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## DEVELOPMENT OF STATE STATISTICS

### MODERNIZATION OF STATISTICAL PRODUCTION IN THE RUSSIAN FEDERATION

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The author presents his understanding of the term «modernization» in relation to official Russian statistics and identifies its development stages; he also reveals the current conditions (international dimension, the challenges of our time) that dictate the need for further reforms related to the production of statistics in the Russian Federation. Special attention is paid to the key direction of modernization of the official Russian statistics - implementing the 2008 SNA into the national practice, which is impossible without a significant strengthening of the inter-agency cooperation and coordination. In the article, along with the questions concerning the development of the SNA, are formulated main directions for further reform of the social and demographic statistics, sample household surveys; statistics of economic activity, employment and unemployment; agricultural statistics, innovation statistics, information society statistics, standardization and centralization of the statistical production technology, increasing the transparency of statistics.

The author emphasizes that the transition to the new format of the national accounting means the revision of the methodology for compiling accounts, carrying out new statistical surveys and development of classifications, implementation of the innovative technologies for collecting and processing of the statistical information required for different types of its users. As a result, a more complete description of the Russian Federation economy will be obtained, analytical potential and international comparability of indicators will increase (which should improve the way they are perceived by the potential investors, affecting the investment climate), along with the quality of regional statistics.

*Keywords*: modernization of the Russian state statistics, integrated statistics, the SNA, social and demographic statistics, sample household surveys, statistics of economic activity, employment and unemployment, agricultural statistics, statistics of innovation, information society statistics, standardization and centralization of the statistical production technology, openness of statistics.

*JEL*: C82, E01, H11.

## MATHEMATICAL AND STATISTICAL METHODS IN SOCIO-ECONOMIC STUDIES

### IDENTIFICATION OF THE UNOBSERVABLE COMPONENTS IN THE OUTPUT TRAJECTORY: POTENTIAL LEVEL AND GAPS

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The authors systematize the most well-known concepts and definitions of potential output and gaps according to the various economic schools approaches. The article also provides a typology of basic econometric methods for estimating potential level and output gap in the national gross product dynamics.

The authors give a brief description of various econometric methods of statistical decomposition of the Gross Value Added dynamics for long-term potential level and short-term deviation - from simple statistical filtering to complex dynamic stochastic general equilibrium models. In particular, they describe properties of one-dimensional filters, which are based on statistical evaluation of interrelations only in the output dynamics, with decomposing long-term level by probabilistic methods without taking into account any settings of economic theory. Also, authors examine advantages and disadvantages of multi-dimensional and structural methods for estimating potential levels and output gaps, which allow considering the economic interrelations through inclusion of additional relevant variables. These include multidimensional Hodrick-Prescott filter, multivariate models with unobserved components, structural vector autoregression models, and stochastic dynamic general equilibrium model.

The analysis of decomposition methods and numerous studies devoted to this problem lead to conclusion that decomposition of time series for long-term and cyclical components is not a trivial task, which may have a unique solution. Many of decomposition methods are sensitive to input data, including presence of additional parameters in the model, therefore more complex algorithms may show poorer results than algorithms based on statistical analysis, without taking into account an economic nature of investigated series.

The results of the research substantiated the assumption that finding the best decomposition method in various countries is possible only through empirical studies.

*Keywords***:** business tendencies monitoring, business cycles, potential output, output gap.
*JEL*: E32, C81, C82.

## MEASUREMENT OF BUSINESS ENVIRONMENT FOR SMALL ENTERPRISES BY MEANS OF COMPOSITE INDICATORS

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In this article are put forward, tested and proved the conceptual and data-measuring hypothesis about the possibilities of building and using composite indicators of business conditions that summarize economic situation in small enterprises and have a statistically stable relationship with the dynamics of growth cycles reference statistics. Theoretical model and description of tools necessary for constructing composite indicators of business environment for small enterprises are presented.

On the example of the development of indicators of retail trade environment all the nuances of the industry specific construction of composite indicators are reflected. Using tracer based on its phase movement, new visualization and analytical representation capabilities of a cyclic profile in the dynamics of the market retail environment indicator are demonstrated. New information and analytical capabilities of the application of non parametric information in the estimation of the existing and expected development of small business enterprises are defined.

*Keywords*: small business, business conditions, indicator of retail trade environment, business cycle tracer.
*JEL*: E32, C81, C82..

## REGIONAL STATISTICS

### STATISTICAL ANALYSIS OF THE SYSTEM OF HIGHER EDUCATION IN THE CENTRAL FEDERAL DISTRICT

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The article presents the results of the study, which aims to evaluate the condition of higher education system in the Central Federal District (CFD) on the basis of statistical data from the project - Monitoring the efficiency of higher educational institutions in 2014. The higher educational institutions have been arranged into groups according to various criteria: status, organizational and legal form, specialization, number of students and departmental affiliation. The article analyzes the location of higher educational institutions within the district and the distribution of the reported number of students at institutions of various types and groups of specialties (majors).

According to the results of the research the majority of the state higher educational institutions in the CFD are located in major cities. Private universities and branches are mainly located in small and medium-sized cities. Approximately one third of higher educational institutions is affiliated with the Ministry of Education and Science of the Russian Federation and is attended by 59,1% of the students in the district. The proportion of non-state higher educational institutions is also considerable (43,2%); however they are attended only by 8,4% of students. Higher educational institutions affiliated with the sectoral ministries, generally offer specialties corresponding to the profile of the ministry. The most popular fields of study in the CFD are: «Economics and Management» and «Humanities»; almost half of the total number of reported students is enrolled in them.

*Keywords*: monitoring of the effectiveness of higher educational institutions, educational statistics, regional systems of higher education, educational policy.

*JEL*: C82, C83, I21.

### ANALYSIS OF INFLUENCE OF ZONAL CONDITIONS ON GRAIN PRODUCTION IN THE REPUBLIC OF BASHKORTOSTAN

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This article substantiates the necessity of statistical analysis (at the regional level), along with macroeconomic, internal factors, external (natural) causes of the increase of costs in agricultural production in order to make informed decisions on the implementation of measures aimed at reducing the negative trends due to increased costs and, respectively, to increase the efficiency of production of grain. Data on the formation of the cost, prices and profitability of grain from the major producers - agricultural enterprises of the Republic of Bashkortostan - is organized. Statistics show that there is a dependency between the level of cost of grain, climatic and production-and-economic conditions in certain geographical areas.

The authors provide evidence base in support of the conclusion on an unequal value of certain factors affecting the change in the price of grain: climatic conditions have move influence than natural conditions of specific geographic areas; top priority objective of price reduction in steppe areas is increasing yields through introduction

of drought-resistant technologies in agricultural enterprises and reclamation works. On the basis of economic and statistical analysis is clarified the task of regional economic policy which is to increase the competitiveness of grain production in the country. According to the authors, it is necessary to create conditions for the transfer of grain production on a new technological basis in black earth regions that, unlike other geographical areas of the country, have favorable bioclimatic potential and significant resources for the production of crops.

*Keywords*: cost, price, profitability, grain, zones, statistical characteristics of dynamics.
*JEL*: E01, Q10, R11, R58.

## RETROSPECTIVE ANALYSIS

### TIME-SERIES FOR THE REAL SECTOR OF THE RUSSIAN ECONOMY (FROM THE LATE 1920S UNTIL 2014)

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Using previously unpublished data stored in Russian archives, the author reconstructed key yearly series of aggregated indicators for the results of production activities in the following sectors of economy: industry, agriculture, railroad transport, housing construction - in the RSFSR and the Russian Federation, starting from 1928. Whereas, in the research the emphasis is laid on physical indicators, i.e. they had no distortions due to improper deflators, which is typical for a sufficiently long period of Soviet statistics. Together, these series of indicators allowed to monitor changes in the level of economic activity in the RSFSR / Russian Federation for nearly 90 years, whatever was the cause of the change - the decision of the authorities, the world market situation or the exhaustion of the resources of a particular model of economic growth.

*Keywords*: economic history, industrial production, agriculture, railroad transportation, residential construction, official statistics, alternative estimates, the RSFSR, Russia.
*JEL*: N54, N64, N74.

## SCIENTIFIC REPORTS

### THE ROLE OF PRODUCTION DECLINE CURVES IN THE ECONOMIC EVALUATION OF OIL SHALE RESERVES

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The article considers economic prospects of shale oil extraction in the United States using the example of materials from the controversial May 2015 presentation of the famous financier David Einhorn. The author considers Einhorn's «statistical» arguments which allow him to see signs of a «financial bubble» in the US shale oil production. A careful analysis of these calculations carried out in the framework of the standard discounted cash flows approach, shows that behind his most controversial findings may lie the inflated by about half the estimate of the volume of capital costs in the oil production costs, which, in turn, was due to the implicit underestimation of the key parameter - decline of oil wells debit. Having corrected this error, Einhorn's calculations produce results that comply with both the companies' estimates and stock market valuations. Thus,

was identified a slight gap between critical statements made by the author of the presentation and calculations they are based on.

It is the author's belief that the answer to the key question of the debate provoked by the publication in the current economic periodicals, the question of «option value» of reserves of shale hydrocarbons in the US, can not be found within a deterministic approach used in the publication that has sparked such a massive public outcry. On the contrary, it requires using formal stochastic models.

*Keywords*: economics of oil production, shale oil, «financial bubble», valuation of investment projects, deterministic approach, stochastic model.

*JEL*: L71, N52, Q41, Q47.