

Funding Research and Development in Regions: Tasks, Current State, Prospects



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Abstract. Financing the research and development sector is an important condition for growth of innovation activity in regions. However, the share of research and development (R&D) expenses in Russia has been decreasing over the last ten years. According to this indicator, Russia lags behind other countries – leaders of innovation development 3–4 times. The formation of funds to support research, scientific and technological, and innovation activities can contribute to the growth of the volume of R&D financing. The purpose of the study is to examine the organizational conditions for the formation of funds to support research, scientific and technological, and innovation activities. Using statistical data from Rosstat, we calculated the variants of growth of R&D costs provided that regional funds are created, the budget of which is formed by deductions from the revenues of organizations in the amount of up to 1.5%. We have identified groups of companies whose financial resources could be a source of formation of the funds budget. The article identifies the main directions and volume of use of finances accumulated in the funds. In the final part of the article we reviewed the support measures for companies that participate in filling the budget of the funds, and proposed adjustments to the main areas of incentives for organizations. The scientific novelty of the presented work lies in the implementation of a comprehensive study of the supporting funds for research, scientific and technological, and innovation activities in the RF constituent entities as a tool for the growth of R&D expenditures. The latter includes studying the issues of financial filling of the funds budget, determining the directions and calculating the possible volume of spending of accumulated funds on them, as well as adjusting the existing measures to encourage organizations to participate in financing the funds budget. The practical significance of the work lies in the fact that its results can serve as an economic justification and organizational support for the creation of regional funds by regional authorities. In addition, the materials of the study can be used to develop a separate federal law regulating the creation and operation of the funds in question.

Key words: region, science, innovation, innovation activity, research and development, R&D, funds, R&D funding.

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Introduction

The task of developing an innovation economy is set before almost all countries, including the Russian Federation. The large-scale changes of recent times require a substantial revision of the established ideas about scientific and technological, and innovation activities, which is a multidimensional task. Here we present only some results of the study of current problems associated with the formation of regional funds to support

research, scientific and technological activities. The problems of scientific and technological development in the aspect of technological modernization of the Russian economy are presented in the work “On the long-term scientific and technological development of Russia”¹.

¹ Belousov D.R., Frolov I.E. (Eds.). (2022). *On the Long-Term Scientific and Technological Development of Russia*. Moscow: Artik Print.

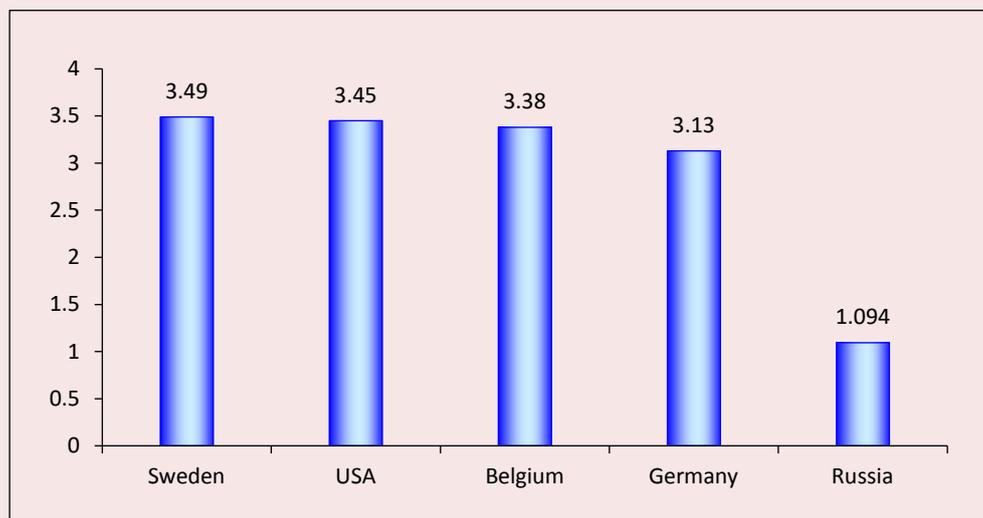
One of the key indicators characterizing the ability of organizations to implement innovations and their degree of involvement in it is innovation activity². Over 10 years (from 2010 to 2020) the level of innovation activity of organizations in Russia increased slightly – by 1.3 percentage points, in 2020 it was 10.8%. According to data for 2020, the same indicator in Belgium and Germany was 67.8%, in the United States – 64.7%, in Sweden – 63.1%³. Statistical data indicate a significant lag of Russian organizations by the level of innovation activity from the world leaders (by 52.3–57.0 p.p.).

“The growth of innovation activity is largely determined by the presence of a well-developed R&D sector, providing the creation of new products, materials and technologies that can subsequently be implemented in the production process and be embodied in marketable products that are competitive in today’s markets” (Mazilov, Ushakova, 2019). An important condition for the effective functioning of innovation activity is the

financing of the research and development sector. However, in the period from 2010 to 2020 there was a slight decrease in the share of spending on research and development in Russia’s GDP (by 0.36 p.p.). In 2020, this indicator was 1.094%. In countries with high innovation activity, this indicator is several times higher. For example, in Sweden it is 3.49%, in Germany – 3.13%, in the USA – 3.45%, in Belgium – 3.38% (Fig. 1). This indicator shows that by the share of spending on research and development in GDP Russia lags behind the world leaders by 2.0–2.4 p.p.

“At the same time the problem is exacerbated by imbalances in financing of the research and development sector in the RF regions. The difference between the leading regions and the outsider regions of Russia, as of 2019, is 140 times. In 58 of 79 constituent entities of the Russian Federation (73.4%) the proportion of domestic spending on research and development in GRP is less than 1% and only in 8.9% of the constituent entities

Figure 1. Share of spending on research and development in international comparison, 2020, %



Source: Organization for Economic Cooperation and Development (OECD) statistical database. Main science and technology indicators. Available at: <https://stats.oecd.org/>

² Indicators of innovation activity. 2022: Stat. Coll. Available at: <https://issek.hse.ru/mirror/pubs/share/589979442.pdf>

³ Ibidem.

spend for these purposes more than 2% of GRP” (Klimova, 2021).

It is worth emphasizing, that there is a problem in Russia, related to budgeting volume of money, allocated for the R&D sector development. Thus, the federal law “On science and state scientific and technological policy” (2000) approved that 4% of the federal budget should be allocated for the R&D funding through to 2004. At the same time, it is noted, that this was canceled in 2004 as it had never been followed. It is noted that in 2004 this norm was abolished because it had never been observed (Todosiichuk, 2013).

In addition, according to the Ministry of Finance of the Russian Federation, in 2021 budget financing of research and development amounted to 635 billion rubles, and in 2022 it was planned only 586 billion rubles, which is 7.7% less than the previous year⁴.

The problem of financial provision of R&D is raised both among experts and public authorities. For example, RAS leaders and the scientific community note that with the current amount of money allocated for science, it is impossible to compete with leading countries⁵. The experts of the Accounts Chamber of the Russian Federation also emphasize that Russia lags behind the leading countries in terms of R&D expenditures, which, in turn, does not allow Russian science and technology to become the main driver of socio-economic growth⁶. The need to solve this problem is declared on the state level. According to the passport of the national project “Science”, by 2024 it is planned to increase spending on research and development to 1.02% of GDP⁷. The contradiction

is that statistically, the figure was 1.2% already for 2019. This circumstance indicates a discrepancy between the planned values of the target indicators and the achieved ones. In addition, even with such indicators, the volume of R&D expenditures remains low. It is necessary to increase it to at least 3% of GDP, bringing it to the level of countries developed in terms of innovation.

Inadequate funding of innovation activity leads to the low return on science and research. In this regard, the problem of financial support for the research and development sector is urgent. At the previous stages of the study, we found that “one of the effective and legitimate methods of enhancing the financing of science in the regions of Russia can be the creation of regional funds to support research, scientific, technological, and innovation activities” (Mazilov, Ushakova, 2019). According to the federal law “On science and state scientific and technological policy” these funds are understood as “organizations which are created by the Russian Federation, constituent entities of the Russian Federation, physical and (or) legal entities for the purpose of financial support of research, scientific and technological, and innovation activity including on conditions of co-financing at the expense of various sources not prohibited by the legislation of the Russian Federation”⁸.

The purpose of the study is to examine the organizational conditions for the formation of funds to support research, scientific and technological, and innovation activity. The main objectives of the work are: 1) to determine the sources of budgeting of the funds in question; 2) to propose directions for using the money accumulated in the funds; 3) to review and adjust the existing areas of incentives for companies to participate in the financing program of the funds.

⁴ How will Russian science be financed? Available at: <https://rg.ru/2021/12/15/kak-budet-finansirovatsia-rossijskaia-nauka.html>

⁵ Ibidem.

⁶ The level of funding for Russian science is insufficient to ensure a technological breakthrough. Available at: <https://ach.gov.ru/checks/9658>

⁷ Passport of the national project “Science”. Available at: <http://static.government.ru/media/files/vCAoi8zEXRVSuy2Yk7D8hvQbpbUSwO8y.pdf>

⁸ “On science and state scientific and technological policy”: Federal Law 127, dated August 23, 1996. Available at: http://www.consultant.ru/document/cons_doc_LAW_11507/ddc6aeb0b1616c6dfe6f3794ef646a8fc98794f6/

The scientific novelty of the presented work lies in the implementation of a comprehensive study of the funds to support research, scientific and technological, and innovation activities in the constituent entities of the Russian Federation as a tool to increase the volume of R&D costs, including the study of fund financing, the definition of directions and calculation of the possible volume of accumulated funds for them, as well as the adjustment of existing measures to encourage organizations to participate in the financing of the funds budget.

Theoretical aspects of research

The need for fund-raising to support research, scientific and technological and innovation activities is caused by the necessity to improve the mechanisms of R&D financing available in the country. It is important to emphasize that the very process of formation includes various aspects (creation of funds, definition of their functions, goals and powers of constituent entities, regulatory and financial support, etc.). The focus of this study is on the financial side of fund budgeting.

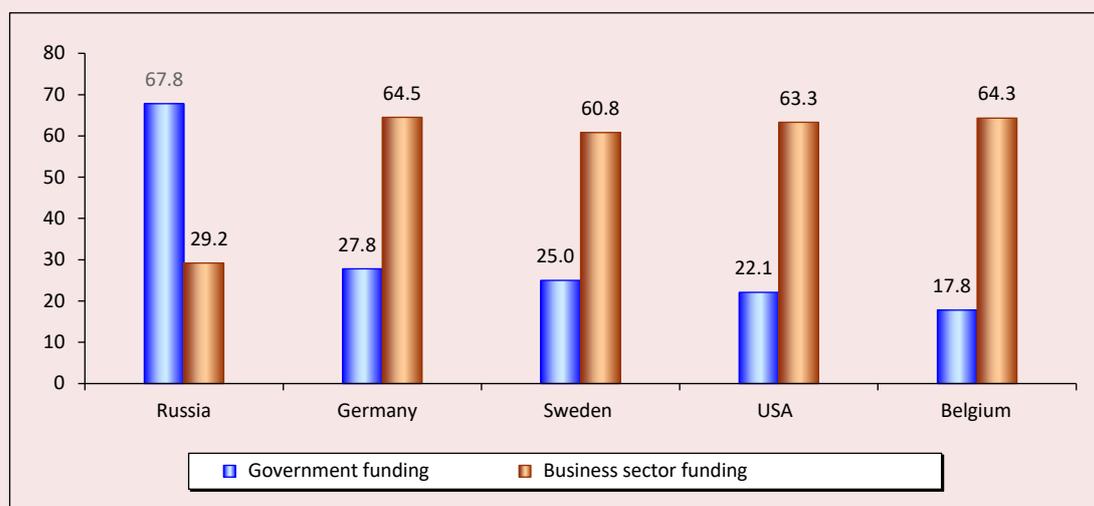
In general, the problems associated with the financing of science and innovation are raised in the works of both Russian (Aganbegyan, 2015; Ivanchenko, Gorbunov, 2018; Mindeli, Chernykh, 2017; Osovin, 2020 et al.) and foreign (Paunov, Borowiecki, 2018; Larrue et al., 2018; Jesemann, 2020; Kimberly, 1979; Schumpeter, 1954 et al.) researchers. A number of works emphasize the importance of financial support for innovation, science and other activities. For example, according to the author (Aganbegyan, 2015), funding plays a significant role in the development of science, education, information technology, etc. From the point of view of the authors of the study (Ivanchenko, Gorbunov, 2018), financial resources are an important condition for innovative development and implementation of innovation, as well as the implementation of innovative directions.

Some works specify the role of financial support, for example, emphasize the importance of funding in supporting basic research and development (Ivanchenko, Gorbunov, 2017). M.N. Osovin calls R&D funding a central element in the creation of future breakthrough technologies (Osovin, 2020). A similar point of view is indicated in the works (Larrue et al., 2018; Schumpeter, 1939). Analysis of the scientific literature has shown that many studies on the problem of R&D financing emphasize the importance of research and development costs in enhancing innovation activity. It follows that the developed system of financial support of R&D is one of the main conditions for increasing innovation activity, which, in turn, contributes to economic growth and competitiveness of the country.

However, it should be noted that in Russia the main source of funding for science and innovation is the state budget. This fact is confirmed by statistical data. In the structure of domestic expenditure on research and development by source of funding as of 2020, the share of funds allocated to R&D in Russia by the state is 67.8%, and by the entrepreneurial sector – 29.2%. However, among the world leaders, highlighted by the level of innovation activity, there is an opposite situation. For example, in Germany the share of funding from the business sector accounts for 64.5%, government funding – 27.8%, in Belgium – 64.3 and 17.8%, in the United States – 63.3 and 22.1%, Sweden – 60.8 and 25.0%, respectively (*Fig. 2*).

The current situation shows that in foreign countries the main source of funding in the structure of domestic R&D expenditures is the funds of the entrepreneurial sector. This fact is due to the developed system of interaction between science and business, when the private sector is interested in expanding and accumulating scientific knowledge in order to increase the competitiveness of manufactured products (Bekkers, Bodas Freitas, 2008; Perkmann, Walsh, 2007). However, in Russia

Figure 2. Structure of domestic spending on research and development by source of funding in international comparison, 2020, %



Note: Ranked in descending order by the “public funds” column.

Source: Science Indicators. 2022: Stat. Coll. Available at: <https://issek.hse.ru/mirror/pubs/share/581310357.pdf>

there is no stable system of interaction between science and business⁹, so in the country a large share of R&D funding falls on the state. The role of this source in the structure of R&D expenditures has changed insignificantly (by 2.5 p.p.) over the last 10 years. This conclusion is also confirmed by various researchers and experts. Specialists from the Accounts Chamber of the Russian Federation, the Institute for Statistical Research and Knowledge Economy at the Higher School of Economics, and others note that, contrary to global trends, the largest source of funding for Russian science remains from the state (60–70%)¹⁰.

The results of the scientific literature analysis have shown that there is no unified opinion on the efficiency of the Russian model of R&D financial

support, characterized by the dominant role of the state; two extreme positions prevail – positive assessment of the state financing of R&D and negative one. The first position is reflected in the study (Makasheva, 2013), which notes that state funding allows carrying out “unaffordable” even for big business scientific research, the practical significance of which may appear only in the very distant future, to develop fundamentally new areas of science and technology. State funds play an important role in shaping the innovation environment, which is reflected in the financing of research and innovation¹¹.

At the same time among experts and representatives of the scientific community there is an opposite point of view on the efficiency of financial support of R&D on the part of the state. Thus, it is noted that most of the research and development does not end with anything, and the quality of the results obtained is of questionable nature (Lebedev,

⁹ Interaction of science and business in the commercialization of research and development: Information and analytical material. HSE. 2017. 12 p.

¹⁰ Kuznetsova E., Starostina Yu. The Accounts Chamber named the problems of Russian science. Available at: <https://www.rbc.ru/politics/07/02/2020/5e3c1bf19a7947c149aa99>; Science awaits business. Available at: <https://rg.ru/2020/12/15/gossredstva-ostaiutsia-krupnejshim-istochnikom-finansirovaniia-nauki.html>

¹¹ Murzagalina G.M., Karimova S.R. The role of the state in supporting innovation. Available at: http://resources.krc.karelia.ru/krc/doc/publ2009/Innov_razv_129-132.pdf

2019). A similar point of view is presented in the study (Feoktissova, Fokina, 2015), which emphasizes that with relatively high public spending on R&D in Russia a significantly lower result is recorded compared to other countries.

In particular, one of the reasons for the inefficiency of public spending on R&D is corrupt activities. The outcome document “Recommendations of the participants of the 9th International Forum “Innovative Development through the Intellectual Property Market” emphasizes that over the past 20 years, corruption is most pronounced in the research and development sphere. ““Kickbacks” for defense research reached 80%, and only 2–3% of the sums allocated for R&D reached the direct executors”¹². As S.S. Gubanov notes, state support of the science sector is aimed not at the formation and improvement of the material and technical base of R&D, but at the payment of salaries to scientific staff (Gubanov, 2021). “The whole system of state support of science is aimed at maintaining the existing structure of departments and organizations, rather than at achieving the goals and priorities of the state in the scientific sphere”¹³. Specialists of the Accounts Chamber emphasize the “toxicity” of receiving state funding. Often budgetary funds are allocated for research and development of “irrelevant topics”. In addition, there are “excessive requirements” for accountability and procedures for controlling the expenditure of funds¹⁴.

Thus, it should be emphasized that in Russia the system of financial support of R&D is characterized by a high share of state participation, but the level of

innovation activity in the country remains low. At the same time in foreign countries, where the funds of the entrepreneurial sector play a dominant role in the financing of science, there is a high level of innovative development. As one of the tools that contribute to changing the current situation in Russia, the funds to support research, scientific and technological, and innovation activities can act, contributing to the implementation of innovation policy, increasing domestic spending on R&D (Chernova, Mikhailova, 2019). According to A.A. Gretchenko, the funds to support research, scientific and technological, and innovation activities by financing R&D contribute to the implementation of various scientific and technological projects (Gretchenko, 2007). Specialists of the Higher School of Economics emphasize that these funds can act as a tool for accumulating funds for long-term scientific projects¹⁵. The need for their formation is also justified in other works (Lapochkina et al., 2018; Chernykh, Bukina, 2013). T.N. Topoleva notes that the activity of the funds contributes to the implementation of measures aimed at stimulating and improving the efficiency of the research and innovation sector at the regional level (Topoleva, 2021). The role of these funds in the creation and development of the national innovation system is discussed in (Kookueva, 2021).

Despite the presence of numerous studies related to the issues of financial support of innovation activities, the publications on the topic of funds are few, there is practically no comprehensive study. Questions concerning the financial content of the funds’ budget and the areas of expenditure of the accumulated funds remain unexplored. In addition, there are no studies that raise the problems of stimulating companies to participate in the financing of funds to support

¹² Outcome document “Recommendations of the participants of the 9th International Forum “Innovative Development through the Intellectual Property Market”, dated April 7, 2017. Available at: https://rniis.ru/download/mf/2017/itog_doc.pdf

¹³ Kuznetsov Yu. Funding of civil science in Russia from the federal budget. Available at: <https://magazines.gorky.media/oz/2002/7/finansirovanie-grazhdanskoj-nauki-v-rossii-iz-federalnogo-byudzhet.html>

¹⁴ The Chamber of Accounts stated that state funding is “toxic” to Russian science. Available at: <https://www.kommersant.ru/doc/4244514>

¹⁵ Corporate Funds for support of research, scientific and technological, and innovation activities as a tool for financing. Available at: <http://irdclub.ru/wp-content/uploads/2015/03/Rozmirovich.pdf>

research, scientific and technological, and innovation activities, which determines the scientific and practical relevance of the work.

It is important to emphasize that in Russia there are already about 15 funds to support research, scientific, technological and innovation activities (for example, in the Tomsk and Chelyabinsk oblasts, the Republic of Bashkortostan, Krasnoyarsk Krai, etc.) (Mazilov, Ushakova, 2019). However, the formation of their budget is carried out at the expense of the state. The most common form of resource provision of R&D is the provision of grants through these foundations on the basis of competitive selection.

A number of foreign countries also have such funds (Germany, USA, Sweden, etc.). The analysis of global experience revealed that in innovatively developed countries the burden of R&D financing is distributed between the state and business. For example, in countries with a high share of participation of the entrepreneurial sector in the financial support of the research and development sector (Germany, USA, Sweden) the source of financing of funds in most cases is the state (*Tab. 1*). In Russia, on the other hand, state financing prevails both in the R&D sphere as a whole and in the formation of the funds' budgets. Taking into account foreign experience, financial support of

R&D in Russia can also be divided between the state and business. For example, the replenishment of funds could take place at the expense of the business sector. A similar practice is observed in Kazakhstan and Uzbekistan.

Thus, if we take into account the experience of R&D financing in foreign countries, one of the sources of funds' budget formation in Russia may be a percentage of companies' revenues. Interaction of organizations with foundations through financial provision of their budget will allow taking into account the priority directions of R&D on the part of the entrepreneurial sector. "This will have a significant impact on increasing the competitiveness of products on both Russian and foreign markets, as well as increasing the practical relevance of developments in connection with the needs of the real sector of the economy". (Ogurtsova, 2014).

It is important to emphasize that in Russia there are certain regulatory conditions for creation of such funds. For example, article 262 of the Tax Code of the Russian Federation regulates the issues related to R&D expenses. According to paragraph 2 of article 262, the expenses also include "deductions for the formation of funds to support research, scientific and technological and innovation activity, established in accordance with Federal Law 127-FZ "On science and state scientific-technical policy",

Table 1. Foreign experience of replenishing the budgets of funds to support research, scientific and technological, and innovation activity

Country	Funds to support research, scientific and technological, and innovation activity	Source of replenishing the fund's budget
Germany	The German Federal Environmental Foundation	Federal budget
USA	The National Science Foundation (NSF) of the USA	Federal budget
Sweden	Sweden's Innovation Agency (Vinnova)	Federal budget
Republic of Kazakhstan	The National Fund of the Republic of Kazakhstan	Entrepreneurial sector
Republic of Uzbekistan	Foundation for Scientific and Innovation Development	Entrepreneurial sector
	Fund to support innovation activities of large state-owned enterprises and economic management bodies	Entrepreneurial sector

Source: The German Federal Environmental Foundation. Available at: https://deru.abcdef.wiki/wiki/Deutsche_Bundesstiftung_Umwelt; The National Science Foundation. Available at: <https://devki.su/2021/03/26/nacionalnyj-nauchnyj-fond-ssha/>; The Science and Innovation Development Fund was established in Uzbekistan. Available at: <https://www.podrobno.uz/cat/tehn/v-uzbekistane-sozdan-fond-nauchno-innovatsionnogo-razvitiya/>

dated August 23, 1996, in the amount not exceeding 1,5% of revenues from sales of products”¹⁶. Paragraph 1 of Article 15.1 of the federal law “On science and state scientific and technological policy” states that “funds may be created by the Russian Federation, the constituent entities of the Russian Federation, physical persons and (or) legal entities in the organizational-legal form of a fund”¹⁷.

Thus, issues related to the financing of science and innovation are relevant and are raised in the works of various researchers and experts¹⁸ (Kim, Heshmati, 2014). The results of the study of statistical data have shown that in Russia the main source of financial support for the research and development sector is the state. However, questions about the effectiveness of such a model remain debatable. Analysis of statistical data shows that Russia lags behind the world leaders by R&D expenditures and the level of innovation activity of the regions. One of the tools to solve this problem is the formation of funds to support research, scientific and technological, and innovation activities. The existing legislation in Russia provides for the possibility of their creation at the expense of deductions from the proceeds of private companies. But the problems of which organizations can participate in the financing of such funds, what areas the accumulated funds will be spent on, and how to encourage companies to make contributions to the budget of the funds have not yet been resolved.

¹⁶ Tax Code of the Russian Federation dated August 5, 2000. Available at: http://www.consultant.ru/document/cons_doc_LAW_28165/aa9832fb416dd0274acf737be8e4c157866abf0b/; On science and state scientific and technological policy: Federal Law 127, dated August 23, 1996. Available at: http://www.consultant.ru/document/cons_doc_LAW_11507/ddc6aeb0b1616c6dfe6f3794ef646a8fc98794f6/

¹⁷ On science and state scientific and technological policy: Federal Law 127, dated August 23, 1996. Available at: http://www.consultant.ru/document/cons_doc_LAW_11507/ddc6aeb0b1616c6dfe6f3794ef646a8fc98794f6/

¹⁸ Fostering Innovative Entrepreneurship. Challenges and Policy Options. United Nations. Geneva, 2012. 68 p.

Methods and information base of the study

To implement the goal and objectives used a system-wide approach, which involves a comprehensive study, focusing on the reproduction of funds to support research, scientific and technological and innovation activities from the perspective of not only their formation, but also the use of attracted funds.

A set of scientific methods was applied in the work. We used the method of comparative analysis to study the scientific literature when considering the theoretical and methodological aspects of the problem raised. Based on statistics, we calculated options to increase R&D costs through deductions from company revenues. In addition, we used tabular and graphical data visualization techniques.

The information base for the study was statistical data from Rosstat, the Higher School of Economics (the level of innovative activity, the volume of spending on R&D). To analyze the activities of companies, part of the revenues of which can potentially be regarded as a source of replenishing the budget of the funds, we used information from Forbes rating, the analytical center “Expert”, the SBIS system (accounting and inventory system), as well as the financial statements of banks. One of the sources was the information published on the official portals of regional governments.

If we characterize the information base of the study in more detail, we should emphasize that the current legislative acts in the field of support of research and innovation activities were used, with the help of which the possibility of creation of funds to support research, scientific and technological, and innovation activities, as well as formation of their budget at the expense of deductions of companies in the amount up to 1.5% of their revenues was substantiated. Along with this, statistical data on the share of domestic R&D expenditures in GDP for 2019 (the last year for which GDP data are presented in Rosstat), as

well as data on companies' revenues were used. The study examined the existing measures to encourage companies to participate in the formation of the budget of the funds in question, making adjustments and suggestions.

Research findings

At the previous stages of the study we substantiated the necessity of formation of regional funds to support research, scientific and technological, and innovation activities. Research work was based on legal and regulatory provisions, in particular, Article 262 of the Tax Code of the Russian Federation and Article 15.1 of the Federal Law "On science and state scientific and technological policy". As a result, options were identified to increase R&D expenditures by regions of the Russian Federation, provided that organizations contribute up to 1.5% of revenues to the budget of the funds in question (Gulin et al., 2019).

A similar analysis in terms of R&D funding was conducted as of 2015 and 2019 (the last year for which Rosstat data on GRP are available). It has been determined that the creation in all constituent entities of the Russian Federation of regional funds for support of research, scientific and technological, and innovation activities will make it possible to increase the share of R&D costs

in GDP to 3.74% (in case of 1.5% of revenues of industrial organizations). In absolute terms, the growth of funds for research and development will reach 17.1 thousand rubles per capita, the costs of research and development may increase threefold (from 7.7 to 24.8 thousand rubles) compared to 2019 (*Tab. 2*).

Thus, the calculations indicate an increase in the opportunities for funding research and development through deductions from the revenues of organizations in the amount of up to 1.5%. They can be directed to the formation of budgets of regional funds to support research, scientific and technological, and innovation activities. This creates the prerequisites for financing at the regional level the necessary fundamental and applied research and development, support for innovation activities. The inclusion of the entrepreneurial sector in pumping up the budget of the funds gives the right to the companies themselves to influence the actual R&D, thus strengthening their practical relevance related to the needs of the real sector of the economy.

We emphasize that the option of contributions to the funds budget by all companies is ideal. To participate in the proposed model in practice, it becomes important to take into account the financial capabilities of enterprises to resourcing the research and development sector. The budget

Table 2. Options to increase the amount of R&D funding subject to the creation of regional funds in all constituent entities of the Russian Federation

Indicator	Year					Share of costs including revenue			Increase in the case of deductions of 1.5%
	2008	2012	2016	2018	2019	+0,5%	+1,0%	+1,5%	
Actual share of domestic spending on research and development in GDP, %	1.27	1.31	1.33	1.37	1.20	2.06	2.91	3.74	2.54
Expenditures on research and development in the Russian Federation, thousand rubles per capita, in current prices	3.0	4.6	6.0	7.0	7.7	13.4	19.1	24.8	17.1

Source: compiled according to Russian regions. Socio-economic Indicators: Stat. coll. Available at: <https://rosstat.gov.ru/folder/210/document/13204>

Table 3. Calculations to replenish the budget of funds subject to the participation of organizations included in the Expert-400 list (as of 2019, in parentheses – 2018)

Federal district	0.5% of revenue	1.0% of revenue	1.5% of revenue
	costs for R&D + 0.5% of revenues, rubles/person	costs for R&D + 0.5% of revenues, rubles/person	costs for R&D + 0.5% of revenues, rubles/person
Central Federal District	14 564.1 (13 782.1)	24 112.3 (22 989.3)	33 660.6 (32 196.5)
Northwestern Federal District	6 178.3 (5 760.2)	7 721.5 (7 344.5)	9 264.7 (8 928.7)
Southern Federal District	2 233.0 (1 931.1)	3 056.8 (2 757.9)	3 880.5 (3 584.7)
Volga Federal District	5 729.0 (5 166.6)	6 386.1 (5 804.1)	7 043.3 (6 441.6)
Ural Federal District	5 860.8 (5 726.9)	8 259.0 (8 010.3)	10 657.3 (10 293.7)
Siberian Federal District	5 279.7 (4 710.1)	6 268.3 (5 479.3)	7 256.8 (6 248.4)
Far Eastern Federal District	3 198.7 (3 479.7)	3 846.4 (4 361.3)	4 494.1 (5 242.8)

Note: The regions of the North Caucasian Federal District were not included in the top 400.
Source: compiled according to the rating of the largest companies in Russia. Available at: <https://expert.ru/expert/2020/43/spetsdoklad/1/>

of the funds can be replenished by deductions from the revenues of companies that have the financial capacity for this. Examples of such organizations include Russian companies in the top 400, the first 15 oligarch companies of the Forbes ranking, and state banks (Klimova, 2021). They can help fund R&D due to the insignificant impact of deductions from their revenues of up to 1.5% on business sector revenues.

The analysis conducted using Expert-400 data for 2019 has led to the conclusion that in the case of deductions from the revenues of the analyzed companies in the amount of up to 1.5%, the volume of R&D costs in Russia will increase up to 2.3 times. The greatest changes in the values of the index are observed in the Siberian (16.1%), as well as in the Central (6.7 times; *Tab. 3*) federal districts (Klimova, 2021).

In the case of participation in the formation of funds of the companies included in the top 400, only half of the regions of Russia will make payments to research and development, because this rating includes organizations of 44 constituent entities of the Russian Federation. This circumstance may lead to an increase in regional differentiation in the field of R&D funding. For example, Moscow and Saint Petersburg account

for nearly one-third (29%) of all expenditures of all regions considered, while “the regions of the North Caucasian Federal District do not participate in financing. The consequence of this is the need to redistribute some funds between regions” (Klimova, 2021).

Based on the data of Forbes rating and the system of business communications and electronic document exchange SBIS estimated the change in the volume of spending on R&D, subject to participation in the formation of the budget of the funds of large companies included in this rating. “According to the data for 2019, there is a possibility of an increase of 3.4% in research and development expenditures due to deductions. In 2019, compared to 2018, this value would increase by 11.9%” (Klimova, 2021).

Within the financial sector of Russia (Sberbank, VTB, Gazprombank, Russian Agricultural Bank, etc.) an analysis was conducted, for which the data of annual financial statements for 2019 were used, indicating the possibility of growth in the volume of R&D expenditure due to deductions from the revenue of state banks by 5.3%. It was determined that there is an opportunity to increase the value of the indicator in 2019 compared to the previous year by 9.3% (Klimova, 2021).

Thus, there were identified groups of large organizations in terms of sales volume, which have significant financial capacity to make deductions to the funds in question. The calculations have shown that this will increase the amount of funding for R&D. The greatest growth of R&D expenditures will be observed when the funds of the companies included in the top 400 companies participate in replenishing the budget (more than twofold). This creates the preconditions for the redistribution of funds to other regions, where there are no large organizations that are able to make contributions.

In the context of the reproduction of the funds' activity, an important issue is not only the formation of their budget, but also its use. In this connection, a problem was solved concerning the determination of directions for spending the funds accumulated at the expense of deductions from the revenues of companies in the funds to support research, scientific and technological, and innovation activity.

Certain areas of funding for the scientific sphere are enshrined in normative legal acts, in particular in the passport of the national project "Science". In the report on the interim results of monitoring the

implementation of measures within the framework of the national project "Science" indicated that "the participation of the constituent entities of the Russian Federation in it is not provided, despite the receipt of proposals from 53 regions"¹⁹. At the same time, in some constituent entities the project is still being implemented, which is confirmed by the publication of its regional passports on the official portals of the governments of the constituent entities of the Russian Federation (Republic of Altai, Republic of Ingushetia, Chelyabinsk and Tula oblasts). Nevertheless, the data presented show the predominant role of federal financial support for the development of science (*Tab. 4*).

Let us put forward the assumption that deducting a certain percentage of companies' revenues to the funds contributes to the formation of additional financial resources that could be allocated for the implementation of activities as co-financing with the federal budget provided for by the national project "Science". The study revealed that the actual amount of spending on R&D in those regions where the national project is being implemented (Altai Republic, Ingushetia Republic,

Table 4. Financial support for the implementation of the national project "Science", million rubles

Source	Amount of financial support by years of implementation							Total, 2019–2024
	2018	2019	2020	2021	2022	2023	2024	
Total for the national project at the expense of all sources, including:	0.0	49 747.6	62 087.9	76 517.3	111 046.3	148 080.5	188 480.4	635 959.9
federal budget	0.0	36 992.2	42 965.8	55 111	80 404.9	97 904.9	91 408.9	404 787.6
budgets of state extrabudgetary funds of the Russian Federation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
consolidated budgets of the constituent entities of the Russian Federation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
extrabudgetary sources	0.0	12 755.4	19 122.1	21 406.2	30 641.5	50 175.6	97 071.5	231 172.0

Note: In the passport of the national project "Science", the values of the amount of funding are specified for the project as a whole.
Source: Passport of the national project "Science". Available at: <http://static.government.ru/media/files/vCAoi8zEXRVsuy2Yk7D8hvQbpbUSw08y.pdf>

¹⁹ Report on the intermediate results of the expert-analytical measure "Monitoring of the implementation of the national project "Science", necessary for the implementation of the tasks set in the Presidential Decree 204, dated May 7, 2018 "On the national goals and strategic objectives of the Russian Federation for the period through to 2024". Available at: <https://ach.gov.ru/upload/iblock/5a5/5a58a9ddd73fefb7df5c0435b4a16d96.pdf>

Table 5. Research and development costs including contributions to funds 0.5% of company revenues, 2019, billion rubles

Region	R&D expenditures actual	0.5% of company revenues	R&D costs + 0.5% of revenue
Tula Oblast	8.3	5.02	13.3
Republic of Ingushetia	0.1	0.07	0.17
Chelyabinsk Oblast	21.4	11.8	33.2
Altai Republic	0.09	0.3	0.39
<i>Total</i>	<i>29.9</i>	<i>17.1</i>	<i>47.0</i>

Source: compiled according to Russian regions. Socio-economic indicators: Stat. Coll. Available at: <https://rosstat.gov.ru/folder/210/document/13204>

Chelyabinsk and Tula oblasts) amounted to 29.9 billion rubles for 2019. At the same time, subject to deductions of 0.5% of companies' revenues in the constituent entities under consideration, the additional volume of financing of the research and development sector in 2019 could amount to 17.1 billion rubles (*Tab. 5*).

The performed calculations demonstrating the growth of the volume of expenses on R&D at the expense of formation of the funds testify to the following. The financial resources of only four regions (participants of the national project "Science"), formed on condition of companies' deductions to R&D at the rate of 0.5% (17 136.0 million rubles), exceed almost half of the federal budget funds planned for 2019 by the national project. This circumstance creates prerequisites for possible distribution of the burden of R&D financing between the state and regional companies.

Among other directions in which the money accumulated in the funds can be allocated, in scientific sources the most common is financing of R&D through grants, implementation of the state task, etc.²⁰

The regional budget is also an important source of financial support for science. The calculations were made on the basis of how much money could be allocated to the designated areas at the expense

²⁰ Erokhina E. Those who do not pull, the state does not need to finance. How the system of science funding in Russia can change. Indicator.ru. Available at: https://www.rfbr.ru/rffi/ru/press_about/o_2081084

of finances accumulated through deductions from company revenues at the rate of 0.5%, and how it would change in comparison with actual data. The approach was tested on the data of the Vologda and Moscow oblasts as the regions with low and high values of R&D expenditures, respectively.

Earlier calculations have shown that in the case of 0.5% deductions from companies' revenues, an additional 6,636.1 million rubles could be received in the Vologda Oblast and 76,102.7 million rubles in the Moscow Oblast (Gulin et al., 2019). Let us assume that the funds received will be allocated to the above-mentioned areas in accordance with the existing structure of their distribution. Thus, in the Vologda Oblast, 0.1% of the generated funds will be used to finance the contest of scientific grants for business, in the Moscow Oblast – 0.8%, for budget programs – 1.8% and 12.2%, for financing regional research projects – 0.8% and 7.7%, for state orders – 97.4% and 79.2% respectively.

Funding for research grant competitions for business in the Vologda Oblast as of 2019 amounted to 1 million rubles, in the Moscow Oblast – 40 million rubles²¹. Contributions of 0.5% of companies' revenues (according to 2019 data) can

²¹ Announcement of state scientific grants of the Vologda Oblast based on the results of the competition held in 2019. Available at: <https://vologda-oblast.ru/dokumenty/2327142/>; Companies from near Moscow will receive grants in the amount of 50 million rubles for scientific developments. Available at: <https://mosreg.ru/sobytiya/novosti/news-submoscow/podmoskovnye-kompanii-poluchili-granty-v-summe-50-mln-rublei-na-novye-razrabotki>

Table 6. Directions for the use of financial resources accumulated in the regional funds to support research, scientific and technological, and innovation activities, million rubles

Direction	Actual values, 2019				Values including 0.5% of companies' revenues			
	Vologda Oblast	%	Moscow Oblast	%	Vologda Oblast	%	Moscow Oblast	%
Science grant competitions for businesses	1.0	0.1	40.0	0.8	4.9	0.1	614.5	0.8
Budget programs	23.4	1.8	606.8	12.2	116.7	1.8	9 320.9	12.2
Government orders	1 296.0	97.4	3 924.9	79.2	6 464.5	97.4	60 291.6	79.2
Funding of regional research projects	10.0	0.8	382.5	7.7	49.9	0.8	5 875.7	7.7
Total	1 330.4	100	4 954.2	100	636.0	100	76 102.7	100

Source: Announcement of state scientific grants of the Vologda Oblast based on the results of the competition held in 2019. Available at: <https://vologda-oblast.ru/dokumenty/2327142/>; Companies from near Moscow will receive grants in the amount of 50 million rubles for scientific developments. Available at: <https://mosreg.ru/sobytiya/novosti/news-submoscow/podmoskovnye-kompanii-poluchili-granty-v-summe-50-mln-rublei-na-novye-razrabotki>; Consolidated budgets of constituent entities of the Russian Federation and budgets of territorial state extrabudgetary funds. Available at: <https://roskazna.gov.ru/ispolnenie-byudzhetrov/konsolidirovannye-byudzhety-subektov/>; Look what the cat dragged in: The state order cannot become a guarantor of industry stability. Available at: https://www.dp.ru/a/2020/09/30/NeIjogkaja_prinesla; SBIS. Available at: <https://sbis.ru/>; Russian Science Foundation. Available at: <https://xn--p1ai/project/>

contribute to an increase in the amount of money coming to this direction in the Vologda Oblast, almost 5 times, in the Moscow Oblast – 15 times (Tab. 6).

The analysis of consolidated budgets of the RF constituent entities revealed that in 2019, 23.4 million rubles were allocated for R&D-related activities in the Vologda Oblast and 606.8 million rubles in the Moscow Oblast²². The participation of companies in the formation of the budgets of funds contributes to the growth of financial resources, the amount of which can be laid in the budget of the region and directed to the development of research and development. In the Vologda Oblast such allocations will allow increasing the item of expenditure on scientific research and development to 116.7 million rubles in the budget of the region, in the Moscow Oblast – up to 9320.9 million rubles.

Analysis was conducted in relation to government orders using the data of the largest companies in the regions: in the Vologda Oblast – “Severstal”,

²² Consolidated budgets of constituent entities of the Russian Federation and budgets of territorial state extrabudgetary funds. Available at: <https://roskazna.gov.ru/ispolnenie-byudzhetrov/konsolidirovannye-byudzhety-subektov/>

in the Moscow Oblast – “Zagorsk Pipe Plant”, which is included in the Expert-400 rating of large Russian companies. Financing of state orders at the expense of contributions of companies may be increased in the Vologda Oblast from 1 296 to 6 464.5 million rubles, in the Moscow Oblast – from 3 924.9 to 60 291.6 million rubles²³.

The analysis of the amount of funding for regional research projects was carried out on the basis of the RSF data²⁴. In 2019, 10 million rubles were allocated in the Vologda Oblast and 382.5 million rubles in the Moscow Oblast. Participation of companies in replenishment of the funds' budget will allow to increase financing of regional research projects 5-fold and 15.3-fold, respectively.

Thus, the funds received in the case of deductions from the proceeds of companies can go to finance the implementation of activities of the national project “Science”. This creates conditions for directing some federal funds to other areas that

²³ Look what the cat dragged in: The state order cannot become a guarantor of industry stability. Available at: https://www.dp.ru/a/2020/09/30/NeIjogkaja_prinesla; SBIS. Available at: <https://sbis.ru/>

²⁴ Russian Science Foundation. Available at: <https://xn--p1ai/project/>

require additional financial resources, to finance research grant competitions for businesses, budget programs, government contracts, and regional research projects. Participation of companies in the formation of additional funds allocated to R&D contributes to the growth of tax revenues to the federal and regional budgets.

The possibility for companies to make contributions to the budget of funds to support scientific, scientific and technological and innovation activity in the amount of up to 1.5% of their revenues actualizes the issue of interest of organizations to participate in this funding program. In this regard, it is advisable to consider the directions of stimulating organizations to participate in the formation of the budget of these funds.

Direct forms of financing include the provision of subsidies to organizations which carry out R&D. Paragraph 1 of RF Government Resolution 1649, dated December 12, 2019 stipulates the possibility for organizations which carry out R&D to receive subsidies²⁵. The study shows that large industrial companies, banking structures, etc., which are not directly involved in research and development, can take part in the formation of the budget of funds. This leads to the need to expand the list of organizations specified in paragraph 1 of the Resolution, which have the opportunity to receive subsidies to cover the costs allocated to the funds to support research, scientific and technological, and innovation activity.

Among the indirect measures of stimulation the most widespread are tax privileges. According to Article 286.1 of the Tax Code there is “an investment tax deduction amounting in the aggregate to no more than 90% of the amount of

R&D costs. If the taxpayer exercised the right to apply the investment tax deduction, he also has the right to reduce the amount of tax (advance payment) to be credited to the federal budget by the amount equal to 10% of the amount of expenses”²⁶. Based on the content of this article, we can conclude that the investment tax deduction can only be given to those companies that are engaged in research and development. In this connection it is expedient to include in Article 286.1 of the Tax Code other companies whose sphere of activity is not directly connected with R&D, but which indirectly participate in formation of the funds to support research, scientific and technological, and innovation activity. It is also proposed to expand Article 78 of the Tax Code²⁷ with an incentive tool widespread abroad – the tax credit, implying a deduction of R&D costs from the amount of accrued profit tax.

Along with this, it seems expedient to include in the Tax Code a provision on the approach in which it is supposed to reduce the profit tax of an organization while increasing its expenses in the form of deductions to the budget of funds, as well as increasing the tax benefits provided to it with regard to, for example, “exemption from customs duties, tariffs, VAT on purchased equipment, devices, raw materials, materials, intellectual property necessary for implementation of radical innovative projects” (Todosiichuk, 2012).

We should note that the very possibility of formation of funds to support research, scientific and technological, and innovation activity is regulated in the federal law “On science and state scientific and technological policy”. This document has information on the legal status of funds, as well

²⁵ On approval of the Rules for granting subsidies from the federal budget to Russian organizations for financial support of the costs of research and development work on modern technologies as part of the implementation of innovation projects by such organizations: RF Government Resolution 1649, dated December 12, 2019. Available at: <https://base.garant.ru/73229392/>

²⁶ Article 286.1 of the Russian Tax Code. Available at: http://www.consultant.ru/document/cons_doc_LAW_28165/7260ba686ad1fa7b436a67a764ee41663d78d2cb/

²⁷ Article 78. Tax Code of the Russian Federation. Available at: http://www.consultant.ru/document/cons_doc_LAW_19671/fbacb44debdc278494b8260675cc5f93f4a24b/

as on the directions of their activities²⁸, but the law does not present provisions on the incentives for the creation of such funds. From our point of view, it is necessary to include in this document proposals for the provision of various benefits and preferences, such as the provision of budget investment, state guarantees, preferences in public procurement, information support, etc.

It is important to emphasize that at the regional level there are laws and regulations focused on scientific and technological development, based on the federal legislation. Accordingly, they contain provisions for the formation of funds to support research, scientific and technological, and innovation activities. It seems necessary to include in regional laws and regulations the information that public authorities of constituent entities of the Russian Federation may grant preferences to organizations that take part in replenishing the budget of the funds in question.

Conclusion

An important factor contributing to the growth of innovation activity in the regions is a well-developed system of R&D financing. However, Russia demonstrates low research and development expenditures and lags far behind the world leaders of innovation development by this indicator. The results of the analysis of statistical data and scientific literature show that in Russia there is such a model of R&D financing in which state funds play a significant role. Currently, there is no consensus on the effectiveness of this model, but statistics show that the country continues to lag far behind the world leaders in terms of R&D spending and the level of innovation activity.

Based on our calculations and analysis of regulatory documents, we concluded that one of the effective and legitimate methods of increasing

the financing of R&D could be the creation of funds to support research, scientific and technological, and innovation activities. The formation of their budget provides for deductions from the proceeds of companies in the amount of up to 1.5%. However, it was noted that not all organizations have the financial capacity to make such deductions. Based on this conclusion, we identified categories of companies (the largest companies included in the top 400, companies of businessmen included in the Forbes rating, as well as state banks), whose cash resources allow making deductions from revenues for the formation of the budget of regional funds without prejudice to the further functioning and development of organizations. The creation of such funds may become one of the options for increasing the volume of financial resources for regional R&D (implementation of measures of the national program “Science”, provision of grants, financing of regional research programs, etc.). In order to implement such a mechanism for replenishing the funds’ budget, a set of measures is needed to stimulate companies to participate in this program. The analysis showed that there are various forms of state support for innovation, the most common of them are financial incentives. In turn, among the financial support measures are direct budget incentives (subsidies, etc.) and indirect incentives. However, they are mainly provided only for educational organizations, as well as for organizations whose activities are directly related to R&D. This fact indicates the need to make adjustments to the regulations in terms of expanding the list of subjects that have the opportunity to receive a certain measure of support.

The work is a comprehensive study, which focuses not only on the role of funds to support research, scientific and technological, and innovation activities in enhancing innovation activity, but also on the study of organizational and legal conditions of their creation, opportunities to

²⁸ On science and state scientific and technological policy: Federal Law 127-FZ, dated August 23, 1996. Available at: http://www.consultant.ru/document/Cons_doc_LAW_11507/

replenish the budget of funds, directions of spending funds, etc., which determines the theoretical significance of the article. The practical significance lies in the fact that the results of the study can serve as an economic justification and organizational support for the creation of regional funds by the authorities at the level of the constituent entities of the Russian Federation. In addition, the results of the analysis of existing modern practices can be used for the development of a separate federal law regulating the creation and functioning of the funds in question.

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