

MECHANISMS OF STIMULATION OF AGRARIAN SCIENCE FOR THE PURPOSE OF HARMONIZING FEDERAL AND REGIONAL INNOVATION AND INVESTMENT POLICY

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Abstract

Improving the competitiveness of the agro-industrial complex in the context of an imbalance in the global food market and a tough sanctions policy can be achieved by stimulating the innovation and investment activities of regional and sectoral agricultural systems. The purpose of this article is to improve approaches to the optimal distribution of investments in agriculture and to develop tools to stimulate innovation and investment activity. It has been empirically proven that in Russia the priority areas for the use of investment resources are significantly underfunded, which is a blocking factor in increasing the competitiveness and economic growth of the agricultural sector of the economy. New investment mechanisms aimed at further improvement of regional and federal investment policy have been studied. Measures to stimulate innovation and investment activity are proposed and a pool of indicators for assessing indirect effects is substantiated. A mechanism for the development of the agro-industrial complex was developed on the basis of systemic mediation with the substantiation of the functions of an innovative mediator as a link between the institutional actors of the organization. This mechanism makes it possible to increase the efficiency of institutional interaction between the stakeholders of the innovation process, ensures planning and coordination of fundamental and applied research at the federal and regional levels.

Key words: innovation, agro-industrial complex, structural transformation, agricultural science, investment resources, system mediation, planning and coordination, harmonization

INTRODUCTION

In the context of an imbalance in the global food market and a tough sanctions policy, there is a need to increase the production of domestic agricultural products and develop import substitution. In accordance with the national development goals for the period up to 2030, the task was set to achieve outstripping growth rates of GRP at a level of at least 3% per year and reach indicators above the world average [12]. The task was also set to increase the real growth of investments in fixed assets by at least 70% [2]. However, various factors influence the

increase in the efficiency of agriculture, and despite the increase in innovation and investment activity in some regions, stagnation is observed in the industry as a whole in Russia. [20]. The problems of increasing innovation and investment activity and the impact of investment resources on accelerating the structural transformation of the agrarian economy are based on the works of classical economic theory and modern conceptual approaches, the priority tasks of the country for a specific period of time. The theoretical and methodological foundations of the study were laid in the theory of capital, economic growth, economic cycles. Among

the founders, it should be noted J. Keynes, K. Marx, J. Stiglitz, J. Harcourt, I. Schumpeter, A. Damodaran, A. G. Aganbegen, I. A. Clark, S. Yu. Glazyev and others. organizational conditions for stimulating innovative development are based on increasing the effectiveness of interaction between institutions of government, science, business, marketing and information support in the process of creating, implementing, distributing and commercializing domestic innovative solutions [7].

In foreign countries, a model of interaction based on systemic innovative mediation has become widespread. "Systemic innovation intermediary" is an organization that functions between various innovation actors, facilitating and coordinating innovation activity at the system level [6]. The system innovation intermediary is capable of stimulating innovation and investment development, is aimed at smoothing out the weaknesses of the innovation system, thus ensuring the acceleration of innovation [8, 9].

MATERIALS AND METHODS

The purpose of the study is to develop methodological approaches to improving the mechanisms for stimulating agricultural science in order to harmonize federal and regional innovation and investment policies.

The methodological basis of the study was legal documents, studies of foreign and Russian scientists on investment activity, the formation and use of investment resources in agriculture and the agro-industrial complex as a whole. In order to implement innovative structural transformations of the agricultural sector, such methods as monographic, abstract-logical, analytical, economic-statistical and expert methods were used.

The information base for the analysis was the statistical data of Rosstat, the Higher School of Economics, the Ministry of Agriculture on innovation, research activities in agriculture, the financing of agricultural science; expert research materials.

RESULTS AND DISCUSSIONS

In modern geopolitical conditions and sanctions policy there is a need for an in-depth study of the processes of formation and use of investment resources in the agro-industrial complex. One of the most important indicators for assessing innovation and investment activity is the indicator of the share of gross capital formation.

Fig.1. shows the dynamics of the share of gross capital formation in GDP is presented on the example of the USA, Russia, India, China, Korea.

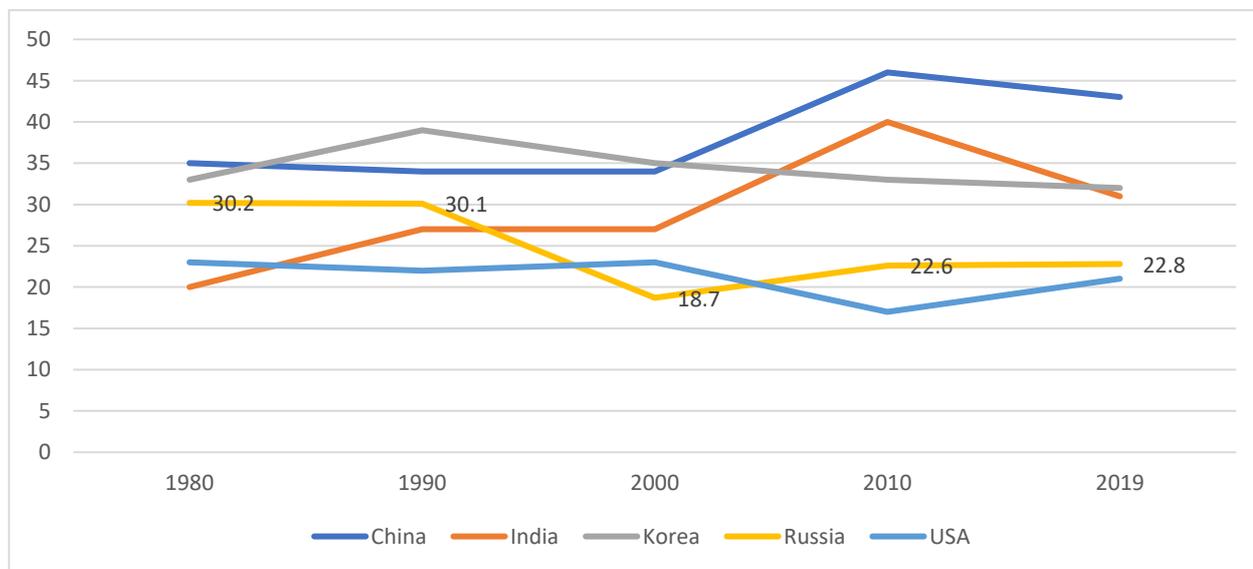


Fig. 1. Dynamics of the share of savings in GDP in various countries in 1980–2019, in %
Source: Own calculations based on data [14].

It can be seen that this indicator in China, Korea and other Asian countries remains at a fairly high level - about 30%. In Russia, this indicator has decreased compared to the earlier period and is now at a low level [10].

According to Maslova V.V., investment capital is formed from non-financial and financial investments.

These include investments in technology, machinery, equipment, productive livestock, intellectual property, non-produced non-financial assets, as well as long-term investments in bank deposits, stocks, securities, and other instruments [11].

An analysis of the level of funding for scientific research and their share in investment expenditures showed a value of 0.7% in the economy as a whole, and 0.003% in agriculture, which shows a huge gap and lagging behind agriculture from general economic indicators.

These values show a significant level of underfunding of strategic directions for the use of investment capital both in the economy as a whole and especially in agriculture [5].

An analysis of the personnel potential of agricultural science showed that in 2010–2020. there was a significant reduction (Fig. 2).

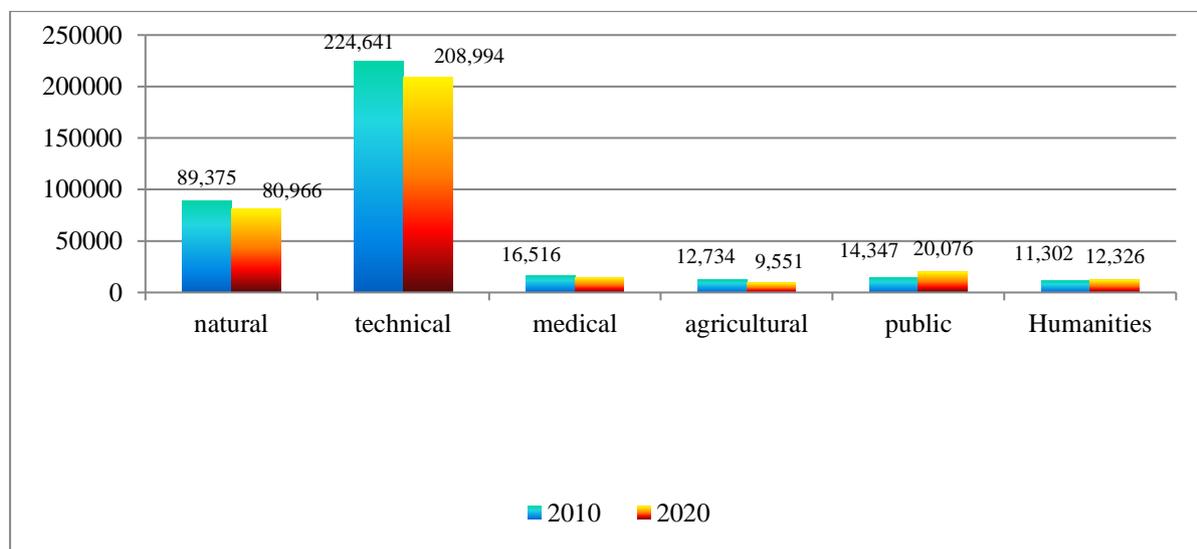


Fig. 2. Dynamics of the number of Russian researchers by fields of science (persons)

Source: Own calculations based on Rosstatdata [19].

The number of research scientists in agriculture over the past ten years has decreased by a quarter and amounted to less than 10 thousand people.

According to statistics, less than a third of the scientific organizations of the Ministry of Agriculture are engaged in research and development, 30–40 times less funding is allocated per organization compared to other areas of science. [4].

As agriculture is a highly labor intensive sector, productivity level in negatively influenced by labour input data while gross value added has to be intensified to contribute to the growth of agricultural output and gross value added [1,15,16]. A significant deterioration in the conditions for financing

Russian agricultural science confirms the ratio of government spending on agricultural science and the value added of agriculture. In such developed countries as the USA, Denmark, Austria, this figure ranges from 2.65% to 3.38%; in Russia - 0.37% [17].

Thus, the development of the scientific potential of the agricultural sector is largely constrained by the low scale of financing of agricultural sciences, which has a direct impact on the intensity of innovation processes in agriculture (Fig. 3).

Along with the low level of funding for scientific research, the innovative development of agriculture is significantly constrained by such factors as the weak interest of business in financing long-term

projects; insufficient level of state support compared to advanced agricultural countries, low level of implementation of digital

technologies, artificial intelligence and machine learning technologies.

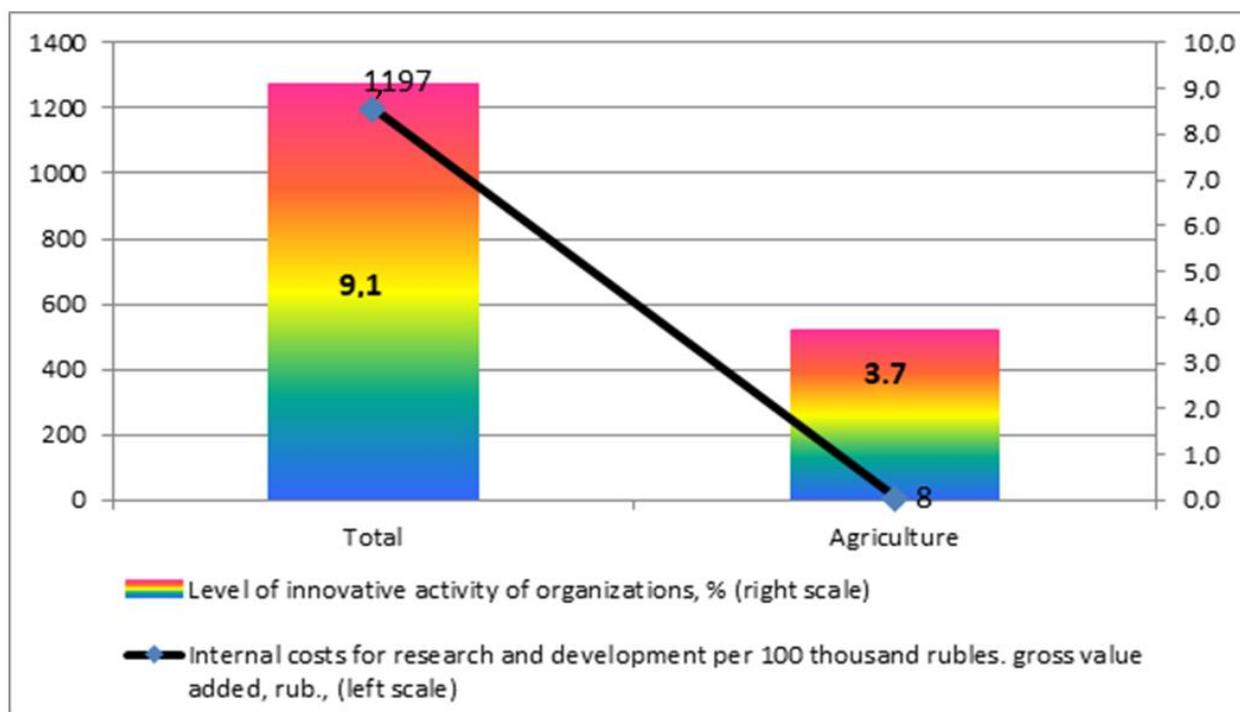


Fig. 3. The ratio of specific internal costs for research and development and the level of innovative activity of Russian organizations (2019)

Source: Own calculations based on data [18].

The agro-industrial complex is characterized by a pronounced inter-regional differentiation in the spread of innovations; regions often compete with each other for the location of high-tech companies.

The formation of an export-oriented agricultural sector of the economy predetermines the need to improve the innovation and investment policy based on the harmonization of management mechanisms at the federal and regional levels.

In the National Plan of Action to ensure the restoration of employment and incomes of the population, economic growth and long-term structural changes in the economy (National Plan), new investment mechanisms were proposed to further improve regional and federal investment policies based on the principles of strategic planning [21].

An assessment of fundamentally new investment instruments made it possible to identify the possibility of observing the principles of planning, coordination, flexibility, maneuverability and preventive

action in the ongoing federal and regional investment policy (Table 1).

The new investment policy measures are aimed at accelerating the technological development of the economy and require enhanced government support.

The study implemented the following hypothesis: achieving harmonization of federal and regional investment policies is possible subject to the principles of strategic planning.

An assessment of the new instruments of federal and regional investment policy showed their compliance with the principles of planning, coordination, flexibility, maneuverability and preventive action.

It should be noted the important role in achieving the harmonization of the federal and regional investment policy of such instruments as the use of the «investment standard» in the formation of portfolios of investment projects in the regions; redistribution of budget funds for financing capital investments.

To assess the effectiveness of the proposed measures, indicators of indirect investment effects (improving the quality of investments, increasing innovative activity, economic growth) can be used [22, 23].

Table 1. Evaluation of new instruments of federal and regional investment policy reflected in the National Plan

List of Investment Instruments of the National Plan	Compliance of federal and regional investment policy with the goal-setting principles of strategic planning
1. Creation of a legal and regulatory framework to increase the investments of companies with state participation, which are under the jurisdiction of the sector	Planning and coordination
2. Introduction of a mechanism for the implementation of special investment contracts	Planning and coordination
3. Formation of a «starting» portfolio of investment projects	Flexibility, coordination
4. Development of project financing tools for the investment phase of projects	Planning and coordination
5. Creation of an information and analytical system for supporting investment processes in the Russian Federation, including regional investment projects	coordination, flexibility
6. Formation of portfolios of investment projects of the regions using the «investment standard»	Planning and coordination
7. Accelerated development and support of technology companies	Planning and coordination
8. Mechanisms for promoting the implementation of investment programs of companies with state participation	Coordination
9. Redistribution of budgetary funds to finance capital investments	Flexibility, coordination, agility
10. Advanced construction of objects of regional (municipal) property on the terms of co-financing from the federal budget	Prevention, coordination, maneuverability

Source: Own calculations based on [13].

In order to increase the competitiveness and investment attractiveness of the agro-industrial complex, the article developed a mechanism for stimulating the innovative and investment development of the agro-industrial complex based on systemic mediation with the rationale for the functions of an innovative mediator as a link between the institutional actors of the organization.

This mechanism makes it possible to increase the efficiency of institutional interaction between the stakeholders of the innovation process, ensures planning and coordination of fundamental and applied research at the federal and regional levels. Systemic mediation predetermines the formation of a collaborative innovative culture of society, which increases the interpersonal and institutional level of trust in society [3].

Under these conditions, the creation of a systematic innovation intermediary, functioning as a coordinator between the actors of the innovation and investment

process and performing unique functions, will stimulate the introduction of advanced scientific achievements in agricultural production.

The mechanism of innovative mediation is intended for information and consulting support of commodity producers, training of highly qualified personnel, increasing the efficiency of scientific research, and expanding the integration of agricultural science and production. High innovative activity will promote economic growth in the agro-industrial complex of Russia, increase the competitiveness of commodity producers in domestic and foreign markets.

Considering the need to provide agriculture with its own veterinary drugs and other resources; development and implementation of domestic technologies, one of the most important tasks of system innovation mediation is the creation of equal conditions for competition for all forms of management. Increasing the innovative activity of small and

medium-sized businesses will help ensure the economic growth of the Russian agro-industrial complex, increase the competitiveness of commodity producers, develop rural areas, produce quality food, increase the economic potential of the industry and its competitiveness in foreign markets.

CONCLUSIONS

The study developed methodological approaches to stimulating innovation and investment development based on the improvement of economic and organizational conditions. The analysis of the processes of formation and use of investment resources in the agro-industrial complex has been carried out. The problems, trends and drivers of the innovative development of the agro-industrial complex are identified. It is substantiated that in Russia the priority areas for the use of investment resources are significantly underfunded, which is a blocking factor in increasing the competitiveness and economic growth of the agricultural sector of the economy. An analysis of the level of funding for scientific research and their share in investment expenditures showed a huge gap and lagging behind agriculture from general economic indicators and indicates a significant underfunding of strategic directions of development. The factors hindering innovation and investment development are identified: weak interest of business in financing long-term projects: gap between the creation and implementation of new ideas and technological solutions; insufficient government support for promising innovative projects. The necessity of observance of the principles of planning, coordination, flexibility, maneuverability and preventive action in the ongoing federal and regional investment policy is substantiated. The following hypothesis is implemented in the work: it is possible to achieve harmonization of federal and regional investment policy, provided that the principles of strategic planning are observed. Measures to stimulate innovation and investment activity are proposed and a pool of indicators

for assessing indirect effects is substantiated. A mechanism for the development of the agro-industrial complex was developed on the basis of systemic mediation with the substantiation of the functions of an innovative mediator as a link between the institutional actors of the organization. This mechanism makes it possible to increase the efficiency of institutional interaction between the stakeholders of the innovation process, ensures planning and coordination of fundamental and applied research at the federal and regional levels.

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