

## ASSESSMENT OF THE COMPETITIVENESS OF TOURISM INDUSTRY IN FERGANA VALLEY FROM ITS CHARACTERISTICS

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**Abstract:** In this article, the author's approach to determining the indicators of competitiveness in infrastructure and actions in attracting tourists of each region of the Fergana Valley is analyzed.

**Key words:** competitiveness, infrastructure, total income, financial costs, touristic potential, modern approaches.

We know that every region wants to attract more tourists and provide them with more quality services. Therefore, in order to initially attract more tourists to regions, their infrastructure competitiveness, and then the competitiveness of services become important. In order for the Fergana Valley to be competitive with other regions, its regions, that is, Andijan Region, Namangan Region and Fergana Region, should be competitive among themselves. We will determine the indicators of the competitiveness of these regions in attracting tourists and infrastructure. We offer the following method. A full description of the analysis data is provided in Table 1.

Index layer	Unit of measure	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total income from tourism (B1)	Andijan billion soums	137.2	148.8	178.1	292.2	370.7	533.3	732.9	743.6	451.7	1007.2	1105.1
	Namangan billion soums	94.8	108.3	168.2	184.1	270.4	382.8	472.9	454.5	235.2	896.5	1103.2
	Fergana billion soums	147.6	166.8	208	314	484.1	595.1	825	795.5	485.3	1183.3	1277.3
The number of places for receiving tourists (B2)	Andijan unity	682	674	824	855	907	1011	1035	958	1076	1134	1232
	Namangan unity	1033	1098	1151	1239	1213	1419	1453	1696	1686	1358	1566
	Fergana unity	1607	1706	1972	2146	2385	1677	1717	2917	3302	1696	1732
Number of foreign tourists (B3)	Andijan person	6684	6843	7189	7725	8636	9546	10676	11939	2954	7783	8956
	Namangan person	3582	3598	3812	4184	4985	6643	8916	11966	3148	6913	8634
	Fergana person	17723	18756	19896	21195	21951	22752	23564	24404	1634	11534	12644
Number of domestic tourists (B4)	Andijan person	43461	44263	44967	45129	45892	46201	46621	41454	23233	38880	49527
	Namangan person	45688	44957	45120	45235	45872	46549	47017	44330	28950	37731	46731
	Fergana person	45999	46249	47119	47856	48254	48981	49740	47714	30579	55466	67909
Number of travel agencies (B5)	Andijan unity	-	2	2	2	3	3	3	3	3	2	3
	Namangan unity	1	3	5	1	1	4	1	5	1	1	2
	Fergana unity	2	3	4	5	4	5	5	5	1	3	4
Number of hotels (B6)	Andijan unity	19	20	21	24	32	25	23	22	21	23	24
	Namangan unity	11	11	16	18	24	26	26	27	36	20	26
	Fergana unity	23	20	46	38	41	49	55	92	109	109	112
Number of star hotels (B7)	Andijan unity	-	-	4	6	5	8	10	4	12	8	8
	Namangan unity	-	1	1	4	6	8	10	8	6	8	8
	Fergana unity	1	2	8	10	13	12	15	26	24	10	10
Gross domestic product (B8)	Andijan billion soums	7 623.8	9 918.6	11,872.3	13,914.0	16 115.6	19,753.0	27,017.7	33 581.3	38,008.5	43 332.5	54 464.0
	Namangan billion soums	5 924.1	7 217.2	8,852.9	10,826.9	12,874.5	15 311.1	18,809.6	23,764.0	27,863.0	34 194.1	41 098.2
	Fergana billion soums	8 684.0	10 427.2	13,029.0	15,698.7	17 290.9	19,837.5	26,611.5	31 818.4	36,538.9	47 331.9	55,972.1
Investments of the whole society in fixed assets (B9)	Andijan billion soums	1 379.9	1 462.3	1 645.0	1 956.5	2 188.5	2 986.0	4 711.9	7 452.1	9 622.6	11 176.6	14,758.6
	Namangan billion	917.3	1205.1	1807.5	2213.3	2811.7	3578	8138.2	12040.5	12007.2	12,982.0	14 348.2

		soums											
	Farghana	billion soums	1 505.8	2 130.0	2 295.3	2 542.3	2 643.6	2 954.5	5 539.1	8 685.4	11 320.0	12,625.2	15,396.7
Financial expenses (B $\text{т.б.}$ )	Andijan	billion soums	1 169.71	1 287.13	1 459.0	1 531.1	1 654.2	1 710.5	2 162.1	3 292.0	2 803.6	3 228.8	3 854.6
	Namangan	billion soums	910.52	1 087.58	1 266.8	1 473.0	1 630.7	1 617.7	1 953.7	3 096.9	2 994.2	3 254.5	3 541.2
	Farghana	billion soums	1 358.99	1 596.22	1 640.7	1 756.9	1 987.6	2 150.2	2 621.3	4 038.0	3 357.5	3 815.0	4 186.3
Financial income (B $\text{т.б.}$ )	Andijan	billion soums	1 169.71	1 287.13	1 459.0	1 531.1	1 654.2	1 710.5	2 162.1	3 292.0	2 803.6	3 228.8	3 854.6
	Namangan	billion soums	910.52	1 087.58	1 266.8	1 473.0	1 630.7	1 617.7	1 953.7	3 096.9	2 994.2	3 254.5	3 541.2
	Farghana	billion soums	1 358.99	1 596.22	1 640.7	1 756.9	1 987.6	2 150.2	2 621.3	4 038.0	3 357.5	3 815.0	4 186.3
Highway distance (B $\text{км}$ )	Andijan	km	2457	2457	2457	2457	2457	2457	2457	2457	2457	2457	2457
	Namangan	km	3168	3168	3168	3168	3168	3168	3168	3169	3176	3176	3176
	Farghana	km	4001	4001	4001	4001	4001	4001	4001	4014	4014	4014	4014
Road density (B $\text{км}$ )	Andijan	Kilometer of road corresponding to 1000 sq. km	571.40	571.40	571.4	571.4	571.4	571.4	571.4	571.4	571.4	571.4	571.4
	Namangan	Kilometer of road corresponding to 1000 sq. km	425.8	425.8	425.8	425.8	425.8	425.8	425.8	425.9	426.8	426.8	426.8
	Farghana	Kilometer of road corresponding to 1000 sq. km	591.8	591.8	591.8	591.8	591.8	591.8	591.8	591.8	593.7	593.7	593.7
Railway distance (B $\text{км}$ )	Andijan	km	155.8	155.8	155.8	155.8	155.8	155.8	155.8	155.8	155.8	155.8	155.8
	Namangan	km	224.8	224.8	224.8	224.8	224.8	228.1	226.7	226.7	224.3	224.3	224.3
	Farghana	km	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Rail density (B $\text{км}$ )	Andijan	Kilometer of road corresponding to 1000 sq. km	36,23	36,23	36,2	36,2	36,2	36,2	36,2	36,2	36,2	36,2	36,2
	Namangan	Kilometer of road corresponding to 1000 sq. km	30,22	30,22	30,2	30,2	30,2	30,7	30,5	30,5	30,2	30,2	30,2
	Farghana	Kilometer of road corresponding to 1000 sq. km	33,82	33,82	33,8	33,8	33,8	33,8	33,8	33,8	33,8	33,8	33,8
Passenger and cargo capacity (B $\text{т.б.}$ )	Andijan	billion soums	673.5	861.7	1 122.0	1 413.4	1 697.8	1 777.7	1 906.6	2 184.2	2 479.7	2 991.3	3 589.9
	Namangan	billion soums	383.0	498.4	629.3	792.3	1053.0	1119.5	1246.0	1501.9	1632.1	2216.0	2 504.5
	Farghana	billion soums	745.7	971.0	1 216.8	1 455.9	1 822.8	1 929.7	2 088.8	2 435.0	2 664.3	3 618.6	3 990.8

		soums											
Passenger traffic (B $\text{т.б.}$ )	Andijan	million passenger, km	8 774.8	9 507.2	10 204.7	10,707.4	11 295.6	11 613.0	12 143.9	12 436.9	11 399.0	12 469.7	12,737.6
	Namangan	million passenger, km	6 163.9	6 898.2	7 262.3	7 520.9	8 044.0	8 407.8	8 610.3	8 933.7	7 901.5	9 151.0	8 906.3
	Farghana	million passenger, km	9,800.6	10,580.6	11 484.7	12,520.8	13 280.1	13,617.9	13 911.5	14,024.9	12,870.5	15 368.2	15 355.5

1. Initially, data showing the touristic potential of the regions is collected. The collected data (aij) are presented in the form of a matrix. In this case, the indicators are written in the row of the matrix, and the name of the regions is written in the column of the matrix.

2. Another column is added to the matrix, and the maximum value of the indicators representing the tourist potential of the regions or their standard value is written in this column.

3. At this stage, it is necessary to normalize each indicator in the matrix. For this, each of the indicators is divided by its maximum value or reference value. This is done by the following formula.

$$x_{ij} = \frac{a_{ij}}{\max_j a_{ij}} \left( \text{yoki } x_{ij} = \frac{a_{ij}}{\text{opt } a_{ij}} \right).$$

In this  $a_{ij}$  – j i indicator of the area.

$x_{ij}$  -  $a_{ij}$  normalized amount of the indicator.

4. The competitiveness index of regions in attracting tourists is determined as follows.

$$R_j = \sqrt{x_{1j}^2 + x_{2j}^2 + \dots + x_{nj}^2}$$

4. If this indicator is high for any of the studied regions, the competitiveness of that region will be high. And for each region to be resistant to competition  $R_j \geq \frac{\sqrt{n}}{2}$  (where n is the number of indicators) the condition must be satisfied. This is definitely considered a recommended condition for each area.

5. For Andijan, Namangan and Fergana regions, we calculate the indicators of competitiveness of regions in attracting tourists.

6. To do this, based on the method we proposed above, we first collect the main indicators that attract tourists in the form of a matrix. This aggregated information looks like this:

2- table

Indicator of competitiveness of regions in attracting tourists for Fergana Valley regions<sup>1</sup>

No	Naming of tourist resources	Andijan region	Namangan region	Fergana region	Maximum
1.	Number of tourist companies and organizations	2	1	3	3
2.	The number of places in hotels and similar accommodation facilities	1134	1358	1696	1696
3.	Sanatorium - the number of places in facilities of spa facilities	835	2915	4183	4183
4.	The number of places in the facilities of recreation organizations and tourist bases	1532	100	1057	1532
5.	Number of museums	2	3	13	13
6.	Number of cultural and recreational parks	21	5	8	21
7.	Architectural monuments	221	91	19	221
8.	Number of festivals	4	3	3	4
9.	Number of resorts	11	20	39	39

<sup>1</sup> stat.uz ma'lumotlari asosida muallif tomonidan to'ldirildi.

10.	Number of star hotels	8	8	10	10
11.	Road distance	2457	3176	4014	4014
12.	Railway distance	155.8	224.3	228.6	228.6

At the next stage, based on our proposed method, another column will be added to the table, and the maximum value of the indicators representing the tourist potential of the regions will be written in this column.

Then, by performing the actions of the third and fourth stages together, we determine the competitiveness index for each region.

We determine the competitiveness index of regions in attracting tourists for Andijan region.

$$R_A = \sqrt{0,44 + 0,44 + 0,04 + 1 + 0,023 + 1 + 1 + 1 + 0,08 + 0,64 + 0,37 + 0,46} = \sqrt{6,51} = 2,55$$

We determine the competitiveness index of regions in attracting tourists for Namangan region.

$$R_B = \sqrt{0,11 + 0,64 + 0,49 + 0,004 + 0,05 + 0,06 + 0,17 + 0,56 + 0,26 + 0,64 + 0,63 + 0,96} = \sqrt{4,58} = 2,14$$

We determine the competitiveness index of regions in attracting tourists for Fergana region.

$$R_F = \sqrt{1 + 1 + 1 + 0,48 + 1 + 0,15 + 0,007 + 0,56 + 1 + 1 + 1 + 1} = \sqrt{9,19} = 3,03$$

We will rank the regions according to the competitiveness index in attracting tourists in the Fergana Valley. It is listed in the table below.

### 2.3.2- table

#### Ranking according to the competitiveness indicator of regions<sup>2</sup>

No	Fergana Valley regions	Indicator of competitiveness in attracting tourists	In competition place
1.	Andijan region	2.55 _	2
2.	Namangan region	2.14	3

<sup>2</sup> Muallif tomonidan ishlab chiqilgan.

3.	Fergana region	3.03	1
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From these results, we can see that among the regions of the Fergana Valley, Fergana region has the highest level of tolerance to competition, Andijan region is in 2nd place, and Namangan region is in 3rd place. We will have to find an answer to the question of whether Andijan and Namangan regions, which are in second and third place, can compete with Fergana region. For this, we need to compare it with the amount of the recommended indicator that we mentioned in the fifth step. The amount of our recommended indicator  $\frac{\sqrt{12}}{2} = 1,73$  is equal to The competitiveness index of Andijan region in attracting tourists is equal to 2.55, and the recommended amount is greater than 1.73. For Namangan region, the competitiveness index in attracting tourists is equal to 2.14, and we can see that the recommended amount is greater than 1.73. From these results, we can see that Andijan and Namangan regions can compete with Fergana region.

We will determine the level of competitiveness in terms of services provided to tourists in 2021 among Fergana region, Andijan region and Namangan region. The volume of services provided to tourists in the Fergana Valley in 2021 is as follows:

3- table

**The volume of services provided to tourists in the Fergana Valley<sup>3</sup>**

No	Fergana Valley regions	Volume of services provided to tourists in 2021 (billion soums)	Percentage of Total (%)
1.	Andijan region	1007.2	32.6%
2.	Namangan region	896.5	29%
3.	Fergana region	1183.3	38.4%
	Total	3087	100%

<sup>3</sup> O'zbekiston Respublikasi davlat statistika qo'mitasi ma'lumotlari asosida.

We use the Herfindahl-Hirshman index to determine the level of competitiveness in the services provided to tourists among the regions of the Fergana Valley. This index is defined as:

$$HHI = \sum_{i=1}^n Y_i^2$$

We study this index in 3 different cases.

1 – case. If  $1800 \leq HHI < 10000$  the condition is appropriate, the market for tourism services is highly concentrated. That is, the level of competitiveness is high.

2 – case. If  $1000 \leq HHI < 1800$  the condition is appropriate, the market for tourism services is considered to be moderately concentrated. That is, the level of competitiveness is average.

3 – case. If  $HHI < 1000$  the condition is appropriate, the market for tourism services is considered to be very low concentration. That is, the level of competitiveness is very low.

If we study the level of competitiveness in the services provided to tourists for the Fergana Valley among its regions using the Herfindahl-Hirshman index, it is as follows:

$$HHI = 32,6^2 + 29^2 + 38,4^2 = 1062,76 + 841 + 1474,56 = 3378,32$$

When we studied the competitiveness between the regions of the Fergana region using the Herfindahl-Hirshman index, its result was equal to 3378.32. From this result, we can see that the competitiveness of tourist services between Andijan, Namangan and Fergana regions is high.

Increasing the competitiveness of the Fergana Valley with other regions, as well as the competitiveness of the infrastructure among its provinces, and then the competitiveness of services, is seen in the results of efforts to increase the number of tourists to the valley. Of course, the more tourists visit the region, and the more quality services are provided, this is an investment in the economy. We know that development will happen in any region where investment comes. The graph below shows the number of tourists visiting Fergana Valley from 2012 to 2022.

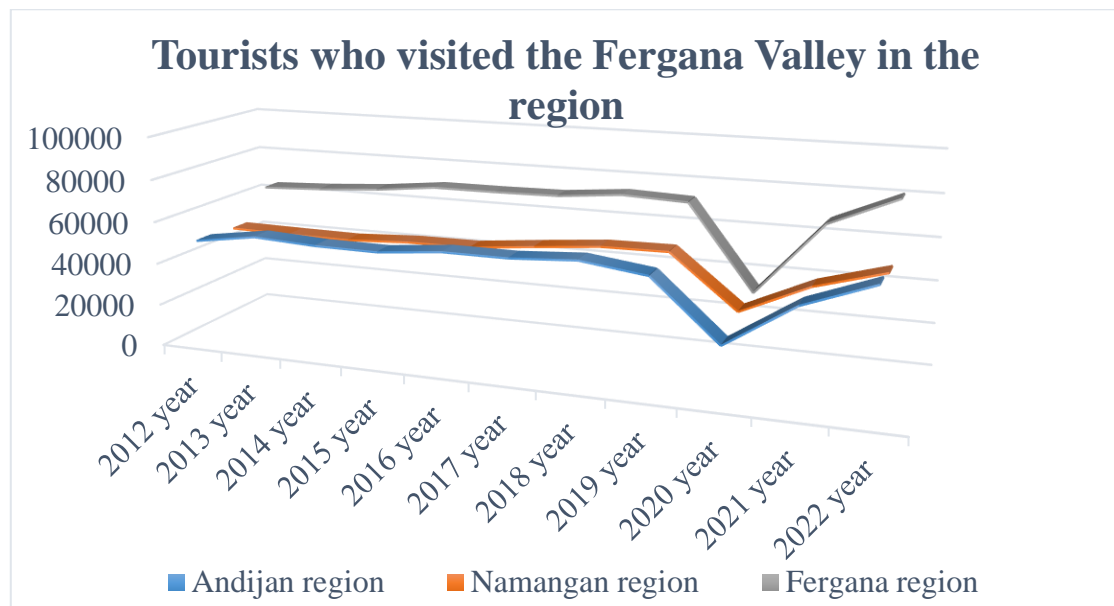


Diagram 1. The number of tourists who visited the Fergana Valley in the regions<sup>4</sup>

It is important to study the factors influencing the increase or decrease in the flow of tourists. Because determining which factors have a positive and negative effect on the change in the flow of tourists will allow us to work with a plan in the future. In this case, we define the flow of tourists in the current period as ( $Q_t$ ). The flow of tourists in the current period is definitely influenced by the flow of tourists in the previous period. Because if the trip left a good impression on the tourists who came in the previous period, they will tell other tourists about their impressions. Here they act as an advertisement. We define the number of tourists in the previous period as  $Q_{t-1}$ . One of the factors affecting the flow of tourists in the current period is the gross territorial product per inhabitant ( $I$ ), UNS - Number of historical objects, TYS - terrorism, infectious disease and spread in the area during the previous 5 years. global political problems, KE - resort, excursion, recreation in the mountains, VS - visa policy of the state and many other factors. Since many of these factors are multicollinear, we cannot accept them as factors affecting the flow of tourists in the current period when constructing the regression equation. And the general form of this regression equation is as follows:

$$Q_t = e^{\alpha} \cdot Q_{t-1}^{\gamma_1} \cdot I^{\gamma_2} \cdot e^{\gamma_3 \cdot UNS} \cdot e^{\gamma_4 \cdot TYS}$$

This function can be expressed in the following form by logarithmizing both sides.

$$\ln Q_t = \alpha + \gamma_1 \ln Q_{t-1} + \gamma_2 \ln I + \gamma_3 UNS + \gamma_4 TYS$$

<sup>4</sup> O'zbekiston Respublikasi davlat statistika qo'mitasi ma'lumotlari asosida

There were many other factors influencing the flow of tourists. One can say currency policy. These factors were not taken as factors influencing the flow of tourists because they were highly correlated with the selected factors (i.e. multicollinear).

This is for convenience in determining the coefficients of the proposed regression equation  $\ln Q_t = y, \ln Q_{t-1} = x_1, \ln I = x_2, UNS = x_3, TYS = x_4$  we introduce the definitions. And the regression equation proposed above will look like this:

$$y = \alpha + \gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4$$

As a result, the appearance of the regression equation, which determines the factors affecting the flow of tourists using statistical data for 2012 and 2022, will be as follows:

$$Y = 6,136 + 0,4716X_1 + 0,034X_2 + 1,175X_3 - 0,275X_4$$

It can be concluded from this model that increasing X1 by one unit increases Y by 0.471 units on average; An increase in X2 by one unit increases Y by an average of 0.034 units; An increase in X3 by one unit increases Y by an average of 1.175 units; A one-unit increase in X4 causes Y to decrease by -0.275 units on average.

In order to determine the reliability of the regression equation proposed above, it is necessary to determine its correlation coefficient and average error. For this, we give the calculations in the table below.

### 2.3.3- table

Correlation coefficient and mean error results <sup>5</sup>

Y	Y(x)	$\varepsilon = Y - Y(x)$	$\varepsilon^2$	$(Y - Y_{cp})^2$	$ \varepsilon : Y $
12,034	12,003	-0,001	0	0	0
12,035	12,041	-0,007	0	0,00162	0,000581685
12,061	12,055	-0,02	0,0004	0,0017	0,00166182
12,078	12,079	-0,018	0,000324	0,00452	0,001492414
12,096	12,098	-0,02	0,0004	0,00709	0,001655903
12,136	12,1	-0,004	0	0,0104	0,000330688
12,111	12,2	-0,064	0,004096	0,0202	0,005273566

<sup>5</sup> Tadqiqotchi hisob-kitoblari asosida



11,413	12,12	-0,009	0	0,0137	0,000743126
11,972	11,42	-0,007	0	0,337	0,000613336
12,178	11,986	-0,014	0,000196	0,000475	0,001169395
12,034	12,2	-0,022	0,000484	0,0279	0,001806536
			0,006096	0,0279	0,015328469

We determine the correlation coefficient.

$$R = \sqrt{1 - \frac{s_e^2}{\sum(y_i - \bar{y})^2}} = \sqrt{1 - \frac{0,006096}{0,0279}} = 0,8840$$

It can be seen that the value of Y that we have chosen has a high degree of correlation with the value of X<sub>i</sub>, indicating that it was chosen correctly.

Its average error is determined as follows.

$$A = \frac{\sum|\epsilon:Y|}{n} \cdot 100\% = \frac{0,0153}{11} \cdot 100\% = 0,14\%$$

This indicates that the regression equation is chosen correctly, since the error is at a very small value.

Fergana Valley competes with other regions in attracting tourists. The number of tourists in the previous period ( ), gross regional product (I=x<sub>2</sub>), UNS (x<sub>3</sub>) – the number of historical objects, TYS(x<sub>4</sub>) – terrorism in the area during the previous 5 years as influencing factors in the competition for attracting tourists , the spread of infectious diseases and global political problems, it is important to determine which factors have a more positive and which have a more negative effect. In this case, we will need to create a standardized equation of the regression equation proposed above. This standardized regression equation is:

$$t_y = 0,464x_1 + 0,0843x_2 + 0,000043x_3 - 0,551x_4$$

From the standardized regression equation, we can see that Fergana Valley competes with other regions and increases the flow of tourists. In this equation, the coefficient of the flow of tourists in the previous period is equal to 0.464, which is higher than the coefficients of the remaining positively influencing factors. However, the factor of terrorism, spread of infectious diseases and global political problems in the region during the previous 5 years, which has a higher and more

negative impact on the module, was considered. Because its coefficient in the standardized regression equation is equal to -0.551, this indicator is modularly higher than all the coefficients.

Thus, due to the characteristics of the Fergana Valley, paying attention to handicrafts and pilgrimage and ecological tourism as a priority, studying the world experience in the organization of new tourism objects on tourism routes will help to improve the possibilities of increasing the competitiveness of the tourism industry in the regions. and requires the development of modern approaches.

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