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## EXTRAPOLATION OF TRENDS AS A METHOD FOR FORECASTING TOURIST FLOWS IN UKRAINE

**Abstract.** The article highlights the current issues of competitiveness of the national tourism industry, the current state of statistical indicators of the industry, as well as the forecast of the peculiarities of its development. Analyzed scientific literature on the socio-economic development of tourism in Ukraine found that empirical studies of statistical data are insufficiently presented.

The authors used the method of extrapolation of trends to predict domestic tourist flows until 2025 and investigated the interpretation of the concept of "extrapolation". The study focuses on the quadratic and linear equations of the trend. The forecast values of the indicators of the number of tourists that the subjects of tourism of Ukraine will serve in 2021-2025 are given. The dynamics of the actual and forecast values of the number of tourists that the subjects of tourism of Ukraine serve are analyzed. The article deserves special attention to the problem of introducing elements of forecasting the development of the tourism industry and evaluating their effectiveness with the help of mathematical apparatus, and more simply - the use of economic and mathematical methods and models to solve management problems in tourism. To assess the degree of adequacy of the constructed trend equation to the real process, the average error of approximation of its value is calculated. 24.2% indicates that the degree of adequacy of the quadratic equation to the real conditions of the tourism industry of Ukraine is average. Studies based on the quadratic and linear equations of the trend allow the authors to determine which of the equations they constructed the calculated forecast (planned) values will have the highest accuracy, ie where the smallest deviations between actual and planned numbers of tourists served by sub objects of tourist activity of Ukraine. The issue of the consequences of the crisis caused by COVID-19 for the tourism industry in Ukraine and ways to solve them, promising ways to develop domestic tourism was raised.

**Keywords:** extrapolation, trend, method of trend analysis, method of extrapolation of trends, quadratic and linear trend equation, average approximation error, subjects of tourist activity.

**Problem statement.** Ukraine's restoration of independence and sovereignty coincided with a fundamental restructuring of its socio-economic structure, a change in the dominant national form of ownership to private ownership, and a transition from an administrative and command system to market-based management methods. All this has led to the need to create a new subsystem of management as forecasting at all levels, which are formed and operate at completely new levels of theoretical and methodological approaches and principles.



At the present stage of development of the Ukrainian economy, special attention should be paid to the problem of introducing elements of forecasting the development of the tourism business and evaluating their effectiveness using a mathematical apparatus or simply as the use of economic and mathematical methods and models for solving managerial problems in the tourism sector.

**Analysis of recent research and publications.** Issues related to the use in the practice of management methods and tools of socio-economic forecasting have become the object of research of the following domestic scientists and economists, namely: V. Voronkova [1], S. Hlivenko, O. Telizhenko [2], B. Hrabovetskyi [3], V. Kasianenko, L. Starchenko [4], O. Senyshyn [5] and others.

The basis for the study of tourism business was the study of both global and domestic experience in international tourism, marketing and management of tourism, which is reflected in the works of domestic and foreign authors, including, namely: L. Agafonova [6], V. Bohaldin-Malykha [7], A. Durovych [8], Y. Zabaldina [9], V. Kyfiak [10], F. Kotler [11], O. Liubitseva [12], M. Malska [13–14], T. Tkachenko [15], L. Shulhina [16], C. Witt, S. Witt, N. Wilson [20], R. Lawa, G. Lib, D. Chio, X. Han [21], S. Chang [22] and others.

**The purpose** of the research is mainly due to the need to apply economic and mathematical calculations, or rather forecast tourist flows in Ukraine using the trend extrapolation technique.

**Materials and methods.** The methodological basis of the research is both general scientific and special economic methods, which are used in a complex to solve the tasks set and achieve the research goal. The article uses such methods of cognition as analysis, systematization, generalization, synthesis, scientific abstraction, logical and structural analysis. Scientific clarification of the dynamics of tourist flows was carried out using graphical and tabular interpretation, socio-economic methods. For socio-economic forecasting of tourist flows of the economy of Ukraine, the method of trend analysis is substantiated and used. When forming forecasts using extrapolation, they usually proceed from statistically confirmed trends in changes in certain quantitative characteristics of the forecast object. These methods extrapolate the quantitative parameters of large systems, quantitative characteristics of economic, scientific, production potential, indicators that characterize the effectiveness of scientific and technological progress, the ratio of individual subsystems, elements in the system, complex systems in general.

The information base of the study was the materials and statistical data of the State Statistics Service of Ukraine, the State Agency of Ukraine for Tourism and Resorts of the Ministry of Economic Development and Trade of Ukraine, the State Service for Tourism and Resorts of Ukraine, current laws and regulations of Ukraine, the results the author's research, publications of periodicals, other materials and literary sources.

**Results of the research.** In modern economic conditions, the problem of using and choosing economic and mathematical methods by enterprises, industries, and complexes is closely related to their survival in the acute competition.

However, the degree of reality of this type of forecast and, accordingly, the degree of confidence in them is largely determined by the argumentation of the choice of extrapolation limits and the stability of the 'measures' of the essence of the object or phenomenon. It should be noted that complex objects, industries or complexes, as a rule, could not be characterized by a single parameter. In this case, the sequence of actions in the statistical analysis of trends and extrapolation is as follows:

- Firstly, a clear definition of the task, hypothesizing the possible development of the projected object, discussing the factors that stimulate or inhibit the development of this object, determining the necessary method of extrapolation;

- Secondly, the choice of the system of parameters, the unification of the units of measurement of each parameter separately;

- Thirdly, the collection and systematization of information. Before summarizing them in the relevant tables, check the homogeneity of indicators and their comparability;

- Fourthly, identifying trends in the studied indicators. In extrapolation forecasts, it is especially important not so much to predict specific values of the object or indicator under study in a particular year but to record objective shifts that are harbingers of trends in a timely manner.

The term 'extrapolation' has several interpretations. In a broad sense, extrapolation is a method of scientific research that consists in spreading the conclusions obtained from observations of one part of the phenomenon to another part of it. In mathematics, it is interpreted as finding by the change of these values of the function of its other values, which are contained outside this series [17, P. 411].

In economics, this is a method of scientific knowledge, in which the conclusions, indicators, trends and regularities of some phenomena, processes, as well as stages and stages of an integrated economic system, are extended to other future expected phenomena and processes, to more developed stages and stages of this system based on reasonable and existing laws and their internal contradictions [17, Vol. 1, P. 211].

In the practice of socio-economic forecasting, extrapolation methods are used in the study of time series. Such extrapolation methods are based on dynamic series as a sequence of indicators that characterize the change in a phenomenon over time.

Depending on the characteristics of the change of levels, extrapolation methods can be simple and complex. Simple ones usually include extrapolation based on analytical indicators of the dynamics series, extrapolation based on the fluid average, and extrapolation based on the seasonality index. Other methods, such as trend extrapolation and exponential smoothing forecasting, are complex extrapolation models.

Structural changes in Ukraine's market economy have had a positive impact on the development of the tourism business, but the pandemic has significantly reduced tourism flows. For example, in the first five months of 2021, the world, according to the forecast calculations of UNWTO, recorded 147 million international arrivals less than in the same period of 2020, and 460 million less than in 2019, and the direct gross domestic product of tourism may lose another USD 2 trillion [18].

Under modern economic conditions, the problem of choosing and applying economic and mathematical methods for forecasting tourist flows or other indicators that characterize the tourism industry in general, is closely related to its functioning in fierce competition, as tourism is an industry whose main goal is to obtain profits. This mainly led to the need to apply economic and mathematical calculations, namely the method of extrapolating trends within the predictive function.

To determine the forecast values of tourist flows, namely the number of tourists served by the subjects of tourist activity of Ukraine in 2021-2025, the method of trend analysis was used. The initial data for the corresponding calculations were indicators of the dynamics of the number of tourists served by the subjects of tourist activity of Ukraine in 2006-2020 (Fig.1).

After the economy recovered from the financial crisis of 2007-2008, from 2006 to 2008, there was a significant increase in the number of tourists, which corresponds to an average annual growth rate of 2.7%. Also, the growth of this indicator has been observed, since 2012, then 3,000,696 people were served by the subjects of tourism activity of Ukraine, and already in 2013, 3,454,316 people were served. In 2014, there was a decline in this indicator: in quantitative terms, it is 2,425,089 people. A sharp increase occurred in 2018 and amounted to 4,557,447, which is 1,751,021 people more compared to 2017, the growth continued in 2019, but 2020 brought a significant decline in indicators, which is associated with the pandemic of a new type of virus as COVID-19. As it can be seen in Fig. 1 then the indicators in 2020 fell sharply and actually returned to the indicators of 2014. It was 2,360,278 people. In Ukraine, the pandemic began on March 12, when the government declared a general 'lockdown', thus pausing various spheres of life, including tourism.

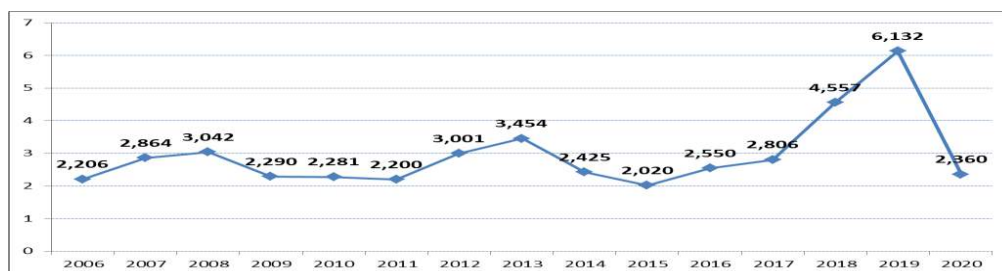
To calculate the forecast values of the number of tourists served by tourism entities of Ukraine, we use the method of extrapolation of trends, the essence of which is to construct the equation of the trend (1) taking into account the patterns in 'prehistory' [3, P. 48]:

$$y = f(t) + \xi_t$$

(1)

where  $f(t)$  is determined non-random component of the process;

$\xi_t$  means a stochastic random component of the process.



**Fig. 1:** Dynamics of the number of tourists served by Ukrainian tourism entities in 2006-2020, million people

**Source:** Compiled by the authors based on [19]

The trend describes the actual average trend for the future process over time, so the trend extrapolation can be applied only if the development of the phenomenon is well described by the constructed equation and the conditions that determine the development trend in the past do not change significantly in the future. Observing these conditions, extrapolation is performed by substituting the value of the independent variable  $t$  in the trend equation, which corresponds to the value of the forecast horizon:

$$\hat{y}_{t+p} = f(t_{n+p}),$$

(2)

where  $p$  means the value of the forecast horizon (the period for which the forecast is made).

This trend describes the actual average for 'prehistory' trend of the process studied over time, its external manifestations. The result is related exclusively to the passage of time. It is assumed that through the time factor ( $t$ ), we can express the influence of all major factors, i.e. time, although not a mechanism for the manifestation of patterns and trends, it seems to accumulate the actions of major factors and express them in the trend equation. The real mechanism of influencing the values of the time series levels, in this case, is not taken into account.

The equation of the trend can be described by a wide range of dependencies: linear, quadratic, power, indicative, exponential, etc. Our research focuses on the quadratic and linear trend equations. Examining these two dependencies, we want to determine which of the equations we constructed the calculated forecast (planned) values will be more accurate, i.e. where the smallest deviations between the actual and planned indicators of the number of tourists served by tourism entities of Ukraine.

First, we present the quadratic equation of dependence

$$\hat{y}_t = a_0 + a_1t + a_2t^2,$$

(3)

where  $t$  means a time factor;

$a_0, a_1, a_2$  mean the coefficients of the equation;

$\hat{y}$  means the estimated value of the function.

To use the trend as a tool for predicting the number of tourists served by Ukrainian tourism entities, it is necessary to quantify the parameters (coefficients) of equations  $a_0, a_1$ , and  $a_2$ .

The parameters of the equation are determined using the least-squares method:

$$\sum (y_t - \hat{y}_t)^2 = \min, \quad (4)$$

where  $y_t$  means the actual value of the function;

$\hat{y}_t$  means the estimated value of the function, which is determined from equation (3).

We write the dependence (4) for this quadratic equation:

$$\sum (y_t - a_0 - a_1t - a_2t^2)^2 = \min. \quad (5)$$

In equation (5)  $y_t$  and  $t$  are known values, and coefficients  $a_0, a_1, a_2$  are unknown. To determine them, we equate to zero the derivatives from this equation for each initial coefficient (parameter) separately.

After the corresponding transformations we obtain a system of normal equations:

$$\left\{ \begin{array}{l} \sum y_t = a_0n + a_1\sum t + a_2\sum t^2 \\ \sum y_t t = a_0\sum t + a_1\sum t^2 + a_2\sum t^3 \\ \sum y_t t^2 = a_0\sum t^2 + a_1\sum t^3 + a_2\sum t^4, \end{array} \right. \quad (6)$$

where  $n$  means period of time (in this case, the number of years).

Substituting the values  $a_0, a_1, a_2$  calculated by solving system (6) into the quadratic equation (3), we obtain the trend equation, substituting only the time factor  $t$ , we obtain the value of the predicted indicator  $\hat{y}$ .

Using the data in Table 1, indicators of the number of tourists, which the subjects of tourism of Ukraine served in 2006-2020, we calculate the parameters and statistical characteristics for quadratic and linear equations according to the following formulas.

The system of equations for the quadratic dependence of the trend after substituting the values of intermediate indicators will take the form (7):

$$(7) \quad \left\{ \begin{array}{l} 44,188 = 15a_0 + 120a_1 + 1240a_2 \\ 383,700 = 120a_0 + 1240a_1 + 14400a_2 \\ 4196,054 = 1240a_0 + 14400a_1 + 178312a_2. \end{array} \right.$$

Based on the parameters calculated by us  $a_0 = 2.743$ ,  $a_1 = - 0.125$ , and  $a_2 = 0.015$  quadratic trend equation is written as follows:

$$(8) \quad \hat{y}_t = 2,743 - 0,125t + 0,015t^2.$$

Substituting the value of the time factor in equation (8)  $t$  for the period 2006–2020, in this case for 2006  $t = 1$ , for 2007  $t = 2$ , etc., we obtain indicators of quantity tourists, whose subjects of tourist activity of Ukraine ( $\hat{y}_t$ ) served for this period, calculated based on the quadratic trend equation.

Table 1:

**Dynamics of the number of tourists served by the subjects of tourist activity of Ukraine in 2006–2020, and calculation of intermediate indicators to determine the parameters and statistical characteristics of the quadratic dependence of the trend equation**

Item number Year (t)	The actual number of tourists served by tourism entities of Ukraine, million people (y)	$\Sigma y$	$t^2$	$t^3$	$t^4$	$t^5$	Number of tourists, calculated based on the quadratic trend equation, persons, $\hat{y}_t$	Deviation, thousand, $ y-\hat{y}_t $	Deviation square, thousand $(y-\hat{y}_t)^2$	$\frac{ y-\hat{y}_t }{y}$	$\left(\frac{y-\hat{y}_t}{y}\right)^2$
1. 2006	2.206	2.206	1	-1	1	2.206	2.633	0.427	0.182329	0.194	0.037467
2. 2007	2.844	5.728	4	8	16	11.456	2.555	0.311	0.096721	0.109	0.011792
3. 2008	3.042	9.126	9	27	81	27.378	2.503	0.539	0.290521	0.177	0.031395
4. 2009	2.290	9.160	16	64	256	36.640	2.483	0.193	0.037249	0.084	0.007103
5. 2010	2.281	11.403	25	125	625	57.625	2.493	0.212	0.044944	0.093	0.008638
6. 2011	2.290	13.200	36	216	1.296	79.200	2.533	0.333	0.110889	0.151	0.022911
7. 2012	3.001	21.007	49	343	2.401	147.049	2.603	0.398	0.158404	0.133	0.017589
8. 2013	3.454	27.632	64	512	4.096	221.056	2.703	0.751	0.564001	0.217	0.047275
9. 2014	2.425	21.825	81	729	6.561	196.425	2.833	0.408	0.166464	0.168	0.028507
10. 2015	2.920	30.200	100	1.000	10.000	302.800	2.993	0.973	0.946729	0.482	0.232019
11. 2016	2.550	28.050	121	1.331	14.641	308.550	3.183	0.633	0.400689	0.248	0.061621
12. 2017	2.806	33.672	144	1.728	26.736	404.064	3.403	0.597	0.356409	0.213	0.045266
13. 2018	4.557	50.241	169	2.197	28.561	770.133	3.653	0.904	0.817216	0.198	0.039153
14. 2019	6.172	85.848	196	2.744	38.416	1.201.872	3.933	2.199	4.835601	0.359	0.128802
15. 2020	2.360	35.400	225	3.375	50.625	531.800	4.243	1.883	3.541689	0.798	0.636815
Total	44.188	383.7	1.240	14.400	176.312	4.196.034	44.745	10.761	12.533855	3.624	1.359351

Source: Author's own calculations

Estimated values of quantity tourists, whose subjects of tourist activity of Ukraine ( $\hat{y}_t$ ) served in 2006–2020, are as follows:  $\hat{y}_{2006} = 2.633$  million people;  $\hat{y}_{2007} = 2.533$  million people;  $\hat{y}_{2008} = 2.503$  million people;  $\hat{y}_{2009} = 2.483$  million people;  $\hat{y}_{2010} = 2.493$  million people;  $\hat{y}_{2011} = 2.533$  million people;  $\hat{y}_{2012} = 2.603$  million people;  $\hat{y}_{2013} = 2.703$  million people;  $\hat{y}_{2014} = 2.833$  million people;  $\hat{y}_{2015} = 2.993$  million people;  $\hat{y}_{2016} = 3.183$  million people;  $\hat{y}_{2017} = 3.403$  million people;  $\hat{y}_{2018} = 3.653$  million people;  $\hat{y}_{2019} = 3.933$  million people;  $\hat{y}_{2020} = 4.243$  million people.

To assess the degree of adequacy of the constructed trend equation to the real process, we calculate the average approximation error  $\bar{\varepsilon}$ :

$$\bar{\varepsilon} = \frac{1}{n} \sum \frac{|y_t - \hat{y}_t|}{y_t} \times 100\% = \frac{3,624}{15} \times 100\% = 24,2\% \text{ or } 0.242. \tag{9}$$

its value of 24.2% indicates that the degree of adequacy of the quadratic equation to the real conditions of the tourism industry of Ukraine is average. This statement allows us to conclude that we can calculate the number of tourists forecast

that the subjects of tourism of Ukraine will serve in 2021-2025. To do this, we use the quadratic dependence of the trend equation (8). The results of the calculations are given in Table 2 and in Fig. 2.

Table 2:

**Forecast values of indicators the number of tourists that the subjects of tourism of Ukraine will serve in 2021-2025, million people**

Year, t	2021	2022	2023	2024	2025
Estimated number of tourists, million people, ( $\hat{y}_t$ )	3.809	3.917	4.024	4.132	4.240

**Source:** Author's own calculations

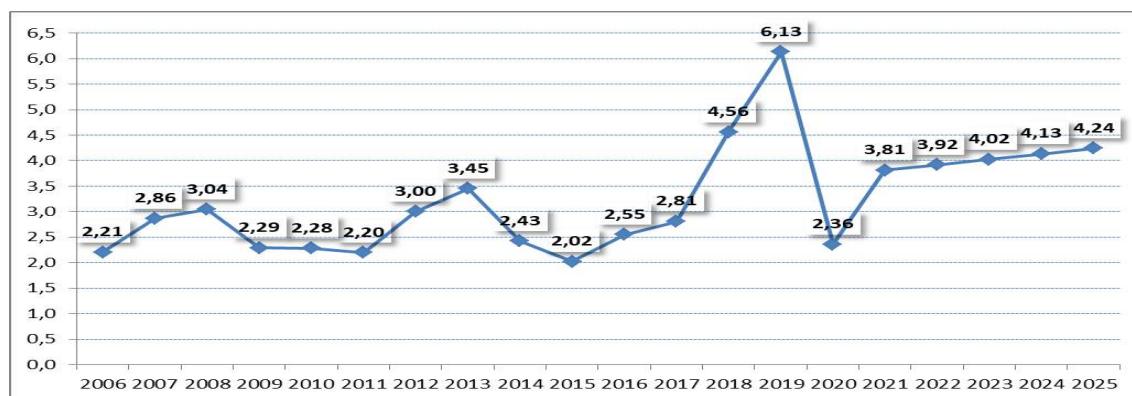
To analyse the deviations between the actual and planned values of the number of tourists served by the subjects of tourist activity of Ukraine, and to select the trend equation, a linear relationship is also constructed:

$$\hat{y}_t = a_0 + a_1 t. \quad (10)$$

To take advantage of the trend of the forecasting tool, you need to find the numerical values of the equation coefficients:  $a_0, a_1$ .

According to the method of least squares:

$$\sum (y_t - a_0 - a_1 t)^2 = \min. \quad (11)$$



**Fig. 2:** Dynamics of actual (2006-2020) and forecast (2021–2025) values of the number of tourists served by Ukrainian tourism entities, million people

**Source:** Developed by the authors

After the corresponding transformations we obtain a system of normal equations:

$$\begin{cases} \sum y_t = a_0 n + a_1 \sum t, \\ \sum y_t t = a_0 \sum t + a_1 \sum t^2. \end{cases} \quad (12)$$

Substituting it with the relevant intermediate indicators listed in Table 2, we obtain a system of equations:

$$(13) \quad \begin{cases} 44,188 = 15a_0 + 120a_1, \\ 383,700 = 120a_0 + 1240a_1. \end{cases}$$

Substituting values  $a_0$ ,  $a_1$ , obtained by solving the system (13), in a linear relationship (10), we write the equation of the trend:

$$\hat{y}_t = 2,083 + 0,108t.$$

(14)

Substituting the value of the time factor in equation (14)  $t$  for the period 2006-2020 (in this case for 2006  $t = 1$ , for 2007  $t = 2$ , etc.), we obtain indicators the number of tourists served by the subjects of tourist activity of Ukraine ( $\hat{y}_t$ ) for this period, calculated based on the linear equation of the trend (estimated data are given in Column 5 of Table 3).

- Table 3

**- Dynamics of the number of tourists served by the subjects of tourist activity of Ukraine in 2006-2020, and calculation of intermediate indicators to determine the parameters and statistical characteristics of the quadratic dependence of the trend equation**

Item No.	Year, (t)	The actual number of tourists served by tourism entities of Ukraine, million people, (y)	$y_t$	$t^2$	Number of tourists, calculated based on the linear trend equation, persons ( $\hat{y}_t$ )	Deviation, thousand $ y_t - \hat{y}_t $	Deviation square, thousand $(y_t - \hat{y}_t)^2$
1	2	3	4	5	6	7	
1.	2006	2.206	2.206	1	2.191	0.015	0.000225
2.	2007	2.864	5.728	4	2,299	0.565	0.319225
3.	2008	3.042	9.126	9	2.407	0.635	0.403225
4.	2009	2.290	9.160	16	2.515	0.225	0.050625
5.	2010	2.281	11.405	25	2.623	0.342	0.116964
6.	2011	2.200	13.200	36	2.731	0.531	0.281961
7.	2012	3.001	21.007	49	2.839	0.162	0.026244
8.	2013	3.454	27.632	64	2.947	0.507	0.257049
9.	2014	2.425	21.825	81	3.055	0.630	0.396900
10.	2015	2.020	20.200	100	3.163	1.143	1.306449
11.	2016	2.550	28.050	121	3.271	0.721	0.519841



12.	2017	2.806	33.672	144	3.379	0.573	0.328329
13.	2018	4.557	59.241	169	3.487	1.070	1.144900
14.	2019	6.132	85.848	196	3.595	2.537	6.436369
15.	2020	2.360	35.400	225	3.703	1.343	1.803649
Total		44.188	383.7	1,24 0	44.205	10.999	13.391955

**Source:** Author's own calculations

Based on the analysis of the results given in Table 1 and Table 3 of the indicators we reach the following conclusion: since the sum of squares of deviations between the actual and planned values of the number of tourists served by tourism entities of Ukraine, in Table 1 is lower by 0.838 million people for further study should use the quadratic dependence of the trend. To assess the adequacy of the quadratic dependence of the equation, we introduce the concept of mean approximation error ( $\bar{\varepsilon}$ ), which is calculated by the formula:

$$\bar{\varepsilon} = \frac{1}{n} \sum \frac{|y_t - \hat{y}_t|}{y_t} \times 100 = 24,2\% \quad (15)$$

Calculating the mean error of the approximation, we propose to assess the quality of the quadratic dependence of the trend equation and such indicators as the standard deviation (absolute and relative) between the actual and calculated values of the function and the mean deviation (absolute and relative) between these values.

The standard deviation between the actual and calculated values of the function is calculated:

$$\text{absolute } \sigma_{\text{abs}} = \sqrt{\sum (y_t - \hat{y}_t)^2 \div (n - 1)}; \sigma_{\text{a6c}} = 0.947 \text{ million people}; \quad (16)$$

$$\text{relative } \sigma_{\text{rel}} = \sqrt{\sum ((y_t - \hat{y}_t) \div y_t)^2 \div (n - 1)} \times 100\%; \sigma_{\text{BID}} = 50.8\%. \quad (17)$$

The standard deviation between the actual and calculated values of the function is calculated:

$$\text{absolute } \bar{\Delta}_{\text{a6c}} = \sum |y_t - \hat{y}_t| / n; \quad \bar{\Delta}_{\text{a6c}} = 0.717 \text{ million people}; \quad (18)$$

relatively equal to the average approximation error  $\bar{\varepsilon} = 24.2\%$ . (19)

It is scientifically proven that the smaller the values of indicators calculated using formulas 16, 17, 18, 19), the higher the quality of the quadratic dependence of the trend equation  $\hat{y}_t = 2.743 - 0,125t + 0,015t^2$ . The calculated indicators confirm the correctness of the choice of the quadratic equation.

**Conclusions.** Thus, the significance of the economic and mathematical method is determined by the degree of adequacy of taking into account the main advantages of this method and the validity of recommendations. We illustrate the range of conclusions that can be reached through the application of the proposed trend

extrapolation method (namely, the construction of the quadratic dependence of the trend equation):

*Firstly*, this method, unlike other methods of extrapolation, allows you to take into account all the elements of the dynamic series level that equally affect the projected indicators (in our case, the projected indicators of the number of tourists served by the subjects of tourist activity of Ukraine);

*Secondly*, the quadratic dependence of the trend equation is constructed adequate to the real conditions of tourist activity, as evidenced by the calculated values of the average approximation error ( $\bar{\varepsilon} = 24.2\%$ ); standard deviation (absolute  $\partial_{\text{abs}} = 0.947$  million people and relative  $\partial_{\text{rel}} = 50.8\%$ ) between the actual and calculated values of the function and the mean deviation (absolute and relative) between these values of the function. So, as a result of the study, a dynamic number of projected indicators of the number of tourists that the subjects of tourist activity of Ukraine will serve in 2021-2025 indicates that in the future tourist flows will grow, but will not soon reach pandemic values, even in 2025 it will not be possible to reach the level of 2018. Despite the improvement, the uneven level of vaccination in the world and new strains of COVID-19, which constantly appear, can affect the already slow and unstable recovery of the tourist market in Ukraine. It is also worth noting that a slight increase in the number of tourists served by Ukrainian tourism entities in quantitative terms (million people) will lead to a slow increase in the profits of the Ukrainian tourism industry.

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