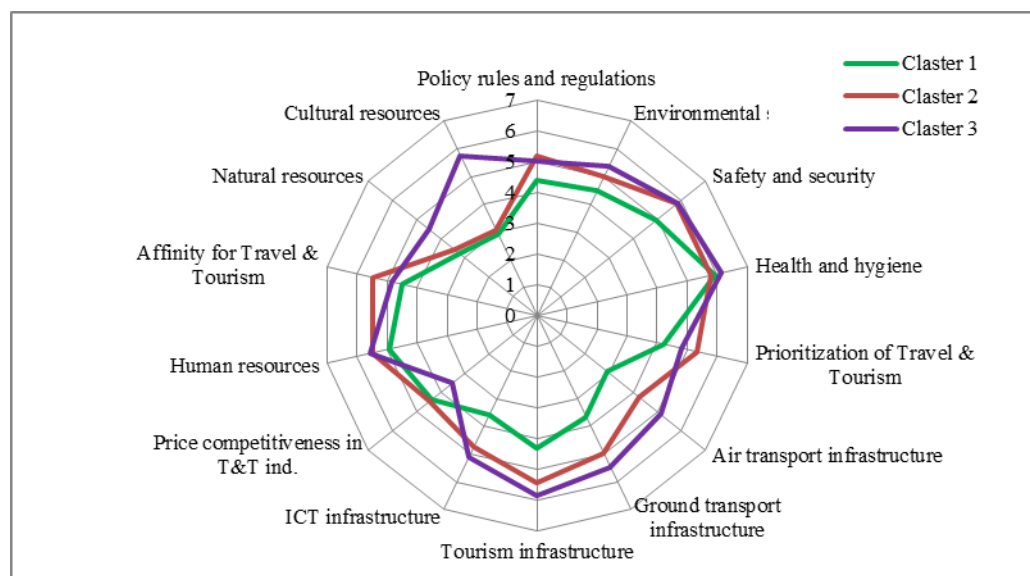

Fig.2. The mean values of the competitiveness components of the tourism industry in the clusters identified in the plane of socio-economic and resource ecological potential of the tourism

Analysis of the selected clusters, based on specific measurable TTIC indicators, revealed the following regularities.

Legislation and state regulation of the tourism industry in the TTCI index is determined by such indicators as: Policy rules and regulations: Prevalence of foreign ownership, Property rights, Business impact of rules on FDI, Visa requirements, no. of countries, Openness bilateral ASAs (0–38), Transparency of government policymaking, No. of days to start a business, Cost to start a business, % GNI/capita. In the first of the selected clusters (Cluster 1) all the indicators except for Cost to start a business,% GNI / capita and the Cost to start a business,% GNI / capita is lower than the average in total and lower than in the other clusters. The third cluster (Cluster 3) differs from the second (Cluster 2) with higher values of such indicators as the Business impact of rules on FDI, Property rights, Transparency of government policymaking.

Such indicators primarily determine the component "Ecology, Environmental safety": Environmental sustainability: Environm. treaty ratification (0–25), Enforcement of environmental regulation, Sustainability of T&T industry development, Carbon dioxide emission, million tons/capita, Particulate matter concentration, $\mu g/m^3$, Threatened species, %, Stringency of environmental regulation. Low level of these indicators is observed in the countries that are combined in the first of the clusters (Cluster 1). This fact indicates problems in the implementation of environmental policy and enforcement. In order to improve the situation, the environmental authorities shall use the most environmentally effective and economically viable methods of work, as well as the appropriate institutional conditions. Countries of the third cluster (Cluster 3) show higher level of compliance with the environmental legislation. Indicator – sustainable tourism development – the ability of tourism to maintain quantitative and qualitative indicators for a long period of time, i.e., to justify the expectations of residents and tourists, both in the short and long term without causing damage to the environment of the territory, interested in this phenomenon. The highest value of this indicator is marked in the countries of second cluster (Cluster 2).

To assess the state of tourism security system the following indicators are being used: Safety and security: Business costs of terrorism, Reliability of police services, Business costs of crime and violence. Countries of the first cluster (Cluster 1) are characterized by a high level of accidents on road, low reliability of police services; also, the costs for terrorism, crime and violence lower than the average. The countries of the second cluster (Cluster 2), by contrast, are characterized by higher spending on terrorism and crime. The third cluster (Cluster 2) has a low number of road accidents and high reliability of police services.

The component "Health" measures access to improved drinking water, following the sanitary regulations in the country, which is important for the comfort and health of travellers. And if tourists get sick, there must be a presence of guarantee that the host country will provide a competent and timely medical care for them and there is a doctor and ward (of beds) in the hospital. The lowest density in distribution of physicians and access to purified drinking water, worse than elsewhere, is observed in the second cluster (Cluster 2). The countries of the first cluster (Cluster 1) experience the problem with the number of hospital beds and access to improved sanitation.

The priority of the tourism industry in the country is determined by such indicators as: Prioritization of Travel & Tourism: Timeliness of T&T data (0–18), Effectiveness of marketing to attract tourists, Comprehensiveness of T&T data (0–120), Government prioritization of the T&T industry. Provided quantitative analysis leads to the conclusion that the tourism is a priority sector for the countries of the second cluster (Cluster 2).

Such indicators identify air transport infrastructure: Air transport infrastructure: Quality of air transport infrastructure, No. of operating airlines, Airline seat kms/week, int'l, millions, Departures/1,000 pop., Airline seat kms/week, dom., millions. The density of air traffic at the airports and the number of departures is the highest in countries of the second cluster (Cluster 2). The third cluster (Cluster 3) demonstrates the largest number of operating airlines, the quality of infrastructure

and passenger-kilometres in international transport. The first cluster (Cluster 1) demonstrates lower all air transport infrastructure indicators and in particular its quality than the average.

Ground transport infrastructure: Quality of roads, Quality of railroad infrastructure, Quality of port infrastructure, Quality of ground transport network. The most developed ground transport infrastructure is in the countries of third cluster (Cluster 3). The second cluster differs from the third with the quality of the railway infrastructure.

Tourism infrastructure is interpreted by the TTCI authors as accommodation (number of hotel rooms) possibilities, the representation of the country's leading car rental companies and the financial infrastructure (availability of ATMs). The largest number of hotel rooms characterizes the second cluster (Cluster 2), while in the third cluster (Cluster 3) most ATMs accept cards Visa. Countries of the first cluster (Cluster 1) have lower indicators of tourist infrastructure than the average.

ICT infrastructure: ICT use for B-to-B transactions, ICT use for B-to-C transactions, Individuals using internet, %, Mobile broadband subscriptions/100 pop., Broadband Internet subscribers/100 pop., Mobile telephone subscriptions/100 pop, Fixed telephone lines/100 pop. The countries of the third cluster (Cluster 3) features the most advanced ICT infrastructure, in the first cluster (Cluster 1) the level of development is lower than the average.

Price competitiveness is considered a particularly important factor in the tourism competitiveness. In accordance with TTCI the price competitiveness of the industry is determined by such indicators as: Price competitiveness in T&T ind.: Ticket taxes and airport charges (0–100), Purchasing power parity, Hotel price index, US$, Fuel price, US$ cents/litre, Extent and effect of taxation. Countries of the second cluster have higher scope and effect of taxation than in the other groups. Countries of the third cluster show higher purchasing power, while in countries of the first cluster this figure is the lowest.

The criterion "Desire to develop tourism" reflects how positive the country and society's attitude towards foreign visitors is. Authors of the Index also evaluate how business leaders are inclined to recommend a recreational vacation in their home country to their business partners and the share of tourism in the country's GDP. Countries of the second cluster show the highest level of the indicators in this component, except to the extent customer focus. The degree of customer orientation is the highest in countries of the third cluster, and the lowest in the first cluster as well as all other indicators.

Such indicators represent natural resources: Affinity for Travel & Tourism: Marine protected areas, %, Quality of the natural environment, Total known species, Terrestrial biome protection (0–17%), No. of World Heritage natural sites. Countries of the second cluster demonstrate the lowest figures on the number of the natural complex objects in World Heritage sites and the total number of known species, and with the highest protection of land biome. The third cluster demonstrate the largest number of the natural complex of World Heritage sites and the best quality of the natural environment.

Cultural resources: No. of World Heritage cultural sites, Sports stadiums, seats/million pop., Creative industries exports, % of world total, No. of int'l fairs and exhibitions. Countries of the second cluster (Cluster 2) demonstrate the largest number of sports stadiums and the lowest number of cultural World Heritage. In the countries of the first cluster (Cluster 1) all figures are lower than the average, but in the third (Cluster 3), on the other hand, above it.

Analysis of the classification tree in the field competitiveness components in tourism leads to the conclusion that the greatest discrimination ability in this field have such components: Cultural resources, Affinity for Travel & Tourism and ICT infrastructure. Cluster 1 involves countries that form a low level of Cultural resources and Affinity for Travel & Tourism, or with high components of Cultural resources, but low levels of ICT infrastructure. Countries of Cluster 1 in average indicators of Cultural resources are distinguished by the high level of Affinity for Travel & Tourism. The countries of the third cluster are characterized by a high level of Cultural resources and ICT infrastructure.

Standardized coefficients of multiple linear regression can be interpreted as direct influence indicators of the factors on the result. Analysis of multiple regression equation built in the field of competitiveness sub-indices, leads to the conclusion that the Business environment and infrastructure greatest contribution to the competitiveness index for the countries under study. However, the most significant competitive advantage in the third cluster is the sub-index T & T human, cultural and natural resources (Table 3).

Table 3. Standardized coefficients of the linear regression equation, which establishes the connection between TTCI and sub-indexes

	Total	Cluster 1	Cluster 1	Cluster 1
T&T regulatory framework	0,253	0,272	0,310	0,438
Business environment and infrastructure	0,439	0,497	0,544	0,382
T&T human, cultural and natural resources	0,382	0,363	0,201	0,566

In the countries of the first cluster (Cluster 1), the greatest direct impact on TTCI have such components: Tourism infrastructure, Cultural resources. In the second cluster (Cluster 2): Prioritization of Travel & Tourism, Air transport infrastructure, ICT infrastructure, Natural resources, Cultural resources, but in the third cluster (Cluster 3): Air transport infrastructure, Ground transport infrastructure, Tourism infrastructure, Natural resources, Cultural resources (Table 4).

Table 4. Standardized coefficients of the regression equation, establishing connection between the components of competitiveness and TTCI

	Total	Claster 1	Claster 2	Claster 3
Policy rules and regulations	0,058	0,051	0,047	0,090
Environmental sustainability	0,074	0,087	0,184	0,191
Safety and security	0,069	0,074	0	0,101
Health and hygiene	0,065	0,105	0,093	0,164
Prioritization of Travel & Tourism	0,080	0,084	0,256	0,174
Air transport infrastructure	0,142	0,129	0,210	0,229
Ground transport infrastructure	0,138	0,142	0,172	0,248
Tourism infrastructure	0,168	0,271	0	0,247
ICT infrastructure	0,112	0,113	0,266	0,147
Price competitiveness in T&T ind.	0,066	0,067	0	0,132
Human resources	0,061	0,047	-0,063	0,121
Affinity for Travel & Tourism	0,072	0,081	0,087	0,114
Natural resources	0,129	0,119	0,254	0,380
Cultural resources	0,233	0,258	0,264	0,296

3. Conclusions

The current article adapted method of estimating the competitiveness of the tourism industry at the national level, which was based on the index of competitiveness of Travel & Tourism. The application of factor analysis to the TTCI dimension components for the competitiveness of the twelve-dimensional space was reduced to two factors: socially-economic and resource-ecological factors. A two-step cluster analysis in the field of these factors allowed to group of 55 countries selected for analysis in the three homogeneous clusters. The comparative analysis of these clusters using TTCI indicators allows describing the model of competitiveness formation in the tourism sector.

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