Information Society and Statistics

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The article describes the impact of the information society on the development and practice of the theory of statistics and the formation of its methodology. The most outstanding achievements of the social research of the 20th century as well as the development of statistics itself are brought into prominence; the interface of the theory of economics and the practice of statistics is defined.

The methodological provision that the theory of social sciences and methods of statistics have to be organically interwoven in the process of statistical research as well as in the process of the development of applied and theoretical social sciences has been substantiated. The idea that the research of the methodology of statistics in Lithuania must be developed has been put forward. It has been pointed out that modern Lithuanian society expects and demands a lot from the statistical institutions of the country, it is therefore necessary to develop regional statistical research and to create the statistics related to the activities of public organizations and private enterprise. The major part of the society has to perceive that the level of its statistical culture is not very high and is not quite in line with the standards of the democratic civic society that is why a lot has to be learned and developed.

Keywords: *information society, statistics, national accounts, statistical methodology, statistical research, consumer price index.*

Introduction

Today the concept "information society" is widely used in scientific literature and publicistics. To get a comprehensive understanding of its content and the importance of information in the modern world one has to familiarize oneself with the works of such outstanding professionals of social information as Herbert Schiller, Anthony Giddens, Manuel Castells, Zygmund Bauman (Webster F. 2006). Some of the given thinkers (H. Schiller, J. Habermass, A. Giddens) argue that life information has to be perceived as an-intermittent process, which, doubtless, has been taking place earlier, some centuries ago. It was only strengthened in the 19th century after the formation of the industrial production and consolidation of national states. It became extremely strong at the end of the 20th century after globalization included into the world market the fields that so far were intact. Explaining information those authors maintain that it is the expression

and the outcome of the relations that have been formed and persist in the society. This can be interpreted as a historical attitude towards the given process and therefore has to be supported since it prevents from giving an excessive prominence to the present time and fashionable actions of the society.

The most important thing that has to be perceived by the present-day researchers is the trends that have formed in the information sphere and find their place in the development of politics, economy and culture.

Today the information world is radically different from the corporate economy system, which let roots at the beginning of the 20th century, in the same way as it differed from the *laissser-faire* that was typical of the second half of the 19th century. Therefore aiming at a better understanding of the functioning of the information society, it is necessary to find out about the public services, functions and outcomes of the activities of the institutions among which public statistical offices hold an important position. Public statistical offices are the only institutions, which are able to collect systematically and regularly the information related to culture, economics and politics, which are able to collect and make systematic information related to such sensitive issues as the regularity of migration or distribution of the income and property. Statistical offices are the most important institutions, which provide us with the information, which allows us to cognize ourselves how we transform, how the society feels, what is the family structure, how households are provided, etc.

Assessment of the functioning of any institution requires a historical attitude towards it. Its genesis, intellectual maturation, tasks, interaction with the society have to be defined. When we have to deal with the functioning of the public information agencies we have to bring into prominence the theoretical expertise that is used by the professionals of the given agencies. Historical investigation of the activities of statistical institutions has to include the intellectual development of the statistical thought as well as the aspects of practical activities. Only by adhering to such provision and proceeding from the principles of the methodology of social analysis, statistics of the country can be discussed, its goal and tasks can be highlighted.

The aim of the given article is to define the development and functions of the statistics of information society.

To this end the following tasks have been formulated:

1. to give a survey of the main features of statistics of the information society;
2. to discuss the peculiarities of the mathematization of the statistical theory and practice;
3. to define the interaction of the information society and statistics;
4. to bring out the functions of statistics in the process of formation and shaping of the democratic attitudes in the civic society.

Methods of the research. Methodological attitudes of different authors related to the issues of statistics have been made systemic in the given article by making use of the logical proof. Summing up the work carried out by different authors an attempt has been made to bring out the interaction of statistics with the society and theoretical paradigms of the information society.

Outcome of the research. a) Importance of the statistical methodology in the formation of the theories of social sciences and hypotheses has been established; b) the nature of the interaction of the economic theory and statistics has been summarized more fully; c) new directions in the research of statistics of the information society have been briefly discussed; d) the goals of statistics of the information society have been formulated.

Statistics in the Industrial Society

The 20th century was the century of scientific, political and technological revolutions as well as that of the calamities of economic development. Economic, political and social institutes, which seemed eternal and steady in the era of agrarian society, were radically altered or considerably modified. True, this was accomplished not always wisely and successfully (Martišius, 2003). New roads to the new post-industrial society were searched (Webster, 2006)

The science of statistics and practice were not left outside the major search and requests of the information society. In this respect the following facts should first and foremost be mentioned (Ūkio statistika (Statistics of Economy), 1995):

1. Formation of the international theory and methodology of statistics, which enabled the emergence of the new macro- and micro-quantitative social analysis of the industrial society.
2. Sundry international organizations started the publication of statistical chronicles and thematic, regional and specialized publications.
3. Official (public) calculation of the GDP and revenues was commenced and the system of national accounts was created.
4. In the science of statistics the stochastic approach grew predominant.
5. Methods and theory of statistics permeated all sciences and fields of research; statistical thinking became an important element in the investigation of the surrounding world.
6. Statistical methodology enriched the empirical as well as the theoretical level of cognition; through the theory of statistics not only separate scientific facts but also their theories were obtained and the applied fields of separate sciences sprang up.
7. Comparative and dynamic statistical analysis of mass processes and phenomena made the cognition of the industrial society's economy, culture and politics much more profound; an ordinary establishment of the facts related to the social life was supplemented by the theory of the measurement of mass phenomena; attempts were made to make the theoretical concepts of the different spheres of social life more concrete and more empirical and to find a quantitative aspect indices (Martišius, Kėdaitis, 2004).

Statistical methods were instrumental in making the quantitative and qualitative analysis of the social processes and phenomena organically coherent. In the field of economics, the linkage, merging of the theories of macro- and micro- economics with the theoretical statistical methods gave birth to the National Accounts – the greatest achievement of the economic science of the 20th century. National Accounts radically altered the nature of administrative statistics of the democratic world countries, the activities of the information agencies and the very management of information (Castells, 2005).

The rise of international statistics altered the nature of national statistical institutions of all democratic countries, made statistical information universal and open to the people of its own country and the world. Macroeconomic calculations are a very important field of international statistics, comparative analysis in investigating consumption, prices and inflation, parity of currencies (Ūkio statistika, 1995).

D. M. Keynes' economic theory and especially his ideas presented in his work "A General Theory of Employment, Interest and Money – 1936" (Leijonhufvud, 1968) produced the greatest impact on the development of the system of National Accounts. In order to apply the general economic scientific conclusions received by D. M. Keynes and his disciples of the formation of the economic policy compre-hensive techniques for the analysis of economic processes and phenomena had to be created. The elements of that new macroeconomic analysis were the following ones: 1. econometric models of the economic development of the country and its separate regions; 2. the system of National Accounts; 3. input-output models (Martišius, 1998).

A considerably big group of economists - R. Frisch, J. Tinbergen, S. Kuznets, V. Leontief, L. Klein, R. Stone- who later became Nobel Prize winners in the field of economics made a major contribution to the creation of the given analysis.

Econometrics - a separate branch of economic sciences - appeared to meet the needs of the economic science and practice. Econometrics makes complicated statements of economic equilibrium concrete making an abstract economic theory empiric and an instrument of the economic policy. Econometrics is ascribed an important role in the formation of the theory of applied economics since it radically enriches and improves the classical statistical analysis of economic processes. When economists carry out an empirical research they have to proceed from the theoretical economic premises, which

makes an essential difference between the economic research of economy and the traditional purely empirical statistical investigation of economy. Econometric modeling and calculations relate to the economic theory of any field with the administrative statistics of different spheres of life, real life and everyday activities.

Besides, in the course of the 20th century applied statistics of industrial and informational countries started getting interested in the future and its forecast apart from the collection, analysis and grouping of data, which sums up the past. On the basis of the works of R. E. Lucas, J. T. Sargent and other so-called "new classics" expectations and aspirations, wishes and hopes of producers and consumers were started to be gathered and analyzed. Thus prognostic statistics sprang up, which radically supplemented the traditional statistical methods oriented exceptionally towards adaptive research. Statistical research of information society seeks to relate the past and the future (Lucas, 1980).

In our opinion, the works of the Nobel Prize winners the Norwegian Finn E. Kydland and the American Edward C. Prescot open great vistas for the statistical programme research. In their opinion, the greatest impact on the cycles of business is exercised by the changes in the aggregate supply. They associated, in theoretical terms, inflation, GDP fluctuations, unemployment and economic growth and made attempts to find the degree of interdependence of all those components. Both Nobel Prize winners concentrated their attention on the long-term human expectations.

They pointed out that alterations of investments and relative price level make influence on scientific and technical progress whereas the latter determines the economic growth as well as short-term economic fluctuations with respect to the long-term economic growth. In this way the concept "time consistent" was born, the essence whereof is such policy, which is considered to be the best by its designers, and which often will not be put into being if the expectations of the households and company bosses have been formed earlier (Lucas, Sargent, 1981). In such case the creators of economic policy have to reshape their choice in such a way as to make the new policy, which they will finally pursue, not worse that the one they had so thoughtlessly chosen earlier. It should be mentioned, however, that the result of the discrepancy fails to depend on the creators of the policy, since they proceed from the tasks, which are considerably different from those of the free citizen's wishes and settled expectations.

The Road to the Mathematization of the Statistical Theory

Statistics of the post-industrial society is the stochastic statistical theory. Without the knowledge of the probability theory definition of the statistical methodology is impossible.

In the course of four hundred years the road of the probability theory was long and twisty. It became a serious mathematical science only in the 20th century although the elements of its application in the fields of insurance, inhabitant statistics and demography could be observed already in the early 18th century. A large number of principle

theorems gradually became the logical basis for the theory of statistical conclusions and enabled statistics to proceed from the purely accounting functions to the pure quantitative analysis. Thus sample statistics appeared in the 20th century (Tschuprov, 1922), which radically enriched the investigations of public opinion, market and production.

Modern methodology of the statistical research of mass processes, related with the theory and logic of the probability theory started its formation in early the 19th century. The Belgian scientist A. Quetelet is considered to be its pioneer who on the basis of the works of J. Bernoulli, S. D. Poisson, P. J. Laplace, A. Cournot, attempted to create "social physics". Later, at the end of the 19th century and the early 20th century W. Lexis, L. Bortkiewicz carried out their investigations in Germany and started a serious mathematization of the theory and practice of statistics. In the given field great tribute has to be paid to the Russian scientist A. A. Tschuproff and the Italian K. Gini. In England, biometric school formed in the 19th century in the process of the mathematization of biological sciences. K. Pearson, W. Gosset ("Student"), R. A. Fisher, G. U. Yule allowed to relate the research carried out by the English statistical school with the works of the continental school and supplement the methods of statistics and the research with the probability theory conclusions and statements. In this way modern statistical theory was formed, the ever increasing use in practice whereof allowed to form 1) statistics of an experiment; 2) applied statistical quality research; 3) applied statistics of sundry fields of activities. Recently, statistics is more and more widely used in technologies and that is why we can talk about the technical (technology) statistics. Statistical decision theory is of major importance for the development of management science, variational statistics – for the biomedical sciences (Martišius, 1998). Today statistics provides science not only with primary data and the quantitative description of the analyzed processes but is also widely used for the creation of the theories of separate fields of science (Koopmans, 1951; Tschuprow, 1924). The history of the physical science is the best proof of that. Formation of the scientific world-outlook in modern physics without the theory of statistics and its stochastic elements would have been unthinkable As early as at the end of the 19th century the works of L. E. Boltzman, M. Smoluchowsky, J. W. Gibs created the classical statistical physics. In the twenties of the 20th century quantum physics as well as statistical quantum physics appeared.

Statistical method became the factor for the creation of physical theory (O'Donnell, 1989, Tschuprow, 1924).

In this way statistics started its way across natural sciences. The myth of the pre-industrial society that statistics can only be used for the investigation of society, its culture and cultural phenomena where individual and typical events prevail was destroyed (Chick, 1998, Martišius, 1997).

Permeation of statistics into the scientific investigation of nature radically changed the scientific status of both theoretical and applied statistical methodology. The nature of statistical regularity, causal problems in the micro-world and society, logical conception of probability, a-priori and a-posteriori probability in scientific proof, use of large numbers in the investigation of mass phenomena turned into the problems of general science and the object of the

philosophy of science and methodology. It has been perceived in the course of all scientific debates that without statistics formation of the scientific outlook is impossible while the theory of the scientific method has to include the logical interpretation of statistical calculations. There is an overall necessity to 1) have a mass attitude towards the investigated phenomena; 2) probability methods and calculations are a mandatory element of the investigation of such phenomena; 3) where scientific methodology seeks support in the mathematical and statistical formulae it has to deliberate upon those formulae in terms of the subject content, interpret them correctly to establish the bridge between them and the concrete phenomena. In no science may the mathematical formalization become an unassailable wall, which separates formulae from concrete reality and life practice (Xodgson, 2006).

Summing up the experience of the industrial society some important conclusions may be formulated: 1. Inertia in thinking is the underlying stumbling-block of life practice based on science and scientific knowledge: obsolete habits, images, intolerance, inability to see the formation of new trends, absence of global attitude to the regional problems. 2. Every stage of the scientific development possesses its own peculiar manner of thinking. Attempts to alter it often gives rise to opposition. 3. Economists of Lithuania of the 20th century had to alter their habits, attitudes and methods of research more than once. Those processes were described by us and by others elsewhere (Adlys, 2008; Martišius, Servaitė, Piatajeva, 2005; Ūkio statistika, 1995).

As for the practical statistical work Lithuanian statistical society, in our opinion, should:

1. Make a bold transition from the commonplace statistical empirics and shallow quantitative analysis to scientific statistical substantiation and reasoning and the formation of statistical knowledge.

2. The theory of economics, pedagogy, communication and social sciences has to become the theoretical basis for the statistical analysis of all levels (micro-, mezzo-, macro-) and merge organically the quantitative and qualitative analysis.

3. When statistical research is done the theory of stochastic statistics and econometry should be made a broader use; the provision "first logic, then, if necessary, mathematics" should be used as broadly as possible(O'Donell, 1989).

4. When an attempt is made to mathematize statistical research J. M. Keynes' provision that realistic economics is an open and organic system, which may not be adequately analyzed if the methods, which are used, are meant to investigate rigid and formally described systems, should be remembered (Chick, 1998, 1859-1869);

5. It is now difficult to imagine a meaningful politics without reliable statistical information. Already back in the 19th and 20th century an attitude formed that the authorities may possess exact and systematically gathered information, which is best ensured by the survey sampling. Today survey sampling is widely applied since it saves time and money, enables the expansion the research programme and checking of the results of continuous observation.

The array of statistical data facilitates valid decisions. The theory of statistical decisions is one of the most important trends of the development and is cultivated by mathematicians, psychologists and economists. Exact references, which have to be observed, when valid operative and strategic decisions have to be made, are non-existent. Three stages of activities, which are mandatory when one is after some valid directive or standard activity, can be singled out: 1) collection of information; 2) establishment of the principle and secondary ties as well as the types of the processes under investigation; 3) singling out of the possible alternatives and choice of the best (Martišius, Kėdaitis, 2004, p.68). All those stages of the activities are, to a greater or lesser degree, related to statistics, stages of its research and its methods. Nevertheless, in the absence of statistical methods, which allow singling out of the accumulated data certain generalized facts of social life, regularities, which are instrumental in establishing the existing tendencies and producing the "generalized statistical picture" of the situation under investigation, even the most comprehensive information looses its value. To this end, the most important methods are statistical-stochastic, modern statistical decision theory or Bayesian statistics.

Statistical Tasks of the Information Society

New and mature theory of social sciences in the information society may not be created and further developed without the incorporation of the organic statistical method into the theory and practice of science. It goes without saying that in the formation of the post-industrial social system the most important role is ascribed to information and knowledge, first and foremost, theoretical. Information society itself can be defined as the one wherein theoretical knowledge is predominant, which was not the case prior to that. True, the supremacy of the theoretical knowledge in the theories of information society is still little investigated although the situation is gradually changing (Webster, 2006).

Theoretical knowledge is perceived as abstract, generalized and codified. Great role for its acquisition is ascribed to statistics. In the case of politics we could see that theoretical knowledge forms the basis of politics and polemics. For example, we know that we are an ageing population and are quite well versed in the regularities of demography. All that knowledge is of a theoretical character since it is abstract and generalized; it was established in the course of statistical analysis and made public by different mass media. Such theoretical knowledge may not be applied directly but it makes influence on the social policy and administration. In this respect theoretical knowledge of the social life, which is often acquired through statistics became a very important feature of our world.

Statisticians related to the social life are greatly attracted by the technological, economical, sociological (employment, professional) phenomena, which can be easily measured and which have very slight ties with the theory. The situation is radically different when the need to make quantitative assessment of the theoretical knowledge arises. Such assessment is neither perfect nor adequate.

There is no mature statistics of science and innovations since so far a single system of indices and assessment methodologies are non-existent, therefore a systemic analysis of science and the development of innovations may not be undertaken. When the development of science and innovations is not assessed objectively a faulty opinion related to the actual situation and an erroneous attitude to the priority development of this or that branches of science as well as a gap between science and society are formed (Castells, 2005).

Development of social sciences simply demands the use of modern statistical theory and its methods. Only preceding this way the backwardness of social sciences may be reduced and the efficiency of their research increased. Where in the 20th century and at present a clearly expressed "economic imperialism" towards all social sciences could be observed it, in the author's opinion, was determined by the great rapprochement of economic theories and research with statistics and mathematics (see: Martišius, 2003,).

Our conclusion is the following: on all levels of the research of social life statistics must not only supplement the theories of social processes, it must make them more concrete and approximate them with the investigation of the specific realistic situations of the economic, cultural, political and social life. At present the society needs an integral statistical theory of social sciences. Sociology, communication and political sciences and economics need scientific categories of statistical content – indices, distribution and the forms of expression of scientific facts and stochastic regularities.

What the society needs is not an abstract, highly generalized economic efficiency of the work of its members but the work that would increase the welfare of all members of society. In the course of history different indices were used to investigate the dynamics of the standard of life and its dynamics. Irving Fischer (1922) is considered to be the pioneer of the scientific so-called atomistic theory of indices. Nobel Prize winner R. Frisch and A.Wald (1939) formulated a functional theory of indices, which is more realistic than the atomistic theory. Such indices as the cost of living index, consumer price index, etc. were used to investigate the standard of life and the dynamics of its change. Consumer price index (CPI) became the main index, which is used to assess the dynamics of the standard of life. It is calculated by comparing the value of the fixed number of the basket of the most important goods and services in different periods.

It is worth noting that in the past the most outstanding economist's theoreticians F. I. Edgeworth, A. Marshal, J. R. Hicks, J. M. Keynes, W. Leontief, L. R. Klein, R. Stone, R. G. Allen as well as the already mentioned R. Frisch and J. Fishen were interested in the economic theory of indices. Comparatively good overview of all those works is presented in R. G. Allen's book (1975). Mathematical formalization seems not to have been avoided in the process of the mathematization of the index theory (Krugman, 1998). Mathematization of the economic theory has always been scrupulously investigated and discussed (Keynes 1973, Koopmans 1957, Martišius, Servaitė, Piatajeva, 2005). It becomes an especially acute problem in the process of formation of the information society.

When respective index formulae for the investigation of the dynamics of the standard of living are drawn great difficulties related to the application of the resulting theoretical conclusions ensue and that was the reason why the use of Consumer Price Index and not Cost of Living Index was started. At present three basic groups of the goals to calculate CPI can be singled out in the West European countries:

1. General social economic analysis and setting of the state policy to regulate the pecuniary income of the population.
2. Regulation of public (taxes, pensions, benefits, financing of social programs) and private (wage rate, rent, insurance pensions) sectors.
3. Comparative analysis of the price change as well as that of inflation whereby general and partial indices of commodity prices are applied.

Such calculations are not sufficient for an information society. It is necessary to start calculating differentiated CPI since the polarization of the inhabitants in terms of income is ever increasing and an average CPI may not reflect all trends. Differentiated Cost of Living indices for different income family groups, urban and rural area dwellers, workers, farmers, entrepreneurs and pensioners must be calculated. To this end types of Lithuanian families according to the social, geographic and demographic indicators should be established.

Calculated differentiated CPI could be used for the analysis of informational processes taking place in the country in the regulation of the social policy of the state and for a more detailed investigation of the purchasing power of currency. This could be done by the trade unions, public organizations or local self-government bodies.

Appearance of information society in Lithuania should be considered an accomplished fact and each i household (family) in t year should be calculated life expenditures, which would enable a) to calculate consumer price indices for each group of households (families), formed according to the income level, belonging to a specific social stratum and being in a specific territory; later on, such indices should be aggregated into group and general ones; b) to establish nominal income indices corresponding to the differentiated consumer price index calculations.

Detailed algorithms for the calculation of differentiated indices of real income have been many times described in the literature (Martišius, Molienė, 1994.). It could only be regretted that practically those indices are calculated for very big inhabitant groups while a differentiated attitude to the inhabitants of the country is non-existent. Establishment of the differentiated consumer price indices calls forth for the scientific practical household typology, which has to be established according to the main economic, social, theoretical and demographic indicators.

Spheres of the consumer price index application are quite varied. One of them is the assessment of the inflation. Inflation is the persistent growth of the general price level, which manifests itself as the consequence of the circulation of excess money. It is the said consumer price index (CPI) that is used to establish the scope of inflation. Since in practice the general CPI are calculated as average indices they, at best, represent the level of an "average" family. In fact, each family consuming different sort of goods and

services will experience different hardships as a result of growing prices. Since in reality the speed of the development of inflation is uneven and since usually it is pensioners and minimum income receiving people that suffer most, it is necessary to assess the scope of inflation to protect those people and, where possible, to forecast it and attempt to mitigate its consequences. This reasserts the necessity of making differentiated CPI calculations.

When some researchers characterize the processes taking place in the country they propose not to restrict oneself to the consumer price index (CPI) and to calculate the scope of inflation in other ways as well (Pasinetti, 1993; Nordhaus 1998; Martišius, Molienė 1995). Theoretically, such methods of the assessment of inflation processes and the devaluation of money are possible but their application is restricted by the shortage of the necessary information and the existing incompleteness of the theory. It is important to learn the exact measurement of the inflation and to assess reasonably the devaluation of money. In our opinion, this is a very important task for the statistics of information society.

Statistics and Society

Many researchers have argued that modern society lacks reflexivity, i.e. ability to assess wisely the meaningfulness of the social actions and the competence to forecast the outcome of those actions and programmes. Whatever our assessment of statistics might be it is part and parcel of the intellectual culture of the society and can not depart too far from the paradigm of thinking inherent in the given society. Statistics, however, is ascribed to very special task – to propose a system of indicators, which characterize soundly the development of the society. It has to shape the main indicators of the qualitative development of the society. Such system of indicators should show that the members of the information society forsake the so far dominant economic standpoint making the consumption cult absolute. The idea of the outstanding American politician R. Kennedy that gross domestic product fails to reflect the health of our children, quality of education, beauty of poetry, our consciousness, our bravery and love of our own country should always be remembered. Gross domestic product calculates everything except things that are worthwhile living for (Adlys 2008). True, the gross domestic product that has been produced fails to tell everything – good indicators could be achieved at the expense of tremendous losses – ecological situation, physical health of people, social soundness, irresponsible waste of natural resources, etc. A system of indicators to characterize the information society, which would demonstrate the achievements of the humanitarian culture in the broadest sense of the word and the achievements of the humanitarian idea as well as the reclaiming of the real values by the society are necessary.

Statistics of social development has to characterize the singleness of social evolution; it has to be oriented to the results of social programmes and social policy and to reflect the aspects of the qualitative development of our society. Aggregated and comparable indicators related to the deterioration of the environment and their physical statuses are necessary, economic accounts of the environment have to be kept.

Statistics in a democratic society is not only an instrument of management but also a prerequisite to the support of democracy, its guarantor and condition for the further development of the society. In fact, the greater part of what we know about ourselves and the society – family, studies, occupation, leisure (time) – is learned from the services of statistics (Webster, 2006). Naturally, the need to meet the demand for statistical information increases the load for the primary suppliers of data and this makes statisticians seek alternative data sources and decide, which data collection form is the most adequate – mandatory or the one supplied voluntarily. The principle of the implementation of statistics, which is increasingly developed by the information society of democratic states, is the legalization of statistical data, i.e. validation of the collection of statistical data. Mandatory and for statistical purposes independently supplied information is delimitated.

Another important principle of democratic statistics of the information society is the confidentiality of personal data. This means that the collected personal data may not be delivered to anybody else or be published without the consent of the person in question. Independence of the statistical services means the possibility to act freely. No political party is entitled to have any priorities and influence the results of the choice of statistical research or the methods of data collection and their processing. One more important principle of statistics is the availability of the statistical information and its publicity. All strata of the society must enjoy the right to have a possibility to make use of statistical information. Naturally, the positive role of statistics for the process of the democratization radically increases in the age of the Internet.

Implementation of the principle of transparency enables the users of the statistical data to familiarize themselves with the scheme of the index calculation. This decreases doubts related to the information value of the index and the perfection of the calculation methods.

Promoting democratic processes in the developing democracies European integration exercises influence on the development of statistics as well. Statistics has to meet not only the national demands but also supply data, which could define the influence on the economy and social development of the countries produced by the globalization processes. Globalization processes taking place in the world become a more and more important factor for the possibilities of sustainable development and perspectives of different countries. These changes are determined by the constantly increasing development of scientific technologies. New information technologies alter radically not only the technologies of production and management but also people's way of life, their interaction, work and culture. Statistics of information society has to turn all that into the language of numbers. This sort of statistics is highly welcome.

Citizens of an information society have to be taught the art of statistical analysis, they have to learn to read statistical texts. A periodical "Statistics for Children" could be a welcome issue. Pupils and students have to be taught to travel in the world of numbers since the beginning of their studies. At schools, much more attention should be allocated to statistics, its theory and methods. More often than not, ideas of the science of economy are simple and

can be expressed in the language, which is understandable to each and everyone but their implementation and the perception of all prerequisites and conclusions proceeding from the theory under investigation requires expertise of the technology of the sophisticated economic investigation – modern statistical methodology. That is why teaching of the essentials of statistics should be commenced in secondary schools and gymnasia. We should not restrict ourselves to the teaching of the essentials of the theory of chances as is the case at present. Long and complicated road to the world of risk and uncertainty has to begin with the teaching of stochastic statistics.

Conclusions

1. In the 20th century the method of statistics became the part and parcel of the theory of the general scientific method. Such issues of statistical theory as the logical content of the chances, the character of the statistical methodology and basic principles, statistical regularities and the forms of their expression, problems of the determinism of mass phenomena, the law of large numbers in knowledge became the object of constant investigation of logic and methodology.

2. Econometrics – an organic combination of economics and theoretical as well as practical statistics was formed. a) econometric models of the development and functioning of the economy of the country as well as that of the regions; b) the system of national accounts; c) input-output matrix models; d) research started in the field of the general equilibrium of country's economy became the new elements of the new macroeconomic analysis.

3. An important achievement of the social sciences of the previous century is the rapprochement of the economic theory, politology, law, demography, educology with the statistical calculations and research, making of the most important categories of the social sciences empiric and turning of them into economic, demographic and social indices. Statistical identification of the theoretical concepts is an important step in the linkage process of the theory and practice of social sciences.

4. Statistics of information society must meet fully the needs of the civil democratic society. It has to investigate more broadly: a) the modern methods of the monitoring of information; b) to make the theory of the sampling method more concrete; c) to create the theory for the complex statistical analysis of the informational arrays; d) to develop the methods for the extraction of the warning social economic information.

5. The theory of conclusions and decisions as the statistical methodology based on stochastic propositions and reasoning should be further developed. It has to associate the propositions, proofs and reasoning of the theory of chances with the statistical calculations.

6. In the practice of Lithuanian statistics analytical character of statistical information has to be expanded. More complex statistical calculations oriented to the comparison of the Lithuanian economy with the neighboring countries have to be carried out.

7. The issue of the quality of statistics is vitally important. The precision of all arrays of data depends on the sample of the investigations and how it represents separate social and economic groups. Education in the field of information is the road to a more perfect economic and social statistics.

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Informacinė visuomenė ir statistika

Santrauka

XX a. statistikos mokslas ir praktika patyrė didelių permainų: susiformavo tarptautinė statistika, buvo pradėti leisti tarptautinių organizacijų leidiniai, atliktas oficialus nacionalinio produkto ir pajamų skaičiavimas. Nacionalinių sąskaitų sistemos (NSS) yra didžiausias socialinių mokslų minties laimėjimas, nes buvo sukurta suvestinė makroekonominės statistikos sistema, balansuojanti šalies ekonomikoje vykstančius procesus ir visų institucinių sektorių ekonomikos rodiklius bei jų ryšius. Ši dabar veikianti vieninga informacinės visuomenės statistikos sistema leidžia ekonomikos mokslo išvadas pritaikyti ūkinei ir socialinei politikai formuoti. Susiformavo ekonometrika – organiškas ekonomikos teorijos ir statistikos junginys, kas leidžia gautas teorines išvadas sukonkretinti, detalizuoti ir sukurti išsamią socialinių procesų ir reiškinių analizės metodologiją, atlikti prognostinius skaičiavimus.

Nemažas industrinės visuomenės socialinių mokslų laimėjimas – ekonominės teorijos, politikos mokslų, sociologijos, komunikacijos, teisės, demografijos, edukologijos suartėjimas su statistiniais skaičiavimais ir tyrimais, svarbiausių socialinių mokslų kategorijų suempirinimas, jų pavertimas ekonominiais, sociologiniais, demografiniais rodikliais. Socialnių mokslų statistikos teorijų sąvokų identifikavimas buvo svarbus žingsnis susiejant tų mokslų teoriją ir praktiką.

Buvo suvokta, kad taikant statistikos metodus socialiniuose moksluose, visada reikia atsižvelgti į tas teorines tų mokslų prielaidas ir teiginius. Dabar tai sudaro esminį skirtumą tarp taikomųjų socialinių tyrimų ir gryno mato-matinio požiūrio į socialinių mokslų teoriją. Suvokta, kad kiekybinė ir kokybinė analizė yra dvi neatskiriamos vienos visumos dalys. Socialinių procesų modeliavimas turi išplaukti iš nagrinėjamo proceso teorijos ir ilgametės praktikos.

Gamybos vadovui, politikui ne mažiau svarbu žinoti ne tik tas kas dabar visuomenėje yra ir buvo, bet ir mokėti formuoti socialinę ateitį, priimti pagrįstus strateginius sprendimus. Neapibrėžtumas ir rizika yra tas fonas, kuris nuolatos supa politikus ir vadybininkus, priimančius sprendimus. Paprastą statistinės tikrovės aprašymą turi pakeisti tikimybinis statistinės esamos situacijos nagrinėjimas ir apibendrinimas.

Moderni statistikos teorija gali tapti reikšmingu socialinio mąstymo komponentu, jeigu ji pildoma tikimybių teorijos teiginiais ir išvadomis. Empiriniai statistikos metodai įgyja pagrįstumą ir išsamumą, jei jie susiejami su tikimybiniais įrodinėjimais ir skaičiavimais.

Statistikos išvadų ir sprendimų dalis tai ta informacinės visuomenės statistinės metodologijos dalis, kuri tiesia tiltus tarp tikimybių teorijos ir gyvenimo praktikos, nustato sąlyčio taškus tarp tikimybių teorijos, statistinių įrodinėjimų ir sprendimų. Statistinių išvadų gavimas, sprendimų priėmimas, esant neapibrėžtumui, neįmanomas be tikimybinio mąstymo pagrindų išma-nymo. Puikus tikimybių teorijos žinojimas gali padėti daugiau taikyti ir toliau plėtoti tikimybių teorijas, matematinius statistikos ir kitų matematinių metodų, pagrįstų masinių procesų aprašymu, taikymo metodologiją kaip integralinę socialinių reiškinių ir procesų matematinio moduliavimo teorijos dalį.

Tikimybių teorijos loginiai aspektai nėra labai paprasti. Jais pirmiausia domėjosi ne viena ekonomistų karta – S. V. Dževonsas (1835-1882), D. M. Keinsas (1883-1946), V. Leksis (1837-1914), L. Bortkevičius (1868-1931), F. Edžvortas (1845-1926). Įvairiausios mokslinio pažinimo kryptys nagrinėjo tikimybinės logikos klausimus. Jos užuomazgų buvo jau Antikoje. Naujaisiais laikais tikimybių logiką, kaip daugiareikšmę logikos sistemą, plėtojo G. Leibnicas (1646-1716), o XIX–XX a. - Dž. Būlis (1815-1864), Dž. Venas, R. Karnapas, H. Reichenbachas, Dž. Keinsas.

Sprendžiant kai kuriuos sprendimų teorijos uždavinius, tikimybė interpretuojama kaip protingo įsitikinimo, kad nagrinėjamas įvykis įvyks, laipsnis. Ši tikimybės interpretacija vadinama subjektyviąja. Jos samprata plačiai taikoma analizuojant neapibrėžtumą ir visuotinio pasirinkimo klausimus, kuriant eksperimentinės ekonomikos teoriją. Alternatyvių strategijų pasireiškimo tikimybės, esant neapibrėžtumo sąlygomis, dažniausiai gali būti gaunamos subjektyviu būdu, pavyzdžiui, pasitelkiant ekspertus ir naudojant atrankinę informaciją, atliekant socialinius eksperimentus, pritraukiant įvairios papildomos informacijos.

Informacinės visuomenės socialinė statistika turi visiškai atitikti pilietinės demokratinės visuomenės reikalavimus. Šių dienų statistika abstrakčią socialinio gyvenimo teoriją turi papildyti ne tik naujais gyvenimo faktais, bet ir pačią teoriją laipsniškai konkretinti, aproksimuoti ją iki realių ūkinio gyvenimo aktualijų nagrinėjimo. Šiuolaikinė moderni statistikos teorija ir metodologija turi padėti žinių visuomenėje į darnią visumą sujungti mokslinių idėjų ir gyvenimo faktų pasaulius.

Statistikos praktikos požiūriu šalia valstybinės turi atsirasti visuomeninė, institucijų ir privati statistikos. Lietuvai reikalingi platesni statistiniai tyrimai istorijos, pasaulinio ūkio ir politikos srityse. Būtina įtikinti visuomenę, kad statistika – tai ne vien skaičiai, bet ir galingas masinių reiškinių pažinimo metodas. Žmogaus laisvos valios klausimus negalima nagrinėti nesusipažinus su šiuolaikine statistikos teorija ir metodologija, kuri yra tiltas į šiuolaikinę mokslinę epistemologiją. Statistika – tai raktas į pasaulio pažinimą.