ABSTRACTS

B. A. Malitsky

Analysis of Science Development in Ukraine in the Science Policy Context

An approach to the chronology of the Ukrainian science & technology system development over the latest 25 years is proposed. Five phases in its development are distinguished depending on peculiarities and conditions of transformation processes in R&D, science and innovation policies in particular, and change in the R&D capacity parameters: the first phase (1991 1994),the second phase (1994 1999), the third phase (1999 2005), the fourth phase (2005 2013), the fifth phase (2013 2015). It is shown by in-depth analysis of each phase that measures taken by the government at the earlier three phases and aimed at creating regulatory framework of R&D in independent Ukraine, stimuli for science & technology and innovation, building up new entities of innovation type, setting up continual dialogue of power authorities and the national scientific community, introduction of the innovation-drive model for economic restructuring in Ukraine, were, in fact, lifted at the later two phases, including on the grounds of the so called "optimization"; as a result, the national R&D was denied the priority status, and the negative change in it aggravated to the destructive scale; it is demonstrated that the quality of political and economic institutes and their capacity to pursue real reforms is a critical factor for introduction of the innovation-driven model of economic development in Ukraine.

Keywords: *science, gross domestic product, research and development, research and development financing, science and technology capacities, science and technology sector, innovation model.*

O. B. Salikhova, H. O. Bak

Building up the Mechanism to Manage Foreign Technology Transfer for Innovation-Driven Economic Development in Ukraine

The framework conditions that need to be created in Ukraine to attract advanced technologies, increase positive effects and eliminate negative effects from their implementation in the national economy are discussed. Analysis of concepts of effective foreign technologies transfer in a national economy leads to the conclusion that policy mechanisms for foreign technology transfer won't be capable for bringing the maximal effect in a recipient country unless the investment-friendly framework conditions and macroeconomic environment are created in it. Poor performance of the Ukrainian macroeconomic environment is shown by data of international ratings. The conception of management mechanism for foreign technology transfer in high tech industries of Ukraine is proposed, involving solution of three basic problems: creation of the framework for advanced technology transfer; integration of foreign technologies in national development plans; maximization of economics effects and minimization of economic risks from foreign technology transfer.

Keywords: *technology transfer, transnational corporations, direct foreign investment, internal investment, industry, modernization, innovation, state policy.*

V. A. Denysiuk, O. M. Khutornoy

Analysis of Economic and R&D Performance in the Southern Region of Ukraine

Economic dynamics in the Southern Region (SR) of Ukraine and its administrative-territorial units (Mykolaiv, Odesa and Kherson oblast) is studied by comparing the measure of gross regional product (GRP) in reported prices and reference process of 2005, for the period of 2005–2015. Results of GRP computations in reference prices of 2005 show no evidence of real reforms to improve the economic performance in the above mentioned territorial units of SR in this period. Analysis of R&D in SR is made by data of the State Statistics Service of Ukraine for 2010–2015. Peculiarities of R&D process in SR in "Basic research" and "Innovation" areas in 2012–2015 are analyzed by data from the South Scientific Center of the National Academy of Sciences and the Ukrainian Ministry of Education and Science. Recommendations on intensification of economic and R&D activities in SR are made.

Keywords: *Southern Region, gross regional product, research and development, Southern Scientific Center, science and technology activities, basic research.*

I. A. Zhukovich

Method for Calculating Summary Index on Innovation for Analysis of Data from Community Innovation Survey of Enterprises

The method for calculating Summary Index on Innovation (SII) is discussed. SII is a weighted aggregate indicator consisting of a number of indicators and enabling for evaluating the innovation performance. The data source for calculating SII are data of the official statistical observation "Survey of innovation of the enterprise" conducted in Ukraine by international methodology Community Innovation Survey (CIS). The system of indicators used to calculate the index system is open, as the nomenclature of basic indicators can be modified depending on the purpose of the study. The method for calculating SII is universal, as it can be used for ranking companies by innovation performance by region, by economic activities nationwide and by region, by field of activity. Also, using the Eurostat database, the method makes it possible to carry out a comparison of the innovation performance in Ukraine and the countries covered by the innovation activity survey of enterprises, conducted by CIS methodology. The data from the innovation activity survey of enterprises in 2015 (for 2012−2014) is used for SII computation for Ukraine. The enterprises were ranked by the innovation performance by region and economic activity.

Keywords: *innovation, innovation survey, aggregate indicators, Summary Index on Innovation (SII), ranking.*

T. A. Sergeyeva, A. V. Elskaya

Biosensors. A Combination of Biotic and Abiotic Nature

The paper describes the main principles of development of analytical devices of the new generation − biosensors. The main prerequisites for development of biosensor technology as well as areas of application of these devices are reviewed. A structure (the main components) and the principles of operation of biosensors as well as classifications of these devises based on a type of a physical transducer and a biological material used as a selective element of a biosensor are discussed. Advantages and disadvantages of biosensors' application in analytical biotechnology are reviewed. Alternative approaches towards creation of highly-stable biosensor devices, where biological macromolecules are substituted with their synthetic counterparts (polymers-biomimics), are described. Achievements of both leading foreign scientists and authors of the present paper in biosensor technology are described as examples of biosensors. The outlook of biosensor technology is also discussed.

Key words: *biosensor, biosensor technology, polymers-biomimics, molecularly-imprinted polymers.*

I. A. Bulkin

Priorities of R&D Financing per Employee in Ukraine in Disciplinary Aspect

A method for evaluating science & technology priorities in Ukraine by Classification of Science Fields (CSF) and R&D financing per R&D employee (financing per employee) is proposed. Objects of priority evaluation are "groups of sciences" and "scientific disciplines", obtained by breaking the set of CSF objects to show the specifics of R&D financing at group and discipline level compared to the average in the national R&D system (system average). The priority of "scientific disciplines" and "groups of sciences" is evaluated by: financing per employee compared to the group average and the system average (for scientific disciplines), and compared to the other group averages and the system average (for R&D groups); duration of the latest period with positive trend in financing per employee; dynamics of R&D employment in an evaluated object and the object size in terms of personnel compared with the other objects at analogous classification level. The study shows that at the level of "groups of sciences" priority ones are technical sciences, although their leadership is an effect of the declining R&D financing in the other groups of sciences in the latest two years. In 2006−2012, social and technical sciences had equal priority, enabling to qualify social sciences as priority objects in the past. The range of priority objects at discipline level in 2015 was very narrow: chemical sciences in the group of natural sciences, chemical technologies in the group of technical sciences, arts criticism in the group of humanities, and national security in the group of social sciences.

Keywords: *Classification of Science Fields, object of Classification of Science Fields, research and development, group of sciences, financing per employee, group average, system average, priority.*

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T. V. Fomina, T. V. Koshman
Evaluating the Scientific Result of an R&D in Medical Field: Methodological Improvements

A review of recent international and national trends in model building for R&D projects evaluation in research institutions, with emphasis on models in medical field, is given. A framework model for evaluating the scientific result of a R&D project in the field of children's and teenagers' healthcare is constructed, where the scientific result is evaluated by the components of information resources and innovation resources. The average score for each component of information resources and innovation resources of a R&D project, their weight coefficients and the weighted score for the scientific result of a R&D project are derived by computer processing of experts' responses. The model is designed as a tool for quick analysis and continual quality monitoring of the scientific results of individual R&D projects.

Keywords: *evaluation, science and technology activities, research and development project, scientific results of a research and development project, information resources, innovation resources.*

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Bibliographic Analysis and Monitoring of Mass Media Publications Devoted to R&D Problems and Activities of the NAS of Ukraine over 2004−2008

The capabilities of national mass media in fostering the socially significant image of R&D and science & technology activities of the National Academy of Sciences (NAS) Ukraine are assessed by data from the monitoring of publications devoted to R&D in national mass media over 2004−2008. The monitoring methodology is highlighted. Analysis of data is given, related with thematic range of publications in national mass media on R&D problems and activities of the NAS of Ukraine (rating of periodic mass media by number of articles devoted to R&D problems and activities of the NAS of Ukraine, rating of thematic headings by publication in national mass media), information activity of academicians and correspondent members of the NAS of Ukraine in national mass media, characteristics of articles' content. The divisions of the NAS of Ukraine with the highest information activity in national mass media are defined by monitoring data.

Keywords: *monitoring, national mass media, National Academy of Sciences of Ukraine, information activity, academicians of the NAS of Ukraine, correspondent members of the NAS of Ukraine.*

S. A. Khorosheva, Yu. O. Khramov
S. P. Parnyakov and His Science and Technology School

This article is the first one containing an account of science & technology work of S. P. Parnyakov as a team leader; emphasis is made on his characteristic qualities of a scientist, an engineer and a human, his contribution in rocket-building, enabling him to establish and develop his science & technology school in development of aiming devices in ground-based missiles and sea-based missiles, and mother missiles.