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R95 **Russian Economy in 2013. Trends and Outlooks.**
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The review provides a detailed analysis of main trends in Russia's economy in 2013. The paper contains 6 big sections that highlight single aspects of Russia's economic development: the socio-political context; the monetary and credit spheres; financial sphere; the real sector; social sphere; institutional challenges. The paper employs a huge mass of statistical data that forms the basis of original computation and numerous charts.

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Situation in Russian science and innovation sector in 2013

The situation in the Russian science sector in 2013 differed largely from that in the innovation sector. The Russian Government launched a radical reorganization of the science sector. The so-called “academic” sector in science ceased to exist, the Russian Academy of Sciences was reorganized into an export entity, a new Federal Agency for Scientific Organizations was established to become the parent agency of the research organizations previously affiliated with the three Russian academies of sciences. A new scientific foundation with a substantial budget was established, thereby changing drastically the mechanisms of funding basic research and exploratory scientific studies.

The innovation sector saw a presumably temporal increase in activity of venture investors including business angels. This took place against the backdrop of aggravating general economic situation in the Russian industry as the principal consumer of technology innovation. No drastic changes to the national innovation policy took place, nor any significant innovation emerged.

R&D expenditures and results

Macroindicators of the situation in the Russian science sector remained stable in 2013 – the contribution of R&D expenditures to the gross domestic product remained unchanged and is predicted to remain the same in 2014 (*Table 8*).

In 2013, the United States remained the global leader with \$450bn of R&D funding in absolute terms. China took 2nd place (\$258bn), Japan (\$163bn), Germany (\$92bn), South Korea (\$61bn). Russia took 9th place (\$38bn).

R&D budget allocations have recently been growing in Russia. This is why the steadily maintained share of expenditures on science (as percentage of GDP) testifies that other sources of funding such as Russian private funding and foreign funding have been contracting. This is an essential characteristic of the science and innovation sectors. The developed countries showed an opposite trend in outstripping growth in R&D extrabudgetary funding with a bigger than in Russia contribution to funding from private sources. For instance, the US federal budget expenditures in 2013 increased 1.5% year-over-year against a 4% growth in private sector funding, given the fact that companies’ contribution to total R&D funding was already more than twofold (71%) against budget allocations¹.

Table 8

Total R&D expenditures: Russia and the world, as % of GDP

Country	2012	2013	2014
Israel	4.3	4.3	4.2
Japan	3.4	3.4	3.4
U.S.A.	2.8	2.8	2.8
Germany	2.8	2.8	2.9

¹ 2014 Global R&D Funding Forecast. Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA Fact Book. December 2013. P.8.

France	2.3	2.3	2.3
China	1.8	1.9	2.0
Great Britain	1.8	1.8	1.8
Russia	1.5	1.5	1.5
Brazil	1.3	1.3	1.3

Source: 2014 Global R&D Funding Forecast. Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA Fact Book. December 2013. P.7.

The results of bibliometrically measured research performance of Russian scientists keep falling. Even in the case of gaining in absolute terms (e.g., the number of articles of Russian authors indexed in the Web of Science (hereinafter – the WoS) and Scopus) database, Russia’s relative score has been declining because of faster growth rate in scientific productivity in other countries, especially China, India, South Korea, Canada, Spain, Italy¹.

The 2012 data show that Russia accounts for less than 2% of the global flow of research publications². Furthermore, citing metrics were even lower for Russia: Russia took 14th place in the world on the number of articles, whereas 23rd place on citing of these articles³. An average citation ratio of Russian articles in the period of 2008 thru 2012 was 2.8, the lowest among the BRIC countries (3.3 in Brazil, 3.5 in India, 4.2 in China), and far below the average global flow of publications (4.8). Additionally, RAS institutions contributed most to scientific productivity while publication activity of the leading universities has recently increased mostly owing to joint publications with RAS institutions’ researchers⁴.

Principal changes to the national science and innovation policy

The year of 2013 became a turning point in institutional reforming of science in Russia, when the three public academies – the Russian Academy of Sciences (RAS), the Russian Academy of Medical Sciences (RAMS), and the Russian Academy of Agricultural Sciences RAAS⁵ – were reorganized, a new public agency – the Federal Agency for Scientific Organizations (FASO) and a new scientific foundation – Russian Scientific Foundation (RSF) – were established.

The principles and the criteria for the performance measurement of scientific organizations, reforming the system of conferment of academic degrees were actively developed at the same time.

However, a series of scheduled initiatives were never implemented, e.g., a project on establishing 1000 laboratories of a new type in this country, summarizing the results of the

¹ In the mirror of Web of Science. 1998-2012. Ivan Sterligov’s Blog. 21.06.2013. <http://sterligov.blogspot.ru/2013/06/web-of-science-1998-2012.html>

² V. Markusova, A. Libkind. How much is to publish? Research cooperation of higher education institutions with the Russian Academy of Sciences in figures // Poisk No. 18, 03.05.2013. <http://www.poisknews.ru/theme/science-politic/5988/>

³ V. Markusova’s report on “RAS and higher education institutions: Competition or Cooperation?” at the Moscow seminar on science studies M.: INION RAN, 30.10.2013. http://www.inion.ru/index.php?page_id=436&id=589&ret=435

⁴ For instance, in the Novosibirsk State University 90% of the published articles were co-authored with the RAS, 65% with the Moscow Institute of Physics and Technology, 60% with the National Research Irkutsk State Technical University, 40% with the National Research University - Higher School of Economics. Source: V. Markusova, A. Libkind. How much is to publish? Research cooperation of higher education institutions with the Russian Academy of Sciences in figures // Poisk, No. 18, 03.05.2013. <http://www.poisknews.ru/theme/science-politic/5988/>

⁵ RAS stands for the Russian Academy of Sciences, RAMS for the Russian Academy of Medical Sciences, and RAAS for the Russian Academy of Agricultural Sciences.

second stage of projects on establishing laboratories directed by leading scientists (mega-grants).

The situation with the innovation policy was less troubled. The legal and regulatory framework concerning exclusive rights to the results of intellectual activity was refined, development institutions kept working, they developed new strategies of their activity.

The focus was placed on the reform in the Russian Academy of Sciences thanks in no small part to its unexpected announcement and unpredictable logics of the subsequent steps of its implementation. At the same time, measures of establishing a new scientific foundation, performance measurement of scientific organizations, creating a new public agency, reforming the system of conferment of academic degrees were worked up in a backdoor manner. The results of the government's decisions more often than not was a total surprise, and, moreover, an atmosphere of chaos was mounting because of their frequent adjustments. This is why the past year reminds of the popular quotation "*First, get into a serious fight, then let chance decide*"...¹ by Vladimir Lenin.

Institutional changes

Reforming the academic sector of science

June 2013 saw maybe the most large-scale reforming process in the Russian science sector since the beginning of 1990s which began with the merger of the three public academies of sciences (RAS, RAMS, and RAAS) which at the same time ceased to be the parent company of their affiliated research institutions, the establishment of a new Federal Agency for Scientific Organizations, the development of new criteria and mechanism of performance measurement of research institutions.

The appearance of the draft law N305828-6 *On the Russian Academy of Sciences, Reorganizing State Academies of Science and Making Amendments to Certain Legislative Acts of the Russian Federation* came as surprise even to the administration of the Russian Academy of Sciences and therefore was not praised by the academic community. Not only did the draft law's contents, but also the method selected for reforming provoked indignation. The draft law was instantly submitted directly to the State Duma in violation of the applicable laws and regulations under which it should have been subject to a social discussion first. The line Ministry of Education and Science of the Russian Federation (MES) denied its participation in the development of the law, which seems to be absurd per se. Careful analysis of the logics of the developments shows clearly that the MES was at least one of the ideologists rather than the driving force of the proposed version of reforming the RAS. For instance, Minister of Science D. Livanov stated in March 2013 that the academic organization of science has no prospects in the 21st century, it should be changed, and he will use his best endeavors to do that². However, President Putin didn't seem to be in favor of supporting drastic measures towards the RAS. He confirmed the need to further develop such "essential for us entity as the Academy of Sciences of the Russian Federation" at his meeting with RAS President Y. Osipov which was held as

¹ V. I. Lenin "On our Revolution". 1923. Complete set of works, Vol. 45, p.381. <http://revarchiv.narod.ru/vladimilitch/lenin45/suhanov.html>

² Dmitry Livanov believes that the RAS has no prospects // *Rossyiskaya Gazeta*, 24.03.2013. <http://www.rg.ru/2013/03/24/livanov-site-anons.html>

early as April 2013¹. However, a headlong process of changes was already launched, and neither protests from official entities, the academic community, nor international appeals could stop it.

It is characteristic that the draft law remained ill-defined and inconsistent even upon two readings in the State Duma. The RAS management submitted five essential amendments to the draft law after it passed two readings, being indicative of very drastic changes provided for by the draft law:

1) Instead of abolishing, reorganize the RAS through merging with the RAMS and the RAAS;

2) Formulate basic and applied research as the principal objective of the RAS;

3) Share powers among the RAS and the Agency (later called the Federal Agency for Scientific Organizations) so that the FASO only be in charge of managing the RAS's assets;

4) Recover the legal entity status of the RAS's regional branches.

5) Retain the two-stage system of the title of correspondent member and academicians, and keep the RAS being entitled to decide how and when new RAS members should be elected.

After the draft law passed three readings, the RAS management managed to uphold most of the five proposals including reorganization by merging the three academies of sciences, retaining the RAS functions of conducting basic and applied research, as well as coordinating research at higher education institutions, restoring the regional branches as stand-alone legal entities, retaining the Academy's status of chief controller of budget funds, including the manager of regional branches. Finally, the title of RAS correspondent member was retained. However, the RAS ceased to own the federal assets which were assigned to the research organizations previously affiliated with the RAS. Finally, it is the provision on research institutions that was left most inexplicit.

The Federal Law was adopted on September 27, 2013², and the Presidential Decree *On the Federal Agency for Scientific Organizations* was issued on the same date³. It was not until then that the development of a provision on the FASO's principles of operation and vested powers was started. In fact, a new ministry of sciences emerged and became in charge of the institutions affiliated with the merged public academies. The FASO became in charge of both the assets of the former academies of science and management of the research institutions, including areas of research to be covered. Since such an organization inevitably results in changes to a substantial part of the science sector, a Commission for Social Supervision over the reform of the Russian Academy of Sciences was established. The situation acted as a catalyst for uniting civil society powers in science – the Commission embraced 10 non-governmental organizations of science and education⁴. Such a union can be regarded as one of a few positive, indirect effects of the commenced reforms.

The Commission focused on making amendments to the developed provision on the FASO, because the Agency's role changed from a soft-line regulator to a hard-line centralized manager, according to the document which was prepared by the Government. In particular, such RAS's functions as coordination of institutions, expert evaluation, and methodological

¹ A meeting with President of the Russian Academy of Sciences Y. Osipov. Novo-Ogarevo, 16.04.2013. <http://kremlin.ru/news/17908>

² No. 253 of 27.09.2013 <http://graph.document.kremlin.ru/page.aspx?1;3586986>

³ No. 735 of 27.09.2013 <http://graph.document.kremlin.ru/page.aspx?1;3587023>

⁴ Scientists establish a Commission for Social Supervision over the reform of the Russian Academy of Sciences, 08.10.2013 http://www.polit.ru/news/2013/10/08/public_control_in_science/ 08.10.2013 г.

support were retained in the initial version of the draft law, but then removed from it¹. A special emphasis was paid to a scientific and steering board which should be established as mediator, a FASO's structural unit, to ensure interaction with the Agency, the RAS, and institutions. The principles of selecting candidates to the steering board and principal parameters of its operation were discussed.

The Russian Government's Regulation *On the Federal Agency for Scientific Organizations* was signed on October 25, 2013 (No. 950), and it derives from the approved provision that neither FASO's goals nor objectives were formulated, however all the key issues associated with funding, institutions' assets, social sector, procurement of equipment and chemical agents are its prerogative. The RAS proposals are only "considered" for the two types of activity, namely planning of basic research and exploratory scientific studies, as well as approving development programs of research organizations affiliated with the Agency, public assignments for basic research and exploratory scientific studies. Therefore, although planning of scientific activities wasn't totally assigned to the FASO, the RAS became to play a minor role. Furthermore, although the Academy of Sciences conducted negotiations on retaining affiliation of certain comprehensive institutions² including a few museums and archives, a final list of the 1007 affiliates with the FASO included all organizations of public academies, from research institutions to in-house clinics and kindergartens³.

The Regulation only specifies that the scientific and steering board shall consist of scientists "conducting universally recognized scientific research". Perhaps, a special regulation on the steering board's formation principles and objectives would be issued, so far the FASO has been developing without a steering unit.

The FASO didn't hesitate too long before getting to work, RAS institutions' budget was approved in time, and they could keep working after January 1, 2014⁴. This result is much better than what the academic community predicted, anticipating that from now on the science in Russia would be administered by "dummies"⁵ and expert boards would be staffed with "punks"⁶. It appeared that the FASO was going to hire former RAS's managers, although scientific and research experience is not mandatory⁷. The Agency instantly offered at least one incentive enhancing efficient performance, i.e. the FASO issued its first administrative order on a monthly salary supplement for various categories of its personnel⁸.

¹ S. Samokhina, N. Gorodetskaya, A. Chernykh, Kh. Aminov. A complex situation// Kommersant, No. 184, 09.10.2013. <http://www.kommersant.ru/doc/2315297>

² V. Vlasov. Premature rumors of science collapse // Polit.ru, 24.12.2013.] <http://polit.ru/article/2013/12/24/vlasov/>

³ The Prime Minister's Executive Order N2591-r of December 30, 2013 "On the Approval of the List of Organizations Affiliated with the FASO of Russia <http://government.ru/media/files/41d4b2ee4aa4fdc62ccb.pdf>

⁴ A financial approach towards the academicians has been found // Kommersant, 25.12.2013. <http://www.kommersant.ru/doc/2376244>

⁵ Waiting for dummies to come. Who is going to rule the science // Poisk, 12.07.2013. <http://www.poisknews.ru/theme/science-politic/6549/>

⁶ Experts will be replaced by punks. An interview with M. Gelfund // Nauka i Tekhnologii RF. 01.07.2013 http://www.strf.ru/material.aspx?CatalogId=221&d_no=57508#.Ur11bLSBY3k

⁷ S. Krymova. To be taken under advisement. What kind of knowledge and skills do the FASO's personnel need // Poisk, No. 51, 20.12.2013. <http://www.poisknews.ru/theme/science-politic/8631/>

⁸ The Federal Agency for Scientific Organizations' (FASO Russia) Administrative Order of December 18, 2013 No. 1n On the Approval of the Provisions on the Payment Procedure of Monthly Salary Supplements for Special Conditions of the State Civil Service to the State Civil Servants of the Personnel of the Central Administrative Office of the Federal Agency for Scientific Organizations and the Managers, Deputy Managers of the Regional

It should be noted that the introduced changes indeed resolve the conflict of interests which was in place at the RAS, where allocation and spending functions were combined. The practice of dividing administration of assets and research activity is quite common worldwide. Furthermore, the “government owned, contractor operated” model¹, when public entities (e.g., national laboratories) are administered by private companies, has proved efficient. However, the cost of the RAS² reform wasn’t defined. More than that, none of the country’s long-term forecasts included assessment of the effect of the reform³. The situation remains uncertain, in particular there is no knowing what would be the Charter of the merged RAS which should be approved at a General Meeting of the merged Academy⁴.

The hit-or-miss quality of the reform became evident as early as October 31, 2013. President Putin imposed a 1-year moratorium on transactions with academic assets and staff changes, as subsequently specified in the list of his orders⁵. The term is realistic for developing measures to ensure further operation of the institutions which previously were affiliated with the RAS, the RAMS and the RAAS. Additionally, no criteria for measuring the performance of research organizations which were developed during a year have not yet been approved. The Government’s executive order on making adjustments to the system of performance measurement for research organizations was adopted on November 1, 2013⁶, but it took much longer to discuss the criteria and indicators. Selection of reliable measures has recently become even more important, because such measures should be relied upon in auditing academic institutions to be affiliated with the FASO. The adopted executive order specifies the following principal approaches towards performance measurement:

- non-departmental nature, establishing a interdepartmental commission;
- merging scientific organizations into reference groups regardless of their departmental affiliation, factoring in scientific knowledge areas and types of scientific research;
- using the measures which the developed countries use to measure the performance of research organizations.

Offices of the Federal Agency for Scientific Organizations, on the Bonus Payment Procedure for the State Civil Servants of the Personnel of the Central Administrative Office of the Federal Agency for Scientific Organizations and the Managers, Deputy Managers of the Regional Offices of the Federal Agency for Scientific Organizations, on the Procedure for Financial Aid, Lump Sum Financial Inducement for Honorable and Efficient State Civil Service and Lump Sum Payment in Granting Annual Paid Leave to the State Civil Servants of the Personnel of the Central Administrative Office of the Federal Agency for Scientific Organizations and the Managers, Deputy Managers of the Regional Offices of the Federal Agency for Scientific Organizations. <http://www.rg.ru/2013/12/27/fano1-dok.html>

¹ Used extensively in the United States, the so-called GOCO (government owned, contractor operated) model. In this case, the government establishes the mission and research areas for the organization, and the private sector implements the mission, using best business practices. See, e.g., <http://www.sandia.gov/about/history/goco.html>

² RAS President V. Fortov estimates that the RAS reform will cost Rb 60-70bn, which is close to the Academy’s 2013 budget. Source: The state will pay Rb 70bn for the RAS reform // *Gazeta.ru*. 01.10.2013. http://www.gazeta.ru/science/news/2013/10/01/n_3222769.shtml

³ N. Volchkova. The space of orders. The President orders a new science and technology policy // *Poisk*, No. 3, 24.01.2014 <http://www.poisknews.ru/theme/science-politic/8796/>

⁴ The Charter is to be adopted in March 2014.

⁵ Putin urges not to squander the assets and human resources// *RVC daily*, 31.10.2013. <http://rbcdaily.ru/politics/562949989414296>; The list of instructions issued at a meeting of the Board of Science and Education. 15.01.2014. Instruction 1, p. g). <http://www.kremlin.ru/assignments/20065>

⁶ *On Making Amendments to the Russian Government’s Executive Order of November 1, 2013 No. 312*. The Russian Government’s Executive Order of November 1, 2013, No. 979. <http://www.ras.ru/news/shownews.aspx?id=613a30f8-1475-4d9a-a6a3-75df1501be7a>

Non-departmental nature is expected to be ensured through establishing an Interdepartmental Commission for the Performance Measurement of Research Organizations. The Commission has a lot of assigned tasks to perform, inclusive of measuring lowest values, which is very important and predetermines largely the results of the performance measurement.

The second aspect is reference groups and general principles of performance measurement. This aspect needs further consideration, because the assessment is most likely to be exclusively quantitative. A combination of 6–7 measures of specific weight will be determined for every reference group, depending on institutions' academic profile. Deviation on final results will automatically classify an institution as stable or lost its scientific potential. The provision under which the number of winners may not exceed one third of the total number of participants of a respective reference group is potentially insecure. Consequently, if a reference group has many strong institutions, a part of them will have to be recognized as weak in any case¹.

The results are also rough because it is organizations that are subject to performance measurement, not scientific laboratories. Quantitative data must be supplemented with qualitative data, and expert evaluation is expected to be performed at the departmental level, but only to analyze institutions facing the threat of liquidation. No assessment of credibility of selecting “winners” on the basis of quantitative parameters is expected to be performed², although the previous experience of quantitative assessments shows that they may provide incorrect results³.

Forming reference groups also requires a serious expert approach, because it is not easy to make areas of knowledge comparable, especially factoring in the nature of performed works. Therefore, criteria for selecting experts also should have been specified in the Executive Order.

The Ministry of Education and Science presented by the end of 2013 a list of 25 performance measurement criteria for organizations broken up into four basic groups. The effectiveness of and demand for scientific research will be measured mostly on the basis of bibliometric data, as well as patent statistics, the number of established small enterprises, and fundraising amounts. The HR development is considered narrowly as trained (in terms of quantity) postgraduates and Ph.D. students, as well as the number of those who have completed their internship. Integration into the global scientific community is bibliometrics again, but in this case it should be international co-authorship metrics.

This system of measuring is distinguished by its heavy reliance upon bibliometric data whose limits are well known. Moreover, adverse effects of using bibliometrics for the purpose of performance measurement have recently become more apparent in the global science⁴. In particular, the practice shows that papers which are not necessarily important but covering a trendy subject matter show growth in citations. There is a wide practice of journals driving up

¹ The RAS Trade Union appeals to V.V. Putin on the need to make amendments to the performance measurement procedure for scientific organizations. 11.01.2014 <http://www.ras.ru/news/shownews.aspx?id=fa8cc4f7-0177-47f3-813e-74bcc9857751#content>

² P. Chebotarev. Expert evaluation: outside and inside // Troitsky variant – Nauka, No. 45, 14.01.2014. <http://trv-science.ru/2014/01/14/ehkspertiza-ikh-i-nasha/>

³ In particular, when the SPI (Scientific Performance Indicator) was in force, which was measured for every researcher at academic organizations, quantitative data was often than not less efficient employees received better scores, e.g., for giving a single course of lectures in several higher education institutions or frequent reports at conferences. For more details on the SPI see Russian economy in 2007. Trends and Outlooks. M. IET, 2008, P. 422.

⁴ B. Alberts. Impact Factor Distortions // Science, vol.30, May 17, 2013. P.787.

the number of citations of published articles in order to improve their impact factors¹. There is a discussion on that bibliometrics is useless for measuring organizations and teams and only can be used to solve local objectives such as recruitment, career enhancement, allocation of grant, as well as selection of winners, and only in combination with expert evaluation².

The system of performance measurement of Russian organizations proposed the MES still remains to be improved. It remains to be defined which metrics are mandatory for all, how specific metrics are to be calculated, where to find the required number of experts on narrow areas of research, having no conflict of interest.

Overall, it should be emphasized that there is no ideal set of metrics especially quantitative ones, and most objective assessment can be achieved in combination with expert evaluations. Such a work can hardly be performed frequently, because it takes a lot of time and financial resources. This makes the role of research institutions even more important, as they can measure the performance (effectiveness and quality) of their personnel. Although such an approach faces the threat of biased assessment, it can be mitigated through advancing completion- and grant-based forms of research funding.

In the meantime, the Russian system of measurement has begun to follow the way towards centralization, as evidenced by “The Russian Science Map”, another project of the Ministry of Education and Science of Russia which has received a controversial response.

Developing the Russian Science Map

The Russian Science Map (hereinafter – the Map) project was launched in the middle of 2012³. The Map was initially designed to be used for identify “research teams operating at high international level, as well as promising areas of science”. However, the ill formulated objective caused concerns and speculations in the scientific community⁴. The concerns increased when PricewaterhouseCoopers Russia B.V., which has neither experience in such work, nor adequate knowledge, won the contract. Regrettably, all the concerns proved true by the end of 2013, when a pilot version of the Map, which was made available to the public on November 12, 2013, showed that there are technical and methodological problems, and the Map can’t be used, even if technical errors would gradually be corrected, because it provides a wrong picture in general.

Moreover, it is still unclear what exactly the Map was designed for. It was written in the text of the bid offer that such maps “can be used for measuring the performance and competitiveness of the Russian science, for making administrative and financial decisions on scientific organizations and research teams, as well as developing measures aimed at further developing scientific activities”⁵. It is the fact that the Map can be used for measuring the performance of organizations and making administrative decisions on them that caused most of the resentment. At the same time, MES’s representatives stated late in the year that the Map will not be used

¹ S. Belyaev. An impact isn’t a fact? Scientific journals are suspected of impurity? // Poisk, No. 26, 28.06.2013. <http://www.poisknews.ru/theme/science/6447/>

² On the proper use of bibliometrics to evaluate individual researchers. Report presented on 17 January 2011 to the Ministry of Higher Education and Research. Institute de France. Academie des sciences.P.6.

³ Dmitry Livanov promises to compile a Russian Science Map // Nauka i Tekhnologii RF. 18.06.2012. http://www.strf.ru/material.aspx?CatalogId=221&d_no=47268#.UufTTftrIU

⁴ Russian scientists will be measured on performance // Nauka i Tekhnologii RF. 29.11.2012. http://www.strf.ru/material.aspx?CatalogId=221&d_no=50459#.Ur6p9LSBY3k

⁵ M. Feigelman. The improper Russian Science Map and its supporters // Troitsky Variant, No. 144, 2013, P.4. <http://trv-science.ru/2013/12/24/krn-im-i-susanina-i-ee-zashhitniki/#more-34032>

for performance measurement, this is a useful database for scientists, the state, and businesses,¹ so that anyone can obtain information about who, where, what kind of research area, and how efficient he/she is engaged in.

However, none of the above listed objectives can be resolved with the Map. The main challenge is the use of a research area classification which is not in place in the Russian science². The Map provides for entries which link incorrectly research areas with certain areas of knowledge, and, moreover, the classification lacks a few important areas. This problem can't be solved even if every scientist, having access to the Map, corrected his/her data which still contain many technical errors (incompleteness, issues with authors having similar names and initials, numerical data mismatch with what is available in other databases, etc).

A less important issue is how often scientists will have to manually correct their data entered in the Map. Additionally, it is not understood whether the future RAS assessment of institutions is linked with the Government's decision to accelerate the development of academic research at universities, which includes allocating considerable financial resources to 15 higher education institutions, of which at least five should be ranked among the top-100 world universities by 2020³. Perhaps, it is financial injections and various types of training events that were regarded as serious tools to help the higher education institutions catch up with the international level.

It is characteristic that the existing university rankings use different groups of metrics, and it seems to be up to the universities to decide which rankings they want to be ranked. However, the level of scientific research plays an important role in all of the rankings, whereas Russian universities show a weak research component. The performance measurement of National Research Universities (NRUs) conducted by the Ministry of Education and Science of Russia in 2013 showed that they, first of all, are behind foreign universities on such metrics as scientific and technological activities – publication activity, and, above all, citation, as well as patenting⁴. At the same time, 11 NRUs and two federal universities made up the 15 winners which were announced in July 2013⁵. These higher education institutions received substantial budget funds, which were also allocated for the development of the research framework, during the preceding years, and were supposed to increase their volumes of extrabudgetary funding. However, their dependence on budget funding remains high, and therefore the new governmental initiative keeps them operating with privileged funding. In October 2013, all of the selected institutions presented their road maps of development until 2020, of which 12 were approved. The quality of these programs allowed the institutions to receive Rb 1,1bn to Rb 1,5bn until the end of 2013 and for 2014.⁶ Indeed, these institutions have a golden opportunity to engage scientists from

¹ Navigating in the world of scientific knowledge// Nauka i Tekhnologii RF. 19.12.2013. http://www.strf.ru/material.aspx?CatalogId=221&d_no=72618#.Ur7Rm7SBY3k

² Key comments on the Russian Science Map. The Commission for Social Supervision over the reform in the science sector. <http://www.rascommission.ru/index.php/documents/statements/57-zamechaniya-k-karte-rossiyskoy-nauk>

³ In 2012 the Russian Government set an objective to help a few of Russian universities become world's leaders by 2020, through allocating substantial budget funding to 10-15 higher education institutions selected on a competitive basis.

⁴ T. Kondakova. All other things being unequal. NRUs have been measured at no discount of the difference in potentials // Poisk, No. 41, 11.10.2013, P.6.

⁵ Fifteen higher education institutions win a competition for subsidies to enter the global rankings of universities 08.07.2013. <http://минобрнауки.рф/новости/3503>

⁶ N. Shatalova. The battle of ambitions. A dozen of Russian higher education institutions are allowed to become world's leaders // Poisk, No. 44, 01.11.2013. <http://www.poisknews.ru/theme/science-politic/7985/>

the former RAS institutions facing a tough period of reforms and streamlining. This is quite a pragmatic approach against the backdrop of weakening RAS and low research results even in leading institutions.

The ongoing institutional changes cause pessimism. Experts have predicted a heavier outflow of young scientists to other countries, but most of them are anticipated to seek employment at research units of domestic companies, especially those engaged in such areas as biotechnology, biomedicine. And it is quite possible, indeed. All in all, emigrational moods have increased especially in the community of young scientists, and the need to choose between an occupation and a country has become more evident than ever. However, the external outflow is limited, at least for now, by the capacity of the external labor market, especially in the United States. At the same time, seeking employment in the domestic private sector can be regarded as positive change, although there are constraints there too. Russia is running short of high-tech companies with a serious approach to the development of in-house R&D units. Speaking of the sciences which refer to basic ones, the ongoing reforms can hardly be useful to enhance effectiveness in this segment. From now forward, a lot will depend on the type of practical steps that will be taken towards performance measurement and administration of the former academic institutions.

Establishing Russian Scientific Foundation

The institutional changes include the establishment of the Russian Scientific Foundation last year, which has considerably changed the composition of institutions supporting scientific research. The Foundation will manage much more budget funds than the two other scientific foundations – the Russian Foundation for Basic Research (RFBR) and the Russian Foundation for Humanities (RFH) – do (*Table 9*). Furthermore, the establishment of RSF has stopped, pursuant to the Presidential Order, financing of basic research and exploratory scientific studies through federal targeted programs (FTPs)¹ and, therefore, changed the structure and mechanisms of research funding in this country. According to RSF’s Director General A. Khlunov, the budget of the Foundation can further be increased, because the Presidential Order covers about one third of the existing FTPs².

Table 9

Budget funding in scientific foundations in Russia, billions of rubles.

Organization	2014	2015	2016
Russia’s asset contribution to the RSF	11,4	17,2	19,1
RFBR	9,2	10,93	14,3
RFH	1,54	1,82	2,37

Source: The Federal Law *On the Federal Budget for 2014 and the Planning Period of 2015 and 2016*, No. 349-FZ of December 2, 2013 <http://pravo.gov.ru:8080/page.aspx?70792>

The need to expand grant financing of science and provide a variety of foundations has long been spoken of. However, the new Foundation plays a unique role among other scientific foundations. Under the Federal Law *On the Russian Scientific Foundation and Making Amendments to Certain Legislative Acts of the Russian Federation* (of November 2, 2013, No. 291-FZ), “The Foundation is intended to support basic research and exploratory scientific

¹ The list of instructions issued at a meeting of the Board of Science and Education. 15.01.2014. Instruction 1, pp. <http://www.kremlin.ru/assignments/20065>

² A. Chernykh. Science will shine with grants. The President make changes to the research funding framework // *Kommersant.ru*, 17.01.2014. <http://www.kommersant.ru/doc/2385314>

studies, the development of research teams leading in certain areas of science”, which has much in common with what the RFBR and the RFH normally do. Additionally, the Foundation will provide support to scientific and research organizations and higher education institutions through creating world-class laboratories and departments, developing their experimental capabilities for scientific research.

At the same time the Foundation may be engaged in business activity, set up business companies. However, the Foundation may not be declared bankrupt, although federal funds account for major part of its budget. It therefore is an amazing hybrid of all that can and can't be combined in other scientific foundations holding the legal status of budget-funded agencies, although a possibility of reorganizing scientific foundations into the form of foundation was considered as early as 2001. Moreover, the MES prepared a draft project of the government regulation *On Investing Idle Resources of the Russian Scientific Foundation (RSF)*¹. The draft project established a list of permitted assets, the procedure and terms of investment of RSF's temporarily idle resources and the procedure for investment transactions. ROSNANO and Russian Venture Company (RVC) make such investment, which is reasonable because of difficulty of selecting quickly promising innovation projects. In the case of RSF, the argument is that investment income may be used for day-to-day operations of the Foundation, thereby increasing the volume of funds allocated to support science².

Therefore, the Russian Government tends to provide the RSF with most favorable treatment, similar to the special terms and conditions offered for Solkovo Foundation. Furthermore, the need to establish a new foundation was explained by the need for more efficient funding of research and technological activities. However, the same objective could have been achieved through the existing scientific foundations, because there was nothing that could interfere with granting them the “foundation” status with the powers that are currently vested with the RSF. Since economic feasibility of establishing a new unit – including respective costs on organization, setting up new expert councils and the development of a series of regulations – is questionable, the emergence of a new unit may be regarded as, above all, realizing political interests. Theoretically, however, the establishment of a parallel donor organization in science has a positive aspect, because it may promote competition and facilitate more efficient performance of foundations. However, the fact that the RSF and other foundations were originally offered different terms and conditions makes the new foundation beyond competition.

Personnel issues in science and ways to a solution

Dissergate and “Dissernet”

The issue of fraudulent dissertation papers, plagiarism, forged scientific publications which should contain the results of a research, and overall deterioration in the quality of dissertations came to the forefront during the year. A growing wave of disclosures of fraudulent dissertations was called “Dissergate”. Although since the beginning of the 2000s the quality of dissertation papers has dropped in all areas of sciences, here is a stand-alone problem in social disciplines, i.e. government officials and politicians prefer to hold a degree in economics, politics,

¹ Temporarily idle funds in the Russian Scientific Foundation to invest in various securities. 21.01.2014. <http://www.finmarket.ru/shares/news/3609662>

² Akexandr Khlunov told reporters about grants in the Russian Scientific Foundation. http://polit.ru/news/2014/01/29/khlunov_about_rscf/ 29.01.2014.

sociology, law. Over the past decade, according to statistics, the number of approved Ph.D. dissertations in social and technical sciences has insignificantly declined (save for chemistry, a growth of 15.5%), whereas it has increased in social science. Political sciences (the number of approved dissertations doubled in the period of 2000 thru 2011) and economic sciences (a gain of almost 1.5 times)¹ should be outlined against others.

Spontaneous disclosures gradually transformed into a social movement (a networking community), “Dissernet”, which launched its website in September 2013. It embraces scientists of various disciplines participating in the scrutiny of Ph.D. and doctoral dissertations defended in Russia since the end of the 1990s. The results of the scrutiny were published to reveal plagiarism by some high-ranking persons in the field of education and science², as well as some politicians³. “Dissernet” shows the existence of mafia networks involved in writing and defending dissertations, covering both academic and educational institutions and experts employed at the State Commission for Academic Degrees and Titles (SCADT). It should be noted that it is mostly education employees – from professors to rectors of higher education institutions – that are involved in the networks⁴.

“Dissernet” has received mixed reviews. For instance, the MES which at the initial stage of a dissertation-fraud muckraking campaign set up 10 workgroups on various areas of sciences to develop recommendations on how to set up dissertation councils, conduct proficiency evaluation of their members, as well as define the criteria for organizations seeking to open postgraduate schools and doctoral schools, believes that the SCADT is the only reputable expert organization⁵.

After all, “Dissernet” has facilitated some changes including an extension from 3 to 10 years of the statute of limitations on plagiarism in dissertations⁶. However, the new rule only covers the dissertations which were defended three years ago or earlier, whereas other science degree holders have virtually been amnestied. Overall, however, the SCADT continues its operation despite “Dissernet’s” activity, ignoring frequently reported cases of dissertation fraud and plagiarism, which is indicative of lack of interconnection between the government’s activity and the social movement for “clear” scientific degrees.

Increasing the level of research by engaging foreign scientists

Last year the program on mega-grants⁷ continued, second priority projects which were financed in 2011⁸ were appraised, the 4th contest’s results were summarized, 42 winners which

¹ Science metrics: 2013. Statistical Book. M.: HSE NRU, 2013. p.63.

² P. Kotlyar. Let’em decide by themselves who steals from whom. Dissernet accuses six former officials of the Ministry of Education and Science of being the authors of fraudulent dissertations 14.11.2013 http://www.gazeta.ru/science/2013/11/14_a_5752705.shtml

³<http://ru.wikipedia.org/wiki/Диссернет>

⁴ A. Rostovtsev. Three fountains of scientific crap // Gazeta.RU. 27.12.2013. http://www.gazeta.ru/science/2013/12/27_a_5821533.shtml

⁵ P. Kotlyar. Let’em decide by themselves who steals from whom. Dissernet accuses six former officials of the Ministry of Education and Science of being the authors of fraudulent dissertations. 14.11.2013. http://www.gazeta.ru/science/2013/11/14_a_5752705.shtml

⁶ The results of the Council of Science’s performance have been summed up. 25.12.2013. <http://минобрнауки.рф/новости/3854>

⁷ For more details on the program on mega-grants see: Science and Innovation // Russian economy in 2012. Trends and Outlooks. Gaidar Institute Publishing House. 2013. pp. 410-412.

⁸ Results of the assessment should have been presented in September 2013 and the projects extended at the same time, but it didn’t happen.

will set up new laboratories were announced. Despite criticism of the program for various reasons, its provisional results deserve a good score. One hundred and nineteen laboratories operating as part of the program have, since their inception, published their results in 800 top-rated journals. Productivity has been found to be seven articles per laboratory against the formal requirement of at least one article per year. More than one third of the heads of laboratories belong to the “middle-age generation” of scientists at the age of 45 to 60, which is quite a good figure¹. A positive effect comes from not only growth in publications and favorable age composition of heads, but also from the fact that these laboratories became centers of diffusion of new knowledge outside their home organizations. They organize seminars and conferences, and even, to a certain extent, facilitate the development of interdisciplinary research. There is an adverse effect which comes from personnel moving to other countries, especially young employees, from the laboratories, because such laboratories have uncertain prospects in Russia, on the one hand, and their well-trained personnel are in demand in the labor market, on the other hand. It therefore is important to develop other laboratories along with this program, in particular, provide support to new and existing laboratories. The MES planned to announce such a contest in November 2013, and now similar projects will be launched in 2014 in the Russian Scientific Foundation².

The results of the projects implemented since 2009 and managed by Russian-speaking scientists were summarized last year.³ The idea of this measure was to draw on the experience and knowledge of the Russian scientific community, engaging them “to take charge of the research of Russian scientific teams, as well as arrange scientific seminars in Russia so that Russian researchers can enrich their knowledge, master new scientific methods”⁴. Project managers were supposed to spend in Russia at least two months annually within two years. The data collected over five years allows conclusions to be made on the results of collective work on the selected projects. However, the information requested and collected by the MES isn’t yet sufficient for assessing sustainability of the established partnerships in prospect.

Two thirds of the external researchers are employed in the United States (31%) and Western Europe. This in general corresponds to the composition of emigration of scientific personnel which has been shaped since the disintegration of the Soviet Union. Most (76%) of them are employed at universities while 17% in scientific institutions (affiliated with the academies of science in the CIS countries, as well as public and private or major international research centers) and 7% in other organizations (this group is made up of all private research organizations)⁵. Almost half of the external researchers (44%) are employed as professors while 26% as researchers.

The data on the results of the projects shows that the quality of publications of the participants was higher than the average in the Human Resources Federal Targeted Program (*Table 10*).

¹ M. Muravyova. Mega-grants: the program proves successful // Nauka i Tekhnologii RF. 19.06.2013. http://www.strf.ru/material.aspx?CatalogId=221&d_no=57230#.Ur7xRrSBY3k

² Alexander Khlunov briefed the journalists about the grants of the Russian Scientific Foundation. http://polit.ru/news/2014/01/29/khlunov_about_rscf/ 29.01.2014 г.

³ The projects were supported as part of the *Scientific and Scientific-Pedagogical Human Resources for Innovative Russia* in 2009-2011 Federal Targeted Program (hereinafter – “Human Resources”) (event 1.5. Conducting scientific research by teams headed by external researchers). Rb 1,6bn were allocated from the federal budget to the projects.

⁴ <http://he.ntf.ru/p6aa1.html>

⁵ The data published by the National Training Foundation.

Table 10

**Publication activity as part of the Human Resources Federal Targeted Program
and the projects headed by external researchers, 2009 – 2012**

	Total number of articles indexed in WoS	Total number of references available in WoS	Articles average citation ratio in 2009–2012	Number of most cited articles
The entire Program	4502	5554	1,23	16
Projects headed by external researchers	878	1580	7,7	5

Source: The data published by the National Training Foundation.

Table 10 shows that the publications made within cooperation with external researchers are cited seven times the total number of the publications made as part of the program. The assessment of the external researcher's contribution, which was performed in the annotated reports of those who participated in the projects, gives a certain description of the effects of this measure. Although this section of the report was completed in no particular format and their data can't be structured into a single structure, a few qualitative conclusions may be made.

In most cases, the role of external scientists was reduced to the following functions:

- General management and control over the project;
- Transfer of knowledge, experience, and research methods;
- Collective publications;
- Conducting seminars. All external scientists participated were involved in holding the seminars in the organizations covered by the project. Some arranged seminars abroad, engaging Russian colleagues.

In some instances the participation of an external scientist made it possible to obtain an access to a unique equipment at foreign laboratories and scientific centers. They also played an important role in helping master a respective western model of organization of research activity, which appears to be a very important result amid relative autarchy in the Russian science sector. Foreign scientists helped get in contacts with other foreign organizations, promoting network interaction.

Many participants plan to continue cooperation. Preparation of publications, as well as collective training of postgraduates is the key forms of cooperation for both external researchers and Russian teams. However, there is a few evidences of establishing more serious scientific relations, e.g. collective applications for Russian and foreign grants and tenders. Perhaps, there are constraining factors such as the level of research conducted in Russia, on the one hand, and unwillingness of representatives of the scientific community to make regular visits to Russia, on the other hand.

Researches' internal labor mobility

Internal (domestic) labor mobility of researchers is an important factor enhancing the performance of science. Labor mobility facilitates growth in the quality of scientific results through transfer of knowledge, allows best practices to be adapted, improves the situation in the labor market, promotes growth in productivity and innovative capacity through growth in social capital of academic researchers. Most effective is cross-sectoral labor mobility including labor mobility from public scientific organizations and institutions to the corporate sector and vice versa. Research shows that such labor mobility promotes growth in scientific productivity in the form of publications and patents.

The figures of internal labor mobility in Russia and globally have since quite recently been collected, although the need to scrutinize trends in internal labor mobility of researchers was stated in the EU countries as early as 2006, and the first papers covering this topic emerged late in the 1990s. Russia has two distinctive features:

1) An extremely low level of internal labor mobility, even to compare with countries having much smaller research sectors. The remarkable fact is that Russia shows the slowest labor mobility among the BRIC countries (*Table 11*).

Table 11

Researchers cross-sectoral labor mobility in the BRIC countries, 1996-2010

Country	Labor mobility to corporations, persons.	Labor mobility from corporations, persons.
China	8732	8280
India	1628	1415
Brazil	1208	935
Russia	718	592

Data source: International Comparative Performance of the UK Research Base – 2011. A report prepared for the Department of Business, Innovation and Skills. Elsevier, 2011. P.77.

2) Labor mobility is mostly driven from scientific-research institutes. The same institutions receive the principal flow of labor force from the corporative sector. This might be explained by persisting relations between the sector-specific scientific-research institutes and companies (enterprises) which existed in the U.S.S.R.. It is researches at universities that show the highest mobility in other countries. Additionally, universities are principal recipients of labor force from corporations.

It was not until recently, 3-4 years ago, that a few labor mobility incentive measures were announced in Russia, although they are non-systemic and in a test mode. They are mostly aimed at developing cooperation between academic and higher education personnel, as well as researchers from the public sector of science and industrial sector. Technology platforms can be considered as incentive for internal labor mobility. However, a research work the author conducted in three technology platforms¹ shows that only one of these platforms gave consideration to labor mobility and how it can be promoted within such platforms.

In addition to the foregoing, platforms’ representatives share the opinion on the state of internal labor mobility and constraining factors. They consider it very low because of the quality of human resources, making certain traditional types of labor mobility incentives (e.g., professors’ consulting in companies) ineffective and therefore useless. Staff training and onsite training measures were regarded as essential. Tougher measures, according to platforms’ representatives, are needed related to some kind of “forced mobility” – through introducing a labor mobility indicator into the reporting indicators for scientific-research institutes and higher education institutions.

The platforms constitute a tool which can help address the HR problems, although the platforms have sector-specific features and different missions which impose some restrictions on mobility incentives. Moreover, a reluctant labor mobility is unreasonable in some areas, because it may lead to potential disclosure of confidential information, rather than transfer of knowledge.

¹ I. Dezhina. Developing mechanisms of knowledge transfer through occupational mobility with the participation of technology platforms. Report on scientific research assigned by the Ministry of Education and Science of Russia. M.: Russian Technology Development Foundation, 2013.

Labor mobility may be increased with the help of Centers for Collective Use of Equipment (CCUE) which provides a sound basis for the development of closer cooperation between higher education institutions (scientific-research institutes) and companies. Russia has currently a broad CCUEs network embracing about 390 Centers¹. The focus on CCUEs will be much stronger in the short run. In particular, the MES is to execute the Presidential orders on defining priorities with a view to ensuring more efficient use of the federal centers for collective use of equipment network (Pr-2426 of October 18, 2013)².

Relations within the innovation system: technology platforms and clusters

The technology platforms tool designed to strengthen relationships within the innovation framework developed in 2013 too, and the government began to increasingly use technology platforms as experts on specific sector-specific and cross-sectoral issues. The total number of technology platforms increased to 34. The MES and the Ministry of Economic Development (MED) suggested that the platforms should be engaged in formulating the contents of federal targeted programs, because they represent the consolidated stand of various stakeholders including businesses, not just the point of view of stand-alone organizations. About 10 of the proposals made by 25 platforms engaged in formulating the contents of the Federal Targeted Program *Research and Development on the Priority Development Areas of Science and Technology Sectors in Russia in 2014–2020* were recognized as high quality ones³. The result shows that the platforms are still weak. This in part can be explained by that the government provided no financial support at the initial stages of the development of this tool.

Nevertheless, there are some reasons for cautious optimism. The MED plans to provide the platforms with larger grants as part of federal targeted programs so that they can conduct competitions for contracts under the terms and conditions of their post-sharing funding by the platforms⁴. The platforms' performances was measured by the end of the year, and support will be provided to those platforms which tend to be communication platforms. A few of the platforms managed to create evaluation systems, while about one third of the platforms can conduct a comprehensive scientific and technological and economic evaluation, which also includes the evaluation requested by development institutions⁵. Furthermore, 2/3 of the platforms stated that their proposals and evaluation reports were referred to in various documents of the executive power bodies, being a good result.

¹ A meeting of the Board for Science and Education. Moscow, Kremlin, 20.12.2013. <http://news.kremlin.ru/news/19865>

² An information report on the collection of proposals on top-priority scientific tasks. November 22, 2013. <http://минобрнауки.рф/новости/3770>

³ A. Gorbatova. A selective support. 31.05. 2013 http://strf.ru/material.aspx?CatalogId=221&d_no=56890

⁴ A report made by Director of the Department of Innovative Development at the Ministry of Economic Development of Russia A.E. Shadrin at The Triple Helix, government, and innovation policy plenary session, The Triple Helix XI International Conference, London, July 8, 2013. <http://tha2013.org/tha/index.php/tha/index/pages/view/programme#Workshops>

⁵ The data of a survey conducted by the Russian Technology Development Foundation at a visiting meeting of technology platform held in Puschino on July 2-3, 2013. The survey covered 22 coordinating organizations of technology platform.

In addition to the foregoing, most successful in terms of best practices, according to the estimates made by the Interdepartmental Analytical Center,¹ are those platforms which are closer to the market demand, where companies account for at least 50% of the participants. Ideologically, they resemble their European analogues.

The platforms may draw much more attention in the year to come, because the annual Presidential Address to the Federal Assembly² places a special emphasis on technology platforms as a tool to enhance innovation capacity, which also means that the platforms should rely on “reaching specific results, obtaining patents and licenses, getting developments into actual practical use”. At the same time, it is important to retain what the platforms are originally designed for, as interconnection tool. This is not a team of developers who patent their inventions, although technology platforms’ success may indeed facilitate creation of alliances, thereby leading to the emergence of patents and know-how.

Innovation clusters developed along with technology platforms. Budget funds (subsidies) were allocated late in 2013 to innovation clusters for implementing educational programs (onsite training, short-term advanced training programs), purchasing technology equipment, conducting exhibition and trade fair activities. In addition to the foregoing, the funds had to be spent as soon as possible, because it was not until the middle of November 2013 that an executive order on the allocation of subsidies to 11 clusters was issued³. It is the development of innovation and education infrastructure facilities that attracted the highest demand⁴, which is absolutely reasonable, because clusters are facing such issues as staff shortage in all areas, from cluster managers to specialists sought by resident companies⁵.

Clusters are expected to see system-wide development in 2014. In particular, this measure is planned to be synchronized with other government’s initiatives, such as innovation development programs of public companies. An “involuntary” approach has been selected once again, i.e. companies will be obliged to cooperate with clusters as part of their development programs. This is unlikely to facilitate skyrocketing growth in innovation activity amid adverse business environment. What raises hackles is that none of the post-Soviet countries has yet managed to implement the cluster theory in practice.

Innovation activity incentives

Analyzing the results of innovation development, one should factor in a few macro-trends which do have an effect the current innovation activity and its prospects. First, the MED announced that the innovation scenario will be replaced with a conservative one in the long-term forecast (until 2030). It is the innovation scenario that was based on accelerated development of science and innovation sector. Second, persisting capital outflow from the country. Third, the deepest over the last four years decline in output in the manufacturing industry. There was some local success in certain segments of venture capital financing.

¹ V.I. Dovgy. Technology platforms and cross-platform relations in implementing major cross-sectoral programs and projects. Presentation at the Technoprom-2013 International Technological Development Forum in Novosibirsk, 14.11.2013]

² The annual Presidential Address to the Federal Assembly of the Russian Federation. Moscow, 12.12.2013. <http://www.kremlin.ru/news/19825>

³ Russian Government’s Executive Order of November 18, 2013, No. 2128-r.

⁴ Clusters to receive money in December // Russyiskaya klasternaya laboratoria. 04.12.2013. <http://cluster.hse.ru/news/1298/>

⁵ N. Ulyanov. All hands to quarters! // Biznes Zhurnal. 21.10.2013. <http://www.computerra.ru/business/57860/vse-po-mestam/>

However, the venture capital market, according to the RVC, will be developing without direct correlation to general economic indicators¹. Perhaps, there is a hope on that innovation activity might increase amid a crisis.

Business angels were indeed more active last year. They mentioned the following factors that have a positive effect on their activity²:

- Developing new market segments;
- Cooperating actively with seed funds;
- Increasing projects' transparency, lowering entry barriers;
- Showing optimism about industry's future development.

At the same time, another study of the early-stage venture capital market³ shows a series of serious barriers to business angels. Following listed are the key barriers:

- 1) Public development institutions have an adverse effect on this segment in the venture capital market, because public organizations basically allot R&D grants. Knowledge intensity of established businesses becomes too high, an inherently risk-averse "grant" ideology develops.
- 2) Large corporations lack culture of purchasing small firms as a way of acquiring new technologies.
- 3) Administration of applicable laws and regulations remains complex, Russian courts' rulings cannot be predictable because of violent interpretation of definitions or actions in the innovation sector.
- 4) Lack of well-defined procedures for exiting from start-ups.
- 5) Finally, there is weak confidence among all participants of venture relations.

Neither is optimistic the overall situation with small-sized innovation entrepreneurship, because small companies have begun to shutdown in response to doubled insurance premiums since the beginning of 2013⁴. In addition to the foregoing, just 14% of small innovation enterprises are private, according to the European Bank for Reconstruction and Development (EBRD)⁵. Manufacturers are in minority among innovation companies, which can be explained by that Russia has no large companies whose business results in manufacturing technology products. Therefore, businesses are overregulated and operate in a non-competitive environment.

At the same time, there were a few positive changes which can facilitate innovation activity. For instance, President Putin signed on January 2, 2013 a federal law under which representatives and employees in large foreign companies investing within Russia, as well as those who engaged in the Skolkovo Foundation's projects, may be entitled to a 5-year visa instead of one year.

¹ D. Butrin. RVC announces the creation of a venture capital market // Kommersant, No. 214, 21.11.2013, p. 6. <http://www.kommersant.ru/doc/2348804>

² The annual study of the angel investment market. Results, dynamics and new challenges. 2013. The Business-Angels National Association (Russia), Atom&Partners, RVC.

³ Early-stage venture capital market: key trends. WCIOM, RVC. M., 2013. pp.36-43. http://www.rusventure.ru/ru/programm/analytics/docs/201302_vciom.pdf

⁴ M. Papchenkova. A Heaven that remains to be seen // Vedomosti, No. 150, 20.08.2013. <http://www.vedomosti.ru/newspaper/article/512591/raj-pod-voprosom>

⁵ E. Noskova. Banks seek innovations // Rossiiskaya biznes gazeta – biznes i vlast. 03.09.2013. <http://www.rg.ru/2013/09/03/securitizaciya.html>

Nonetheless, there are few optimistic figures. The number of transaction in Russian early-stage venture capital market increased 65% year-over-year in 2013; the volume of business-angels' transactions increased 70%. The amount of investment in early-stage projects with the participation of Russian business angels totaled \$116,5m through the first 11 months of 2013, almost 4.5 times the value recorded in 2012¹. However, the seed stage accounts for less than 5% of the investment available in the investment market. It is late stages that are basically financed. Internet-projects account for more than 70% of the investment, most of which is e-commerce, rather than long-term or emerging developments². Experts explain this by undeveloped applied sciences³. However, regrettably, Thomson Reuters's review shows that Russia is not ranked in the top-100 promising areas of science⁴ and, therefore, behind in the applied research, basic research and exploratory scientific studies which have always been ranked the strongest in this country. This is another reason why there is no point to wait for the appearance of emerging projects attractive for venture capital financing.

The situation can be mitigated by development institutions, although their effectiveness remain in abeyance despite that some of them have been operating for about seven years.

Although development institutions have key performance indicators (KPIs), their effectiveness can hardly be assessed. It is well-known that through its foundations the RVC financed 135 projects including nine foreign projects. In addition to the foregoing, the projects in Moscow accounted for the most of investment (58.03%), projects in the United States (15.35%), and St. Petersburg (6.37%)⁵. The initial wave of RVC-created foundations' exist from portfolio companies is not expected until 2014⁶.

ROSNANO has put into operation a progressive total of 35 plants⁷, production output increased, although a target of Rb 300bn volume of sales of products manufactured with the participation of ROSNANO can hardly be reached by 2015, because production output was merely Rb 23,5bn at the end of 2012 (the latest data available)⁸. In fact, ROSNANO will obtain off-the-shelf technical solutions for manufacturing innovation products, i.e. supporting import substitution. To be more specific, this cannot be regarded as true innovation activity.

It is characteristic that the RVC and ROSNANO plan to follow new, similar development strategies designed to divide between asset management and asset holding functions. Asset managers (AMs) will be established to exercise the asset management function. ROSNANO will hold a 80% interest in AMs and then sell it stagewise within 2016–2020⁹. Having created

¹ The data of the Report on *Money Tree TM: Venture Capital Market Navigator and the Results of the Business-Angels National Association (Russia) Research*. Source: The Russian venture capital market development in Russia in 2013: RVC contribution <http://www.rusventure.ru/ru/press-service/news/detail.php?ID=25893>

² M. Kozlov. A sowing season is suffering. Start-up investors still in shortage. // *Poisk*, No. 26, 28.06.2013 <http://www.poisknews.ru/theme/innovation/6433>

³ Opinion of the Managing Partner of Almaz Capital Partners A. Galitskiy. Source: I. Tsukanov, Y. Nekhaichuk. RVC opens a sowing season // *Vedomosti*, No. 215, 20.11.2013. <http://www.vedomosti.ru/newspaper/article/572711/rvk-otkryvaet-posevnyuyu>

⁴ C. King, D. Pendlebury. *ResearchFronts 2013. 100 top-ranked specialties in the sciences and social sciences*. Thomson Reuters. April 2013. <http://img.en25.com/Web/ThomsonReutersScience/1002571.pdf>

⁵ Based on the data as of December 29, 2013. http://www.rusventure.ru/ru/innovative_projects/

⁶ I. Tsukanov, Y. Nekhaichuk. RVC opens a sowing season // *Vedomosti*, No. 215, 20.11.2013. <http://www.vedomosti.ru/newspaper/article/572711/rvk-otkryvaet-posevnyuyu>

⁷ Based on the data as of December 29, 2013. <http://www.rusnano.com/projects/portfolio>

⁸ I. Tsukanov. Chubais takes charge of Rosnano to be privatized till 2020 // *Vedomosti*, 18.12.2013. <http://www.vedomosti.ru/companies/news/20378071/upravlyayuschaya-kompaniya-rosnano-stanet-polnostyu-chastnoj>

⁹ Chubais calls off the sale of Rosnano's share. 13.06.2013. <http://lenta.ru/news/2013/06/13/rosnano/>

MCs, the RVC plans to reserve the right to strategic and financial control over the companies owned by the holding company¹. In addition to the foregoing, the RVC plans to focus on seed and even preseed stages and establish 4 to 6 foundations with a total of Rb 3bn to Rb 4bn. This is almost equal to the annual budget of the Foundation for Assistance to Small Innovative Enterprises in Science and Technology. Therefore, there is ongoing process of interexchange of initiatives in development institutions². Theoretically, it may make them compete for best projects and provision of services of higher quality.

Changes to the regulation of rights to the results of intellectual activity

Intellectual property rights is an aspect related to promoting innovation activity, which has an impact on commercialization of projects developed in scientific-research institutes and higher education institutions. Some improvements were achieved in this area last year.

The Russian Government Executive Order (No. 458 of May 30, 2013) *On Making Amendments to the Rules of Exercising by Public Sector Customers of the Russian Federation's Rights to the Results of Civil, Military, and Dual Purpose Intellectual Activity* was adopted, which triggered further changes. Prior to the adoption of the Executive Order there were rules in effect which secured the results of intellectual activity and allowed public sector customers to unreasonably retain the rights to the results, thereby constraining seriously to commercialization of intellectual property created as part of public contracts. The Executive Order No. 458 raised *de facto* barriers to this practice, because from now on every public sector customer must annually revise and publish on its website a list of unused results of intellectual activity and notify the developer of such results of that the Russian Federation's right may be alienated in his favor. In other words, this measure discourages public entities to reserve the rights "just in case", by tradition, as well as based on their wrong impression of the fact that the state should retain the budget-funded results obtained through funding from the federal budget.

Furthermore, updates to rules and terms of securing rights to the results of intellectual activity (the draft government executive order *On Making Amendments to the Executive Order of the Government of the Russian Federation of April 22, 2009, No. 342 On Certain Issues of Regulation of Securing the Right to the Results of Scientific and Technological Activities*) were considered during the year, but they haven't yet been adopted. It was suggested to change the terms of securing exclusive rights to the results of intellectual activity to the Russian Federation. The grounds for securing the rights to the state have been narrowing to create conditions for securing them to those who create intellectual products. This is an overall positive development of public regulation. It would be important, however, to specify the terms, because the draft executive order's provisions seems to be more of a concept than guidelines for those who will in practice be securing and executing the rights to new intellectual products.

Another aspect of the draft executive order is that a free nonexclusive license to the results obtained through funding from the federal budget is secured to the state. This measure well corresponds to the US experience originated from The Bayh–Dole Act (1980). It is

¹ OJSC RVC plans to establish an RVC holding company to set up business entities. 20.11.2013. http://ria.ru/nano_news/20131120/978724145.html

² For instance, RVC has started debt financing of projects (see, e.g. information on the Fund Civil Technologies, Ltd http://www.rusventure.ru/ru/investments/opk/index.php?sphrase_id=26291), and plans to further establish a venture shared financing foundation, thereby duplicating the activity of the Russian Technological Development Fund.

characteristic that the government of the United States hasn't yet exercised the right to use a license, which can easily be explained by the fact that the Government is far from being most efficient entrepreneur.

Does it mean that the introduced changes will promote more of registered intellectual property? Patent statistics is likely to improve. It doesn't mean, however, that commercialization of ideas will increase, because the demand for patents and licenses will not increase until certain conditions are created. The internal demand for such results of intellectual activity has been weak so far. Although changes to the legal and regulatory framework do create more favorable conditions for commercialization of intellectual property, they per se cannot provide new incentives for growth in commercialization.

* * *

Hence, 2013 can be described as having seen serious changes to the organizational structure of science. This is, first of all, related to the fact that the academic sector of science ceased to exist, the RAS was reorganized into an expert organization without affiliates. It is hard to estimate what kind of effect it may have on the performance of scientists, the development of new areas of science, further integration of the Russian science into the global science. A lot depends on the new entity's (FASO) performance, soundness of the policy towards scientific organizations, methods of performance measurement. These tasks are not easy to accomplish: any attempts to conduct an "unbiased" performance measurement of both scientific-research institutes (by the RAS) and higher education institutions (by the MES) haven't yet been successful.

The establishment of the Russian Scientific Foundation, whose budget overtakes the total amount of funding of the existing scientific foundations, became a significant event. The grant form of supporting scientific research will be expanded after the establishment of the RSF. Still obscure is economic feasibility of the framework having several foundations which are financed with the federal budget funds, assigned with similar tasks but subject to radically different basic terms and conditions for operation.

Innovation activity developed in several segments last year, which also included growth in private venture capital investment. Development institutions' growing interest in supporting early-stage projects, for all the efficiency of such a solution, might not help achieve the expected results, because Russia has no large companies manufacturing high-tech products but has adverse conditions which don't allow small firms to grow and develop. Innovation activity can hardly increase in the medium-term perspective against the backdrop of worsening business environment and moving away from the innovation-based development scenario.