SCIENTIFIC CONCEPTION OF STATISTICAL METHODOLOGY: METHODS, INDEXES, CRITERIA OF RELIABILITY

Oprya A.T.

Conceptual approaches of statistical methodology are considered in research of intercommunications of the economic phenomena and processes. The necessity of application of statistical methods is grounded for deep research of causal-investigation connections from positions of approach of the systems of their use: methods, statistical indexes, estimations of reliability. An attempt to unite the empiric aspect of research work with scientific methodology is done, coming from conceptual positions of statistical science.

Raising of problem. Considering the research methodology as a science of techniques during the last system we understand learning methods essence of phenomena and processes. Based on the classic definition of concept "method" (method of theoretical research and practical implementation of anything), in the research we took into account two of its aspects: formal logic and content-genetic. It is understood, that the methods and receptions of leadthrough of research are carried out in indissoluble connection with theoretical generalizations of using a system of laws, categories and principles of dialectics of development of the probed processes and phenomena (in this case – economic). Under a concept «methodology» are understood the aggregate of cognitive principles of research, methods and methods of his organization, which are used in any science [7].

The educational literature in Theoretical and Applied Statistics does not contain enough material on statistical methodology, and their fragmentary exposition does not always provide issues under objects of the research, in particular the economic phenomena. The feature of the study of the last is that the research should not be limited to empirical analysis. The last shows by itself the initial stage of science and with development of scientific cognition, such analysis yields the methodology and theory, that give an opportunity to study the complex mechanism interdependence of phenomena and processes [5].

Proceeding from the foregoing, we have attempted to combine the empirical aspect of scientific research methodology leaning on the conceptual science on statistical methods, conceptual positions of statistical science in relation to methods, statistical indexes and estimations of reliability of the informative field (accumulation, presentation, analysis, interpretation).

One of lacks of the organization of this research work in industry of economy it follows to name the presence of methodological errors in its realization, as a result of what we have the followings failings: a number of factors of the causal models of the economic phenomena and processes is unexposed; the applied aspect of research of this problem remain impoverished; practical conclusions are limited to the analysis (sometimes only by comparison) of levels or their correlations. In researches of the applied aspect, it is quite often possible to

look after utilitarian quantitative approach, when the concrete indexes of the economic phenomena are examined out of connection with their economic nature or political economy maintenance. It should be remembered that an economic indicator is dialectical unity of high quality and quantitative parties of the probed phenomenon. Therefore, for his description a deep analysis is needed with the wide bringing in of traditional and modern methods of statistics and, in particular mathematical statistics. Consequently, a question appears about the necessity of subsequent perfection of method statistiko-economic to the analysis with the purpose of providing of system research of those or other phenomena and processes of public life.

In this article the done attempt of complex approach is in research of certain problem, when methodology of statistics is examined in the format of three directions, namely: basic statistical receptions of quantitative analysis of causal connections; objectivity of economic indicators; criteria of authenticity of indexes of the informative field of researches. Third from the noted directions it follows to consider especially important in research work, poskil'ki on this stage objectivity of initial, intermediate and effective information finds confirmation.

In the literature, such approach did not yet get enough complete illumination now. Moreover, to this time the system structuring of the directions of practical realization of statistical methodology adopted higher in economic researches is not carried out.

A state-of-the-art review of basic publications is on this issue. Teoretiko-methodological and to the applied aspects of research of problem questions of statistics the labours were devoted by quite a bit scientists of distant foreignness, in particular: D. Vaynberg, In. Vensel', M. of Ezekiel, M. of Kendel, K. Pearson, Ch. Spirmen, R. Fisher K. Foks, Frish, And. Kh'yutson, E. Yul but other. In relation to development of statistical science on the lifestyles of former Soviet Union, scientists-statisticians left a considerable scientific inheritance from the thorny and actual problems of theory and methodology: A.Ya. Boyar, I.G. Veneckiy, A.M. Gataulin, M.K. Druzhinin, L.O. Kazinec', G.S. Kil'dishev, Ya.I. Lukomskiy, V.S. Nemchinov, S.S. Sergeev, E.S. Sluckiy, N.S. Chetverikov, O.O. Chuprov, B.S. Yastremskiy but other.

Among the domestic scientists, the methodological aspects of statistical science were found by reflections in labours: V.Yu. Andrienka, O.A. Buguckogo, S.S. Gerasimenko, A.V. Golovacha, A.M. Erinoy, V.B. Zakhozhaya, O.I. Kulinicha, R.M. Motorina, N.O. Parfencevoy, Y.S. Paskhavera, M.V. Ptukhi, V.P. Trofimova, E.V. Chekotovskogo, V.G. Shvecya but other.

At the same time, examining teoretiko-methodological principles of forming and development of statistical science in the context of approach of the systems in relation to the use of statistical and matematiko-statistical methods in research work, the question of necessity (to expedience) of subsequent development of this direction aktualizuet'sya. A scientific contribution to statistics of the scientists adopted higher consists in that in their labours statistical methods are examined, usually, from positions of their autonomous (isolated) use in researches. In their labours of prioriteti get the questions of importance of

statistical methods in research, but to find even orientiri on approach of the systems in the use is an exception. Separate developments are orientated on the picture of functions of statistical methods from position them additional role in execution the tasks of research without accents on possibility of study of deep connections and relations, which determine conformities to law, proportions, tendencies, properties and specific of the phenomena. It is impossible to decide such wide spectrum of tasks without approach of the systems in the process of the use of receptions and methods of statistics. Besides intercommunications of the economic phenomena differ complication them structural constructions which form prichinno-naslidkovu dependence, and in number to measure the action of factors of influence in such dependence possibly only at the terms of complex approach in application of modern and traditional methods of statistics. The decision of these questions is predetermine actuality of development teoretiko-methodological and the applied directions, as to the guarantor of reliability of the informative providing on all stages of research work, beginning from descriptions of authenticity of initial information and concluding the estimation of reliability of research results.

Research purpose – to light up possibilities of statistical science in the deep quantitative analysis of the socio-economic phenomena and processes. Task – to expose methodical features and specific of the complex use of statistical and matematiko-statistical receptions in the context of providing of reliability of the informative field of research with the purpose of achievement of authenticity, and consequently, to objectivity of his results.

Research results. As, as a rule, the statistical come forward methodological basis of scientific research and matematiko-statistical methods, stopped more in detail for their use and scientific effectiveness (speech will go about basic).

The mass phenomena of public life consist of units which differ between itself both in number, and high-quality. Therefore one of main tasks of statistics consists in that, to divide such difficult aggregate of units into homogeneous inwardly, but substantially excellent between itself aggregates, and also in good time to find out after variation of quantitative units their high-quality transitions. Such task of statistician decides by the method of the statistical groupings.

Method of the static groupings, except for descriptions of co-operation of all variety of factors of variation (in particular, economic indicators) leads to their importance in research of those or other socio-economic phenomena. It is at that rate needed to pay regard to essence of method, namely on that the difficult phenomenon (and it is present in economic models) is examined not as the unique unit, and the separate groups of units, the indexes of which give a quantitative estimation all probed aggregate, are selected in him.

In researches research workers quite often assume errors in the decision of question about formation of groups (except for groupings on an attributive sign, where limited to the amount of values of sign). In relation to it there are different methodical approaches [2]. Determination of number of groups, offered Sterdzhessom (such recommendations are contained by almost all textbooks and

manuals on the theory of statistics), which consists in the calculation of formula of pint=1+3,322lgn releases from possibility of economic thought; it follows to acknowledge a reception formal, and on occasion – dangerous. It follows to acknowledge most successful recommendations of V.P. Levinskogo, which offers original norms numbers of intervals (groups), predefined the volumes of the probed aggregate. Advantage of these recommendations, by comparison to offered Sterdzhessom consists in that at such approach not so the number of groups is hardly CPLD with the quantity of units of supervision: at that rate a researcher is in a position of certain choice of number of groups depending on character of aggregate. In economic researches the most widespread volume of aggregate 100 – 500 units. After Sterdzhessom, at such quantity of units the amount of groups will be evened 7 – 10, and in opinion of V.P. Levinskogo – 10 – 17.

Deciding a question in relation to the choice of amount of groups on the probed array of information, it should be remembered that this amount is in proportional dependence on the change of grupuval'noy sign: what it is greater, it is the more so necessary to form groups. The selected groups must be filled enough units of supervision. Presence of unfilled intervals or negligible quantity for them units of supervision is the result of unsuccessful choice of intervals. A presence is little gap-filling groups (to 3 units) possible only on the edges of grouping, where the greatest and lowest indexes are concentrated in relation to a middle level. A methodical feature is marked above all things touches the type of the structural groupings. An amount of groups here must not be large enough or small enough. In first case there is a risk to get lost in trifles, in the second – not to find out important enough properties of the probed aggregate.

Will notice that deep research of the socio-economic phenomena is impossible without the use of methods of mathematical statistics. Application of them in agrarian-economic researches became an urgent necessity and necessity.

In the multivariable analysis of the socio-economic phenomena and processes practically an effective enough method is not used matematiko-statistical processing of data is a dispersible method. As well as other probabilistic-statistical methods, he extends possibilities of economists (practical workers or research workers) far, considerably promoting the scientific level of researches and their effectiveness. Coming from modern requirements to the level of economic analysis, such method must occupy one of leading places in him, as for his help the riznoplanovi tasks get untied. At first, having an independent value in the study of causal connections a method provides: 1) the quantitative measuring of force of influence of the probed factor signs and their connections is on the probed effective sign; 2) determination of authenticity (to authenticity) of influence and him confiding limits; 3) analytical measuring of changes separate middle and statistical estimation of difference between them. Secondly, in a deep economic analysis the method of analysis of variance can execute auxiliary functions. In this direction his use opens wide possibilities in relation to the scientifically grounded going near application of other methods of statistics in a quantitative analysis.

Examined method, as well as other matematiko-statistical receptions – it the hardware of scientific cognition especially. Therefore his use foresees

knowledge of essence (economic nature) of the probed phenomena, understanding of nature of origin and action in them of causal connections, and also ability to select major parties of their dependences and vzaemozumovlenostey above all things.

As a purpose and task of this article was foresee exposition of not technical, but methodological, features of the use of this method in the analysis of the socio-economic phenomena, stopped for them more detailed.

Using a dispersible method in the format of implementation them of independent functions on the last of peat-time of design decide a question about reliability (authenticity) of the got results of calculation. Here can take place that fact, when the action of separate factors and their connections appears not reliable, that the actual values of criterion of reliability of Fishera below from their standard mathematical (tabular) value. Separate analysts at that rate conduct speech not about a failure to prove of authenticity of influence, but about well-proven of non-existance (to absence) of influence of factor signs on an effective index. The fallaciousness of such assertion is obvious, poskil'ki nature of the economic phenomenon testifies to the presence of dependence, and nature (mathematical) of criterion – about a failure to prove in concrete case of presence of reliable influence. At that rate it follows to go by deepening of research: to find out a question in relation to accordance of the probed aggregate distributing laws (Gaussa, St'yudenta, Pirsona but other); to extend the volume of units of the probed aggregate which will provide possibility to work «Law of large numbers»; to check distributing character for asymmetry and excess and others like that.

Mathematical nature of method of analysis of variance opens possibility of objective estimation of results of the statistical groupings (especially difficult – their petticoat kinds), determination of importance of differences middle, reliability of coefficients of correlation, estimation of linear regression.

Annoying, unfortunately, it follows to acknowledge circumstance that this method in textbooks and train aids is expounded not for economic directions of preparation, – and in such case to use algorithms in the calculation of dispersible complexes it is impossible for economic models (this failing is removed in educational editions after our authorship).

Using the method of analysis of variance in research, it should be remembered about the substantial feature (possibly, failing) of this reception of mathematical treatment of the informative field, in particular it is dependence of results of analysis from the level of indexes of the formed groups (gradations) after the probed factors. That, dispersible models, formed at one levels of factor signs, can give reliable influence, for other is his absence. Scientific methodology foresees the different methods of forming of models at that rate. Dispersible complexes can be built after principles of the even, uneven, proportional, ortogonal distributing. It is needed to be also oriented in the methodical going near the construction of groups with the different quantity of units of supervision. Exactly scientific approach in application of this method in research of the socio-economic phenomena and processes provides him large advantages among other statistical methods of multivariable quantitative analysis.

Giving important value a foregoing method, it costs to pay attention researchers and take up arms such effective reception of analysis of causal connections as cross-correlation regressive method. Will notice, in literature he meets, as a rule, under the name there is a «cross-correlation method» (or «cross-correlation analysis»), that it follows to consider illegal from point of solvable them analytical tasks. A cross-correlation method (cross-correlation analysis) decides the followings tasks: estimation of parameters of the normally up-diffused probed (general) aggregate (general middle, dispersions of parnikh coefficients of correlation), plural and separate coefficients of correlation; verification of importance of the estimated parameters and receipt of interval estimations for determination of substantial among them; exposure of structure of interdependence of signs. A regressive method (regressive analysis) is foreseen by the decision of such tasks: a degree of the separated and general influence of factors is on an effective sign, and also quantitative estimation of this influence.

Will mark, method cross-correlation regressive found sufficient illumination an analysis in educational and scientific literature, however much the authors of theoretical and practical parties of his use sometimes do not take into account methodological features given matematiko-statistical to the reception. What here it should be remembered? At first, mathematical nature cross-correlation regressive orients a copula on that it especially mathematical reception which does not expose the physical picture of intercommunications, and only establishes their presence. Secondly, correlation though does not find out reasons of connection, but gives an estimation the set copulas from position of their force and crowd conditions, and also sets the degree of authenticity of reasonings about the presence of connections. Therefore, analysing socio-economic the phenomenon a researcher, following methodological principles (by rules) cross-correlation regressive to the analysis, above all things must go out from economic maintenance of the probed dependences; after it can be set and in number measured them cause and effect nature.

It follows erroneous to acknowledge methodical approach, when a researcher with the purpose of receipt of useful practical information tries to consider (designs) plenty of factors, besides separate from them closely CPLD between itself. Under such circumstances the change of one of such factors will stipulate the change of other (related to him) factor, as a result hardness to separate net influence of one of them and satisfy mathematical nature of plural regressive model.

Methodologically more correct will be to take away basic major factors. It is considered from position of action of «Law of large numbers», that quantity of units of supervision in probed to cross-correlation regressive the amount of select factors must exceed models in 6 – 8 times (better – in 8 – 10 times).

Has substantial methodological features cross-correlation regressive analysis of sentinel rows and rows of dynamics. By the way, in the special literature these two statistical concepts equate, that it follows to acknowledge erroneous. Concept «dynamics» – more wide, engulfs not only sentinel changes but also any changes of economic indicators, predefined the action of external

terms. This question has specific features in the applied direction of his decision. (The detailed consideration of methodical approaches in the construction of such models is contained in our editions of textbooks and train aids).

There is yet and such specific feature of design cross-correlation regressive connections, non-parametric criteria are fixed in basis of algorithms of analysis of which. Speech will go later about them.

Except for the considered higher statistical methods research of causal connections is et al no less effective matematiko-statistical constructions of analysis of the socio-economic phenomena, such as methods of multidimensional statistical analysis (a method of main is a component, klasternniy analysis, recognition of patterns, factor analysis, but other). In them the practical use needs the special mathematical knowledges.

It is necessary to notice that the methodological and methodical features of the considered higher basic statistical methods are lighted up give the key to understanding of creative approach in their use not only it is isolated (independently) but also in a complex. The last acquires the special, and exceptionally important value, in fact on such conditions a researcher (whether practical analyst-worker) is in a position it is deep to understand existence, nature and action of factors, in the causal models of connections of the socio-economic phenomena and processes, that they are formed.

Scientific principles of application of methods of statistics in the certain understanding have general methodological nature with statistical indexes from positions of objectivity of their use. In a theoretical and practical format these (statistical) indexes peculiar cognitive, administrative, stimulant and ideological functions. Such wide spectrum of their «duties» in cognition of quantitative and high-quality parties of public life requires attentive attitude toward nature of formation of the phenomena; calculable and logical actions; criteria of scientific character; sentinel and spatial features of the phenomena; to reprezentativnosti of informative streams; empiric and logiko-theoretical ways of education; essences of absolute and relative sizes of the phenomena.

Taking into account executable the statistical indexes of function, it is possible to formulate the requirements (or rule) of them scientific application. Coming from that nature of the socio-economic phenomena bagatoplanova enough and specific, implementation of cognitive functions of indexes must be provided scientific principles of their calculation. The question is not only about the sequence of calculable logical and other executions (that about algorithms) but also about theoretical validity, and also belonging, to the empiric base. The process of formation of statistical index is based on knowledge of philosophy, economic theory, concrete economy and separate special sciences. In relation to theoretical validity – this criterion of scientific character is determined by essence of statistical index. Under the criterion of belonging to the empiric base understand formation of index on the base of scientific information. Poskil'ki any research is begun with the accumulation of information, conclusions which are accumulated in statistical indexes will have objective basis in the case of validity them by concrete facts.

Expounded scientific principles orient on the followings requirements to the construction of statistical indexes: plenitude of initial information, compared and authenticity (whether exactness) of information [6].

The special place in statistical methodology of research is occupied by the questions of criteria of reliability, that statistical estimations of calculations and their results. As any research is based on information of supervision (initial information), they must be checked for reliability, that objectivity. To that end statistical science offers the row of criteria.

Primary information must engulf mass information, in fact differently, as marked higher, mathematical «Law of large numbers will not find the display». Basic data are well-organized as rows of distributing (variation or attributive) test on accordance of their character of normal distribution (to the law of Gaussa-laplace). Will notice, to meet in an ideal kind such distributing it is almost impossible in the economic phenomena, however much approaching to him must be in sign of researcher. Such approaching is given by descriptions asymmetry and distributing excess, that mowed or vershinnist' of curve of Gaussa.

After verification of reliability of initial information a researcher, as a rule, is engaged in a report and grouping of information of supervision. In obedience to the requirements of statistical science, it follows to pay regard to important enough moment in the practical use of results of groupings is a process of verification of them on authenticity. In this connection on the initial stage of realization of the statistical groupings check «doubtful» factor signs for belonging them to the statistical row of distributing. For this purpose tau criterion (τ) is used.Yes, before to expect the size of even interval, it is preliminary necessary to estimate the extreme indexes of ranzhirovanogo row of distributing on belonging them to the last. To the probed aggregate the standardized deviation of values of «doubtful» indexes (it, as a rule, minimum, maximal and near to them) comes forward the criterion of such belonging from their middle level. The size of the standardized rejection must not exceed a number 3.

On the final stage of realization of the statistical groupings the got conclusions are on their results it is necessary also to check for reliability. As marked before, in case here are auxiliary functions of dispersible method of analysis. By correlation of factor and remaining dispersions expect the criterion of Fishera (F-criterion) and compare it to the theoretical value after standard mathematical tables at the proper thresholds of probability (for economic calculations – R=0,954). If the calculation value of F-kriteriya is evened or exceeds theoretical, the results of the statistical groupings are considered reliable, that reliable.

In analytical (to research) work often enough deal with the small quantity of units of supervision. Yes, economic calculations can be executed on the aggregate of enterprises of administrative district (10–25), zootekhnologichni experiments – on the two-bit of zoons (5–10 goal.), the field experiments conduct on the limited amount of areas (4–5), etc. In statistics such it is named a quantity small selections. The small aggregate of units of supervision predetermines certain limitations in relation to the use of sample data for description of all (general)

probed aggregate. Taking into account that small selections can be formed as dependent (the supervisions of one selection depend on the supervisions of the second) and as independent (units of supervision are not contrasted each other), middle indexes are subject an estimation. In dependent selections estimate a middle difference, in independent – difference of middle. Such statistical estimation is determined by the calculation of kriteriya of St'yudenta (t-criterion), which shows by itself the rationed rejection of middle in relation to a standard error (σ).

Let's go back to large selections on materials of which the considered use higher quantitative matematiko-statistical receptions of research, in particular cross-correlation regressive and dispersible methods. What is foreseen by scientific methodology in relation to objectivity of the got results on the base of their algorithms?

In the construction of cross-correlation models it is necessary to take into account the following important moment of methodological character: in a cross-correlation model it is impossible to include the group of factors linear dependence of which equals a permanent size or near to it.

In relation to the estimation of authenticity of descriptions of correlation and regression, by the most widespread methods of estimation cross-correlation regressive models there is a criterion of St'yudenta (t-criterion) and Fishera (F-criterion).

Except for the considered higher self-reactance criteria of estimation cross-correlation regressive connections there are non-parametric criteria are the close estimations of crowd conditions of connection. Researchers, unfortunately, use (usually) the traditional charts of calculations, although a requirement arises up in the use of non-parametric criteria, in particular, when the fact of absence of certain terms of methodological character takes place, namely: accordance of law of normal distribution; possibility of the quantitative measuring of the probed signs; requirement in research of attributive signs but other.

To the non-parametric criteria cross-correlation regressive connections belong: coefficient of correlation of grades; criterion of signs (coefficient of Fekhnera); coefficient of association, coefficient of kontingencii (to the germination). Algorithms in relation to their calculations are contained in the special literature from mathematics and mathematical statistics and in educational editions after our authorship. There are other non-parametric criteria of study cross-correlation regressive connections, although they give the close enough values of descriptions of reliability of crowd conditions of connection. For the estimation of reliability of both initial information of research and his results, mathematical description – standard deviation is often used (σ). Given a statistical estimation can execute independent and auxiliary functions. In first case it is used for description of variation (in the natural measuring of sign), in the second – as basis for the construction of other statistical descriptions: coefficients of variation; errors of reprezentativnosti of distributing descriptions; coefficients of correlation and regression, structural elements of analysis of variance; formulas of regression. In the case of the practical use of standard deviation it should be remembered that

his size depends not only on the degree of variation of signs but also from absolute levels them medium-sized. Therefore to do comparison of such estimations, expected after variation rows with riznoymennimi signs (as well as with different levels), it is directly impossible. Possibility of such comparison is provided by the relation of standard deviation to the middle level (in %) is a coefficient of variation (σ). Characterizing the relative measure of variation in rows with the different level of middle, a statistical estimation is given also comfortable for comparison of variation of the different phenomena (for example, labour productivity and its payment; profitability of enterprises and level of their specialization and others like that).

A coefficient of variation is the estimation of reliability medium-sized index. At his values to 5 % variation is considered weak; 6–10 – moderate; 10–20 – considerable; 21–50 – large; over 50 – very large. For the small aggregates of units of supervision a size of coefficient of variation must be not more than 33 % [1].

It's important to mark, that the previous questions of criteria of reliability are considered touched the sizes of parameters of the probed aggregates mainly. Reasonings were here conducted coming from predictions about homogeneity of aggregate and normality of distributing of its units, that accordance of law of Gaussa-laplace. It meant that aggregates which is probed were typical and differs between itself only after the sizes of levels of signs.

However required the special cases are by verifications of hypothesis in relation to character of distributing. That, a researcher must decide such tasks: to define accordance of the empiric distributing that is why or to other theoretical type of distributing – to normal, binomial, polinominal'nomu and t.p.; to define possibility of belonging two and more empiric distributing to the same their kind; to find out the presence of dependence in distributing of signs one from other.

Transferred higher task the chi-square of criterion decide by application (criterion of consent of Pirsona-Kh2). The last is the objective estimation of closeness of the actual distributing to theoretical. Will underline, this criterion is used in the cases when it is necessary to set accordance of two compared rows of distributing – actual and theoretical or two actual.

Using the criterion considered higher it should be remembered about separate limitations (that is not always taken into account in researches) which it follows to adhere to in his calculation. It is important to know that a quantity of units of the probed aggregate must be not less than 50, but in every group (interval) minimum possible granicya of frequencies – 5 (they are united differently).

If to the researcher (to the experimenter) unknown form of distributing of information (that happens quite often) which a selection is conducted from, the use of the criteria considered higher can sometimes result in the subjective estimation of results of supervision. In this connection by mathematical statistics the developed criteria of estimations of the selections from any type of distributing. These criteria got the name «non-parametric». To such criteria belong: criterion of Kolmogorova (? it is lambda), criterion of Uayta, criterion of Uilkoksona. The most simple after the construction criterion of Kolmogorova settles accounts as

attitude of maximal difference (in the module) of the accumulated frequencies of empiric and actual rows of distributing toward square Cornu from the quantity of selection. Than is there greater divergence in rows, the greater size of criterion.

At the complete coincidence of the compared frequencies in the rows of distributing ?=0. Using him in research it is needed to adhere to the condition is a sufficient number of units of supervision. To the estimation of not numerous selections the criterion of Kolmogorova is unacceptable [1].

Conclusion. Insufficient concentration of efforts of the research workers in the direction of the wide use of statistical and matematiko-statistical receptions in practice of economic calculations and unrealizedness of that the regulative functions of management of operations need to be examined in the complex of economic and statistical problems, stipulated a necessity to consider the question of approach of the systems in research of the economic phenomena and processes in the format of combination of empiric analysis, theory and methodology of statistics.

In a methodological plan the mechanism of economic research of causal connections must be based on scientific conceptions of statistics taking into account economic nature of the probed phenomena and statistical (matematiko-statistical) nature of methods, indexes and criteria of reliability of the informative field. Just the same approach will be able to decide the task of deep research structurally of difficult economic models of causal connections.

Bibliography

1. Zaks L. Statisticheskoe ocenivanie : [monografiya] / L. Zaks/. M. : Statistics, 1976. – S. 81.

2. Oprya a.t. Statistics : [pidruch.] / A.T. Oprya/. K. : Harvest, 2006. – 448 s.

3. Oh teorii veroyatnostey I matematicheskoy statistike (correspondences of A.A. Markov I of A.A. Chuprova) : [monografiya]. it is M. : Science, 1977. – 197 s.

4. Popovich I.v. Method ýêîíîìè÷åñêèõ issledovaniy in sel'skom khozyaystve : [monografiya] / I.V. Popovich /. M. : Ýêîíîìèêà, 1977. – S. 4–8.

5. RyabushkiN T.v. Teoreticheskie koncepcii in otechestvennoy statistike : [monografiya] / T.V. Ryabushkin, V.M. Simchera, E.A. Mashikhin/. M. : Science, 1986. – 311 s.

6. Suslov I.P. Teoriya statisticheskikh pokazateley : [monografiya] / I.P. Suslov/. M. : Statistics, 1995. – S. 3–5.

7. Filosofskiy of slovar' [under editor M.A. Queen] : [monografiya]. it is M. : Izdatel'stvo of politicheskoy literatury, 1987. – S. 278..