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Budgetary Mechanisms for Implementing the Priorities of Scientific and Technological Development of the Russian Federation

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Abstract. The need to determine the priorities of the scientific and technological development of the country and the effective financing of research and development dictates the application in practice of the ideas of the scientific budget. Based on the conducted research, the authors proposed the principles of the scientific budget, of which the most significant are: the priority of financing the most significant areas of research and development; ensuring a single targeted approach to managing the costs of R&D at all stages of the life cycle of scientific research and experimental development. The procedure for developing a scientific budget, from the point of view of the authors, consists of a number of stages. In particular, it is envisaged to assign additional functionality to the Unified State Accounting Information System of R&D related to the evaluation and selection of scientific topics (R&D projects), as well as determining the amount of funding for work from the federal budget. The algorithm for implementing the additional functionality of the system includes a procedure for determining the compliance of the R&D project with the priorities of scientific and technological development of the Russian Federation, evaluating the scientific and scientific and technical results of the project according to the criteria of the technology readiness level, as well as conducting a comparative analysis of the project under consideration with the average indicators of a sample of analog projects generated in the system automatically. The application of a methodological approach to assessing the effectiveness of the tools of the state program "Scientific and Technological Development of the Russian Federation" in the formation of the scientific budget allows us to draw conclusions about the need to optimize, expand or reduce the list of program tools. Evaluation of the effectiveness of the program tools is carried out according to the criteria: 1) necessity; 2) sufficiency; 3) the degree of contribution to the achievement of the goal.

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Introduction

The implementation of the priorities of scientific and technological development of the Russian Federation, among which is the achievement of technological sovereignty, involves pooling resources and efforts to solve key tasks, eliminating duplication and inefficient budget spending on research and development, overcoming interdepartmental barriers and concentrating resources on priority projects and the best teams, focusing researchers on projects of the full innovation cycle, assessed according to the criteria of technology readiness levels (TRL), providing scientific and technical reserves and teams for solving industrial development tasks. The solution of these tasks lies in the plane of consolidation of state funding for research and development, implemented in the budget process. The actual principles of state financing of scientific research and development are embodied in the concept of "scientific budget", and the most adequate form of their practical implementation is the state program. However, the scale of such a program is so large that the risks of its inflexibility and unmanageability increase. The purpose of the work is to present the results of the normative and methodological study of mechanisms aimed at ensuring the practical implementation of the principles of the scientific budget in the state program "Scientific and Technological Development of the Russian Federation" (S&TDRF).

Materials and Methods

The current situation determines the choice of strategic goals of scientific and technological development, which are set as:

• achieving "technological sovereignty", defined through maintaining technological parity with the leading countries of the world, and technological leadership

(possession of key technologies that determine the possibility of solving strategic, socio-economic and defense tasks);

- "economization of technologies", turning them into a significant factor in the growth of gross domestic product;
- technological support for the restoration of an integral system of production and technological chains violated as a result of sanctions restrictions;
- the formation of "technoeconomics" is the reengineering of the functions of market institutions in the form of digital platforms, where operations are performed in a non–documentary form without human participation and are not tied to a single decision-making center [1].

The implementation of such large-scale initiatives involves the creation and adjustment of mechanisms aimed at effective consolidation of management and financing of research and development for civil purposes. Our country, with its high resource potential, vast territory and developed education sector, can become one of the leaders among technologically sovereign states, but it is obvious that this process will require time, goal setting, strategic planning and prioritization of research, development and technological works (R&D), as well as the organization of new industries, focused on achieving technological independence and creating competitive domestic products. Overcoming the growing technological deficits faced by the domestic economy in modern conditions will require targeted mobilization of personnel, competencies, scientific and industrial infrastructure and financial resources.

The state program "Scientific and Technological Development of the Russian Federation" (S&TDRF), developed in a new format, creates prerequisites for the consolidation of research and development for civil purposes and their financial support, acting as the largest state program, including several dozen structural elements (federal projects, departmental projects, complexes of process measures and federal target programs), and more than fifty participants. The state program S&TDRF unites almost all existing mechanisms of state support not only for scientific research and development for civil purposes, but also for higher education. The main managers of budget funds, who previously acted as responsible executors of sectoral scientific and technical programs, become co-executors of the unified state program, which is a new practice for them and requires increased attention to the coordination of actions with other co-executors of the program. The new format of the program strengthens the role of the responsible executor of the program — the Ministry of Education and Science of Russia in achieving strategic goals and operational management tasks, coordination of participants [2].

The new format of the S&TDRF allows to put into practice the idea of a scientific budget. Within the framework of the research carried out by the authors, the idea of the scientific budget was embodied in two main developments — the Concept of the Scientific Budget and the Regulations on the Scientific Budget [3], as well as a number of methods that reveal the mechanism for implementing the basic principles laid down in these documents. Among the most important principles of the scientific budget stated in the concept, it should be noted:

- priority of financing the most significant areas of research and development;
- ensuring a single targeted approach to managing the costs of R&D at all stages of the life cycle of scientific research and experimental development.

Taking into account the fact that the scale of the new program increases the risks of its lack of manageability and slow reaction to external shocks, proposals were developed within the framework of the study to introduce an algorithm for adjusting the list and content of the tools of the State Scientific Research Institute in the budget process, as well as the rules of interaction of the responsible executor, co-executors and participants of the program during the planning, implementation and control of the scientific budget. All proposals are implemented within the deadlines set by the schedule for drafting the federal budget and draft budgets of state extra-budgetary funds of the Russian Federation for the next fiscal year and planning period [4].

Results

In the developed Regulation on the scientific Budget, the procedure for its development is fixed. Here is a description of some of its significant stages.

After the approval by the government of the most important innovative projects of national importance, federal scientific and technical programs on issues requiring a separate decision of the President of the Russian Federation, and comprehensive scientific and technical programs and projects of the full innovation cycle, the Ministry of Education and Science of Russia, together with external co-executors of the S&TDRF, ensures the inclusion of research and development on the above projects and programs in the structural elements of the S&TDRF. After the distribution by the responsible executor of the basic budget allocations for the participants of the S&TDRF, subordinate institutions of the co-executors of the program submit to the USISU R&D projects of research and development topics.

The principal point is that within the framework of the developed proposals for the formation of the scientific budget, additional functions for the evaluation and selection of scientific topics (R&D projects), as well as determining the amount of funding for work at the expense of the federal budget, are assigned to the USISU R&D. The expansion of the system's functionality makes it possible to make decisions on the appropriateness of financing from the federal budget of new announced projects, on the appropriateness of continuing financing from the federal budget of previously initiated projects, as well as on the sufficiency of the declared amounts of funding for new and ongoing R&D projects. The algorithm for implementing the additional functionality of the system includes a procedure for determining the compliance of the R&D project with the priorities of scientific and technological development of the Russian Federation, evaluating the scientific and scientific and technical results of the project according to the criteria of the UGT [5], as well as conducting a comparative analysis of the project sgenerated in the system automatically.

Based on the results of the examination of projects of scientific subjects, justifications of budget allocations for R&D are formed, which are transferred to the GIS "Electronic Budget" for the development of a draft federal law on the federal budget.

In parallel with the justification of budget allocations for R&D, the Ministry of Education and Science of the Russian Federation, together with the co-executors of the S&TDRF, is preparing proposals on the amount of financial support for the field of research and development in the context of the structural elements of the S&TDRF. These proposals are corrected and approved by the Commission for Scientific and Technological Development of the Russian Federation.

The Ministry of Education and Science of the Russian Federation, together with the co-executors of the S&TDRF, in accordance with the schedule of the budget process, no later than August 26 of the current fiscal year, form drafts of state assignments and other instruments for financing research and development. These projects are clarified and approved after the Government submits a draft federal law on the federal budget for the next fiscal year and planning period to the State Duma. After the approval of the budget law, during December of the current fiscal year, contracts and agreements for R&D are concluded and clarified.

At the end of the reporting year, educational institutions of higher education and federal scientific organizations, no later than February 20 of this year, upload to the USISU R&D information on the results of R&D within the framework of state tasks and other direct financing instruments, as well as under contracts and agreements within the framework of the State Research and Development Program. The results of the analysis of these reports are used as part of the new budget cycle. Based on the expertise of scientific and scientific and technical results achieved within the framework of R&D, the Ministry of Education and Science of the Russian Federation, together with the co-executors of the S&TDRF, develop and submit to the Commission for Scientific and Technological Development of the Russian Federation proposals on the list of priorities for scientific and technological development of the Russian Federation.

The methodological approach developed within the framework of the study to assess the effectiveness of the tools of the State Scientific and Technical University in the formation of the scientific budget allows us to establish the compliance of the program tools with the goals of scientific and technological development of the country, which were mentioned above. The application of the approach allows us to draw conclusions about the need to optimize, expand or reduce the list of S&TDRF tools. Evaluation of the effectiveness of the tools of the S&TDRF is carried out according to 3 criteria: 1) necessity; 2) sufficiency; 3) the degree of contribution to the achievement of the goal.

The analysis of the tools according to the criterion of necessity for achieving the goals of scientific and technological development of the Russian Federation is based on the identification of tasks for which funding is provided under the program, recipients and requirements for obtaining funding, as well as indicators reflecting the effectiveness of the implementation of measures. Based on the results of the analysis of tools according to the criterion of necessity, three possible conclusions are possible:

- for each goal of scientific and technological development of the Russian Federation, a list of tools ensuring its achievement has been identified;
- for a number of purposes of scientific and technological development of the Russian Federation, the tools that ensure its achievement have not been identified;
- a number of tools do not ensure the achievement of any of the goals of scientific and technological development of the Russian Federation.

All the tools that fall into the group that ensure the achievement of a specific goal are evaluated according to three criteria. The assessment according to the third criterion is carried out expertly based on the experience of using similar tools in the past, as well as using computational models. A positive assessment according to three criteria means that the relevant tools are recognized as effective. A negative assessment based on the criteria of necessity or the degree of contribution to the achievement of goals means that it is advisable to optimize the list of tools within the framework of a specific goal of scientific and technological development of the Russian Federation. A negative assessment on the sufficiency criterion means that it is advisable to expand the list of tools within the framework of a specific goal of scientific and technological development of the Russian Federation.

If no tools have been identified for the specific purpose of scientific and technological development of the Russian Federation that ensure its achievement, it is advisable to expand the list of tools of the State Scientific and Technological Enterprise. If a number of tools do not ensure the achievement of any of the goals of scientific and technological development of the Russian Federation, it is advisable to optimize or reduce the list of tools.

The state program "Scientific and Technological Development of the Russian Federation" (S&TDRF) has a complex structure and a large number of participants and co-executors, therefore, it is extremely urgent to specify and develop a detailed procedure for the interaction of participants, co-executors and the responsible executor of S&TDRF. Analysis of the current regulatory legal framework of the Russian Federation has shown that currently there are no approved and valid regulations for the interaction of direct and indirect participants of the program. The Regulations should determine the interaction between the structural units of the Ministry of Science and Higher Education of the Russian Federation, as well as the interaction between the Ministry of Science and Higher Education of the Russian Federation of the Russian Federation as the responsible executor of the State Enterprise of the Russian Federation of the Russian Federation and other federal executive authorities at all stages of the implementation of S&TDRF.

The absence of effective regulations for the interaction of the participants of the S&TDRF is manifested through a number of particular problems:

- in the current regulatory framework, there is no clear definition of the main stages of the implementation of the program, within which the interaction of participants takes place;
- the sequence of actions of the participants of the S&TDRF at each stage is not fixed;
- the deadlines for the implementation of each action by the relevant participants of the S&TDRF and the deadlines for receiving feedback, if necessary, are not fixed;
- there are no established forms for providing information at each stage.

The developed rules of interaction of the participants of the S&TDRF solves these problems. In the regulations, the interaction of the responsible executor, co-executors and participants of the S&TDRF is structured according to clearly defined stages:

- interaction in the process of planning the state program;
- interaction during periodic monitoring of the state program;
- interaction in the preparation of the annual report on the implementation of the state program;
- interaction when making changes to the state program. For each of the stages, the regulations define:
- — the sequence of actions of the participants of the S&TDRF;
- the timing of each action by the relevant participants of the S&TDRF and the timing of receiving feedback, if necessary;
- forms of providing information.

Let's consider the order of interaction of the responsible executor, co-executors and participants of the S&TDRF in the process of planning the state program.

The interaction of the responsible executor, co-executors and participants of the State Scientific and Technical Enterprise in the process of planning the state program is carried out taking into account the Rules for drafting the federal budget and draft budgets of state Extra-budgetary Funds of the Russian Federation for the next financial year and planning period, approved by the decree of the Government of the Russian Federation dated March 24, 2018. No. 326, and within the time limits determined by the schedule approved by the Government of the Russian Federation for the preparation and consideration of draft federal laws, documents and materials developed during the preparation of the draft federal budget and draft budgets of state extra-budgetary funds of the Russian Federation for the next year and for the planning period (hereinafter — the budget schedule), and the schedule for the preparation and consideration this year of documents and materials necessary for the development of the forecast of socio-economic development of the Russian Federation and the federal targeted investment program for the next year and for the planning period, as well as federal target programs, passports of state programs of the Russian Federation (hereinafter — the schedule of state programs).

When planning the state program and its structural elements, the responsible executor, co-executors and participants of the S&TDRF ensure that decisions taken and/or approved by the Commission for Scientific and Technological Development of the Russian Federation are taken into account.

Within 2 (two) working days after the publication of the budget schedule, the Department of Strategic Development of the Ministry of Education and Science of the Russian Federation sends a request to the external and internal co-executors of the S&TDRF for the formulation of proposals on the structure of the state program for the next year and for the planning period, on the redistribution of activities,

results and funding volumes between structural elements, as well as proposals on the composition of indicators (indicators) and their values. External and internal co-executors, together with the participants of the relevant structural elements of the S&TDRF, prepare proposals and, no later than 10 days after receiving the request, send them to the Department of Strategic Development and to the curator department responsible in the Ministry of Education and Science for coordinating the interaction of co-executors and participants in the implementation of a specific structural element of the S&TDRF.

The Department of Strategic Development collects, processes and systematizes the information received from external and internal co-executors. The curator departments within 10 days assess the compliance of the received proposals with the priorities of scientific and technological development of the Russian Federation and send the appropriate conclusion to the Department of Strategic Development.

The Department of Strategic Development forms a layout of the structure of the S&TDRF for the next financial year and for the planning period and sends the layout of the structure of the state program to the Department of Economic Policy of the Ministry of Education and Science of the Russian Federation for the preparation of budget projections in the context of budget expenditure classification codes.

In the terms determined by the schedules of the budget and state programs, external and internal co-executors form proposals and requests for changes in the GIS "Electronic Budget" regarding changes in the structure of the State Enterprise, indicators, tasks, results, activities and control points for the relevant structural elements. The supervising departments and the Strategic Development Department coordinate these proposals and requests for changes.

The Department of Economic Policy ensures the distribution of the basic budget allocations formed by the Ministry of Finance of the Russian Federation in the system of budget classification codes corresponding to the new structure of the S&TDRF by the participants (hereinafter — distribution).

External and internal co-executors form a position on the distribution, determine and declare an additional need for financing for the relevant structural elements of the S&TDRF.

Following the results of coordination with the Ministry of Finance of the Russian Federation, the Department of Economic Policy brings to the Department of Strategic Development and co-executors the final distribution option and information on the declared additional need for financial support of the structural elements of the S&TDRF in the context of budget classification codes.

The Department of Economic Policy informs the Department of Strategic Development of up-to-date information on tax expenditures under the state program for the next fiscal year and for the planned period of the implementation of the S&TDRF (until 2030).

In the terms determined by the schedules of the budget and state programs, external and internal co-executors form up-to-date passports of structural elements, update information on the volume of extra-budgetary financing, financing from the consolidated budgets of the budgetary system of the Russian Federation, from the funds of extra-budgetary funds of the Russian Federation. If necessary, activities (results) and control points are updated. The co-executors give suggestions on the adjustment of the passport of the S&TDRF in connection with changes in structural elements. The supervising departments and the Strategic Development Department coordinate proposals and requests for changes to the passports of structural elements.

In the terms determined by the schedules of the budget and state programs, the Department of Strategic Development, based on the final distribution option and information about additional funding needs, clarifies the numerical values of the indicators of the S&TDRF for the next financial year and for the planning period and forms a draft passport of the State Enterprise in two versions (the option corresponding to the volume of basic budget allocations, and the option corresponding to the basic budget allocations, taking into account additional funding) on the basis of passports of structural elements formed by co-executors.

The Department of Strategic Development processes and, together with the participants of the S&TDRF, eliminates comments on the draft passport of the S&TDRF received from the Ministry of Economic Development of the Russian Federation, the Ministry of Finance of the Russian Federation, co-executors and participants of the state program, as well as comments of the Accounts Chamber of the Russian Federation and ensures that the position of the Commission for Scientific and Technological Development of the Russian Federation is taken into account.

If necessary, based on the results of the decisions of the Government Commission on Budget Projections, the Department of Economic Policy informs the Department of Strategic Development, co-executors and participants about changes in the planned amounts of financial support for the next year and for the planning period to clarify the draft passports of structural elements and the passport of the S&TDRF.

The Strategic Development Department forms a draft passport of the State Enterprise for submission to the Government of the Russian Federation and subsequent submission to the State Duma of the Federal Assembly of the Russian Federation; sends the draft passport of the State Enterprise for approval to the Curator of the State Enterprise and for signing to the Chairman of the Government of the Russian Federation.

In accordance with the budget schedule, the co-executors bring the passports of structural elements in accordance with the parameters of the adopted federal law on the federal budget for the next year and for the planning period, if necessary, update information on extra-budgetary financing and control points.

The co-executors approve (sign) the passports of the structural elements in the GIS "Electronic Budget".

The Department of Strategic Development brings the passport of S&TDRF in accordance with the parameters of the adopted federal law on the federal budget for the next year and for the planning period; coordinates the passport of S&TDRF with the Ministry of Finance of Russia and the Ministry of Economic Development of Russia in the GIS "Electronic Budget"; initiates and ensures the approval (signing) of the passport of S&TDRF in the GIS "Electronic Budget"; sends the draft passport of the S&TDRF for approval to the Supervisor of the S&TDRF and for signing to the Chairman of the Government of the Russian Federation.

On the basis of the passports of structural elements approved by the coexecutors, a unified plan for the implementation of the state program for the next year and for the planning period is automatically formed in the GIS "Electronic Budget", on the basis of which the subsequent monitoring of the implementation of the state program is carried out. The co-executors of the S&TDRF carry out verification and ensure that the information in the specified Unified Plan and passports of the relevant structural elements of the S&TDRF.

Discussi on

The issues of the formation of state programs as a means of implementing the priorities of scientific and technological development of our country have repeatedly been the subject of discussion in the scientific community [6; 7; 8]. Summarizing the position of interested experts and researchers, we can note a positive assessment of the changes taking place in public administration and financing of the scientific and technical sphere. At the same time, the authors point to the incompleteness of the process and the presence of a number of problems.

These include:

- weak focus of program activities on specific technological results [6];
- problems of linking the goal-setting of state programs with the priorities of scientific and technological development [7];

- problems of uncoordination of research and development support tools in different departments [7];
- problems of inefficient organization of program-targeted financing [8].

To date, within the framework of the S&TDRF, it has been possible to consolidate expenditures on research and development, previously dispersed in industry programs, as well as to form basic mechanisms for managing the state program. Currently, the issues of effective integration of the state program into the management system of scientific and technological development to achieve national goals, focusing the program on achieving specific technological results, launching and debugging mechanisms for financing science on the principles of project management within the scientific budget are being resolved.

Conclusion

The main results of the research presented in this article — the Regulation on the Scientific Budget, the methodological approach to assessing the effectiveness of the tools of the State Scientific and Technical Committee, as well as the rules of interaction of participants, co-executors and the responsible executor of the State Scientific and Technical Committee, will solve a number of problems associated with the formation of the State Scientific and Technical Committee as an effective form of practical implementation of the principles of the scientific budget aimed at implementing the priorities of the scientific and technical-technological development of our country.

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Бюджетные механизмы реализации приоритетов научно-технологического развития Российской Федерации

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Аннотация. Необходимость определения приоритетов научно-технологического развития страны и эффективного финансирования исследований и разработок диктует применение на практике идей научного бюджета. На основе проведенных исследований авторами

АКТУАЛЬНЫЕ ПРОБЛЕМЫ ГОСУДАРСТВЕННОГО УПРАВЛЕНИЯ

предложены принципы научного бюджета, из которых наиболее значимыми являются: приоритетность финансирования наиболее значимых направлений научных исследований и разработок; обеспечение единого целевого подхода к управлению расходами на выполнение НИОКТР на всех этапах жизненного цикла научного исследования и экспериментальной разработки. Порядок разработки научного бюджета, с точки зрения авторов, состоит из ряда этапов. В том числе предусмотрено закрепление дополнительного функционала за ЕГИСУ НИОКТР, связанного с оценкой и отбором научных тематик (проектов НИОКТР), а также определением объема финансирования работ за счет средств федерального бюджета. Алгоритм реализации дополнительного функционала системы включает процедуру установления соответствия тематики проекта НИОКТР приоритетам научно-технологического развития Российской Федерации, оценку научных и научно-технических результатов проекта по критериям уровня готовности технологий, а также проведение сравнительного анализа рассматриваемого проекта со средними показателями выборки проектов-аналогов, формируемой в системе автоматически. Применение методического подхода к оценке эффективности инструментов государственной программы «Научно-технологическое развитие Российской Федерации» при формировании научного бюджета позволяет получить выводы о необходимости оптимизации, расширения или сокращения перечня инструментов программы. Оценка эффективности инструментов программы осуществляется по критериям: 1) необходимость; 2) достаточность; 3) степень вклада в достижение цели.

Ключевые слова: научный бюджет, государственная программа, научно-технологическое развитие, научные исследования и разработки, финансирование науки, бюджетное финансирование научных исследований и разработок, приоритет научно-технологического развития

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