THE DEMAND FOR RUSSIAN SCIENCE: AS REFLECTED IN RUSSIA'S STRATEGIC DOCUMENTS

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The problem of creating adequate demand for the results of scientific research has been discussed in Russia for nearly two decades. The low demand for innovation technologies and the orientation to budget funding are the long-standing and well-known issues in the sphere of science and technologies. The new strategic documents concerning this country's innovation-based development that were made public in autumn 2015 put forth, among other things, the decisions aimed at boosting the performance level in the science sector. However, the issue presented by the low demand for science products is not explained clearly enough in those documents in relation to the proposed approaches and measures to be implemented, and so no target instruments applicable in this connection are suggested.

The postulate that science must be in demand, this being the main condition for it producing maximum benefits to this country's national economy, has already been maintained by representatives of both the State and hi-tech and research organizations and companies for a long time. The idea of 'demand' is understood as the various areas where science products can be applied – from the military to multiple civilian uses. The demand for scientific research projects is usually created by the government (in Russia, the government is the main consumer of R&D products), the business community[1] and society (the education system being one of the consumption channels available for the latter).

Although the problem posed by the less than adequate demand for science in Russia appears to be self-evident, the available official documents, including those where the national strategies are stipulated, offer very few direct instructions as to how the problem should be presented, and what the possible solutions to it might be. The problem itself is outlined in rather generalized terms like 'the effectiveness of science' and 'the ability of science to produce results'. A typical example is the two reports released in autumn 2015: *'Rossiia: Kurs na innovatsiiu. Vypusk III'* [Russia: A Course to Innovation. Issue III'] (M.: RBC, F&S)[2] and *Nationalnyi doklad ob innovatsiiakh v Rossii* [National Report on Innovation in Russia] (RF Ministry of Economic Development; Open Government; RBC)[3].

The first report analyzes the process of implementation of the Strategy for Innovative Development of the Russian Federation Until 2020 as it is stipulated in its initial version approved in 2011, with no account for the alterations introduced in 2015. The second one looks not only at the current situation

1 In Russia, the low activity of businesses in the R&D sector is the focus of numerous discussions. See, e.g., Mekhanik A. Dolina, kotoraia dolzhna stat' tsvetushchim sadom [The Valley That Must Become a Garden in Bloom] // Ekspert [The Expert], No 51, 14 December 2015. See http://expert.ru/expert/2015/51/dolina-kotoraya-dolzhna-stat-tsvetuschim-sadom/

2 See http://www.rusventure.ru/ru/programm/analytics/docs/2015_Public_report_Strategy_Innovative_Development_RU_web.pdf

3 See http://www.rusventure.ru/ru/programm/analytics/docs/NROI_RVC.pdf

with regard to innovation in Russia, but also at its possible evolvement in the future. It is expected that such a report will be released annually and serve as a basis for 'administrative decision-making, developing the innovation and economic policies, and comprehensively monitoring the national innovation system, the factors and results of innovation activities'[1]. Thus, these two reports cover the fields of current and prospective development of Russia's innovation system, where the science sector is an integral part.

The first report is structured so as to be compatible with the sections of the Strategy for Innovative Development, where *Effective Science* is presented as a separately defined theme. *Effective Science* is treated as a sector that is in demand by both Russian and international companies; consequently, if Russia is in possession of this science potential, it should join the nations – world leaders in scientific research. The report criticizes the comparatively high government expenditures on applied research: only a third of all budget funding available in this sphere is allocated to fundamental research, while the rest goes to applied research and development. It should be noted that this state of affairs is far from being extraordinary: if we take a look at the structure of budget allocations to R&D in the USA, about a third of it is also spent on the support of fundamental research, while the rest is allocated to applied research and development. The problem evidently lies elsewhere. The USA differs from Russia in that the businesses there spend on applied research nearly three times as much as the government does[2]. Russian statistics makes it impossible to compare the amounts spent by the government and private businesses on applied research and development – it only reflects their relative shares in the funding allocated to R&D, including data broken up by sector in the sphere of science. Available data indicate that in Russia, the government invests in the R&D projects implemented in the private business sector 1.7 times more that the private businesses themselves[3]. And if we add here the funding allocated by the government to applied research at higher educational establishments and research institutes, the fact of private funds being replaced by government funding will become obvious, which cannot be conducive to boosting innovation. Besides, as follows from the experts' estimations cited in the report, the cost-effectiveness of budget funding increases only slightly, if at all: only 17% of respondents believe that it has become more effective[4]. As the government share in R&D funding has remained stably high for several decades in a row, the demand for science remains an unsolved problem. The report's (and the Strategy's) authors suggest that the problem can be solved through improving the mechanisms applied in the protection of intellectual property and developing the system of technology transfer. Both these measures are unquestionably important, but they can hardly be viewed as playing the key role, because the system of

1 Mikhail Abyzov, RF Minister for Open Government: Global'noe innovatsionnoe sorevnovanie [Global Competition in Innovation] // Nationalnyi doklad ob innovatsiiakh v Rossii [National Report on Innovation in Russia]. Draft. M.: RF Ministry of Economic Development; Open Government; RBC. 2015. P.5.

2 Science and Engineering Indicators: 2014. NSF, NSB: Arlington, VA, 2015. Table 4-3. See http://www.nsf.gov/statistics/seind14/index.cfm/etc/tables.htm

3 Estimations based on data from: Indikatory nauki [Science Indicators]: 2015. Statisticheskii sbornik [Statistics Collection]. M.: NRU HSE, 2015. P.73.

4 Rossiia: Kurs na innovatsii [Russia: A Course Towards Innovation. Issue III. M.: RBC, F&S, 2015. C.47.

regulation of intellectual property rights is steadily improving every year[1] (as confirmed by the results of expert survey presented in the report), while the creation of technology transfer offices (even when these function smoothly and employ efficient professionals) cannot really boost the demand for science products in face of the existing low demand in industry for R&D produced by universities (at present, less than 5% of R&D products offered by higher educational establishments are being commercialized in the real sector of the economy[2]). The demand for 'effective science' could also have been displayed by businesses, including big companies. However, this group is dominated by state companies, and the measures designed to 'push' state companies towards innovation (that have been implemented over recent years) do not yield impressive results. Meanwhile, no alternative to the 'innovative development programs' implemented by companies with state stakes is suggested in the report. Essentially, the report only points once again to the existence of several well-known problems and measures, but offers no systemic overview as to what needs to be done in order to boost demand for the results of R&D projects.

A similar outlook with regard to science can also be found in the second report, *Natsionalnyi doklad ob innovatsiiakh v Rossii* [National Report on Innovation in Russia]. The description of the state of affairs in the sphere of science presented there does not make it possible to come to any conclusions as to the quality of the development processes going on in that sphere. The sphere of science is estimated on the basis of the following parameters:

The reorganization of state academies of sciences established by the Federal Agency for Research Organizations, the Russian Scientific Fund and the Fund for Perspective Research has been accomplished.

The N.E. Zhukovsky Scientific Research Center has been established, which represents an integrated structure in aviation science designed to consolidate scientific research, the technological potential and human resources of Russia's key research centers and to promote their science products in the world market.

The Long-term Program of Fundamental Scientific Research in the Russian Federation is approved.

The Long-term Science and Technology (S&T) Foresight until 2030 for the Russian Federation Until 2030[3] is approved.

Thus, no estimation of the progress in the field of science and of the vector of changes going on therein has been offered. The fundamental research program (and the same is true of science and technology foresights) has been in existence for a sufficiently long period of time, and it is their content that matters, not the mere fact of their existence. Reform in the academic sector is an important achievement, and its consequences will be versatile. And finally, the information on the Scientific Research Center was for some rea-

1 In particular, in 2015, Decree of the RF Government of 31 October 2015, No 1174 'On Approving the Rules for Consolidating to the Performers of Work and Other Persons the Exclusive Right to the Result of Intellectual Activity Created under a Government Contract before 1 January 2008 and Owned by the Russian Federation or a Subject of the Russian Federation, If the Customer Representing the State Did not Practically Applied (Implemented) That Result before 1 January 2015' was adopted, whereby the opportunities for transferring the rights to intellectual property from the State to performers of work were expanded.

2 Ibid. p. 49.

3 Nationalnyi doklad ob innovatsiiakh v Rossii [National Report on Innovation in Russia]. Draft. M.: RF Ministry of Economic Development; Open Government; RBC. 2015. P. 32.

son included in the brief description of the science sphere, which is strange because it is only an example of one entity of this type, and not a general model. Taken together, these four parameters say nothing of the state of affairs in the science sphere on a national scale.

The second report, similarly to the first one, makes the statement of an excessively large share of the government in the support of commercial applied research projects, in addition to making public the impressive fact that Russia comes first in the world by its rate of government spending on commercial R&D[1].

So, what solutions that could be regarded as measures designed to boost the demand for science products are suggested in the National Report? With a certain degree of approximation, these could be the measures aiming at increasing 'the effectiveness of R&D'. To achieve this aim, six methods are offered[2]. One of them is to attract back into this country the émigré scientists, ostensibly in the hope that they may boost the quality of research and improve the age structure of human resources. Another method that has been suggested is to speed up the transfers from fundamental to applied research through integrating these fields into big clusters. This scheme appears to be an abstract one, and besides, it obviously cannot boost the demand for science. The third solution is a well-known one: redistribution of budget funding towards the recognized high priority areas. It has both its opponents and supporters, because the choice of priorities is the prerogative of the government and implies its interference in the developments in the science sphere and can be strongly influenced by lobbying groups[3]. If the choice is erroneous, the redistribution of budget funding in favor of one priority to the detriment of another may yield results that would be contrary to what has been expected. In Russia, the choice of priorities and allocation of funding to them through the mechanism of federal target programs has been practiced for 20 years, while the problem of 'science effectiveness' is still acute. The remaining three solutions are non-systemic and of minor importance. They have to do with measures designed to improve the performance of equipment sharing centers, involve scientists specializing in humanities in dealing with global humanitarian issues, and develop a system for regulating the participation of the staff of higher educational establishments in commercial ventures. Taken together, these measures give the impression of a list of options suggested by the participants in a brainstorm group, as they appear to be a haphazard selection that lacks inner logic.

Thus, the reports under consideration offer no strategic outlook with regard to the issue of boosting the effectiveness of Russian science – and consequently boosting the demand for it. At the same time, among the measures being implemented today, the most noteworthy one is the National

1 Natsionalnyi doklad ob innovatsiiakh v Rossii [National Report on Innovation in Russia]. Draft. M.: RF Ministry of Economic Development; Open Government; RBC. 2015. P. 47.

2 Ibid. P. 102.

3 Thus, in January 2016, the new priority was being actively discussed, which had been put forth by the National Research Center 'Kurchatov Institute' (convergent technologies), along with the substantial chunk of budget funding that had been applied for in order to support that priority. See, e.g., Chuikov A. U Putina prosiat milliardy na nesushchestvuiushchuu nauky [Putin is Asked to Give Billions to Nonexistent Science] // Argumenty nedeli [Arguments of the Week], No 1, 14 January 2016. See http://argumenti.ru/science/n521/430428 ; Onishchenko E. Nauka na biudzhetnykh zadvorkakh [Science in the Budget's Backyard] // Gazeta.ru, 20 January 2016. See http://www.gazeta.ru/science/2016/01/20_a_8032067.shtml

Technology Initiative because it offers the potential for linking science to the development of hi-tech products, including those with multiple uses that can propel Russia into new markets. The vital component in such structures is the emergence of links between research institutes, businesses of various sizes and forms, service providers, technology brokers, and venture and other funds. Therefore, we believe that the key role should belong to the measures designed to create such links. These instruments have already been used in Russia, or continue to be used. Some examples are subsidizing grants[1], consulting[2], technology platforms. These methods may indeed be modified or upgraded, but first they must be assessed from the point of view of their success or failure.

1 Decree of the RF Government of 9 April 2010, No 218 (as amended as of 12 February 2015) 'On Government Measures Designed to Support the Development of Cooperation between Russian Higher Educational Establishments, State Research Institutions and Organizations Implementing Comprehensive Projects Aimed at Creating Hi-tech Production Entities, in the Framework of the Subprogram "Institutional Development of the Scientific Research Sector" of the Government Program of the Russian Federation "Development of Science and Technology" for 2013–2020'.

2 This was possible in the framework of Decree of the RF Government of 9 April 2010, No 219 (as amended as of 3 June 2011) 'On Government Support of the Development of Innovation Infrastructure in Federal Educational Establishments for Higher Professional Education'.