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ASSESSMENT OF INNOVATION AND INVESTMENT ATTRACTIVENESS OF THE WESTERN UKRAINIAN REGIONAL MARKET OF TOURIST SERVICES

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ABSTRACT

Methodological approaches to assessing the level of innovation and investment attractiveness of the Western Ukrainian market of tourist services (WUMTS) substantiated the dependence of WUMTS on investment factors analyzed the level of competitiveness of WUMTS. In order to determine the level of dependence (independence) of WUMTS on investment and innovation factors, a paired linear regression was built for each of the regions (regions) included in the WUMTS, Volyn, Rivne, Lviv, Ternopil, Khmelnytsky, Zakarpattia, I. Frankivsk, Chernivtsi). In order to eliminate the disproportionate impact of the size of the impact of tourist services (the so-called effect of scale), the studied absolute indicators were converted into relative (growth rate). To assess the innovation and investment attractiveness of WUMTS, it was decided to apply methodological approaches to implement and evaluate the effectiveness of state and regional policy with further improvement in several groups of indicators, monitoring and evaluation of innovation, investment, and social development of the studied areas. Data, information of central executive bodies, regional state administrations, etc. The assessment of WUMTS development indicators was carried out by calculating the rating for each area and the overall rating for all areas. The rating assessment was performed by comparing the deviations of the values of indicators for each specific region under the conditions of the best values for the relevant (reporting) period and the corresponding ranking of regions from 1st to 8th position. As a result of calculations, the integrated rating was determined as the arithmetic means of the sum of ratings in all areas using the formula. The competitiveness of regional tourism markets should be assessed comprehensively, where two groups of indicators should be used to determine the competitiveness of an individual region: indicators of the tourism market and indicators of development of the region as a whole.

Keywords: *innovation, investment, attractiveness, regional market*

1. INTRODUCTION

An essential condition for the effective functioning of Ukraine's economy is the implementation of processes of regulation and stimulation of the Western Ukrainian market of tourist services WUMTS tourism sector. Innovation and regional levers for modernization and regulation should be the impetus for forming regional tourism markets as centers of competitive territorial and spatial units.

However, for regional tourism markets to take a worthy position in the structure of world tourism markets, several problems related to the lack of sustainable innovative vectors of tourism and recreation, reducing consumer interest from domestic and foreign tourists, exacerbating several

socio-economic consequences that inhibit the reproduction of any market structure.
Achieving a diverse positive effect of tourism on the dynamics of socio-economic systems of each region primarily involves the formation of theoretical and scientific foundations for the study of the nature, meaning and structural and subjective interaction, regional markets for tourism services, products, and activities; analysis and evaluation of innovation and investment processes within WUMTS and identification of institutional and cluster approaches as integral components of modernization and regulation of their competitiveness.
This study aims to evaluate a wide range of indicators to determine the peculiarities of the innovative and infectious attractiveness of the tourism services market in western Ukraine and the regions within its borders.

2. LITERATURE REVIEW

A significant contribution to the theory of tourism markets research, methods of assessing investment and innovation and competing processes, the role and importance of the institutional environment of regional terrorist systems made domestic and foreign scientists: L. Gontarievska (Gontarievska, 2008) - in terms of studying the current trends in the formation and development of the tourism services market in Ukraine, which have been taking place for a long time; V. Kifyak (Kifyak, 2010) - in terms of developing strategic directions for the development of recreational and territorial systems from the standpoint of theoretical recommendations and methodological and practical guidelines for their implementation; N. Kudla (Kudla, 2011, 2012) - in terms of researching the principles of the most effective management of enterprises operating in the tourism business, as well as marketing of tourism services; P. Ljubotina (Ljubotina et al., 2022) - in terms of the possibility of restoring a high level of tourism potential in the country after the impact of Covid-19 and the Ukrainian crisis; M. Malska (Malska et al., 2008) - in terms of outlining the specifics of the functioning of tourism markets and various tourism services in the international and international dimensions; B. Mašić, L. Vladušić (Mašić et al, 2018) - in terms of studying possible approaches to the use of digital technologies in the hotel and restaurant industry to increase the level of its transformation indicators; S. M. Ohiienko (Ohiienko et al., 2020) - in terms of innovation and investment initiatives that will promote the development of tourism markets in the regions of the country; O. Pavlova (Pavlova et al., 2021, 2020) - in terms of calculating the innovation and investment potential of the tourism industry in Ukraine; K. Pavlov (Pavlov, 2013; Pavlov, 2019, 2020) - from the perspective of formation and regulation of competitive relations in the regional housing markets of Ukraine, as one of the components potentially affecting the tourism industry of the State; in terms of optimization of multichannel mass service systems within the tourism services market; the author's approach to diagnostics and ways of managing environmental innovations in the tourism sector was also studied; ways and methodological approaches to regulating investment and housing relations in Ukraine were outlined; N. Popadynets (Popadynets et al, 2021) - The proposals for modeling the possible factors of influence of the factor determinants on the functioning of the hotel and restaurant industry in the State are analyzed; O. Strishenets (Strishenets et al, 2017) - from the perspective of studying the issue of tourism clusters as a determinant of socio-economic development of the region; V. Tkach (Tkach et al., 2021) - from the point of view of evaluating an environmentally friendly conductive device for diagnosing and identifying diseases in other countries, which can directly affect the functioning of the tourism sector in countries around the world; T. Wolowiec (Wolowiec et al., 2022- from the perspective of studying various approaches to analyzing and rating various indicators in the field of tourism services in the country and its regions; A. Yakymchuk (Yakymchuk et al, 2021, 2021) - from the standpoint of "green" tourism as one of the drivers that directly contributes to the development of the local economy in the process of changes in the field of decentralization of power in the regions of the State; from the standpoint of public administration of environmental protection in Ukraine in comparison with similar indicators of

one of the European Union countries; V. Zatserkovnyi (Zatserkovnyi, 2020) - from the perspective of creating and implementing specialized geological portals that contribute to and will contribute to the development of the tourism industry in general in the future; K. Zaychuk (Zaychuk, 2019) - from the perspective of the practice of analyzing the rating indicators of social and economic assessments of the tourism market.

Paying tribute to the work of scientists and practitioners on this topic, the focus should be noted on the problems of tourism in general. At the same time, the development of tourist markets in the regions takes place under the influence of destructive processes, which are the consequences of economic crises of chronic origin, shortage of innovation and investment resources, imperfect regulatory framework, and so on.

This causes the need for theoretical and scientific understanding of the content and importance of tourism markets and poses challenges for the priority solution of problems to develop a sound concept of modernization of mechanisms for regulating and stimulating regional tourism markets. The importance of seeking to modernize the regulation of regional tourism markets on an innovative basis also determines the prospect of obtaining a synergistic effect on the institutional environment of other industries and spheres of the region, which ultimately guarantees the reproduction of mechanisms of all regional centers of Ukraine. Thus, the importance and significance of the outlined problems led to the choice of topic and setting goals and objectives of the study, which is related to the timeliness and relevance of the study.

3. METHODS

Methodological approaches to determining regional markets' dependence on tourism services on investment and innovation factors. To determine the level of support (independence) of regional markets of tourist services on investment and innovation factors, it was decided to build a pairwise linear regression from each of the regions of the Western region of Ukraine, as well as the following sequence (1):

$$\tilde{y}_i = b_0 + b_1 x_i \tag{1}$$

However, to eliminate the excessive influence of the size of the markets of tourist services (the so-called effect of scale), the studied absolute indicators are converted into relative (growth rates).

1. Estimate the parameters of linear regression, finding the coefficients b0 and b1 for the equation by formula (2):

$$\begin{cases} b_0 = \bar{y} - b_1 \bar{x}; \\ b_1 = \frac{\overline{xy} - \bar{x} \cdot \bar{y}}{\overline{x^2} - \bar{x}^2} \end{cases} \tag{2}$$

2. To construct the correlation field and the graph of the regression line, we calculate the model values (3):

$$y_i = b_0 + b_1 x_1 \tag{3}$$

3. To estimate the closeness of the relationship between the dependent variable Y and the independent variable X, we use the correlation coefficient, which is calculated by the formula (4):

$$r_{xy} = \frac{cov(x,y)}{\sigma_x \sigma_y} \tag{4}$$

Where $cov(x,y) = \overline{xy} - \bar{x} \cdot \bar{y}$ – covariance of statistical quantities *x* and *y*;

$\sigma_x = \sqrt{\overline{x^2} - \bar{x}^2}$ – standard deviation of the statistical value *x*;

$\sigma_y = \sqrt{\overline{y^2} - \bar{y}^2}$ – standard deviation of the statistical value *y*.

4. We will evaluate the quality of the constructed model. The coefficient of determination for pairwise linear regression is related to the correlation coefficient by formula (5):

$$R^2 = r_{xy}^2 \tag{5}$$

The average approximation error is found by formula (6):

$$\bar{A} = \frac{1}{n}\sum_{i=1}^{n}\left|\frac{y_i - \tilde{Y}_i}{y_i}\right| \cdot 100\% \tag{6}$$

5. The coefficient of elasticity is found by formula (7):

$$\bar{E} = b_1 \frac{\bar{x}}{\bar{y}} \tag{7}$$

6. Before estimating the obtained equation of pairwise linear regression, we will compile a variance analysis table (Table 1). Here *n* - is the number of measurements for which the pairwise linear regression model is compiled (in our case, *n*=9); *m* – the number of independent model variables (in our case, *m*=1).

Table 1. General view of the analysis of variance.

Dispersion components	The sum of squares	Number of degrees of freedom	Dispersion to one degree of freedom
General	$SST = \sum_{i=1}^{n}(y_i - \bar{y})^2$	*n-1*	$S^2_{\text{заг}} = \frac{\sum_{i=1}^{n}(y_i - \bar{y})^2}{n-1}$
Factor	$SSR = \sum_{i=1}^{n}(\tilde{Y}_i - \bar{y})^2$	*m*	$S^2_{\text{факт}} = \frac{\sum_{i=1}^{n}(\tilde{Y}_i - \bar{y})^2}{m}$
Residual	$SSE = \sum_{i=1}^{n}(y_i - \tilde{Y}_i)^2$	*n-m-1*	$S^2_{\text{зал}} = \frac{\sum_{i=1}^{n}(y_i - \tilde{Y}_i)^2}{n-m-1}$

Source: Constructed by authors based on results of model development.

The calculated value of Fisher's F-test is found by formula (8):

$$F_{\text{розр}} = \frac{S^2_{\text{факт}}}{S^2_{\text{зал}}} \tag{8}$$

The calculated value of Fisher's *F*-test should be compared with the tabular value of Fisher's *F*-test. The opposite is true if the pairwise linear regression equation is statistically significant.

7. To assess the statistical significance of regression parameters and correlation coefficient, first of all, it is necessary to estimate their variance according to the formulas (9, 10, 11):

$$m_{b_0} = \sqrt{S^2_{\text{зал}} \frac{\sum_{i=1}^{n} x_i^2}{n^2 \sigma_x^2}} \tag{9}$$

$$m_{b_1} = \sqrt{\frac{S^2_{\text{зал}}}{n \cdot \sigma_x^2}} \tag{10}$$

$$m_{r_{xy}} = \sqrt{\frac{1 - r_{xy}^2}{n-2}} \tag{11}$$

Next, determine the estimated values of the Student's t-statistics for each of the values of formulas (12, 13, 14):

$$t_{b_0} = \frac{b_0}{m_{b_0}} \tag{12}$$

$$t_{b_1} = \frac{b_0}{m_{b_1}} \tag{13}$$

$$t_r = \frac{r_{xy}}{m_r} \tag{14}$$

If the calculated value of the Student's t-statistics is greater than the tabular value, the corresponding value is considered statistically significant. The tabular value of the Student's t-test can be found in the MsExcel spreadsheet using the Steadrosprob function.

8. To calculate the confidence intervals for each of the parameters of the pairwise linear regression, it is necessary to calculate the corresponding marginal errors according to formulas (15, 16):

$$\Delta_{b_0} = t_{\text{табл}} m_{b_0} \tag{15}$$

$$\Delta_{b_1} = t_{\text{табл}} m_{b_1} \tag{16}$$

Then the confidence intervals can be written as (17, 18):

$$b_0 - \Delta_{b_0} \leq b_0 \leq b_0 + \Delta_{b_0} \tag{17}$$

$$b_1 - \Delta_{b_1} \leq b_1 \leq b_1 + \Delta_{b_1} \tag{18}$$

9. To make a forecast, you must first find the value x_{np}. Provided it is 10% higher than the maximum value of factor *x*.

Values are sufficient for a point forecast x_{np} and make the appropriate calculations (Table 2):

Table 2. Estimated values.

X*np*=	114,17
Ynp=	74,23

Source: Constructed by authors based on results of model development.

For the interval forecast, it is necessary to find the variance estimate and the corresponding marginal error according to formulas (19, 20):

$$m_{Y_p} = \sqrt{S^2_{\text{зал}} \cdot \left(1 + \frac{1}{n} + \frac{(x_{\text{пр}} - \bar{x})^2}{n \cdot \sigma_x^2}\right)} \tag{19}$$

$$\Delta_Y = m_Y \cdot t_{\text{табл}} \tag{20}$$

Then the interval forecast will be written (21):

$$Y_{\text{пр}} - \Delta_{Y_p} \leq Y_{\text{пр}} \leq Y_p + \Delta_{Y_p} \tag{21}$$

Based on the calculations and taking into account the importance of the correlation coefficient (Table 3), we can conclude that it is worth examining only that a high level of correlation is observed between the growth rate of tourists., % (y) and the growth rate of research and development costs, % (x) for Chernivtsi region.

Table 3. Significance of the correlation coefficient.

Correlation	**Negative**	**Positive**
Not available	−0.09 до 0.0	0.0 до 0.09
Low	−0.3 до −0.1	0.1 до 0.3
Average	−0.5 до −0.3	0.3 до 0.5
High	−1.0 до −0.5	0.5 до 1.0

Source: Constructed by authors based on results of model development.

In particular, we can draw the following conclusions for the constructed function of the dependence of the growth rate of the number of tourists on the growth rate of research and development costs for the Chernivtsi region:

1. The result of the calculations in MS Excel is presented in table 4.

Table 4. Copy of the MsExcel worksheet with estimates of the parameters of pairwise linear regression (for example -Chernivtsi region).

№	xi	yi	xi*yi	xi²	Yi=b0+b1 xi
2013	0,01	-0,44	-0,005396242	0,000152436	-0,26
2014	-0,01	-0,47	0,002983557	3,94975E-05	-0,30
2015	0,10	-0,02	-0,002039501	0,010851067	-0,11
2016	-0,03	-0,11	0,003152487	0,000842291	-0,33
2017	0,26	-0,05	-0,014054292	0,067171636	0,15
2018	0,33	0,24	0,079959607	0,111347024	0,27
2019	0,12	0,05	0,005618187	0,013875388	-0,09
2020	0,27	0,45	0,123312505	0,073995072	0,17
2021	0,21	-0,08	-0,016632737	0,043261357	0,06
Average value	0,14	-0,05	0,02	0,04	-0,05
σ²	0,015754924719	0,08			
Coefficients of the pairwise linear regression equation					
***b1*=**	1,68	***b0*=**	-0,29		
Regression equation	*y=-0,29+1,68x*				

Source: Constructed by authors based on results of model development.

Thus, the regression equation is obtained:

$$y=-0,29+1,68x$$

The value of the coefficient b_1 can be explained as follows: with an increase in spending on research and development by 1%, the increase in the number of tourists increases by 1.68%.

2. To construct the correlation field and the graph of the regression line, we calculate the model values by the formula. Add another column to the spreadsheet. The results of the calculations are presented in table 5 respectively.

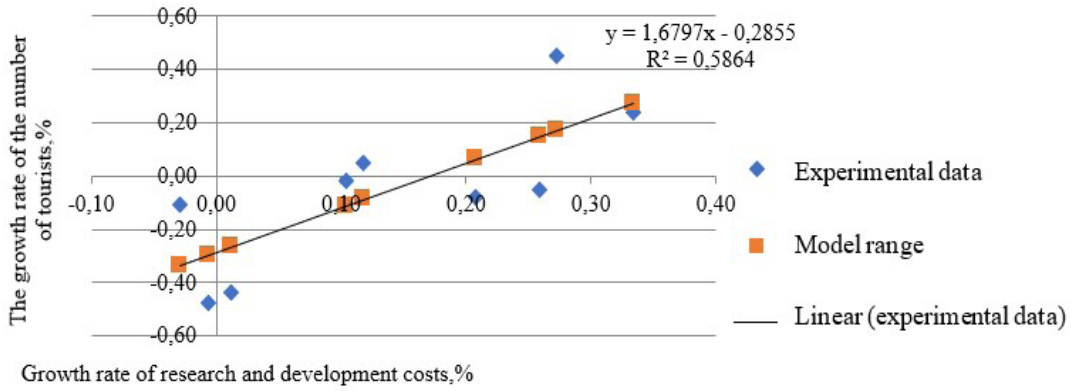
Table 5. Copy of MsExcel worksheet with calculations of model values *Yi.*

№	xi	yi	xi*yi	xi^2	Yi=b0+b1 xi
2013	0,01	-0,44	-0,005396242	0,000152436	-0,26
2014	-0,01	-0,47	0,002983557	3,94975E-05	-0,30
2015	0,10	-0,02	-0,002039501	0,010851067	-0,11
2016	-0,03	-0,11	0,003152487	0,000842291	-0,33
2017	0,26	-0,05	-0,014054292	0,067171636	0,15
2018	0,33	0,24	0,079959607	0,111347024	0,27
2019	0,12	0,05	0,005618187	0,013875388	-0,09
2020	0,27	0,45	0,123312505	0,073995072	0,17
2021	0,21	-0,08	-0,016632737	0,043261357	0,06
Average value	0,14	-0,05	0,02	0,04	-0,05
σ^2	0,015754924719	0,08			

Source: Constructed by authors based on results of model development.

Construct a correlation field and graph of model data (Fig. 1).

Figure 1. Correlation field and graph of model data.



Source: Constructed by authors based on results of model development.

Figure 1 shows straight-line model data and the correlation field separately scattered points.

3. We use the correlation coefficient to estimate the closeness of the relationship between the dependent variable Y and the independent variable X.

Table 6. Copy of MsExcel worksheet with calculation results y^2.

№	xi	yi	xi*yi	xi²	Yi=b0+b1 xi	yi²
2013	0,01	-0,44	-0,005396242	0,000152436	-0,26	0,191028
2014	-0,01	-0,47	0,002983557	3,94975E-05	-0,30	0,225372
2015	0,10	-0,02	-0,002039501	0,010851067	-0,11	0,000383
2016	-0,03	-0,11	0,003152487	0,000842291	-0,33	0,011799
2017	0,26	-0,05	-0,014054292	0,067171636	0,15	0,002941
2018	0,33	0,24	0,079959607	0,111347024	0,27	0,05742
2019	0,12	0,05	0,005618187	0,013875388	-0,09	0,002275
2020	0,27	0,45	0,123312505	0,073995072	0,17	0,2055
2021	0,21	-0,08	-0,016632737	0,043261357	0,06	0,006395
Average value	0,14	-0,05	0,02	0,04	-0,05	0,08
σ²	0,015754924719	0,08				
Coefficients of the pairwise linear regression equation						
b1=	1,68	**b0=**	-0,29			
Regression equation:		*y=-0,29+1,68x*				
rxy=	0,77		**R²=**	0,59	**Ã=**	185,16

Source: Constructed by authors based on results of model development.

4. Assess the quality of the constructed model. According to calculations, the coefficient of determination. $R^2 = 0,59$. This means that 59% of the variation in the growth rate of the number of tourists (y) is due to factor x - the growth rate of research and development costs. This percentage is quite acceptable for further study of the model.The average approximation error Ā=185,16% is more than 10%. However, given the excellent coefficient of determination, further evaluation and study of the obtained equation of pairwise linear regression should be continued.

5. In our calculations, the coefficient of elasticity E = -4.93. This result can be interpreted as follows: if the factor x (growth rate of research and development costs) deviates by 1% from its average value, the result y (growth rate of the number of tourists) on average will deviate by 4.93% from its average value.

6. The result of calculating values for analysis of variance according to our example is shown in table 7.

Table 7. Table of analysis of variance.

Dispersion component	The sum of squares	Number of degrees of freedom	Dispersion to one degree of freedom
General	0,68	8	0,09
Factor	0,40	1	0,40
Residual	0,28	7	0,04

Source: Constructed by authors based on results of model development.

Because $F_{dev} \geq F_{tabl}$ (9,92>4,75), the pairwise linear regression equation is statistically significant.

7. Since all calculated values of t-statistics are more significant than the tabular value (2.36), pairwise linear regression and the correlation coefficient coefficients do not accidentally differ from zero and are statistically significant.

8. Because $\Delta_{b0}=0,24$ *and* $\Delta_{b1}=1,26$, the corresponding confidence intervals are recorded as follows (Table 8):

Table 8. Confidence intervals.

-0,52	≤b0≤	-0,05
0,42	≤*b1*≤	2,94

Source: Constructed by authors based on results of model development.

9. To make a forecast, you must first find the value x_{np}. Under the condition, it should be 10% higher than the maximum value of factor *x*.

Values are sufficient for a point forecast. x_{np} substitute in formula (3) and make the appropriate calculations (Table 9):

Table 9. Estimated values.

Xnp=	0,37
Ynp=	0,33

Source: Constructed by authors based on results of model development.

From the calculations, we can draw the following conclusions:

1. the forecast value of the growth rate of costs for research and development, $x_{пр}$ =0,37%;
2. point forecast of the growth rate of growth of the number of tourists, $Y_{пр}$ =0,33;
3. the marginal error of the forecast The growth rate of the number of tourists in 95% of cases will not exceed ΔY = 4.25%;
4. the forecast growth rate of the number of tourists with a probability of p = 0.95 will be from -3.92% to 4.58%.

Methodological approaches to determining the competitiveness of regional markets for tourism services by rating. To assess the competitiveness of the tourist markets of the Western region, a decision was made to use methodological approaches to monitoring and evaluating the effectiveness of state regional policy, with improvements to several groups of indicators.

The development of regional markets for tourism services was assessed by calculating the rating (ranking) of regional markets for tourism services in each area and calculating the overall rating for all areas.

The rating assessment was performed by comparing the deviation of the values of indicators for each specific market of tourist services from their best values by region for the relevant (reporting) period and the corresponding ranking of regions from 1st to 8th place in the ranking. The rating is performed according to the following formula (22):

$$R_j = \sum_{i=1}^{n} \frac{X_{maxi} - X_{ij}}{X_{maxi} - X_{mini}} + \sum_{i=1}^{n} \frac{X_{ij} - X_{mini}}{X_{maxi} - X_{mini}} \quad (22)$$

where R_j - is the sum of ratings of a particular region for each of the indicators that characterize a particular area of activity;

x_{ij} - the value of the i-th indicator of the j-th region;

$x_{max\,i}$ - the maximum value of the i-th indicator;

$x_{min\,i}$ - the minimum value of the i-th indicator.

The first part of the formula is used to assess indicators, the increase of which has a positive value (for example, the volume of sold industrial products per capita); the second part - is used to assess the indicators, the increase of which has a negative value (for example, the amount of arrears of wages).

Determining the arithmetic mean of the sum of ratings of a particular region for all indicators of the annual assessment, which characterize a particular area of activity, is carried out by formula (23):

$$R_{cpj} = \frac{R_j}{n}, \quad (23)$$

where R_{cpj} - arithmetic mean of the sum of ratings of a particular region for all indicators of a particular area;

n - the number of indicators for which the calculation was carried out in a particular area.

According to the results of calculations, the integrated rating is determined as the arithmetic means of the sum of ratings of a particular region in all areas by the formula:

$$I_j = \frac{\sum_{1}^{m} R_{cpj}}{m}, \quad (24)$$

where I_j - arithmetic mean of the sum of ratings of a particular region in all areas;

m - the number of areas in which the calculation was performed.

As for the tourist markets of the western region, in our opinion, their competitiveness should be assessed comprehensively based on two groups of indicators: indicators of the tourist market; indicators of the region's development as a whole.

The indicators of the tourism market include statistics by region. However, to offset the impact of the market scale, we used relative indicators in our study, adjusting statistics for the all-Ukrainian indicator. Namely:

- the share of the number of tourism entities in the region to the all-Ukrainian indicator (legal entities, individuals);
- the share of the average number of full-time employees in the region to the all-Ukrainian indicator (legal entities, private entrepreneurs);
- the share of the average number of full-time employees who have higher or secondary special education in the field of tourism in the region to the all-Ukrainian indicator (legal entities, individuals);
- the share of income from the provision of tourist services (excluding VAT, excise duties, and similar mandatory payments) of the region to the all-Ukrainian indicator (legal entities, individuals);
- the share of the number of tourist vouchers sold by tour operators in the region to the all-Ukrainian indicator (legal entities, individuals);

- the share of the cost of tourist vouchers sold by tour operators in the region to the all-Ukrainian indicator (legal entities, individuals);
- the share of the number of tourists served by tour operators and travel agents in the region to the all-Ukrainian indicator (legal entities, individuals);
- the share of the number of tours sold by tour operators, tour operators, and tourist vouchers in Ukraine in the region to the all-Ukrainian indicator (legal entities, individuals);

4. RESULTS AND DISCUSSION

Thus, based on research on the territorial distribution (zoning) of our State, to some extent, we agree with the opinion of K. Pavlov and O. Pavlova (2013, 2020) and single out WUMTS as follows: Khmelnytsky Regional Market of Tourist Services (RMTS); Transcarpathian RMTS; Ivano-Frankivsk RMTS; Chernivtsi RMTS; Volyn RMTS; Rivne RMTS; Lviv RMTS; Ternopil RMTS.
It is important to emphasize that the areas that makeup WUMTS differ significantly in a wide range of features, including economic characteristics; social and economic cohesion; innovative level of development; level of investment support; indicators of the tourist market; level of small and medium business development; level of financial self-improvement; the level of infrastructure development and its development schemes; labor market efficiency; the level of quality of environmental conditions and rational use of nature; level of social protection; availability of medical care, etc. A generalized indicator of the division of WUMTS by the demographic and geographical structure is shown in table 10.

Table 10. Demographic and geographical indicators of WUMTS, the average value on January 1, 2022.

RMTS	*Population, thousand people*	*In% to the scale of the State*	*Population density per person / sq. Km.*	*Area sq. Km.*	*In% to the scale of the State*
Volyn	1042	2,4	52	20143	3,4
Khmelnytskyi	1290	3,0	62	20929	3,4
Lviv	2534	5, 9	116	21833	3,6
Chernivtsi	909	3,1	112	8098	1,4
Zakarpattia	1259	3,0	98	12777	2,1
Ivano-Frankivsk	1321	3,2	99	13928	2,3
Ternopil	1062	2,5	77	13823	2,2
Rivne	1162	2,7	58	20047	3,3
Average value by region	1330	-/-	84	16409	-/-
Total by region	10640	25,8	-/-	131277	21,7
Ukraine in general	48673	100	75	603766	100

Source: (Main Department of Statistics in Chernivtsi region; Main Department of Statistics in Ivano-Frankivsk Region; Main Department of Statistics in Khmelnytsky Region; Main Department of Statistics in Lviv Region; Main Department of Statistics in Rivne Region; Main Department of Statistics in Ternopil region; Main Department of Statistics in the Volyn region; Main Department of Statistics in Zakarpattia Region).

It should be noted that the Western RMTS is the lowest in Ukraine in some respects, including North, South, Central, East, and Capital.
After all, its total area is about 131,277 square kilometers, and the population, in turn, is - 10,640 people; the average population density is 84 people per square kilometer, respectively (State Statistics Service of Ukraine: official website; State Agency for Tourism and Resorts of Ukraine).
Socio-economic features of regional markets for tourism services. Volyn RMTS. As shown in Table 11, during 2012-2021, the number of tourists served by tour operators and travel agents in the Volyn region decreased by almost 47% (from 52041 people to 27403 people).

Table 11. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Volyn region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*The growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	52041	1766967	17356,9			
2013	14657	2577117	18884,4	-0,72	0,46	0,09
2014	19789	3254394	15769,9	0,35	0,26	-0,16
2015	19490	3327142	16521	-0,02	0,02	0,05
2016	14593	3389726	10188,4	-0,25	0,02	-0,38
2017	15620	6166812	13873,9	0,07	0,82	0,36
2018	26526	6384165	13604,1	0,70	0,04	-0,02
2019	17047	7041881	18414,9	-0,36	0,10	0,35
2020	21807	8687043	18434,7	0,28	0,23	0,00
2021	27403	12663952	9948,3	0,26	0,46	-0,46

Source: Constructedcted by authors based on results of model development (Main Department of Statistics in the Volyn region).

In turn, based on the study to determine the correlation field and graph of model data in calculating indicators in the Volyn region, it was determined that the dynamics of costs for research and development showed almost identical downward dynamics (-43%). At the same time, the volume of capital investment increased by more than 6 times.
We can assume that the development of the market of tourist services in the Volyn region does not depend on investment factors, and the impact of innovation should be further investigated to draw appropriate conclusions.
Khmelnytsky RMTS. As shown in12, during 2012-2021, the number of tourists served by tour operators and travel agents in the Khmelnytsky region decreased by almost 54% (from 59,806 people to 27,613 people).

Table 12. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Khmelnytsky region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*The growth rate of growth and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	59 806	2947584	6164			
2013	31 212	3546804	7389,8	-0,48	0,20	0,20
2014	32 437	3489339	13932,6	0,04	-0,02	0,89
2015	24 402	3637605	12715,5	-0,25	0,04	-0,09
2016	19 027	4078277	14485,8	-0,22	0,12	0,14
2017	25 416	6809321	15445,1	0,34	0,67	0,07
2018	19 885	9123259	12959,2	-0,22	0,34	-0,16
2019	26 829	10499875	17510	0,35	0,15	0,35
2020	25 738	11274895	21286,9	-0,04	0,07	0,22
2021	27 613	10534118	17254,7	0,07	-0,07	-0,19

Source: constructed authors based on results of model development (Main Department of Statistics in Khmelnytsky Region).

In turn, based on the study to determine the correlation field and schedule of model data in the calculation of indicators in the Khmelnytsky region was determined, the dynamics of costs during 2012-2021 for research and development (increased 1.8 times) and the amount of capital investment (increased 2.6 times) showed identical upward dynamics.

We can assume that the development of the market of tourist services in the Khmelnytsky region depends on innovation and investment factors, but this should be further investigated.

Lviv RMTS. As shown in 13, from 2010 to 2019, the number of tourists served by tour operators and travel agents in the Lviv region increased more than 3 times (from 79,695 people to 249,442 people).

Table 13. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Lviv region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*The growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	79 695	8 830,20	291877			
2013	128 709	12 114,00	308666	0,62	0,37	0,06
2014	124 013	11 173,30	300107	-0,04	-0,08	-0,03
2015	188 520	9 816,70	308121	0,52	-0,12	0,03
2016	92 128	9 555,00	290363	-0,51	-0,03	-0,06
2017	112 472	13 386,50	302826	0,22	0,40	0,04
2018	181 827	18 605,20	264800	0,62	0,39	-0,13
2019	175 150	24 105,90	366000	-0,04	0,30	0,38
2020	182 255	28 995,50	426800	0,04	0,20	0,17
2021	249 442	31 061,50	465500	0,37	0,07	0,09

Source: Constructed by authors based on results of model development (Main Department of Statistics in Lviv Region).

In turn, based on our study to determine the correlation field and schedule of model data when calculating indicators in the Lviv region, it was determined that the dynamics of costs during 2012-2021 for research and development (increased 1.6 times) and the volume of capital investment (increased 3.5 times) showed identical upward dynamics.

We can assume that the development of the market of tourist services in the Lviv region depends on innovation and investment factors, but this should be further investigated.

Chernivtsi RMTS. As shown in Table 14, during 2012-2021, the number of tourists served by tour operators and travel agents in the Chernivtsi region decreased by 58% (from 64084 people to 27198 people).

Table 14. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Chernivtsi region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*Growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	64084	1714677	33588,5			
2013	36075	1794320	34003,2	-0,44	0,05	0,01
2014	18949	2229278	33789,5	-0,47	0,24	-0,01
2015	18578	2257350	37309,3	-0,02	0,01	0,10
2016	16560	1686948	36226,5	-0,11	-0,25	-0,03
2017	15662	2789194	45615,5	-0,05	0,65	0,26
2018	19415	2668813	60836,8	0,24	-0,04	0,33
2019	20341	2992111	68003	0,05	0,12	0,12
2020	29562	3720598	86501,2	0,45	0,24	0,27
2021	27198	4096834	104492,9	-0,08	0,10	0,21

Source: constructed by authors based on results of model development, (Main Department of Statistics in Chernivtsi region).

In turn, based on our research to determine the correlation field and schedule of model data when calculating indicators in the Chernivtsi region, it was determined that the dynamics of costs during 2010-2019 for research and development (increased 2.1 times) and the volume of capital investment (increased 1.4 times) showed a downward trend.

The development of the market of tourist services in the Chernivtsi region does not depend on innovation and investment factors, but it is worth further research.

Transcarpathian RMTS. As we can see from Table 15, during 2012-2021, the number of tourists served by tour operators and travel agents in the Transcarpathian region decreased by 46% (from 52080 people to 28044 people).

Table 15. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Transcarpathian region during 2012-2021 .

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*GrowThe growthe of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	52080	2205374	24500			
2013	21773	3051927	30200	-0,58	0,38	0,23
2014	20180	2736109	34100	-0,07	-0,10	0,13
2015	19892	2645793	35500	-0,01	-0,03	0,04
2016	11625	2638670	31400	-0,42	0,00	-0,12
2017	10656	3778415	38900	-0,08	0,43	0,24
2018	11601	4662988	46400	0,09	0,23	0,19
2019	14652	5623663	55200	0,26	0,21	0,19
2020	25348	7500586	75100	0,73	0,33	0,36
2021	28044	9330284	75700	0,11	0,24	0,01

Source: constructed by authors based on results of model development, (Main Department of Statistics in Zakarpattia).

In turn, based on our research to determine the correlation field and schedule of model data when calculating indicators in the Volyn region, it was determined that the dynamics of costs during 2012-2021 for research and development (increased 2.1 times) and the volume of capital investment (increased 3.2 times) showed a downward trend.

We can assume that the development of the market of tourist services in the Transcarpathian region does not depend on innovation and investment factors, but it is worth further research.

Ivano-Frankivsk RMTS. As we case 16, during 2012-2021, the number of tourists served by tour operators and travel agents in the Ivano-Frankivsk region increased by 19% (from 53333 people to 63545 people).

Table 16. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Ivano-Frankivsk region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*Growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	53333	4378716	34720,1			
2013	59327	4256221	37526,7	0,11	-0,03	0,08
2014	110162	5166935	35120,7	0,86	0,21	-0,06
2015	77666	4797231	21289,3	-0,29	-0,07	-0,39
2016	63848	6837474	20870,5	-0,18	0,43	-0,02
2017	65885	9609271	16746,7	0,03	0,41	-0,20
2018	79973	7947642	20325,8	0,21	-0,17	0,21
2019	73309	9707832	28051,2	-0,08	0,22	0,38
2020	55781	9393710	47914,5	-0,24	-0,03	0,71
2021	63545	9305479	42107,7	0,14	-0,01	-0,12

Source: constructed by authors based on results of model development, (Main Department of Statistics in Ivano-Frankivsk Region).

In turn, based on our study to determine the correlation field and schedule of model data when calculating indicators for the Ivano-Frankivsk region, it was determined that the dynamics of costs during 2010-2019 for research and development (increased by 0.21%) and the volume of capital investment (increased 1.1 times) showed dynamics upward.

We can assume that the development of the market of tourist services in the Ivano-Frankivsk region depends on innovation and investment factors, but this should be further investigated.

Ternopil RMTS. As we can see from Table 17, during 2012-2021, the number of tourists served by tour operators and travel agents in the Ternopil region increased 22 times (from 1341 people to 31425 people).

Table 17. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in the Ternopil region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*Growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	1341	1937089	10176,2			
2013	9490	2565835	11103,8	6,08	0,32	0,09
2014	13473	2770912	11775,3	0,42	0,08	0,06
2015	13545	2837341	11639,2	0,01	0,02	-0,01
2016	8936	2804554	9883	-0,34	-0,01	-0,15
2017	6640	4334225	9363,4	-0,26	0,55	-0,05
2018	9022	4324071	9327,1	0,36	0,00	0,00
2019	11168	6126758	13723,8	0,24	0,42	0,47
2020	22027	7227975	19323,8	0,97	0,18	0,41
2021	31425	6729238	17619	0,43	-0,07	-0,09

Source: constructed by authors based on results of model development, (Main Department of Statistics in Ternopil region).

In turn, based on our study to determine the correlation field and schedule of model data when calculating indicators in the Ternopil region, it was determined that the dynamics of costs during 2012-2021 for research and development (increased by 0.73%) and the volume of capital investment (increased 2.47 times) showed dynamics upward.

We can assume that the development of the market of tourist services in the Ternopil region is weakly dependent on innovation and investment factors, but this should be further investigated.

Rivne RMTS. As we can see from Table 18, during 2012-2021, the number of tourists served by tour operators and travel agents in the Rivne region decreased by 47% (from 52041 people to 27403 people).

Table 18. Dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment and expenditures for research and development in Rivne region during 2012-2021.

Years	*Number of tourists served by tour operators and travel agents, total*	*Capital investments, thousand UAH*	*Expenditures for research and development - total, thousand UAH*	*The growth rate of the number of tourists,%*	*Capital investment growth rate,%*	*Growth rate of research and development costs,%*
1	*2*	*3*	*4*	*5*	*6*	*7*
2012	52041	1766967	17356,9			
2013	14657	2577117	18884,4	-0,72	0,46	0,09
2014	19789	3254394	15769,9	0,35	0,26	-0,16
2015	19490	3327142	16521	-0,02	0,02	0,05
2016	14593	3389726	10188,4	-0,25	0,02	-0,38
2017	15620	6166812	13873,9	0,07	0,82	0,36
2018	26526	6384165	13604,1	0,70	0,04	-0,02
2019	17047	7041881	18414,9	-0,36	0,10	0,35
2020	21807	8687043	18434,7	0,28	0,23	0,00
2021	27403	12663952	9948,3	0,26	0,46	-0,46

Source: constructed by authors based on results of model development, (Main Department of Statistics in Rivne region).

In turn, based on our study to determine the correlation field and schedule of model data when calculating indicators for the Rivne region, it was determined that the dynamics of costs during 2012-2021 for research and development decreased by 42.7%), and capital investment increased 6.2 times, showing dynamics upward.

We can assume that the development of tourist services in the Rivne region depends not on investment factors but on the possible connection with innovation factors. We believe that this hypothesis should be further tested.

Thus, to assess the level of innovation and investment attractiveness of the Western Ukrainian regional market of tourist services and its sectors (regional regional markets of tourist services), we summarized and ranked the study's results (Table 19).

Table 19. Unified values of rating positions of tourism services markets included in the Western region by years.

№	*Year*	*RMTS's position within the Western Ukrainian market of tourist services*							
		Volyn RMTS	**Lviv RMTS**	**Rivne RMTS**	**Chernivtsi RMTS**	**Ivano-Frankivsk RMTS**	**Transcarpathian RMTS**	**Khmelnytsky RMTS**	**Ternopil RMTS**
1	**2017**	5	1	7	4	2	3	6	8
2	**2018**	4	1	8	5	2	3	6	7
3	**2019**	3	1	8	6	2	7	4	5
4	**2020**	5	1	8	2	3	4	7	6
5	**2021**	5	1	3	2	4	7	8	6
Average value		*4,4*	*1*	*6,8*	*3,8*	*2,6*	*4,8*	*6,2*	*6,4*

Source: constructed by authors based on results of model development.

In summary, we note that based on a unified approach to ranking within WUMTS, we determined that the most competitive are the Lviv, Ivano-Frankivsk, and Chernivtsi regional markets for tourism services.

At the same time, the following are insufficiently competitive: Volyn RMTS; Transcarpathian RMTS; Volyn RMTS; Khmelnytsky RMTS; Ternopil RMTS.

5. CONCLUSIONS

As a result of the study, we came to the following conclusions:
The author's vision of regional distribution within WUMTS is offered, according to which there is a conditional division of the territory of Ukraine, taking into account economic, social, geographical, climatic, and cross-border differences, etc. The above criteria allowed us to consider the following: integrity, viability, homogeneity and statistical identity, objectivity, complexity, and problems.
To determine the level of dependence of RMTS on investment and innovation factors, it was decided to build a pairwise linear regression for each region of Ukraine's western region. In order to eliminate the disproportionate impact of the size of the market of tourist services, the studied absolute indicators were converted into relative ones. Correlation, determination, and elasticity coefficients were used to estimate the relationship between dependent and independent variables.
Methodical approaches to monitoring and evaluating the effectiveness of the state regional policy were used to assess the competitiveness of the tourist markets of the western region. The development of ZURMTS was assessed by calculating the rating for each area and the overall rating for all areas. The rating was performed by comparing the deviations of the values of indicators for each specific RMTS from their best values by region for the relevant (reporting) period and the corresponding ranking of regions.
Two groups of indicators assessed comprehensive assessment of the competitiveness of WUMTS: indicators of the tourism market; indicators of development of the region as a whole. Indicators of the first group cover statistics by region. The second group included relative indicators about the all-Ukrainian indicator.
The dependence of regional markets of tourist services on innovation and investment factors was assessed, based on such socio-economic features as the dynamics of the number of tourists served by tour operators and travel agents, the amount of capital investment, and research and development costs of each region during 2012 -2021 years, the calculations suggest that the development of the market of tourist services in Volyn, Chernivtsi, Zakarpattia regions do not depend on investment factors. The impact of innovation should be further investigated to draw appropriate conclusions. The development of tourist services in the Khmelnytsky, Lviv, and Ivano-Frankivsk regions depends on innovation and investment factors. The development of the market of tourist services of the Ternopil region is weakly dependent on innovation and investment factors, and the Rivne region is not dependent on investment factors but is weakly dependent on the innovation factor.
Based on the proposed methodology, the studied RMTS within Ukraine and the Western region were calculated and evaluated. This allowed us to assess the competitiveness of Western Ukrainian regional markets for tourism services. This calculation considered the period of activity of regional markets within WUMTS. Financial self-sufficiency "," indicators of small and medium business development", "labor market efficiency indicators", "infrastructure development indicators", "renewable energy and energy efficiency indicators", "indicators of accessibility and quality of services in education", "indicators of accessibility and quality services in the field of health," "indicators of social protection and security," "indicators of rational nature use and quality of leisure," "indicators of innovative development."

REFERENCES

Gontarzhevska, L. (2008). The market of tourist services in Ukraine. Eastern Publishing House.

Kifyak, V. (2010). Strategy of development of territorial-recreational system: theory, methodology, practice: monograph. Knygy.

Kudla, N. (2012). Management of a tourist enterprise.

Kudla, N. (2011). Marketing of tourist services: textbook. Znannya.

Ljubotina, P. & Raspor, A. (2022). Recovery of Slovenian Tourism After Covid-19 and Ukraine Crisis. *ECONOMICS-Innovative and Economics Research Journal*, 10(1), 55-72. https://doi.org/10.2478/eoik-2022-0003

Main Department of Statistics in Chernivtsi region. http://www.cv.ukrstat.gov.ua/

Main Department of Statistics in Ivano-Frankivsk Region. http://www.ifstat.gov.ua/

Main Department of Statistics in Khmelnytsky Region. http://www.km.ukrstat.gov.ua/ukr/index.htm

Main Department of Statistics in Lviv Region. https://www.lv.ukrstat.gov.ua/

Main Department of Statistics in Rivne Region. http://www.gusrv.gov.ua/

Main Department of Statistics in Ternopil region. https://gusrv.gov.ua/

Main Department of Statistics in the Volyn region. http://lutsk.ukrstat.gov.ua/

Main Department of Statistics in Zakarpattia Region. http://uz.ukrstat.gov.ua/

Malska, M., Antonyuk, N. (2008). International tourism and services: textbook. Kyiv.

Mašić, B., Vladušić, L. & Nešić, S. (2018). Challenges in Creating Transformative Growth for Companies In Digital Economy. *ECONOMICS-Innovative and Economics Research Journal*, 6(2) 37-48. https://doi.org/10.2478/eoik-2018-0024

Ohiienko, M., Sarkisyan, A., & Lyubarov, Y. (2020). Development of regional tourist markets through introduction of innovations. *Economic Scope*, (164), 152-159. https://doi.org/10.32782/2224-6282/164-24

Pavlov, K. (2013). Regulation of investment and housing relations in Ukraine: monograph. Rivne: NUWEE.

Pavlov K., Pavlova O. (2020). Innovation and investment potential of the transport industry of Ukraine. *Ukrainian Journal of Applied Economics*. T.51. 17–24. http://ujae.org.ua/en/innovation-and-investment-potential-of-the-transport-industry-of-ukraine/

Pavlov K., Pavlova O. (2019). Formation and regulation of competitive relations in the regional housing markets of Ukraine: a monograph, Teren.

Pavlov, K., Pavlova, O. and al. (2020). Optimization of multi-channel queuing systems with a single retail attempt: Economic approach. *Decision Science Letters*, 9 (4), 559-564. https://growingscience.com/beta/dsl/4211-optimization-of-multi-channel-queuing-systems-with-a-single-retail-attempt-economic-approach.html

Pavlov, K., Pavlova, O. et al. (2021). Economic Diagnostics and Management of Eco-Innovations: Conceptual Model of Taxonomic Analysis. In: Russo D., Ahram T., Karwowski W., Di Bucchianico G., Taiar R. (eds) Intelligent Human Systems Integration 2021. IHSI 2021. *Advances in Intelligent Systems and Computing*, 1322. https://doi.org/10.1007/978-3-030-68017-6_84

Popadynets, N., Skrypko, T., Topchiy, O., Garasymliuk, M. (2021). Analysis and modeling of the impact of factor determinants on the functioning of the hotel economy in Ukraine. *International Journal of Information Systems in the Service Sectorthis link is disabled*, 13 (3), 39-48.
https://ideas.repec.org/a/igg/jisss0/v13y2021i3p39-48.html

State Agency for Tourism and Resorts of Ukraine.
http://www.tourism.gov.ua

State Statistics Service of Ukraine: official website.
http://www.ukrstat.gov.ua

Strishenez, O., & Lyashenko, O. (2018). Theoretical Aspects of Tourist Clusters as Determinants of Socio-economic Development of the Region. *Economic Journal of Lesya Ukrainka Volyn National University*, s4(12), 7-12.
https://doi.org/10.29038/2411-4014-2017-04-7-12

Tkach, V., Kushnir, M., Oliveira, S., Musayeva, D. et al. (2021). Theoretical evaluation for the function of economical and green conducting composite material-based chip for jamaican vomiting sickness diagnostics. *Biointerface Research in Applied Chemistry*, 11(3), 10317-10324.
https://biointerfaceresearch.com/wp-content/uploads/2020/10/20695837113.1031710324.pdf

Wołowiec, T., Pavlov, K., Pavlova, O. & Zaichuk, K. (2022). sTourist Services of the Western Region of Ukraine: Rating and Analysis. *ECONOMICS – Innovation and Economics Research Journal*, 10(1), 183-198.
https://doi.org/10.2478/eoik-2022-0007

Yakymchuk, A., Popadynets, N., Valyukh, A., Skrypko, T., & Levkov, K. (2021). Rural "green" tourism as a driver of local economy development in the process of decentralization of power. *Agricultural and Resource Economics: International Scientific E-Journa*l, 7(1), 232-259.
https://doi.org/10.51599/are.2021.07.01.12

Yakymchuk, A. et al. (2020). Public Administration and Economic Aspects of Ukraine's Nature Conservation in Comparison with Poland. In: Kantola, J., Nazir, S., Salminen, V. (eds) Advances in Human Factors, Business Management and Leadership. AHFE 2020. *Advances in Intelligent Systems and Computing*, 1209.
https://doi.org/10.1007/978-3-030-50791-6_33

Zatserkovnyi V. I., Trofymenko D. P., Ilyin L. V., Trofimenko N. V., Hotko V. (2020). Analysis of approaches for "Geological heritage of Ukraine" geo-portal. Conference Proceedings, Geoinformatics: Theoretical and Applied Aspects , 1-5.

Zaychuk, K. (2019). Analysis of rating of socio-economic activity of the western regional tourist market. *Economic Journal of Lesya Ukrainka Volyn National University*, 4(20), 149-156.
https://doi.org/10.29038/2411-4014-2019-04-149-156