

Аннотации

Л. А. Яценко

Методологические основы спектрального анализа на примере исследования численности населения Украины

В статье описана процедура реализации спектрального анализа в программном обеспечении Statistica на примере исследования численности населения Украины с 1850 по 2012 г. В результате спектрального анализа записана циклическая компонента в виде ряда Фурье, а также построен прогноз для нее до 2050 г.

Ключевые слова: *спектральный анализ, ряд Фурье, цикличность, циклическая компонента, периодограмма, численность населения.*

М. В. Лесникова

Инструментарий и индикаторы оценивания качества данных государственного статистического наблюдения внешней торговли услугами

В статье рассмотрены вопросы оценивания качества статистической информации. Разработан инструментарий и индикаторы оценивания качества данных государственного статистического наблюдения внешней торговли услугами.

Ключевые слова: *качество статистических данных, внешняя торговля услугами, статистический процесс, релевантность, точность, своевременность и пунктуальность, пользователи, доступность.*

И. А. Жукович

Smart-город как новый объект статистических исследований: определение термина

В статье рассмотрены и проанализированы различные трактовки термина “smart-город”. Сделан вывод, что на сегодня единое определение этого термина еще не сформировано. Разнообразие вариантов трактовки этого термина зависит от заинтересованных сторон и области фокусирования.

Ключевые слова: *smart-город, умный город, инновации, ИКТ, социальный капитал, сетевая инфраструктура.*

Е. Н. Мотузка

Статистический анализ доходов государственного бюджета Украины

В статье проведен статистический анализ доходов государственного бюджета Украины, их объема и динамики, структуры источников доходов. Исследованы внешние и внутренние факторы, влияющие на уровень доходов государственного бюджета.

Ключевые слова: *бюджетная классификация, валовой внутренний продукт, государственный бюджет Украины, доходы бюджета, налоги.*

А. Ю. Редько

Вопросы аккомодации украинского аудита к требованиям ЕС (Tacito consensu)

В статье рассмотрены новейшие вызовы для украинского аудита в связи с принятием Директив и Регламента ЕС об аудите субъектов общественного интереса.

Ключевые слова: *директивы ЕС, Регламент № 537, аудит, новые условия аудиторской деятельности, Международные стандарты аудита.*

Н. Б. Ткаченко

Моделирование и анализ процесса осуществления государственных закупок

В статье рассматриваются прикладные аспекты моделирования и прогнозирования экономических задач управления государственных закупок. Построена регрессионная зависимость конкурентности торгов от факторов стоимостной и количественной структуры торгов.

Ключевые слова: *управление государственными закупками, уровень конкурентности торгов, количественная и стоимостная структура государственных закупок, теория самоорганизации, моделирование.*

М. В. Щурик

Статистическое оценивание деятельности хозяйств населения в аграрном секторе: противоречия и пути их преодоления

В статье анализируется роль и значение хозяйств населения в аграрном секторе, исследуется ретроспектива их деятельности. Оцениваются результаты влияния аграрной и земельной реформ на развитие сельскохозяйственного сектора экономики.

Ключевые слова: *хозяйства населения, приватизация, земля, использование, производство, демография, благополучие.*

Э. В. Чеботовский

Табличный метод: теория и история.

Часть III. Разработка теоретичних основ табличного метода

В статье рассмотрены исторические аспекты возникновения, зарождения, формирования и практического использования табличного метода – одного из основных статистических методов представления, обобщения и анализа статистической информации. Содержатся критические замечания и методологические обобщения относительно имеющих в статистической литературе взглядов на значение и роль табличного метода в экономико-статистических исследованиях, определения статистической таблицы, классификации статистических таблиц.

Ключевые слова: *табличный метод, статистическая таблица, основные элементы и виды статистических таблиц, подлежащее и сказуемое статистической таблицы, простая статистическая таблица, групповая статистическая таблица, комбинационная статистическая таблица, классификация статистических таблиц.*

Abstracts

L. O. Yaschenko

Methodological Background for Spectral Analysis, Illustrated by Studying the Number of Ukrainian Population

A data series usually has three components: trend, periodic (seasonal or cyclic) and random. Cyclic recurrence is periodic swings going beyond the limits of one year. The time span between the two next peaks within one year is considered as the length of cycle. Cyclic recurrence reflects repetitive character of economic processes during long periods.

Two methods are used to analyze cycles, harmonic (based on periods) and spectral (based on frequencies). Phases of spectral analysis are: (i) testing of a time series for stationary state; (ii) for non-stationary series, transformation of the first difference, to bring it to the stationary form; (iii) construction of the graph of periods and computation of periods, frequencies and coefficients at sines and cosines; (iv) construction of the spectral density graph and final computation of frequencies, periods and coefficients at sines and cosines, to derive the Fourier series; (v) computation of the cyclic components values on the basis of the derived Fourier series, to build the graph for identifying the extreme points and crisis periods.

Cyclic recurrence of social and economic processes in Ukraine can be most explicitly shown by the population data. These data are, therefore, taken for studying the Ukrainian population in 1850–2012 by use of spectral analysis.

Results of the spectral analysis of the number of Ukrainian population in 1850–2012 allow for identifying three periods: 12.5 years (Juglar cycle), 27 years (Kuznets cycle) and 81 years.

Below zero value of the cyclic component is an evidence of crisis condition and instability. In Ukraine, the crisis condition (instability) started in 1991 and will be on, according to the prognosis, till 2032. The lowest value of the cyclic component occurs in 2018. The crisis condition is aggravated due to random factors, which strongest influence began in 2013, and which will be declining in 2032 and on. These conditions of uncertainty and crisis enhance the significance of forecasting and strategy elaboration at country, industry, enterprise and individual level.

Keywords: *spectral analysis, Fourier series, cyclic recurrence, cyclic component, graph of periods, number of population.*

M. V. Lyeshnikova

Tools and Indicators for Data Quality Assessment for Official Statistical Observation of Foreign Trade in Services

The quality of statistics is the most valuable asset that statistics agencies can offer to users, because it largely determines the validity of decision-making in government and business enterprise sector, promotes statistical awareness of broader community and community's trust to statistics. Foreign trade in services is defined as trade in services between residents and non-residents of Ukraine. Statistical data on foreign trade in services is based on data from the quarterly official statistical observations performed by the format "Report on exports (imports) of services", administrative data coming from public administration offices, chief managers of central and local budgets, ministries and government agencies.

The main purpose of the official statistical observation of foreign trade in services is to collect statistical data on export and import of services related to transportation, travel, construction, insurance and pension services, financial services, royalties and licensing services, telecommunication, computer and information services, services related with processing of material resources, business services, individuals services in culture and leisure, services in repair and maintenance, public goods and services not included in other categories. Informing users about the quality of statistical data on foreign trade in services is an important element of mutually beneficial relations between the statistics offices and the community, and an important objective for professional producers of statistics.

The purpose of the study is to develop tools and indicators for data quality assessment for official statistical observations of foreign trade in services.

Most part of users are interested in the quality of statistical information, as it affects the validity of their decision-making, and not interested in the quality of statistical processes because it is supposedly an internal matter of statistics producers. However, there are some external users who might be interested in this information, such as researchers or students in statistics.

Components of the quality of statistical processes and statistical information are the cornerstone in structuring the quality report. However, as the quality of statistical process is a factor of the quality of statistical information, the quality report needs to be prepared by avoiding duplication of its components.

Foreign trade in services is part of the section “Foreign trade and the trade balance,” included in the broader field “Economic statistics”. Accounting of foreign trade in services as part of foreign trade was launched in Ukraine in 1998, following the Resolution of the Cabinet of Ministers of Ukraine and the National Bank of Ukraine from 10.03.1997 p. No1092 “On Compilation of Trade Balance Report of Ukraine”. During the 1998–2012, services in foreign trade were accounted by the Classification of Foreign Economic Activities, harmonized with the Classification of Economic Activities (NACE, 1996), NACE.

Data quality components in the quarterly official statistical observations of foreign trade in services are as follows: (i) compliance/relevance; (ii) accuracy (reliability); (iii) timeliness and punctuality; (iv) availability; (v) consistency (coherence); (vi) assessment of the needs and expectations of users.

Keywords: *statistical data quality, foreign trade in services, statistical process, relevance, accuracy, timeliness and punctuality, users, availability.*

I. A. Zhukovych

Smart-City as a New Subject of Statistical Studies: Terminological Definitions

Cities consume 75% of global resources, and city administrations, regardless of country and size, face enormous challenges. These are high level of air pollution, congestion of roads, lack of public transport, poor security (meaning not only the crime but also road safety, the ability to obtain timely medical care, food quality etc.), poor quality of water, inefficient use of energy resources, the problem of waste disposal, increased costs and the need for their minimization.

Existing forms of urban management of public services, being obsolete, cannot meet modern requirements. An attempt to solve the complex of city problems is conceptualization of the notion of “smart-city”. Although the efforts at conceptualization and definition of “smart-city” are continuing on the global scale, there has been no crisp and consistent understanding among practitioners and in academia. The article aims to review and analyze the currently existing definitions of smart-city and its component characteristics.

The author's investigation leads to the conclusion that definitions of smart-city depend on the stakeholders (institutional agencies, academic community, civil society, business companies or enterprises) and focus area. Thus, institutional agencies have been increasingly focused on network infrastructure (energy, mobility, and ICT), while aspects of smart-city associated with the increasing quality of life play a secondary role. Definitions offered by the scientific community are more systematic and cover all the urban activities; they are largely concentrated on the theoretical basis of the concept and the different dimensions of smart-cities. Business companies, as well as institutional agencies, in their interpretations tend to focus on network infrastructure and particularly on ICT as a product or service.

Keywords: *smart-city, innovations, ICT, social capital, network infrastructure.*

O. M. Motuzka

Statistical Analysis of Public Budget Revenues in Ukraine

The problem of filling the revenue part of the public budget is a pressing one for Ukraine. Public budget revenues lay the financial basis for the operation of the domestic government, show the economic performance of a country; budgetary process, when executed in a proper way, is the key for economic and social stability and good living standards of the population.

The system of public budget statistics in Ukraine has to meet the requirements of international organizations, which determines the areas of its current reforms. The issue of constructing a good and effective system for budgeting the revenue part of the Ukrainian public budget is, therefore, quite important now.

The objective of the study is to make statistical analysis of public budget revenues in Ukraine and investigate the factors affecting the amount of public budget revenues.

The analysis shows that the amount of public budget revenues in Ukraine has been affected by external and internal factors of economic, social, political and national origin. External factors include external public debt, level of integration in the global economic area; prices on energy sources; the scopes of external financial assistance from other countries and international organizations. Internal factors include the scopes of domestic GDP, interest rate, internal public debt, tax rates, domestic currency rate, population incomes, and inflation rate.

The consolidated source of both the central budget and the local budgets is the domestic GDP. When interpreting the economic meaning of the category “public budget revenues”, it needs to be remembered that, on the one hand, their amount is determined by sectoral distribution of GDP, and, on the other hand, once accumulated in the budget they become subject to further distribution. In the latest period, GDP growth in Ukraine has been

due to the increasing gross value added in sectors like manufacturing, transport, wholesale and retail trade, agriculture, construction etc.

The analysis allows for the conclusion about the negative consolidated effect of the above factors for budgeting of revenues of the Ukrainian public budget. Problems affecting the budgeting of revenues are outlined: the boosting negative balance of foreign trade in commodities, the deteriorating financial performance of domestic enterprises and organizations, year-by-year contraction of GDP, the increasing foreign debt, ineffective taxation system.

The above problems can be solved by targeted long-term and short-term measures to stabilize the national economy, stimulate and expand domestic industries, shorten the nomenclature of existing taxes and introduce more effective and feasible taxes.

Keywords: *budget classification, gross domestic product, public budget of Ukraine, budget revenues, taxes.*

A. Yu. Redko

Accommodating the Ukrainian Audit to the EU Requirements (Tacito consensu)

Once the EU-Ukrainian Association Agreement was signed, the Ukraine faced the challenge of implementing a series of EU regulatory acts in the national legal framework. It is also the case of audit, as the domestic practices of audit meet the European standards and IFA requirements from merely theoretical point.

The article focuses on the specifics of requirements to organization of auditor's activities, fixed in the EU Directives No 34 and No 56 and the Regulations No 537. Main directions of change in the Ukrainian audit, to be made in keeping with the requirements of the above documents, are outlined.

Of the tasks to be addressed by Ukrainian auditors, the need for change in the organizing principles of the auditor's activities, for control and quality enhancement of audit services, for implementation of the EU requirements to the domestic audit of public interest entities is emphasized.

The conclusion is made on the necessity of elaborating the new national regulations on the domestic audit.

The analysis demonstrates the uneven distribution of consumption of goods and services across Ukraine.

Keywords: *EU directives, Regulations No 537, audit, new conditions of auditor's activities, International Standards of Audit.*

N. B. Tkachenko

Modeling and Analysis of the Public Procurement Process

Public procurement, being a powerful instrument of macroeconomic regulation and a means to prevent crisis tendencies in the economy and secure economic growth, is a form of market activity of the government. The considerably extended range of econometric problems allows for scientifically substantiated modeling and forecasting of many economic processes that can be interpreted mathematically as conventional random processes. Their modeling can use the advanced mathematical tools, information and communication technologies, enabling for processing large scopes of information and constructing mathematical models of optimal (but not preset) complexity.

The study contains analysis of applied aspects of modeling and forecasting of econometric problems related with management of public procurement. Its purpose is to apply the inductive method of mathematical models self-organization to the public procurement process.

The method for group accounting of the argument is used to derive correlations of the level of public procurement auctions competitiveness with the total amount of government funds (factor 1), the structure of auctions by value and volume (factor 2). The results show the existence of high stochastic correlations. The derived model can also be used for forecasting purposes.

Keywords: *management of public procurement, level of auctions competitiveness, structure of auctions by value and volume, theory of self-organization, modeling.*

M. V. Schuryk

Statistical Evaluation of Households Activities in the Agricultural Sector: Contradictions and Ways to Overcome Them

The role and importance of the households' participation in the agricultural sector in Ukraine are analyzed by use of retrospective time series. Effects of agrarian and land reforms on the development of agricultural sector in Ukraine are assessed. It is shown that due to the households' participation in agricultural production, the domestic agricultural sector could maintain and even increase the gross agricultural output. Households engaged in the agricultural sector in the Carpathian macro-region (Western Ukraine) now provide more than 80–90% of the

output of vegetables, potatoes, fruit, dairy products, wool etc. Special attention is paid to the participation of the households in transformation-specific events in the agricultural sector, like denationalization, privatization and sharing the land fund of former agricultural enterprises. The study confirms that the theoretical and methodological background used for denationalization, land sharing and privatization was and remains imperfect.

Free distribution of agricultural lands to almost everyone who wished was not favorable to the establishment of advanced land management in small and medium-sized agricultural enterprises and households. Moreover, the land plots were given into possession of the peasants who were incapable to ensure their proper use, improvement, conservation and protection. Results of the analysis give the author grounds to propose grouping of household farms (into three groups) for statistical evaluation purposes.

The first and the second group should cover the farms that are actually or potentially capable to organize reproduction of privatized land by implementing advanced technologies, have sufficient financial and human resources, can ensure a high level of marketability of agricultural products. The third group should include household farms that are totally incapable of providing adequate use and protection of land in the near future. The author's recommendations are as follows: general inventorying of the land fund owned and exploited by households; when land owners or users were not or would not be capable to properly use and protect the land plots, the latter should be withdrawn from them and given to the households capable to do this. The possibility of cultivation, maintenance, improvement and protection of land in accordance with the requirements for organization of advanced land and market oriented economy should be the background of the land use including privatized one.

Keywords: *contribution of households, privatization, land, usage, production, demography, welfare.*

E. V. Chekotovsky

Tabular Procedure: Theory and History.

Part III. Development and Initiation of Tabular Procedure

The paper deals with historical aspects of initialization and development of tabular procedure on the basis of literature review. The article consists of three parts, each being devoted to a certain period of development and application of tabular procedure in statistics science.

It is mentioned that the idea of tabular procedure as an essential method of generalization and analysis is belonged to English philosopher Francis Bacon. He was the first to assume in his work *The Novum Organum* (published in 1620) that tables provided the opportunity for mind to reveal the essence of phenomenon and subjects, discover causal links between phenomena.

The paper emphasizes that the background of tabular procedure in statistics, from the perspective of modern understanding, was given in the works of founders of political arithmetic and their followers. They were the first to establish drawing up tables for systematizing of statistical data and setting them in the most suitable and clear form, and to use applied tables for calculating general statistical characteristics, namely, relative and average indexes.

A detailed review is given of the contributions of Russian academic statistics (Yu. E. Yanson, O. I. Chuprov, L. V. Fedorovich, L. V. Hodskiy) and Zemstvo (elected body of local self-governance) statistics in development and application of tabular procedure. It is mentioned that Zemstvo statistics discovered combinational statistical tables, devised the methodology for making up group and combinational tables and their application in statistics studies. The attention is paid to the scientific contribution of O. A. Kaufman, a famous Russian statistician, who was the first to propose a scientific definition of statistic table and to lay the background classification of statistical tables, which nowadays is used widely in statistic science.

Following the analysis of advantages and disadvantages of the classification of statistical tables, found in the literature, a new classification is provided by the author.

Keywords: *tabular method, statistical table, main elements and types of statistical tables, subject and predicate of statistical table, elementary statistical table, sectional statistical table, combinative statistical table, classification of statistical tables.*