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G.O. Gorina, V.V. Barabanova, G.A. Bohatyryova, O.A. Nikolaichuk, A.M. Romanukha

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## Clustering of regional tourism service markets according to indicators of the functioning of subjects of tourism activity

Ganna O. Gorina, Valentyna V. Barabanova, Galina A. Bohatyryova, Olga A. Nikolaichuk, Aleksander M. Romanukha

*Donetsk national university of economics and trade named after Mykhailo Tugan-Baranovsky, Kryvyi Rih, Ukraine, [gorina@donnuet.edu.ua](mailto:gorina@donnuet.edu.ua)*

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**Abstract.** Clustering of regional tourism service markets of Ukraine is performed according to the indicators of functioning of subjects of tourism activity (number of subjects of tourism activity; number of staff members of tourist activities; income from tourism; number of tourists served by tour operators and travel agents; cost of travel packages sold). The

clustering was performed in the software STATISTICA 10, the Ward method was chosen as the clustering algorithm, and the Euclidean distance was chosen as a measure of distance. The calculations made it possible to distinguish 6 clusters of regional tourism service markets of Ukraine, which are formed at a threshold distance of 0.5, namely: cluster 1 is Kyiv city, cluster 2 is Zaporizhia, Kyiv, Poltava, Ivano-Frankivsk regions, cluster 3 is Dnipropetrovsk, Lviv regions, cluster 4 is Odessa, Kharkiv regions, cluster 5 is formed from Zhytomyr, Ternopil, Chernihiv, Kirovograd and Luhansk regions, cluster 6 unites Vinnytsia, Chernivtsi, Donetsk, Cherkasy, Transcarpathian, Rivne, Khmelnytsky, Volyn, Sumy, Kherson and Mykolaiv regions. The clusters on the vertical dendrogram of hierarchical clustering are visualized, the spatial distribution of clusters of regional markets of tourist services is shown on the map of Ukraine. It is established that the high degree of regional differentiation of tourist service markets in Ukraine is caused by differences in the distribution of natural resources, climatic features of the regions, cultural and historical conditionality, and uneven placement of transport, communication, resort and entertainment infrastructures, asymmetrical distribution of recreational resources. It is suggested to take into account the restrictions of development of regional tourism service markets of Ukraine (clusters of regional tourism service markets) in terms of spatial polarization, to distribute them into internal (historically-formed basic and innovative determinants) and external ones.

**Keywords:** *tourism, tourism service market, service sector, cluster analysis, subjects of tourism activity, tourism activity, spatial polarization*

## Кластеризація регіональних ринків туристичних послуг за показниками функціонування суб'єктів туристичної діяльності

Г.О. Горіна, В.В. Барабанова, Г.А. Богатирьова, О.А. Ніколайчук, О.М. Романуха

*Донецький національний університет економіки та торгівлі імені Михайла Туган-Барановського, м. Кривий Ріг, Україна, [gorina@donnuet.edu.ua](mailto:gorina@donnuet.edu.ua)*

**Анотація.** Здійснено кластеризацію регіональних ринків туристичних послуг України за показниками функціонування суб'єктів туристичної діяльності (кількість суб'єктів туристичної діяльності; кількість штатних працівників суб'єктів туристичної діяльності; дохід від надання туристичних послуг; кількість туристів, обслугованих туристичними операторами та туристичними агентами; вартість реалізованих туристичних путівок). Кластеризацію було здійснено у програмному продукті STATISTICA 10, у якості алгоритму кластеризації було обрано метод Ворда, мірою відстані обрано Евклідову відстань. Проведені розрахунки дозволили виокремити 6 кластерів регіональних ринків туристичних послуг України, які утворюються при пороговій відстані у 0,5, а саме: кластер 1 – м. Київ, кластер 2 – Запорізька, Київська, Полтавська, Івано-Франківська області, кластер 3 – Дніпропетровська, Львівська області, кластер 4 – Одеська, Харківська області, кластер 5 утворено з Житомирської, Тернопільської, Чернігівської, Кіровоградської та Луганської області, кластер 6 об'єднує Вінницьку, Чернівецьку, Донецьку, Черкаську, Закарпатську, Рівненську, Хмельницьку, Волинську, Сумську, Херсонську та Миколаївську області. Візуалізовано виокремлені кластери на вертикальній дендограмі ієрархічної кластеризації, просторовий розподіл кластерів регіональних ринків туристичних послуг відображено на карті України. Встановлено, що високий ступінь регіональної диференціації ринків туристичних послуг України обумовлений відмінностями в розподілі природних ресурсів, кліматичними особливостями регіонів, культурно-історичною обумовленістю, нерівномірністю розміщення транспортної, комунікаційної, курортно-

розважальної інфраструктури, асиметрією розподілу рекреаційних ресурсів тощо. Запропоновано облік обмежень розвитку регіональних ринків туристичних послуг України (кластерів регіональних ринків туристичних послуг) в умовах просторової поляризації здійснювати розподіливши їх на внутрішні (історично-сформовані базові та інноваційні детермінанти) і зовнішні.

*Ключові слова:* туризм, ринок туристичних послуг, сфера послуг, кластерний аналіз, суб'єкти туристичної діяльності, туристична діяльність, просторова поляризація

**Introduction.** The high degree of regional differentiation of the tourist service markets in Ukraine makes the usage of unified approaches to the tourism development management and regulation ineffective. The achieved strategic goals of the state policy in the field of tourism, coherences and satisfaction of interests of the tourism activity subjects and the state is possible through the development and implementation of optimal specific models of regional support to the development of business processes in the tourism industry. In this regard, the question of identifying clusters of regional tourist services markets of Ukraine similar in tendencies and indicators of tourism activity is urgent. The use of cluster analysis and profiling of each selected segment can serve as an informational and analytical basis for working out effective strategies and models for the development of regional tourism service markets.

The use of cluster analysis and clustering methods has become widespread in the tourism industry, both in the works of domestic scientists and foreign researchers. L. Golovkova, Yu. Yuhnovska (Golovkova, Yuhnovska, 2019) propose an algorithm for the formation and development of the tourism industry of the region on the basis of a cluster approach, insist that the structure of the tourism cluster of the region should be based on enterprises (organizations, firms) that are geographically located, tourist infrastructure, local labor markets and tourist product, which is a geographical and historical component of an appropriate region. The influence of tourism clustering on the formation of regional image, the spread of clustering processes through the promotion of the image of the territory is raised in the work of S. Kolyadenko (Kolyadenko, 2018). N. Andrusiak (Andrusiak, 2014) explores the general trends in the development of national and cross-border recreational and tourism clusters as effective instruments for interregional and international cooperation. A cluster analysis of tourist flows by cross-section of regions of Ukraine was carried out in the work of D. Ocheretin (Ocheretin, 2015), the task of which is to find similar groups of objects in the sample and to identify the location of each region in the tourist flow. O. Chernega, G. Gorina, O. Romanukha, G. Bohatyryova, K. Nikolenko (Chernega, Gorina, Romanukha, Bohatyryova, Nikolenko, 2019) zoned the territory of Ukraine for the development of cultural and educational tourism,

which is based on the calculation of average data on the number of museums by region, analysis of their visits and volume of tourist flows. N. Ivanova (Ivanova, 2017) investigates the socio-economic indicators of the development of the regions of Ukraine in order to identify the homogeneity of objects (regions) of the crisis management system with the help of using cluster analysis methods. A. Okhrimenko (Okhrimenko, 2013) substantiates the urgency and necessity of the development of tourist clusters at the regional level, emphasizes their advantages and importance.

A number of national scientists who use cluster analysis and clustering methods in their studies place emphasis in their works on certain regions of Ukraine. Thus, A. Parfinenko, K. Bosenko (Parfinenko, Bosenko, 2018) explore the potential of tourism clustering of Podilskyi region of Ukraine, V. Hotra (Hotra, 2013) outlines the stages and levels of clustering of the Transcarpathian tourism business in rural development, P. Romaniv (Romaniv, 2017) studies the cluster model of managing tourist activity of Lviv region, and also analyzes the role of cluster entities in the economic development of the regions. O. Mykhailiuk, I. Davidenko (Mykhailiuk, Davidenko, 2018) carry out the analysis of existing and perspective clusters in the tourism sphere of Odessa region, offer directions of tourist activity improvement in the region by taking into account the clustering process.

Cluster analysis and clustering methods are widely used by foreign scientists in studying tourism at all economic levels of its implementation. J. Chávez, A.I. Zamora Torres, M. C. Torres (Chávez, Zamora Torres, Torres, 2016) mainly focus on the analysis of 14 competitiveness tourism factors for 20 country members of the Asia-Pacific Economic Cooperation (APEC) forum. The authors analyze secondary data from the Travel and Tourism Competitiveness Index to create clusters, and then multidimensional scaling techniques were employed for detecting the more or less effective determinants of destination competitiveness. T. Yalçinkaya, T. Güzel (Yalçinkaya, Güzel, 2019) focuses on general overview of tourism clusters. Authors propose the explanation what a tourism cluster is, how it is processed, how its network system functions and how tourism clusters are classified. G. Kol'vecková, E. Liptáková, Ľ. Štrba, B. Kršák, C. Sidor, M. Cehlár, S. Khouri, M. Behún

(Kol'veková, Liptáková, Štrba, Kršák, Sidor, Cehlár, Khouri, Behún, 2019) discuss the fusion of 54 regions of Central and Eastern Europe (Czech Republic, Slovakia, Hungary, Poland, Estonia, Lithuania, Latvia, Slovenia, Romania, and Bulgaria) into clusters according to the selected accommodation tourism indicators used by the European Statistical Agency (Eurostat) to evaluate tourism. The cluster analysis resulted in the definition of six clusters consisting of regions with similar indicators' statistics characteristics. D. Lascu, L. Manrai, A. Manrai, A. Gan (Lascu, Manrai, Manrai, Gan, 2018) identify traits of the most attractive tourism destinations in Spain using a two-step cluster analysis to ascertain the relative importance of natural, cultural, and dual attractions to target consumers. A. Ramiresa, F. Brandaob, A.C. Sousa (Ramiresa, Brandaob, Sousa, 2018) segments international tourists visiting the World Heritage City of Porto based on their travel motivations relating to specific destination attributes, as well as gauging their satisfaction with the tourist experience. N. Iswandhani, M. Muhaji (Iswandhani, Muhaji, 2018) used K-means cluster analysis of tourist destination in special region of Yogyakarta using spatial approach and social network analysis.

The result of this research is the determination of the top-10 most popular destinations in Yogyakarta, map of html-based tourist destination distribution consisting of 121 tourist destination points and forms 3 clusters. J. Dew (Dew, 2018) examined different segments of visitors to Tanzania with respect to their values around sustainability through a combination of non-hierarchical and hierarchical cluster analyses. A follow-up analysis using ANOVA and Chi-square indicates that three clusters are significantly different in their sustainable values, their travel motives, and their demographics. J. Rodríguez, I. Semanjski, S. Gautama, N. Van de Weghe, D. Ochoa (Rodríguez, Semanjski, Gautama, Van de Weghe, Ochoa, 2018) developed and implemented a hierarchical clustering approach for smartphone geo-localized data to detect meaningful tourism related market segments. The application of the proposed approach in the Province of Zeeland in the Netherlands allowed to distinguish two major clusters and four sub-clusters which we were able to interpret based on their spatial-temporal patterns and the recurrence of their visiting to the region.

Content analysis of modern domestic and foreign researches devoted to diagnostics of tourist activity allowed to confirm the hypothesis about widespread use of methods of multidimensional statistical analysis, in particular cluster. Researchers subjected to clustering as individual tourist enterprises or organizations and

regional tourist markets of whether the same state and tourist regions.

At the same time, it is established that in Ukraine the process of implementation of the cluster model of organization of tourist activity is in the stage of formation. Clusters combine mainly tourism entities, while the regional aspect both of the diagnostics of tourism markets and establishment of the joint strategies and the models of regional travel market development with similar historically formed basic and innovation determinants is ignored.

The aim is to carry out cluster analysis of the regional tourism market indicators for the functioning of tourism, which should improve diagnostic approaches to market and create a basis for study strategies and development models.

**Material and research methods.** The theoretical basis of the study were the provisions of the theory of tourism and tourismology (spatial model of the tourism travels (displacement), structural models of tourism, spatial models of tourism development), economic geography, regional economy, economic theory, macro and micro economics, works of leading domestic and foreign scientists on the tourism development issues.

To achieve this purpose, the following research methods were used in the work: generalization, systematization (for content analysis of the works of domestic and foreign scientists, devoted to the use of cluster analysis and clustering methods in tourism industry studies); analysis and synthesis (to determine the features that clustered the sample objects (regional tourist services markets)); method of cluster analysis based on the integration of objects (regional tourist services markets) into clusters, using a measure of similarity or the distance between them using the STATISTICA 10 software (StatSoft, USA, 2014) (for grouping regional markets of tourist services of Ukraine by indicators of functioning of subjects of tourist activity); graphical and tabular methods (for visualization and ability to see statistical material); cartographic method (to illustrate clusters of regional tourist services markets of Ukraine).

The reliability of the obtained results is ensured by the use of official data of the State Statistics Service of Ukraine. However, it should be noted that the composition and number of clusters depends on the selected partition criteria. In our case, the characteristics by which the grouping (the breakdown criteria) are the indicators selected by the authors from the data of the statistical collection of the State Statistics Service of Ukraine "Tourism in Ukraine in 2018" and which, according to the authors, most reflect the func-

tioning of the subjects of tourism activity. However, the absence/presence of certain features of clusters in a given set can change their structure. Also, the composition and number of clusters will change significantly, taking into account the data of the temporarily occupied territory of the Autonomous Republic of Crimea, Sevastopol and part of the temporarily occupied territories in Donetsk and Luhansk regions.

**Results and their analysis.** Taking into account the regional specificity of the tourism development should not be based only on the administrative-territorial division of the country. Regional markets for tourism services in Ukraine with similar trends in tourism development may not be related by territorial or administrative feature. It is proposed to carry out the identification of groups of regions with similar tendencies of development of tourist entities and further development of the most relevant and popular development strategies and models by cluster analysis.

24 regions of Ukraine and the city of Kyiv serve as the sampling objects, which features were used for clustering made in 2018 are: the number subjects of tourist activity, the number of staff members of tourist activities, income from tourism, the number of tourists served by tour operators and travel agents, the cost of travel packages sold in different regions.

Initial statistics for cluster analysis of the regional tourism market is presented in the Table 1.

Previous valuation of output data to eliminate differences in performance units made by the formula:

$$Z = \frac{(x-\mu)}{\sigma}, \quad (1)$$

where  $Z$  – the value of the standard normalized distribution,

$x$  – the value of the output distribution,

$\mu$  – the average value of the original distribution,

$\sigma$  – standard deviation of the original distribution.

Dendrogram hierarchical clustering regional travel market was built on the software STATISTICA 10 (StatSoft, USA, 2014) by consecutive Clustering of the nearest first, and then of more and more distant from each other objects. The Euclidian distance was selected as the clustering algorithm. Euclidean distance matrix for the analyzed object (regional tourism market) given in the table 2.

To determine the number of clusters enlarged it is advisable to choose a threshold distance of 1 or higher, while for more detailed fundamental analysis of the tourism services market it is needed to develop the local development strategies advisable to choose a threshold distance of 0.5 and lower, will determine the optimal composition of cluster indicators of activity of the regional tourism market. The built dendrogram is shown in the Fig. 1.

**Table 1.** Initial statistics for cluster analysis of the regional tourism market of Ukraine, 2018 (compiled by the author using (Statistical yearbook "Tourist activity in Ukraine", 2018))

Region	Number of subjects of tourist activity (units)	Number of staff members of tourist activities (persons)	Income from tourism (ths. UAN)	Number of tourists served by tour operators and travel agents (persons)	The cost of travel packages sold (ths. UAN)
Vinnyska	87	202	44367.8	42178	50789.1
Volynska	74	100	23620.1	21807	41564.8
Dnipropetrovska	416	748	99660.1	116981	550359.9
Donetska	93	164	45414.5	28425	139199.5
Zhytomyrska	63	67	10550.6	17957	94454.6
Zakarpatska	91	125	29122.4	25348	101795.9
Zaporizka	188	309	45976.2	56374	396231.8
Ivano-Frankivska	128	554	453399.9	55781	61754
Kyivska	217	339	58981.2	66385	289505.1
Kirovohradska	54	58	16571.6	11556	39793
Luhanska	29	39	7461	6261	5286.5
Lvivska	342	811	511590.4	182255	386274.4
Mykolaivska	87	72	16583.5	19002	93039.6
Odeska	270	741	202190.7	81381	532000.4
Poltavska	155	217	25604.5	32007	70424.8
Rivnenska	93	135	19992.3	22027	77158
Sumska	79	74	15788.2	16178	46447.6
Ternopil'ska	63	104	12345.8	13103	37343.4
Kharkivska	266	443	86603.2	62232	344204
Khersonska	80	136	53914	26130	34531.1
Khmelnyska	89	120	12610.6	25738	38228
Cherkaska	101	167	22722.1	26383	42603.4
Chernivetska	77	194	28990.1	29562	128982.4
Chernihivska	58	97	12074.5	22306	66293.7
Kyiv	1093	5861	19769786	3550090	13398039.7



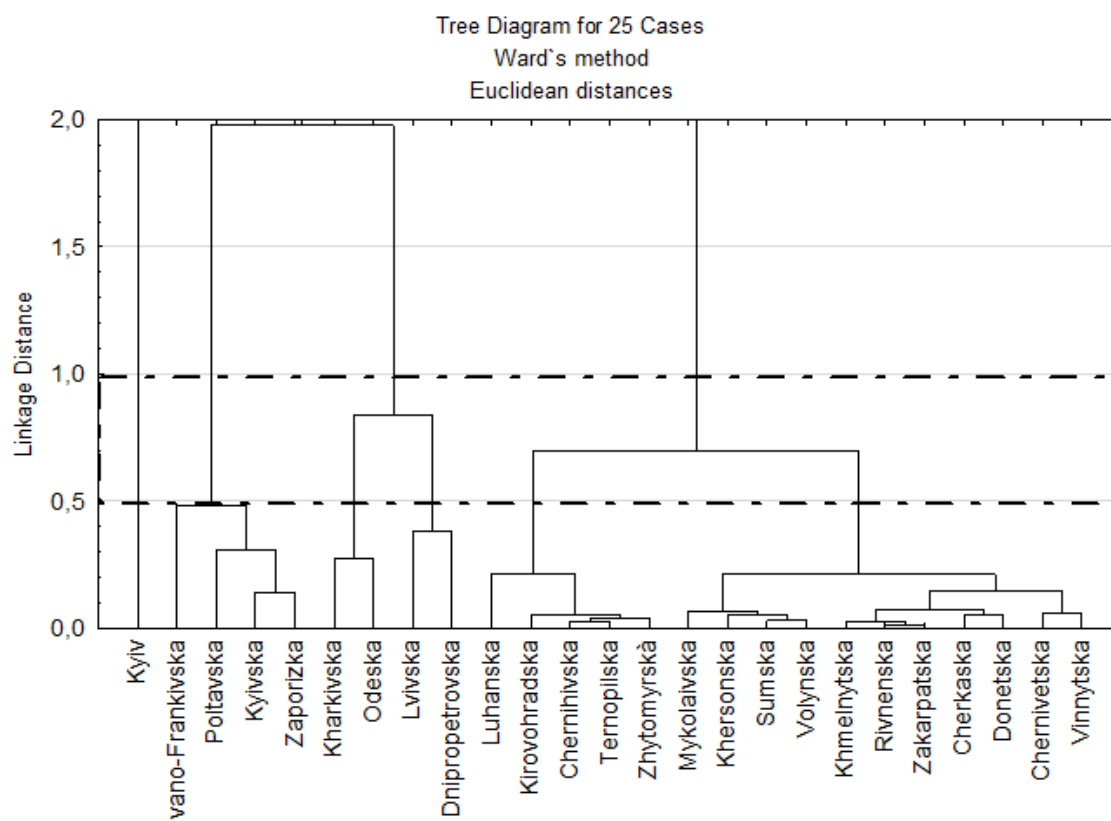


Fig. 1. Dendrogram of hierarchical clustering of regional tourism service markets of Ukraine (compiled by the author)

At a threshold of 0.5, 6 clusters are formed in the tourist services market of Ukraine. *Cluster 1* is Kyiv, which according to all indicators of the functioning of the subjects of tourist activity (number of subjects of tourist activity; number of staff members of tourist activity; income from tourism; number of tourists served by tour operators and travel agents; the cost of travel package sold) is in the first place. *Cluster*

Table 2. Euclidean distance matrix for regional tourist services markets of Ukraine (compiled by the author)

Region	Vynnytska	Volynska	Dnipropetrovska	Donetska	Zhytomyrska	Zakarpatska	Zaporizka	Ivano-Frankivska	Kyivska	Kirovohradska	Luhanska	Lvivska	Mykolaivska	Odeska	Poltavska	Rivnenska	Sumska	Ternopilska	Kharkivska	Khersonska	Khmelnytska	Cherkaska	Chernivetska	Chernihivska	Kyiv
Vinnnytska	0.00	0.11	1.62	0.06	0.17	0.08	0.50	0.38	0.62	0.20	0.31	1.33	0.12	0.99	0.32	0.07	0.12	0.15	0.87	0.07	0.08	0.04	0.17	11.02	
Volynska	0.11	0.00	1.70	0.11	0.06	0.09	0.58	0.48	0.71	0.10	0.22	1.42	0.07	1.09	0.39	0.09	0.03	0.05	0.95	0.04	0.07	0.14	0.09	0.08	11.11
Dnipropetrovska	1.62	1.70	0.00	1.60	1.76	1.62	1.13	1.37	1.00	1.80	1.92	0.38	1.65	0.68	1.32	1.61	1.69	1.75	0.75	1.67	1.63	1.57	1.66	1.77	10.10
Donetska	0.06	0.11	1.60	0.00	0.16	0.04	0.47	0.39	0.60	0.21	0.32	1.31	0.09	0.98	0.29	0.04	0.11	0.16	0.84	0.08	0.06	0.05	0.08	0.18	11.02
Zhytomyrska	0.17	0.06	1.76	0.16	0.00	0.14	0.63	0.54	0.76	0.05	0.16	1.48	0.11	1.14	0.45	0.15	0.08	0.04	1.01	0.10	0.13	0.20	0.13	0.04	11.14
Zakarpatska	0.08	0.09	1.62	0.04	0.14	0.00	0.49	0.43	0.62	0.18	0.30	1.34	0.05	1.01	0.31	0.02	0.08	0.13	0.87	0.06	0.03	0.06	0.09	0.16	11.05
Zaporizka	0.50	0.58	1.13	0.47	0.63	0.49	0.00	0.39	0.14	0.68	0.79	0.87	0.53	0.54	0.22	0.48	0.57	0.63	0.38	0.54	0.51	0.45	0.54	0.65	10.72
Ivano-Frankivska	0.38	0.48	1.37	0.39	0.54	0.43	0.39	0.00	0.47	0.57	0.66	1.04	0.48	0.71	0.34	0.42	0.49	0.51	0.66	0.44	0.44	0.38	0.41	0.53	10.75
Kyivska	0.62	0.71	1.00	0.60	0.76	0.62	0.14	0.47	0.00	0.81	0.92	0.74	0.66	0.44	0.32	0.61	0.69	0.75	0.25	0.67	0.63	0.57	0.67	0.78	10.67
Kirovohradska	0.20	0.10	1.80	0.21	0.05	0.18	0.68	0.57	0.81	0.00	0.12	1.52	0.16	1.19	0.49	0.19	0.12	0.06	1.05	0.14	0.17	0.24	0.17	0.04	11.17
Luhanska	0.31	0.22	1.92	0.32	0.16	0.30	0.79	0.66	0.92	0.12	0.00	1.63	0.27	1.30	0.61	0.31	0.24	0.17	1.17	0.25	0.29	0.35	0.27	0.15	11.24
Lvivska	1.33	1.42	0.38	1.31	1.48	1.34	0.87	1.04	0.74	1.52	1.63	0.00	1.38	0.38	1.05	1.33	1.41	1.47	0.52	1.38	1.35	1.28	1.37	1.49	10.12
Mykolaivska	0.12	0.07	1.65	0.09	0.11	0.05	0.53	0.48	0.66	0.16	0.27	1.38	0.00	1.05	0.34	0.06	0.04	0.12	0.90	0.07	0.05	0.11	0.12	0.14	11.09
Odeska	0.99	1.09	0.68	0.98	1.14	1.01	0.54	0.71	0.44	1.19	1.30	0.38	1.05	0.00	0.73	1.00	1.08	1.13	0.27	1.05	1.02	0.95	1.03	1.15	10.35
Poltavska	0.32	0.39	1.32	0.29	0.45	0.31	0.22	0.34	0.32	0.49	0.61	1.05	0.34	0.73	0.00	0.30	0.38	0.44	0.56	0.36	0.32	0.25	0.36	0.46	10.89
Rivnenska	0.07	0.09	1.61	0.04	0.15	0.02	0.48	0.42	0.61	0.19	0.31	1.33	0.06	1.00	0.30	0.00	0.09	0.14	0.86	0.06	0.03	0.05	0.09	0.17	11.05
Sumska	0.12	0.03	1.69	0.11	0.08	0.08	0.57	0.49	0.69	0.12	0.24	1.41	0.04	1.08	0.38	0.09	0.00	0.08	0.94	0.06	0.06	0.13	0.11	0.10	11.11
Ternopilska	0.15	0.05	1.75	0.16	0.04	0.13	0.63	0.51	0.75	0.06	0.17	1.47	0.12	1.13	0.44	0.14	0.08	0.00	1.00	0.09	0.12	0.19	0.11	0.03	11.13
Kharkivska	0.87	0.95	0.75	0.84	1.01	0.87	0.38	0.66	0.25	1.05	1.17	0.52	0.90	0.27	0.56	0.86	0.94	1.00	0.00	0.91	0.88	0.81	0.91	1.02	10.53
Khersonska	0.07	0.04	1.67	0.08	0.10	0.06	0.54	0.44	0.67	0.14	0.25	1.38	0.07	1.05	0.36	0.06	0.06	0.09	0.91	0.00	0.05	0.10	0.06	0.11	11.08
Khmelnytska	0.08	0.07	1.63	0.06	0.13	0.03	0.51	0.44	0.63	0.17	0.29	1.35	0.05	1.02	0.32	0.03	0.06	0.12	0.88	0.05	0.00	0.07	0.09	0.15	11.07
Cherkaska	0.08	0.14	1.57	0.05	0.20	0.06	0.45	0.38	0.57	0.24	0.35	1.28	0.11	0.95	0.25	0.05	0.13	0.19	0.81	0.10	0.07	0.00	0.12	0.21	11.02
Chernivetska	0.06	0.09	1.66	0.08	0.13	0.09	0.54	0.41	0.67	0.17	0.27	1.37	0.12	1.03	0.36	0.09	0.11	0.11	0.91	0.06	0.09	0.12	0.00	0.13	11.04
Chernihivska	0.17	0.08	1.77	0.18	0.04	0.16	0.65	0.53	0.78	0.04	0.15	1.49	0.14	1.15	0.46	0.17	0.10	0.03	1.02	0.11	0.15	0.21	0.13	0.00	11.14
Kyiv	11.02	11.11	10.10	11.02	11.14	11.05	10.72	10.75	10.67	11.17	11.24	10.12	11.09	10.35	10.89	11.05	11.11	11.13	10.53	11.08	11.07	11.02	11.04	11.14	0.00

2 is formed by Zaporizhzhya, Kyiv, Poltava, Ivano-Frankivsk regions. *Cluster 3* and *Cluster 4* consist of two sample objects - Dnipropetrovsk, Lviv and Odesa, Kharkiv regions respectively. *Cluster 5* unites the Zhytomyr, Ternopil, Chernihiv, Kirovograd and Luhansk regions. *Cluster 6* is the most numerous, grouping eleven regions of Ukraine, namely Vinnytsia, Chernivtsi, Donetsk, Cherkasy, Transcarpathian, Rivne, Khmelnytsky, Volyn, Sumy, Kherson and Mykolaiv regions (table 3).

Accounting constraints of the development of the regional tourist market of Ukraine (regional cluster of tourist market) in terms of spatial polarization is advisable by dividing them into *internal and external*. *Internal constraints* delineate the boundary of individual travel market in the region (regions, clusters) caused by the imperfection or absence of endogenous determinant of the market, which in turn is advisable to distinguish between the *historically-formed base* and *innovative determinants* (Horina, 2016).

**Table 3.** Clustering regional tourism market of Ukraine (compiled by the author)

Threshold – 0.5			Threshold - 1		
Cluster	Cluster integration level	Cluster	Cluster integration level	Cluster	Cluster integration level
1	2	3	4	5	6
Cluster 1	-	Kyiv	Cluster 1	-	Kyiv
Cluster 2	0.4865010	Zaporizka. Kyivska. Poltavska. Ivano-Frankivska	Cluster 2	0.4865010	Zaporizka, Kyivska, Poltavska Ivano-Frankivska
Cluster 3	0.3802633	Dnipropetrovsk. Lvivska	Cluster 3	0.7004833	Vinnytska, Chernivetska, Donetsk, Cherkaska, Zakarpatska, Rivnenska, Khmelnytska, Volynska, Sumska, Khersonska, Mykolaivska, Zhytomyrska, Ternopilska, Chernihivska, Kirovohradska, Luhanska,
Cluster 4	0.2732135	Odeska. Kharkivska			
Cluster 5	0.2139298	Zhytomyrska. Ternopilska. Chernihivska. Kirovohradska Luhanska	Cluster 4	0.8406595	Dnipropetrovsk, Lvivska, Odeska, Kharkivska
Cluster 6	0.2129407	Vinnytska, Chernivetska, Donetsk, Cherkaska, Zakarpatska, Rivnenska, Khmelnytska, Volynska, Sumska, Khersonska, Mykolaivska			

It should be also noted that geography hasn't been used and isn't taken into account when combining regional travel market in clusters on indicators of functioning of tourist activity. Only economic indicators of activity were applied.

Regional differentiation of the development of tourist services markets of Ukraine is caused by "... differences in the distribution of natural resources, climatic features of the regions, cultural and historical conditionality, disproportional placement of transport, communication, resort and entertainment infrastructure, asymmetry of distribution of recreational resources" (Gorina, 2016) and other factors that shape spatial polarization. In this regard, the polarizing aspects of the spatial development of tourism, the causes and consequences of increasing imbalances and asymmetries in the structure of the tourism market, must be taken into account when forming strategies and models of market development.

*Historically-formed determinants* are revealed through the "... assessment of the imperfection localization or lack of necessary natural resource and socio-demographic factors for the development of the tourist service market, namely favorable geographical location and natural and climatic conditions, access to natural resources, optimal proximity to external borders / center, the availability of a sufficient number of skilled labor resources, the level of labor productivity caused by socio-cultural characteristics and ethnic composition of the population" (Gorina, 2016). Among the historically-formed determinants that influenced the formation of tourist services regional market clusters of Ukraine, natural resource determinants prevail, namely: provision and access to natural resources, favorable natural and climatic conditions, proximity to external borders.

*Innovative determinants* are revealed due to set of restraining restrictions that arise as a result of im-

perfection of institutional and infrastructural support for the formation of the tourist market (transport and sectorial infrastructure, organizational and institutional structures), heterogeneity and structural unevenness of the industrial and economic complexes, which ensures the low level of tourism, imperfect sectorial and regional development strategies. Among the innovative determinants that traditionally influence the formation of inequality in the development of tourist regions of the tourism service national market are the most influential: institutional and infrastructural determinants (transport and sectorial infrastructure), determinants of innovation (innovational and investment activity in the tourism industry), political and economic determinants (regional policy in the field of tourism; the presence of a tourism and recreational

External constraints are hindering integration, globalization and the development of the tourism market and are manifested in the absence of exogenous determinants of development. These restrictions mainly concern the national tourism market as a whole.

Analyzing the spatial distribution of clusters of regional tourist service markets of Ukraine, shown in the Figure 2, we can conclude about the prevailing lack of geographical proximity of the formed clusters. Only the cluster 6 is the exception as it combines more than 40% of the sample sites (eleven regions of Ukraine, namely Vinnytsia, Zaporizhia, Donetsk, Cherkassy, Transcarpathian, Rivne, Khmelnytsky, Luts'k, Sumy, Kherson and Mykolaiv regions), with common geographical boundaries in a limited space.

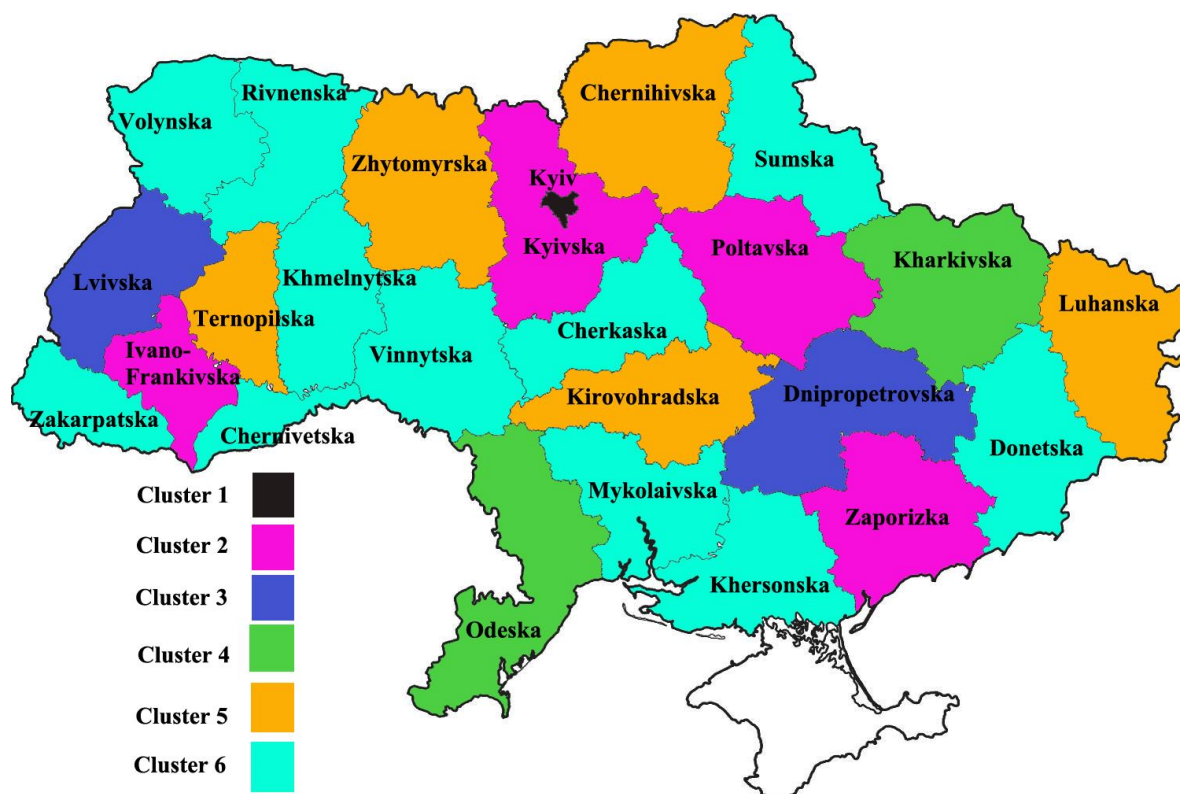


Fig. 2. Spatial distribution of regional clusters of tourism market of Ukraine (distance threshold - 0.5)

component in the development strategy of the region), integration determinants (degree of the region involvement in foreign economic activity; participation in relevant integration associations, cross-border cooperation in the field of tourism), globalization determinants (presence and position of large corporate structures in the region, namely the presence of international hotel nets, international tour operators, etc.; involvement in the international specialization and cooperation in the tourism industry; involvement in international trade, international investment processes, interregional competition).

Cluster 1, which was established in Kyiv, is a center for tourism development, on the basis of which the main volume of tourist demand is formed, tourist infrastructure is concentrated, tourist flows are concentrated, major innovations in the Tourism sector are generated, and as a result of the spatial diffusion process, they are spread to other clusters / regional tourist service markets.

Further calculation of the cluster market shares in the tourist service market of Ukraine will allow to determine what place the cluster occupies in the relevant segment in relation to its competitors (other

**Table 4.** Market shares of clusters of regional tourism service markets of Ukraine, 2017

Cluster	Market share of the number of subjects of tourist activity, %	Market share of the number of staff members of tourist activities, %	Market share of the income from tourism, %	Market share of the number of tourists served by tour operators and travel agents, %	Market share of the cost of travel packages sold, %
<b>Cluster 1</b>	<b>25.46</b>	<b>49.35</b>	<b>91.42</b>	<b>77.90</b>	<b>78.51</b>
Cluster 2	16.03	11.95	2.70	4.62	4.79
Cluster 3	17.66	13.13	2.83	6.57	5.49
Cluster 4	12.49	9.97	1.34	3.15	5.13
Cluster 5	6.22	3.07	0.27	1.56	1.42
Cluster 6	22.15	12.54	1.45	6.20	4.65

clusters), to predict the further prospects of their development, to evaluate the effectiveness of cluster activities, etc.

The calculated market shares of 6 clusters, which were determined at a threshold distance of 0.5 (table 3) are given in the table 4. The objects of the cluster sample correspond to the column 3 of the table 3.

In terms of indicators by which the clusters were grouped and evaluated, we have the following results:

by market share of the cluster by the number of subjects of tourist activity, the largest market share belongs to the cluster 1 (25.46%), the smallest – to the cluster 5 (6.22%);

by market share of the cluster by the number of staff members of tourist activities, the largest market share belongs to the cluster 1 (49.35%), the smallest – to the cluster 5 (3.07%);

by market share of the cluster by income from tourism, the largest market share belongs to the cluster 1 (91.42%), the smallest – to the cluster 5 (0.27%);

by market share of the cluster by the number of tourists served by tour operators and travel agents, the largest market share belongs to the cluster 1 (77.90%), the smallest – to the cluster 5 (1.56%);

by market share of the cluster by the cost of travel packages sold, the largest market share belongs to the cluster 1 (78.51%), the smallest – cluster 5 (1.42%).

These data allow us to state that the largest market shares by all indicators belong to the cluster 1 (Kyiv), the smallest – to the cluster 5 (Zhytomyr, Ternopil, Chernihiv, Kirovograd, Luhansk regions).

**Conclusions.** It is determined that the disproportion of the distribution a redistribution of natural a recreational a socio-economic resource and the influence of historically formed and innovative determinants leads to uneven development of the tourist space. In this regard, it is concluded that the regional differentiation of the development of tourist services markets in Ukraine is caused by factors of formation of spatial polarization, which affect the

spatial structure of the tourism system, cause and enhance its asymmetry and lead to the need to take into account the identified processes in the development of concepts and strategies of development markets.

The cluster analysis of regional tourist service markets according to the indicators of functioning of tourist entities (the number of subjects of tourist activity; the number of staff members of tourist activities; income from tourism; the number of tourists served by tour operator an travel agents; the cost of travel packages sold) allowed to distinguish 6 clusters at a threshold distance of 0.5, namely: cluster 1 – Kyiv, cluster 2 – Zaporizhia, Kyiv, Poltava, Ivano-Frankivsk region, cluster 3 – Dnipropetrovsk, Lviv regions, cluster 4 – Odessa, Kharkiv regions, cluster 5 is formed from Zhytomyr, Ternopil, Chernihiv, Kirovograd and Luhansk regions, cluster 6 unites Vinnytsia, Chernivtsi, Donetsk, Cherkasy, Transcarpathian, Rivne, Khmelnytsky, Volyn, Sumy, Kherson and Mykolaiv regions. The clustering carried out can serve as the basis for the further evolution of strategies and models for the development of certain clusters.

Study of tendencies for the development of each cluster, determination of market share of clusters in the market of tourist services of Ukraine, in-depth and detailed analysis taking into account factors of formation of spatial polarization using the methods of multidimensional statistical analysis and other analytical methods may be the topic of further researches.

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