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Research Article

MECHANISMS TO ENSURE THE TRANSITION OF THE ECONOMY OF THE SUBJECTS OF THE MACROREGION TO THE NEW TECHNOLOGICAL STRUCTURE

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Abstract:

The article analyzes the state of technological structures of the macroregion under study, identifies the dominant structures, considers factors, including investments, the introduction of fixed assets and the level of education that influence the formation and development of the technological structure. A direct correlation has been revealed between the increase in the educational level of those employed in the economy and the increasing level of the technological structure. The ways of modernization of technological development that are possible for the macro-region are determined on the basis of the choice of the strategy of catch-up and advanced development. The main result of the work is the conclusion that knowledge of the state of the technological structure of the region will allow to outline a strategy for its development, that a high educational level of people employed in the economy and social sphere will allow the region to move to a higher technological level at a faster rate. The implementation of the strategy of catching up and advancing development is designed to implement technological innovations that should lead to an increase in labor productivity, renewal of fixed capital and increased competitiveness, which will change the structure of the economy, determine the most important areas of its modernization. The methodological base of the research is based on the use of a systematic approach and general scientific methods: scientific abstraction, analysis and synthesis, synthesis, system-structural analysis.

Keywords: *macroregion, technological order, fixed assets, investments, education, technological development, NCFD.*

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INTRODUCTION:

At present, the main resources for the development of the economy are intellectual and scientific and technical potential. As a result of the use of innovations and new knowledge, there is a change in the technological structure of the economy, the buildup of elements of the innovation economy, the knowledge economy and the digital economy, a new technological structure is being formed. For the subjects of the industrial sphere, advanced technological developments, innovative products and human capital are becoming the main factors ensuring progressive development and competitive advantages. Issues and problems of technological structures are currently given little attention, it is believed that they have already been studied and should not be returned to them. However, non-use of the theory of technological structures in the development of the tasks of the technological development of the country, especially regions, their development strategies, lead to errors in forecasting and management, to the wrong choice of the main directions of investment, a formal approach to the necessary technological changes, inefficient use of innovation, knowledge and human capital.

Meanwhile, in advanced countries, the bulk of the increase in gross output is created by new knowledge, embodied in technology, new forms of organization of production, processes of education and training of personnel [1].

The technological structure forms not only the framework of the economy, but also other elements related to infrastructure and transactional industries. And not to take into account its state, level of development, peculiarities of functioning would be a superficial approach to managing the region.

The economy of the North Caucasus Federal District (NCFD), which is the object of our research, is dominated by the third technological order, while here are also the basic signs of the fourth way, there is a combination of them. The ratio between the structures is approximately in the range of "55% to 45%," in favor of the third structure. The third and fourth technological orders form the industrial type of economy.

The NCFD subjects need to complete the transition to the fourth technological order and prepare the basics of the subsequent order, begin the formation of an innovative economy and knowledge economy. The main task is to determine the course of transformation of the existing technological structure on the basis of new knowledge. But in order to solve these problems,

it is necessary to find out which way is dominant in a given region, on which resources it holds, what factors can influence the formation and formation of the next technological order. It is also important to choose such a strategy for technological changes in the existing structure, which will allow for a transition to a new, more progressive way of life.

Russian and foreign researchers made a great contribution to the study of the foundations of the formation and development of technological structures. The undoubted founder and initiator of the study of economic structures is N. Kondratiev, who put forward the theory of large conjuncture cycles [2]. The works of D. Lvov [3] and S. Glazyev [4] are of great scientific importance in expanding and deepening the foundations of the theory of technological structures. Of the works of foreign authors, the greatest interest is the work of such authors as K. Perez [5], S. Firmen [6], J. Rifkin [1], D. Rodrik [7]. Issues related to technological development were developed in the works of N. Komkov [8], K. Schwab [10], and others.

The main disadvantage of the existing literature is the small number of studies characterizing the state of the technological structure in the macroregion and its relationship with the factors that shape it and can ensure its transformation and modernization in order to move to a higher level of development.

MATERIAL AND METHODS:

To achieve these goals, a systematic approach was used with the use of statistical analysis and determination of weighted average values, as well as the integral level of the technological structure. Calculations were made taking into account the opinions of experts. To assess the consistency of expert opinions, the coefficient of variation or the coefficient of concordance was used. In the course of the study, classical and modern works of domestic and foreign scientists on the subject under study were used, as well as general scientific methods: analysis, synthesis, system-structural analysis. Applied and specific techniques, in particular, expert. The objects of study are the subjects of the North Caucasus Federal District (NCFD).

RESULTS AND DISCUSSION:

An important feature of the economy of the district is its multi-structure and high level of technological heterogeneity. Technological multistructure production is today becoming one of the main problems of the development of the district economy. The features of heterogeneity and multi-structure manifest themselves in the coexistence of industries

that belong to different structures, and in their development they rely on resources that differ significantly in their qualitative characteristics, as well as the presence of highly qualified and unskilled personnel, the use of advanced and outdated equipment. Multi-structure is a sign of any economy, and is its usual state, but it can be developing provided that lower orders communicate with higher ones and are gradually replaced by them. In the NCFD economy, the production of outdated technological structures continues to function, and their positions are being strengthened. According to many researchers, the conservation of the existing multi-pattern in time and its long-term preservation lead to accumulation of imbalances, technological obsolescence and loss of competitiveness. Accordingly, there is a need to form an adequate technological policy, which provides for the replacement of an inefficient technological structure with a new one. The implementation of such a policy involves the development of programs for the modernization of industries that operate on the basis of modern technologies and form a new technological structure.

The main reasons for the need to move to a new technological order are changes in society and the economy, associated with an increase in the level of competition both between market actors and between countries, the emergence of new needs in various areas, from household to military. A situation is created in which new requirements become impossible to satisfy with the tools (technologies) of the existing technological order. Of course, as a result of scientific and technological progress, significant changes can occur in the structure of the technological population, which are capable of reconstructing the "internal content" of this technological order, raising the speed and level of production to a higher level. However, this does not mean that a transition to a new or new technological level has occurred or is taking place. The emergence of a progressive structure is associated with the emergence of a new key factor - the core, and the formation of new industries based on it (the key factor), as well as the training of workers with relevant qualifications.

To solve this problem, researchers have proposed different approaches. As noted by J. Tulchinskaya and D. Kurochkin, "the transition from one technological mode to another has a discrete-evolutionary character. Technologies of the dominant lifestyle require specialists with certain skills to enable them to implement the content of technologies of the new technological order. Such

personnel should be developed (trained) in parallel or ahead of the stages of the emerging structure. Advancing development should undergo not so much staff as interaction system, part of which is a certain system of management activities, within which it is possible to provide conditions for the implementation of technologies that form the core of the technological structure "[9].

The development of advanced technologies and the emergence of new production schemes radically change the existing economic structures, in addition, the emergence of completely new industries. New technologies and related processes violate the homogeneity of technological development, which leads to a change of technical and economic paradigm, as it was called K. Perez and K. Freeman [5, 6]. Or there is the emergence of new technological orders [2-4], which are radically and more rapidly than before changing the economy and society. This process in different countries is at different stages, but the general trend is that the industry 4.0 begins to act as the main driver of the country's development. [10].

In order to develop long-term strategies and make sound management decisions, it is important to know what the structure of the studied economy is, what technological structure dominates here and how to determine the integral level of the technological structure.

Using these methods, technological structures were determined that function in the economy of the North Caucasus Federal District, to which the integral level corresponds, and the conditions of technological structures by regional entities are considered. As a baseline, the data on the structure of the GRP of NCFD subjects for 2005 and 2016, the number of people employed by economic activity for 2005 and 2017, by level of education for the same period, the sectoral structure of fixed assets, the introduction of fixed assets and fixed investment by economic activity. All indicators are calculated for each subject of the NCFD, in addition, for all the studied criteria, summary tables were prepared for the whole district.

In the course of the study, an attempt was made to establish the contribution of each of the factors that are involved in shaping the technological order and contributing to its renewal and development. The following results were obtained:

- investment in fixed assets - 46.8%;
- commissioning of fixed assets - 38.7%;
- higher and secondary special education - 14.5%.

In our opinion, the most important outcome of this analysis is that the increase in the level of technological structure is directly influenced not only by material factors - investments and input of fixed assets, but also non-material factors, namely, the level of education (knowledge) of human capital. By the way, in those NCFD subjects where the number of people employed with higher and secondary special education increased during the study period, the growth of the integral level of the technological structure is higher. Hence, we can draw the following conclusion: in order to accelerate the transition to a higher technological order, to pursue a policy of re-industrialization, the formation of an innovative and digital economy, district actors should give priority to education in the broad sense of the word.

CONCLUSION:

In the Russian regions there are negative processes in various spheres of the national economy that can be overcome with the directional development of research activities and the use of high technologies. To do this, it is necessary to find out the state of the regions at the present stage in order to organize an effective transfer of technologies and technological developments to the development of the economy and the social sphere.

An important feature of the NCFD economy is its multiple structure and high level of technological heterogeneity. The features of heterogeneity and multi-patterns manifest themselves in the coexistence of industries that rely in their development on resources, which differ significantly in their quality characteristics. In the constituent entities of the district, there are quite acute problems of structural and technological transformations of production and economic systems, in order to form production of modern technological structures, allowing to create a competitive economy and ensure sustainable economic growth.

For the studied macro-region, most of the problems can be solved on the basis of new industrialization (re-industrialization), which will allow to increase the rates of economic growth and development. The study of the structure of technological structures of the district's economy showed that structural and technological changes in the economy were largely carried out spontaneously, using current macroeconomic competitive advantages, which led to intersectoral distortions and changes in the production structure, indicating essentially deindustrialization of production in the district. There was a peculiar restructuring "vice versa" - towards the dominance of low-tech, energy-intensive and

environmentally flawed industries.

Currently, NCFD is in the industrial stage of development. The main task is to complete this stage and, based on the use of advanced technologies and increasing the scientific and technological level of enterprises and industries, to ensure a transition to more progressive technological structures. Achieving the goals depends on the level and pace of scientific and technological development, as well as on the choice of catching up or advancing development strategies. For NCFD subjects, the most acceptable is a combination of these strategies with adaptation to the conditions and state of the region's economy.

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