

INDEXES SYSTEM OF TECHNOLOGICAL CONDITION ASSESSMENT OF ECONOMIC BRANCHES

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Abstract. The increased level of innovative production process, connected with the current trends, points out the necessity of economic diversification of the whole national economy as well as regional economies in order to increase competitiveness and stable development. Russian regional economies are characterized with local directive of development and innovative processes have evident local vector. Intensive development of Siberian regional economies, which depends on oil and mining industries, considerably falls behind the world indicators according to the GRP output per head. To improve the quality of economic space the authors have suggested a new scientific approach, which allows qualitative assessment inside the economic space of resource-based regions, based on principles of high technological modes development inside economic branches taking into account density, regular enterprise distribution and connectivity of commercial organizations as well as secures innovative development of regional economy and its competitiveness. In this context it is necessary to develop a modern system of indexes, characterizing the structure of economic branches in accordance with present technological modes and at the same time the dynamics of appropriate structural shifts in regional economies of this type.

Economic growth in Russia is mainly formed due to mining and processing industry which provides over half of all the budget revenues of the country.

Emerging of economy at the cost of primary sector determines extensive rather than intensive modification of the development of the country. High prices on world commodity markets in primary resources have made a tangible contribution to the maintenance of high rate in GDP growth.

The decline and subsequent shutdown of resource-intensive productions in the 90s had a positive impact on the decrease in unit costs of product release of the industrial sector as a whole, having enhanced the efficiency in the use of resources. This situation had a short-term effect and has led to the generation of appalling records in the costs of resources for the production release in the process of demand recovery. It was partly achieved due to the increase in the rate of the load of manufacturing facilities close to the optimum level (75 – 85%). The average age of equipment in the industrial sector has risen from 8.5 to 22 years which practically means the need to replace more than 40% of the total volume of basic production assets. GDP growth rates data published in the press reflect quantitative changes taking place in terms of extensive as well as intensive constituents of the economic growth [1].



By the end of 2013 the deterioration rate of basic assets had been equal to 48.6% in the whole country, 53.7% for enterprises of mining industry and 47.8% for manufacturing industries [2]. The existence of physically and mentally worn-out basic assets results in inefficiency of their use and insufficient rates of renewal restrain the modernization of the economy as a whole.

The current management techniques, which develop regional economic and social systems, are accomplished with the application of official data taken from statistical records containing a limited number of indicators, which define the technological condition of regional economy branches [3]. The relevance of present inquiries is emphasized in the President's Message to the Federal Assembly on 12th December 2013 devoted to the 20th anniversary of Russian Federation Constitution: "... I propose to establish the statistical estimation system of the technological condition level in industry sectors in order to have an objective picture of our competitiveness" [4].

The establishment of regional economic space assessment system requires selection of appropriate national measures, introduction of some new measures and their distribution based on economic space assessment criteria.

According to up-to-date theoretical principles of regional economy the regional economic space quality is identified with the following characteristics: density, distribution and connectivity. It is essential to generate main assessment quality indicators of regional economic space in accordance with these particular criteria [5].

The system of indicators, characterizing economic space quality of resource-based area in response to technological condition evaluation of industry sectors and allowing to conclude a proper correspondence of the economic situation within a resource-based area between the challenges of economical globalization, has been clarified on the basis of specialists' expert evaluation in the field of regional economy (chart 3).

Table 1. Indexes system of economic space qualitative evaluation within a resource-based area.

Groups of indexes	Economic maintenance of basic indexes
1. Agglomeration and the density of resources distribution	
1.1. Resource capability indexes	Land resources, natural and inorganic resources, water supply, forest and other natural resources per km ² .
1.2. Urbanization and economic density indexes	Quantity of urban settlements, cities of regional and territory significance, agglomerations, megacities and megalopolises in the region. Amount of economically active population, economic density and others.
1.3. Economic enterprise density indexes	Amount of industry, construction activity, farming complex, market, human services enterprises, units of production and non-production infrastructure per km ² .
1.4. Communication lines density indexes	Percentage of all the means of transport, communication, internet resources enterprises per km ² . The length of railways and highways per km ² .

1.5. GRP amount density indexes	Amount of territory GRP which indicates the way GRP value corresponds to the territory size where the product is manufactured.
1.6. Budget potential indexes	Regional and local taxes and duties, federal taxes allocations in accordance with standards, the capacity of grants, subventions, subsidies, transfer payments and others.
2. Traffic and delivery acceleration, connectivity and disposition	
2.1. Transport infrastructure development indexes	Rapidity of economic cycles and processes. Capacity of all the means of transport traffic flow, length of highways and railways, federal paths, oil and gas pipeline routes and others means of transport.
2.2. Information infrastructure development indexes	Connectivity and access to Internet host, amount of Internet users, ICT competence, local calls cost, toll line, Internet providers market, telephone lines. Percentage of computers, fixed line and mobile phones users and others.
2.3. Uniformity indexes of regional population distribution (variations)	Variations of typical uniformity distribution of population over the territory of a resource-based region as the standard deviation attitude of the featured interest towards its equidistributed estimate.
2.4. Uniformity indexes of regional enterprises and sectors distribution over the regional territory (variations)	Variations of typical uniformity enterprises and sectors distribution over the territory of a resource-based region as the standard deviation attitude of the featured interest towards its equidistributed estimate.
3. Technological condition of economic sectors	
3.1. Indexes of sectors with high technological modes	The percentage of sectors with critical technologies, approved by the Russian Federation President's decree № 899, from 7th July 2011. The unit weight of 5th, 6th and higher mode sectors in the economic system.
3.2. Conversion indexes of technological state of economy	Indicators of income transportation sources from low technological mode sales towards the development of technologically high mode sectors (creation of regional reserve funds due to the partial income transfer from mining industry production sales) and others.
3.3. Science and innovation potential	The volume of innovative output. Scientific

indexes Import substitution programmes	research charges, the amount of innovative product and processes developments or applications, the structure and the percentage of enterprises involved into innovative activity, number and structure of staff employed in R&D.
3.4. Investment potential indexes	Fixed capital investments due to all the sources of finance, overhaul charges for enterprises and organizations, capital investments into the economic potential development.
3.5. Innovation transfer and extension indexes	The amount of shared innovative projects, created with associated companies. Existence of organizational framework of innovative promotion management. The number of staff employed in innovative promotion management. The volume of innovative promotion charges.
3.6. Indexes of strategic and lawmaking initiatives	Existence of investment projects and business initiatives including those which have been checked by local government, tenders and proposals submitted to alter present legislation and innovative climate in the field of innovative activity.

The novelty of a modern approach for the qualitative assessment of the resource-based regional economic space is to supplement the system of existing indicators such as “density”, “connectivity” and “distribution” with a fresh block of indicators, defining the technological condition in economic sectors of a resource-based region and innovative potential development of the territory. At the same time it is supposed that the technological condition level in economic sectors of resource-based region depends on primary ratings, which are connected with density, connectivity and distribution, in other words the processes of traffic and delivery acceleration and agglomeration, of economic space quality.

These indicators are apt to evaluate technological condition of regional economy sectors, which should define the tendencies towards the overcoming of raw subordination in regional economies, single out prospective projects of import substitution and develop innovative industries, so that to ensure competitiveness.

On condition that national economy is switching over the innovative course of development modern organizational and qualitative requirements of the economic space within a resource-based region have pointed out the necessity for the extension of basic qualitative assessment criteria inside the economic space, allowing estimation of technological condition among regional resource-based economies that promotes the economical upturn of regional self-sufficiency and their competitive strength as competent market players.

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