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Summary: Term "green economy" until now did not get unambiguous determination. Traditional industries are examined in most estimation. Considerably the less number of estimations is sanctified to other important aspects of "green economy". Affecting environment, analysis of life cycle of commodity, finances, trade and tourism behave to them. The article reveals the fundamental principles and essence of market statistics tourism product. It considers detailed the system of basic indicators as a methodology of statistical evaluation and analysis of tourist activities, as well as its competitiveness at different levels. In this case, statistical evaluation covers international and domestic tourism. International tourism development indicators are important to develop strategies and tactics of the tourism product of the country. Intelligently chosen to analyze the statistical methods are always successful. All given indicators make the foundation of the knowledge base needed to make management decisions in the field of tourism industry.
Key words: "Green economy", statistical estimation, system of statistical indexes, strategy and tactics of product of tourism, industrial tourism.

Анотація: Термін "Зелена економіка" ще досі не отримав однозначного тлумачення. Традиційно дослідження індустрії підпадає оцінюванню. Значно менше число оцінок присвячене іншим важливим аспектам "зеленої економіки". Вплив на довкілля, аналіз життєвого циклу продукту, фінанси, торгівля і туризм відносяться до них. Стаття виявляє основні принципи і суть продукту туризму щодо ринкової економіки. Надається деталізована система основних показників як методологія статистичної оцінки і аналізу туристської діяльності, а також його конкурентоспроможності на різних рівнях. У цьому випадку, статистична оцінка характеризує роль внутрішнього туризму. Показники розвитку міжнародного туризму важливі щодо розробки стратегії і тактики продукту туризму країни. Розумно вибрано статистичні методи щодо аналізу предмету дослідження. Усі ці показники роблять основу щодо прийняття рішень управління у сфері індустріального туризму.
Ключові слова: «Зелена економіка», статистична оцінка, система статистичних показників, стратегія і тактика продукту туризму, індустріальний туризм.

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STATISTICAL METHODOLOGY OF ANALYTIC GEOMETRY OF GREEN EKONOMY

Summary

Term "green economy" until now did not get unambiguous determination. Traditional industries are examined in most estimation. Considerably the less number of estimations is sanctified to other important aspects of "green economy". Affecting environment, analysis of life cycle of commodity, finances, trade and tourism behave to them. The article reveals the fundamental principles and essence of market statistics tourism product. It considers detailed the system of basic indicators as a methodology of statistical evaluation and analysis of tourist activities, as well as its competitiveness at different levels. In this case, statistical evaluation covers international and domestic tourism. International tourism development indicators are important to develop strategies and tactics of the tourism product of the country. Intelligently chosen to analyze the statistical methods are always successful. All given indicators make the foundation of the knowledge base needed to make management decisions in the field of tourism industry.

Introduction

With the development of the global economy the influence of tourism shows a substantial growth and is continuously exerted on both the global and the “green economy”. Tourism is being transformed into a major independent industry of the national economy. It becomes one of the subjects of the global integration processes.

Secretary General UNWTO Taleb Rifai in the performance at conference Tourism and energy of the future mark that: "Tourism is in the forefront of the transformations sent to providing ecologically of clean energy". On his estimations, tourism is responsible for 5% of global extras of CO2, 40% that are on an air transport and 20% - on hotels and other objects of residence. Other 40% is related to other transport segments (by cruise courts, motor, railway transport and т. of п.) and entertaining services for tourists [1, c.10].

As a science, statistics deals with objective regularities and patterns of social phenomena development, and, therefore, statistical methods are used actually in all areas of social life featured by mass nature of the phenomena and, inter alia, in tourism.

The relevance of statistical research of tourism is explained by the need to obtain unbiased and reliable information about the condition of tourism and its development, tourist industry and to estimate its contribution into the total gross domestic product. The relevance of statistical research is also explained by the necessity to evaluate the tourist flows, the loads produced on tourist resources and on tourist industry facilities, to evaluate the satisfaction of tourists demand and the correlation between the consumers’ expectations and the supply in the tourist market.

The necessity to use statistic methodology to estimate the main tendencies in the development of tourist product market is outlined.

The analysis of the latest researches and publications showed that the methodical and practical questions of statistical tourist market of product research had become a main theme in works of such famous economists as: Biletskaya I.M., Vishnevskaya O.O., Gelman V.J., Grinenko V.V., Karmanova T.E., Kaurova O.V., Kvartalnov V.A., Ковальчук С.Я. Kovalevskiy G.V., Ljubiceva O.O., Maloletko A.N., Parfinenko A.J., Sidorov V.I., Soboleva E.A., Tsikhanovskaya V.M. et al.

Part 1. System of tourism statistical indicators

Statistical indicators are expressed in absolute, relative and average statistical quantities.

Quantity is a characteristic of the object or a phenomenon of a material world, common in qualitative terms but it is individual for every object in quantitative terms.

Value of a particular quantity is its estimate obtained by multiplying a particular figure by the unit adopted for such quantity.

The initial form of expression of a statistical indicator is represented by absolute quantities. Individual absolute quantities characterize the absolute dimensions or properties of a studied phenomenon for each measured unit. If indicators characterize the whole set, they are referred to generalizing absolute indicators. Absolute indicators always have units of measure: physical or cost units (rubles, dollars, euro, etc.).

Simple physical units of measure are meter, liter, kg, etc.

Compound physical units of measure are estimated indicators obtained as a result of multiplying two or several indicators having ordinary measurement units: man-days, watt-hours, etc.

Conditional physical measurement units are used in the instances where it is necessary to obtain a final value of indicators of the same type which are not directly comparable.

However, rather frequently absolute values are not able to give an analytical characteristic for a process or phenomenon under study. In this case relative statistical values are used. They serve analytical purposes: they enable a researcher to compare the dimensions of the phenomena, to evaluate their dynamics and changes in structure.

Relative values are always obtained as a quotient of two absolute quantities. If absolute quantities are homonymous, then they obtained relative quantity is expressed in factors, percent (multiplied by 100), per mile (multiplied by 1000). If absolute values are not homonymous their relation shall be a relative value, which has a compound unit of measurement: center/hectare, m^2/person, etc.

Types of relative indicators:

Relative value of target (RVT):

$$RTV = \frac{Target\ value\ of\ indicator}{Indicator\ level\ in\ the\ baseline\ period} \times 100$$

Indicator level in the baseline period

Relative value of target achieved (RVTA):

$$RTVA = \frac{Actually\ achieved\ level\ of\ indicator\ in\ the\ given\ period}{Target\ level\ of\ indicator} \times 100$$

Relative dynamics value (RDV):

$$RDV = \frac{Actually\ achieved\ level\ of\ indicator\ in\ the\ current\ period}{Actual\ level\ of\ indicator\ in\ the\ baseline\ period} \times 100$$

There is the interrelation between these three indicators:

$RDV = RTV \times RVTA$.

Relative value of structure (RVS, shows a specific weight, a share of each part as a whole):

$$RVS = \frac{Part}{Whole} \times 100$$

Relative coordination value (RCV, shows how many units of the 1st part accounts per one unit of the 2nd part):

$$RCV = \frac{1st\ part}{2nd\ part} \times 100$$

Relative intensity value (RIV, describes the density of phenomena distribution within the given environment – demographical coefficients). For example:

$$E_{BIRTH} = \frac{Number\ of\ new\text{-}born\ persons\ per\ year}{Average\ annual\ number\ of\ population} \times 100$$

Relative comparison value (RCV) is a ratio between the absolute homonymous indicators referred to different locations or objects.

The most commonly used form of statistical indicators is the average value.

Average value $\bar{x}$ is a generalized quantitative description of a certain character in the statistical population under particular conditions of place and time.

Average value reflects specific, typical and actual levels of phenomena under study; it characterizes such levels and their changes in time and space. It is calculated solely for those populations that include qualitatively homogenous units.

Depending on a particular purpose of research and the nature of data there may be used different types of means: arithmetic, harmonic, geometrical, quadratic and other types of structural means.

Arithmetic, harmonic, geometrical and average quadratic means are classified into a common group named *exponential means*. Formulas for their calculation may be transformed into the general formula as follows:

$$\bar{x} = \sqrt[m]{\frac{\sum x_i^m f_i}{\sum f_i}}$$

where *m* is the exponent of mean: at m = 1 we obtain the formula for calculation of arithmetic mean; at m = 0, for geometrical mean; at m = –1, for harmonic mean, at m = 2, for quadratic mean;

x_i are options (of value assigned to the character);

f_i are occurrences (number of units of observation that have the value of the given variant).

Arithmetic mean value is used when the gap between the minimal and top values of character is small.

Simple value is calculated for loose data or for grouped data with equal occurrence rates.

Weighted value is calculated for grouped data with uneven occurrence rates.

Simple arithmetic mean:

$$\bar{x} = \frac{\sum x_i}{n}.$$

Weighted arithmetic mean:

$$\bar{x} = \frac{\sum x_i \times f_i}{\sum f_i}.$$

Main properties of arithmetic mean: the amount of the character variances from its arithmetic mean is equal to zero; when all values of character are decreased (increased) by A times the average arithmetic mean will accordingly decrease (increase) by the same A times; if the occurrence rate of each value of the character decreases or increases by *m* times the value of arithmetic mean will not change.

Properties of arithmetic mean are based upon one of the methods used for its calculation, the method of moments.

The method of moments is a method of counting from conditional zero.

This method is acceptable solely for sequences with equal intervals.

$x = \bar{x}'d + c$,

where $\bar{x}$ is a moment of the first order.

$$\bar{x}' = \frac{\sum\left(\frac{x_i - c}{d}\right)f_i}{\sum f_i},$$

where *d* is the interval value;

c is the value of the middle of the interval which is in the center of the sequence.

The harmonic mean is calculated when the values of occurrences are unknown but products of the variants and the appropriate occurrences are known.

$F_i = x_i \times f_i$.

Simple harmonic value:

$$\bar{x}_{SIM} = \frac{n}{\sum \frac{1}{x_i}}$$

Weighted harmonic value:

$$\bar{x}_{WTD} = \frac{\sum F_i}{\sum \frac{F_i}{x_i}}$$

Geometrical mean is calculated either when the minimal and maximum value of a character differ from each other substantially or when we have data in the form of a ratio of two indicators (indices or growth ratios).

The simple geometrical mean is used for loose data (when occurrences are missing) or for grouped data with equal occurrences:

$\bar{x}_{geom} = \sqrt[n]{x_1 x_2 x_3 ... x_n}$.

For grouping data with uneven occurrences the geometrical weighted mean is used:

$$\bar{x}_{GEOM.WTD} = \sqrt[n]{(x_1)^{f_1}(x_2)^{f_2}(x_3)^{f^i}...(x_n)^{f_n}}$$

Quadratic mean and cubic mean are calculated when it is required to calculate the average size of a character expressed in quadratic or cubic units of measure

simple quadratic mean

$$\bar{x}_{GUAD.SIM} = \sqrt{\frac{\sum x_i^2}{n}};$$

weighted quadratic mean

$$\bar{x}_{GUAD.WTD} = \sqrt{\frac{\sum x_i^2 f_i}{f_i}}$$

simple cubic mean

$$\bar{x}_{CUB.SIM} = \sqrt[3]{\frac{\sum x^3}{n}};$$

weighted cubic mean

$$\bar{x}_{CUB.WTD} = \sqrt[3]{\frac{\sum x^3 f_i}{f_i}}$$

Structural means are used for study of the internal composition and structure of the distributed sequences of character values.

Mode (Mo) is the most frequently used occurring value of a character or a value of a variant with a highest occurrence rate.

If there exists a sequence of data, which are presented as intervals, it is required to calculate, first of all, the modal interval, that is the interval with a highest occurrence, and then the following calculation shall be made:

$$Mo = X_{MO} + d_{MO}\frac{f_{MO} - f_{MO-1}}{(f_{MO} - f_{MO-1}) + (f_{MO} - f_{MO+1})},$$

where X_{Mo} is the lower boundary of the modal interval;

d_{MO} is the interval value;

f_{MO} is the frequency of the modal value;

f_{MO-1} is the frequency of the interval, which precedes the modal interval;

f_{MO+1} is the frequency of the interval, which follows the modal interval.

Median (Me) is the value of the variant in the center of the population character values arranged in ascending order. The median divides the sequence of values into two equal parts.

To calculate the median, it is necessary to find its ordinal number by the following formula:

$$N_{ME} = \frac{n+1}{2}.$$

where *n* is the volume of the population.

Median will be the value of the variant which is directly under the median No. To obtain the median in the interval sequences it is necessary, first of all, to calculate the median interval by the following formula:

$$N_{Me} = \frac{n}{2}.$$

Then, on the basis of the accrued occurrence rate (the amount of all previous occurrence rates), it is necessary to determine the interval the median value of the character belongs to. The median is directly calculated by the formula:

$$Me = X_{Me} + d_{Me} \frac{\frac{\sum f}{2} - S_{Me-1}}{f_{Me}},$$

where X_{Me} is the lower limit of median interval;

d_{Me} is the value of the median interval;

S_{Me-1} is the sum of the accrued occurrence rates of the interval preceding the median interval;

f_{Me} is the frequency of the median interval.

Part 2. Analytic geometry of international and internal tourism

During the statistical analysis, a situation may occur when the mean values are similar, when the underlying set used for their computation contains units which values differ from each other substantially.

It is obvious that the mean values in the first and second cases are similar, however, it is clear that the first and second sets are qualitatively heterogeneous, i.e., the variation of values in characters within them is different. Variation analysis investigates this problem.

Variation is a difference in values of a character in different units of a given set, or population, within the same period or a moment of time.

Discordant observations imply radically varying characters.

Absolute indicators of variation:

Variation R- scope: $R = x_{\max} - x_{\min}$

Mean linear variance ($\bar{d}$) is the arithmetic mean value calculated on the basis of the absolute values of variances in a character particular values from their mean value:

$$\overline{d_{sim}} = \frac{\sum \left| x_i - \bar{x} \right|}{n}; \qquad \overline{d_{wtd}} = \frac{\sum \left| x_i - \bar{x} \right| f_i}{f_i}$$

Variance $\left(\sigma^2\right)$ is a mean deviation square of variations deviations from their mean value:

$$\sigma_{sim}^2 = \frac{\sum \left(x_i - \bar{x} \right)^2}{n}; \qquad \sigma_{wtd}^2 = \frac{\sum \left(x_i - \bar{x} \right)^2 f_i}{f_i}$$

Let us consider the variance behavior:

if $x_i = c,$ where is a constant value, then $\bar{d}$ =0;

if we subtract constant value c from all character values, $\bar{d}$ will not change;

if we decrease all character individual values by d times, $\bar{d}$ will decrease by $\overline{d^2}$ times.

Below is the formula for computation of the variance in variation sequences with equal intervals by method of moments:

$$\sigma^2 = \frac{\sum \left(\frac{x_i - c}{d} \right) f_i^{\,2}}{\sum f_i} d^2 - \left(\bar{x} - c \right)^2$$

where c is the value of the class mark in a sequence centre;

d is the value of the interval.

Mean square deviation (standard deviation):

$$\sigma_{sim} = \sqrt{\frac{\sum\left(x_i - \bar{x}\right)^2}{n}}; \qquad \sigma_{wtd} = \sqrt{\frac{\sum\left(x_i - \bar{x}\right)^2 f_i}{\sum f_i}}.$$

Variation comparative indicators.

In order to compare the same indicator for different sets , various comparative indicators of the variation shall be used.

Oscillation coefficient of (V_R) reflects oscillatory nature of extreme values of a character around the mean value: $V_R = \frac{R}{\bar{x}}100$.

Relative linear deviation $(V_{\bar{d}})$ describes a share of the averaged value of absolute deviations from the mean value: $V_{\bar{d}} = \frac{\bar{d}}{\bar{x}}100.$

Variation coefficient (V_σ): $V_\sigma = \frac{\sigma}{\bar{x}}100.$

An aggregate shall be recognized to be quantitatively homogeneous if the variation coefficient does not exceed 33%.

Empirical determination coefficient (η^2)describes the variance share resulting from intergroup character variation in the total variance of the indicator.

The total variance (describing the character values variation due to all factors) is computed.

Intergroup variances (describing the variation in values of the investigated character within the groups irrespective of the particular value of the group character) are calculated.

Intergroup variance (describing the variation of a character value due to the effect of the grouping character solely) is calculated as follows:

$$\delta^2 = \frac{\sum\left(\bar{x}_j - \bar{x}_{tot}\right)^2 n_i}{\sum n_i}.$$

The dependence exists between the mean value of the intergroup variances, intergroup variance and the total variance, i.e., “the rule of variances added”:

$$\sigma_{tot}{}^2 = \bar{\sigma}_j + \delta_j^2.$$

Determination empirical coefficient is calculated as follows:

$$\eta^2 = \frac{\delta^2}{\sigma^2_{tot}}.$$

Empirical correlation ratio shows how close is the connection between the grouping and the resulting characters (it assumes values from zero to unity). It is calculated as a square root of the empirical determination coefficient.

If the connection is missing, the correlation ratio is equal to zero.

If the functional connection exists, the correlation ratio is equal to unity.

The State statistics service of Ukraine monthly publishes new data on a great variety of multiple indexes, which give a deeper understanding of the current state of economy and manufacturing sector. Indexes relate to the most commonly used statistical indicators.

Index is a comparative indicator describing a change in social and economic phenomenon in time or in locality, as against the target value and normal value or against a certain standard value.

Individual indexes are used to characterize the change of individual elements of a complex phenomenon. The individual index is a relative indicator describing the change in a particular element of a complex economic phenomenon.

The general index reflects the change in all elements of a complex phenomenon. Therewith, the complex phenomenon is understood as such statistical set of values where individual elements are not subject to summarizing directly.

Individual index of the physical volume of the product is calculated by the following formula: $i_q = \frac{q_1}{q_0}$

General indexes of quantitative indicators.

Aggregate index of the product cost or the goods turnover:

$$I_{pq} = \frac{\sum p_1 q_1}{\sum p_0 q_0}.$$

This index shows at how many times the product cost has increased in the reporting period via the base period. By multiplying the result by 100 we obtain the percentage index of the product cost increase.

The aggregate index of the product physical volume is calculated as follows:

$$\overline{I_q} = \frac{\sum\left(\frac{q_1}{q_0}\right) q_0 p_0}{\sum q_0 p_0} = \frac{\sum i_q q_0 p_0}{\sum q_0 p_0} = \frac{\sum q_1 p_0}{\sum q_0 p_0} \ .$$

Index of the product output physical volume shows how many times the physical product output has increased or, if we multiply the result by 100, it shows its percentage increase in the reporting period against the base period.

Average harmonic weighed index of the physical volume of output:

$$\overline{I_p} = \frac{\sum p_1 q_1}{\sum\left(\frac{1}{i_p}\right) p_1 q_1}$$

Each qualitative indicator is connected with a particular volumetric indicator per unit of which it is calculated. Thus, such qualitative indicators as price p, cost z, and labour intensity t relate to the production output.

Paasche prices aggregate index formula is presented as follows:

$$I_p^P = \frac{\sum p_1 q_1}{\sum p_0 q_1}$$

Paasche price index shows how many times on average the price level has increased for the mass of goods sold in the reporting period or shows its growth in percentage in the reporting period against the base period.

Laspeyres aggregate index formula is presented as follows:

$$I_p^L - = \frac{\sum p_1 q_0}{\sum p_0 q_0} = \sum i_p d_{q_0 p_0}$$

E. Laspeyres proposed to calculate the price summary index with weighted functions represented by the amount of products manufactured in the base period.

Fisher “ideal” price index is presented as follows:

$$I_p^F = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \cdot \frac{\sum p_1 q_1}{\sum p_0 q_1}}\ .$$

In studying the average value dynamics, the task is to calculate the degree of the effect of the two factors: the changes in the averaged index values and the changes in the phenomenon structure. This task is performed by index method, i.e., by creation of the system of interconnected indexes into which variable structure indexes, constant structure indexes and structural shifts are included.

Variable structure index is presented as follows:

$$I_{\text{var}.str.} = \frac{\sum q_1 p_1}{\sum q_1} : \frac{\sum q_0 p_0}{\sum q_0} = \frac{\sum d_1 p_1}{\sum d_0 p_0}\ .$$

The fixed (constant) structure index takes account of changes in solely him indexed value and shows the average rate of change in reviewed value of the set units:

$$I_{fxd.str.} = \frac{\sum q_1 p_1}{\sum q_1} : \frac{\sum q_1 p_0}{\sum q_1} = \frac{\sum d_1 p_1}{\sum d_1 p_0} = \frac{\sum d_1 i_p}{\sum d_1}\text{, and if } \Sigma d=1,\ I_p^p = \sum d_1 i_p\ .$$

Index of the structural shifts characterizes the effect of the change in the studied phenomenon on the dynamics of the average level of the indexed indicator:

$$I_{str.sh.} = \frac{\sum q_1 p_0}{\sum q_1} : \frac{\sum q_0 p_0}{\sum q_0} = \frac{\sum p_0 d_1}{\sum p_0 d_0}\ .$$

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Chain and baseline indexes.

Chain indexes reflect the change of the indicator level in the current period as compared to the level of the previous period; baseline indexes, as compared to the baseline level, which is most often taken as the initial level of the dynamics sequence.

The product of chain indexes is equal to the baseline index value of the last period (the property of transitivity or of circular convergence of indexes). Consequently, the relation between the baseline index of the reporting period and the baseline index of the preceding period will allow obtaining the chain index of the reporting period.

All Paasche price indexes used the current period of weight functions (indexes with variable weights), while the physical volume indexes and Laspeyres price indexes use the fixed (indexes with constant weight functions) or the baseline one.

Analysis of dynamics sequences.

One of the most important purposes of statistics is studying analyzed indicators changes in time, i.e. their dynamics. This task is solved by means of analysis of dynamics sequences.

The dynamics sequence (or dynamical sequence) represents a sequence of numeric values of a statistical indicator, arranged in chronological order and describing the change in the given social phenomena in time.

The dynamical sequence always consists of the following two components: the moment or the period (t), in relation to which the statistical data is given, and the statistical indicator describing the amount of the examined phenomenon during the appropriate period and called as the “dynamical sequence level” (y).

Sequence levels are indicators whose numeric values form a dynamical sequence.

Time means moments or periods, to which levels are related.

Creation and analysis of the dynamics sequences allow identifying and measuring the regularities in social phenomena development in time. These regularities do not clearly express themselves on each particular level, but are shown solely in a trend, in a rather long-term dynamics. Different factors influence the general dynamics regularity, most often they are incidental and sometimes they have seasonal effects. Identification of the main trend in the level change is one of the key tasks in the analysis of the dynamics sequences.

For graphic presentation of a dynamic sequence, the time indicator t is marked on X-axis and the value of the studied attribute y is marked on Y-axis.

Depending on the contents of the time indicator, the dynamics sequences may be moment and interval ones.

The moment dynamics sequence is such a sequence, which levels characterize the condition of the phenomenon as of specific dates (moments).

The dynamic sequence, which levels characterize the amount of the phenomenon for a certain time interval (e.g., a month, a quarter, a year, etc.) is called the interval sequence.

Depending on the type of the statistical indicator, dynamic sequences are subdivided into the sequences of absolute, relative and average values.

Dynamic sequences of relative values may contain information on the change of specific weights of any indicator in the general set of objects during a specific period, the indicator growth during a specific period, etc.

Dynamic sequences of average values content information on the time change in the indicator, which is the average level of the reviewed phenomena. For example, average wages, average amount of credits granted by banks, etc.

Depending on the distance between the time indicators, dynamic sequences with equal and unequal time intervals are distinguished. Methods of the analysis of such series also differ.

In constructing the dynamic sequence, one should ensure its levels to meet the requirements of comparability, i.e. characterize the same object or the phenomenon, be related to the same territory and comparable period, and should be calculated by consistent methods with identical indicators measurement units.

Dynamic sequences can be represented graphically. The chart allows visualizing the phenomenon development in time and helps to analyze the levels. The most common graphic presentation (for analytical purposes) is the linear diagram created in the rectangular coordinate system.

Alongside with the linear diagram, for the dynamic sequences chart with a view of popularization, bar, sector, and other diagrams are widely used.

In creating dynamic sequences, specific rules should be observed. The main condition for obtaining correct results during the dynamic sequences analysis and forecasting its levels is comparability of the dynamic sequences levels. The statistical data should be comparable by territory, the scope of covered objects, units of measurement, the registration time, prices, methods of calculation, etc.

In order to provide comparability of the data sequences it is necessary to present them in the same units of measurement.

It is quite evident that currency units of different countries and the currency units within one country in different periods (in case of the change of the currency exchange rate) are incomparable.

In some cases, incomparability can be eliminated by processing dynamic sequences by method, which is called joining dynamic sequences. This method allows overcoming the data incomparability occurring owing to a change of the range of the covered objects in time or the methods of indicators computation and obtaining a uniform sequence which is comparable in time. For example, we have two sequences of indicators describing dynamics of a phenomenon within new and old boundaries for the same range of objects, and such dynamic sequences may be linked together.

In studying of the social phenomena dynamics we encounter the problem of describing the intensity of change and calculation of the average dynamics indicators.

The analysis of dynamic sequences requires calculation of the following indicators: average level of dynamic sequences; absolute increments (chain and baseline, average absolute increment of growth); growth rates (chain and baseline, average growth rate); increase rates (chain and baseline, average increment of growth); absolute value of one per cent (1%) increase.

Chain and baseline indicators are calculated for describing the change of dynamic sequences levels and differ by baselines of comparison: chain indicators are calculated in relation to the previous level (variable baseline of comparison) and baseline indicators, to the level accepted as the baseline of comparison (constant baseline of comparison).

Chain and baseline absolute increases are interconnected: the sum of sequential chain absolute increases is equal to the baseline increase, i.e. to the total increase for the whole period.

Average indicators are generalized characteristics of dynamic sequences, and with their help the phenomenon development intensity is compared in relation to different objects, for example, by countries, branches, enterprises, etc.

The indicator values in specific moments or periods are called the dynamic sequences levels and are represented through y_i (where i is the time indicator).

The procedure for calculation of the average level depends on the type of the dynamic sequences, namely, on whether it is a moment or an interval series, with equal or unequal time intervals between proximate dates.

If an interval sequence of absolute or average dynamic values with equal periods is given, the formula of simple arithmetic mean is used for calculation of the average level:

$$\bar{y} = \frac{\sum y}{n}.$$

If the moment series with equal time intervals is given, then the series average level is calculated by the formula of the simple chronological average:

$$\bar{y} = \frac{\frac{1}{2}y_1 + y_2 + ... + y_{n-1} + ... + \frac{1}{2}y_n}{n-1}$$

The chronological average is used when the moment dynamic sequences levels are not specific dates of change of the indicator under consideration.

Calculation of the sequences average level looses analytical meaning in case of a significant variability of the indicator within the sequences and in case of a radical change in the direction of the phenomena development.

Absolute increases are calculated as the difference between two values of the dynamic sequences proximate levels (chain increases) or as the difference between the values of the current level and the level accepted for the comparison baseline (baseline increases). Indicators of the absolute increase have the same measurement units, as the dynamic sequences levels; they show by how many units of own measurement the indicator has changed at transition from one moment or time period to another.

Characteristics of dynamic sequences relative change are the indicator value growth rates and increase rates.

The growth rate is the relation between two levels of dynamic sequences expressed in coefficients or percent. Like absolute increases, the growth rates can be chain and baseline.

The chain growth rate expressed in coefficients shows by how many times the indicator current level has grown in comparison the preceding one.

The baseline growth rate is calculated in relation to the selected baseline period (more often to a level). Expressed in coefficients, it shows by how many times the indicator value of the current level has changed in comparison with the baseline level.

The average growth rate (average growth coefficient) in dynamic sequences with equidistant levels is computed by formula of simple average geometrical value.

In order to identify by how many percent the indicator current level is more or less than the values of the preceding or the baseline level, the rates of increase are calculated. They are calculated by subtraction from the corresponding growth rates expressed in percent, 100.

Significant seasonal fluctuations in the demand for tourist products are specific for tourist market. By the degree of tourist trips intensity four seasons of tourist activity are identified: peak season is the most favorable period for organization of recreational activity, characterized by maximum density of tourists and the most comfortable conditions for recreation; high season is the period of the greatest business activity in the tourist market, the period of the highest tariffs for the tourist product and services; low season is the period of the tourist activity decreasing in the tourist market, for which the lowest tariffs for the tourist product and services are specific; slack season is the maximum unfavorable period for recreation activity organization.

Seasonal prevalence in tourism affects the demand and production, significantly influences profitability of all tourist firms as well as other manufactures directed, toward tourist service operations.

Seasonal prevalence is a steady pattern of annual increases (decreases) in the levels of a particular indicator for a number of years.

Seasonal prevalence is defined by several factors. These factors are subdivided into primary and secondary ones.

To primary factors those factors are referred, which are formed under the influence of natural climatic conditions, the quantity and the quality of benefits for the development of sport, recreation, informative and other types of tourism. Natural & geographical conditions are governing for selection of this or that region for visiting by tourists.

To secondary factors of seasonal fluctuations the following ones are referred:

economic, i.e., the goods and services consumption structure, creation of the demand solvency through supply; demographic, i.e., differentiated demand by age and sex pattern and other attributes; psychological, i.e., traditions, fashion, imitation; material & technical, i.e., accommodation, catering, transport, cultural & recreation services network development; technological, i.e., a complex approach to providing of high-quality services; political situation and international environment[2]. Researches of author proceed [3].

Conclusion

Thus, there is a set of statistical indicators varying in purpose, methods and tasks of estimates, as well as in the designated area of use.

The set of such inter-related indicators applicable to specific areas or processes of the social life is called the system of statistical indicators. The system of statistical indicators covers all aspects of life of the human society at various levels: at the country level, at the region level (macro level) or at the level of tourist enterprises (micro level).

The types and forms of such systems are rather diverse and depend on a particular task and complexity of objects under study.

In the process of realization of the set tasks of survey the tourism statistics uses the relative indicators, quantitative and qualitative characteristics of these phenomena and processes that in total and in different combinations generate the tourist market. These indicators are designed to reflect the condition, development and stability of the market at various levels, in time and in space (geographic and social and economic).

Each particular branch of statistics works out its specific indicators, which should be interconnected and represent a complete and logical system making it possible to study in detail the social and economic process and to obtain valid statistical data. Interrelation and links of the social and economic phenomena and processes determine the links between statistical indicators.

The system of statistical indicators is based on economic and social categories of the tourist market. These include services, tourist product, demand, price, offer, distribution costs, and profit from sale of services.

The set of indicators of the tourist market is a set of interconnected and internally consistent indicators describing the key economic processes and the economy as a whole. The internal consistency of the indicators makes it possible to use them in a combination and also to calculate various derivative coefficients for analytical purposes.

For development of the tourist market it is necessary to perform, apart from the overall basic and economic analysis, a detailed analysis of various data, including: infrastructure of the region; tourist sites and types of tourist activities; condition of tourist facilities and services; the existing and potential forms of tourism; various tourist market segments; environmental condition of the region; social and cultural aspects; institutional elements.

In a number of areas, tourism affects the national economy as a whole. In entrepreneurial activities creation of a tourist enterprise generates benefit, as it provides tourist product, services to consumers, jobs and wages are provided to the employees; the founders receive profit; the government and the region budget collect taxes and charges. In consumer segment, the tourists' demand for various merchandise and services facilitates the development of local production and improved living standards of population. In the currency exchange sector, tourism generates substantial inflows of foreign currency. The tourist infrastructure also develops and this can be used by the local population as well.

In relation to tourism it is expedient to consider the following groups of statistical indicators: social and economic indicators; indicators of tourism development, particular indicators describing activities of tourist enterprises.

To a certain extent social and economic indicators are measurers of development of different branches of industry and types of services, including tourist services. They serve the basis of the opinions on the position held by a country or region in the economy, the basis for the initial valuation of the economic and human potential. To a certain extent indicators serve a basis of social and economic forecast of any activity development.

The major indicators of the state social and economic policy are: area of the territory; population; gross domestic product (GDP); volume of exported products; average annual number of population employed; average annual unemployed population; monthly average wages; cash income of the population; cash expenses of the population; average level of education.

The unified indicator reflecting the level of economic development of the regions may also serve as the indicator of development. Such indicator used in the international practice of inter-country comparison, is the index of development of human potential. It is calculated on the basis of three indexes: longevity, educational level (including literacy of adult population) and the gross domestic product per capita.

Indicators of tourism development provide information about condition of the tourist industry and tourist resources. The list of the key tourism indicators is selected by experts chosen for description of the tourist potential of the administrative and territorial unit.

Individual indicators characterize an object or a particular observation unit in the area of tourism: a hotel, a travel agency, a tourist. Individual indicators are presented in forms of statistical reporting and in other forms of observation. On the basis of individual statistical indicators the consolidated absolute and relative indicators are calculated that constitute the basis for information data base required for taking management decisions. The presented statistical methodology can be successfully used in analytic geometry of any industry of economy.

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