

WHAT RUSSIA'S ECONOMY SHOULD EXPECT FROM THE ADOPTION OF THE FEDERAL LAW ON THE ADVANCED RESEARCH FOUNDATION?

V.Tsymbal

The recently created Advanced Research Foundation (ARF), advertized by some Russian officials as a long-awaited instrument for innovation and development of the Russian economy, is hoped to transform Russia's defense-industrial complex into the locomotive of innovation that will be capable of pulling forward all the other branches of the economy. However, some skeptics insist that such hopes are groundless.

The immense volume of legislation passed by the RF State Duma has recently been increased by yet another legislative act – the Federal Law ‘On the Advanced Research Foundation’¹. It should be noted that ‘The Advanced Research Foundation’ is the officially approved English name of the new establishment. Some RF officials called this foundation the Russian analogue of the famous US Defense Advanced Research Projects Agency (DARPA). Others objected and pointed out that it is not the United States but Russia where the government first began to apply the factor of government influence in boosting an accelerated development of the national economy, because the creation of the DARPA had been the US Government’s managerial response to the post-WW2 Soviet successes in the fields of nuclear weaponry, nuclear energetics (both military and civilian), missile construction, space technologies (also both military and civilian), and jet aviation, as well as in a number of other fields of scientific and technological progress.

In the USA, the DARPA quickly proved its worth by ensuring major technological breakthroughs and their rapid proliferation throughout the US economy. Regretfully, this cannot be said of the DARPA’s Soviet counterparts. While gradually becoming obsolete, especially in the epoch of USSR stagnation, those Soviet managerial structures became the major factor that determined the Soviet Union’s increasingly lagging behind the United States and a number of other countries. The truth about these facts was suppressed. The law efficiency of the Soviet system of managing the development of science and technology was not acknowledged. Many outstanding Soviet experts put forth analytical proposals designed to upgrade that system and to improve a number of its most important parameters, so as to make them comparable to those of the DARPA². All those proposals were rejected or simply ignored.

As a result, the Soviet advocates for better management of defense-related issues could boast, in fact, of few real achievements. However, owing to their insistence,

R&D activities aimed at creating the most important components of armaments and military and special equipment (AMSE) and ‘breakthrough’ technologies were ‘detached’ from concrete weapon patterns and included instead, as a whole, in the State Armaments;

one of the central research institutes of the USSR Ministry of Defense undertook a partial inter-departmental analysis of the results of fundamental and exploration research.

However, those would-be-reformers failed to extend the above-mentioned research and to disseminate its results beyond the framework of the Soviet defense-industrial complex (DIC), law enforcement agencies, special services and the military. Despite their insistence that fresh resources scientific resources should be involved in the newest projects, and budget funds be allocated for that purpose, this was not done. The USSR also failed to make ‘defense-oriented’ achievements available for use in civilian areas.

1 For the Advanced Research Foundation, see RF Federal Law of 16 October 2012, No 174-FZ, adopted by the State Duma of the RF Federal Assembly on 28 September 2012, approved by the Federation Council of the RF Federal Assembly on 26 December 2012 // *Rossiiskaia Gazeta* [The Russian Gazette]. 31 December 2012.

2 In particular, see *Predlozheniia po sovershenstvovaniuu poriadka ispol'zovaniia (vnedreniia) dostizhenii nauki i tehniki i sovershenstvovaniia informatsionnogo obespecheniia robot: otchet o NIR* [Proposals on the Improvement of the Procedure for the Use (or Introduction) of Scientific and Technological Achievements and for Improving the Information Back Up of Research: A Report on Research Work] /C/ Part 11520. Manuscript. Tsymbal V.I. Moscow, 1984.

This state of affairs has not improved after the collapse of the Soviet Union. For example, there were also some more modest proposals¹ – to borrow at least some of the DARPA's best features, if it was impossible for the new Russia to create an analogue of that agency. These proposals were rejected. They were cold-shouldered by the Russian officialdom even after the establishment, in 2011, of the RF Commission for Modernization and Technological Development, later transformed into the Council for Economic Modernization and Innovative Development under the President of the Russian Federation. High profile officials are especially unenthusiastic about the fact that almost 90% of the financial resources placed at the disposal of the DARPA (more than \$ 2bn) is not allocated to either the traditional developers of AMSE, or to any analogue of the Russian defense-industrial complex, but to non-governmental and non-traditional organizations².

Even after the Draft Law on the Advanced Research Foundation had been passed by the State Duma in its first reading, the then Vice Prime Minister Sergey Ivanov unambiguously stated as follows: *'We will certainly not create any institution approximately analogous to the American DARPA. But money flows, including those from the budget, must be distributed and allocated to finance fundamental science in the form of so-called exploration research...'*³. So, Ivanov did not mince words on that point. He clearly explained that he and the people who shared his views wanted to distribute the available funds among the 'old guard', without any transparency or competition.

At the end of 2012, Russia finally adopted the Law on the Advanced Research Foundation. At the beginning of 2013, the Foundation gradually began to take shape along the lines. By that time the officialdom had reluctantly acknowledged that the Foundation's activities should resemble those of the DARPA. But even before the Advanced Research Foundation is to begin functioning, experts express a number of doubts about its effectiveness.

Thus, unlike the DARPA, Russia's Advanced Research Foundation is not a statutory authority, although the Law on the ARF has determined both its (rather exalted) status as a body under the Government of the Russian Federation, and the representational bodies to be responsible for its management – the Board of Trustees consisting of 15 persons (7 members representing the RF President and 7 members representing the RF Government, plus the General Director) and the Management Board of the Foundation. The Law also refers to the body designed to supervise the financial and economic activities of the Foundation – the Audit Commission. Moreover, the Law even mentions the existence of an advisory body – the Science and Technology Council. However, the Law has failed to stipulate any prerogatives for the academic and engineering communities, which can easily give rise to the risks of corruption and official arbitrariness.

After having focused our discussion on the individual provisions of the Law on the ARF, we will now turn our attention to its concept as a whole. First of all, it should be noted that the Russian ARF differs from the US DARPA by being a non-transparent entity isolated from society and standing aloof from all social interests. Thus, the Law on the ARF does not contain a provision introducing unlimited competition at all stages of searching for new scientific and technological ideas and their implementation.

Naturally, much will depend on the subordinate acts that should be adopted in the nearest future, on the particular persons who will become members of Advanced Research Foundation's Board of Trustees, and other bodies responsible for its management, and on the rights that will probably be granted to the experts. So far, all that we have at our disposal is tentative data on the number of specialists (50 at present – and eventually up to 150) and a number of colorful statements made by Dmitry Rogozin at the State Duma session on 4 July 2012, including the following one: "Today, there is no point for us to try to catch up with somebody and to keep to the beaten

1 Tsymbal V. I., Terekhov I. I. *SShA: opyt perekhoda na intensivnyi put' razvitiia vooruzhenii i voennoi tekhniki*. [The USA Experience of a Switchover to Intensive Development of Armaments and Military Equipment] // *Obozrevatel'* [The Observer]. 1991. No 28. Tsymbal V. I., Titarenko A. I., Terekhov I. I. *Problemy upravleniia razvitiem tekhnologii dvojnogo naznacheniiia v sovremennoi Rossii*. [Key Issues in Managing the Development of Dual-purpose Technologies in Contemporary Russia] // *Iadernyi kontrol'* [Nuclear Control]. 1998. No 4.

2 Barannik A. A. *DARPA rabotaet na perspektivu*. [The DARPA Works for the Future] // *Krasnaia Zvezda* [The Red Star]. 28 January 2011.

3 An observer of *Nezavisimoe Voennoe Obozrenie* [The Independent Military Review] has justly characterized this statement as 'anti-DARPA'. See *Miasnikov V. I. DARPA a la Russe is not DAPRA at all* // *Nezavisimoe Voennoe Obozrenie*. 3–9 August 2012.

track. We must abandon the traditional way of thinking and begin planning not for tomorrow but for the day after tomorrow. To do so we must exercise strict control over the coordination, planning and implementation of research projects, as well as over the use of their results. We are planning to considerably increase the independent scientific expert community's role in the merit-based selection of research projects to be financed from the budget¹.

Table 1

RESULTS OF AN ANALYSIS OF THE MOST IMPORTANT PROVISIONS OF THE LAW ON THE ARF

The Most Important Provisions of the Law on the ARF	Comments
The aim (aims) of the ARF is (are) frequently mentioned in the Law thereon, sometimes as a singular concept and sometimes in the plural form, which disrupts the integrity of its structure. What is actually meant is the provision of assistance to high-risk R&D projects in the interests of national safety and state security.	Such a formulation of the ARF's aim fails to clarify as to who would act and not simply assist, who would manage the conduct of R&D, and, most importantly, who would be responsible for the results of R&D projects. Long ago, the same formulation adopted by the Applied Problems Section under the Presidium of the USSR Academy of Sciences, and then of the Russian Academy of Sciences, made it possible to shift the responsibility for poor results by resorting to a very simple justification: 'We assisted as best we could, but those who had to perform the task did things the wrong way'.
The first of the ARF's major functions referred to in the Law is the formation of a scientifically substantiated understanding of the possible critical threats to national defense and security, of the origins of those threats, and of the methods for their elimination.	It could have been possible to consider this ARF function to be a major or even the most important function, if only other RF official bodies were not assigned the same task. The bodies performing that same function are as follows: the RF Security Council and its Academic Council (the results are taken into account in the National Security Strategy); the General Staff of the Armed Forces of the Russian Federation (the results are taken into account in the Military Doctrine of the Russian Federation); and the Executive Office of the RF President (the results are reflected in the Commander-in-Chief's annual addresses and his specific orders (issued in the course of application of the 'manual control method'). Apparently, there is no need for yet another team of experts to compose yet another list of possible threats and to devise methods for fending off these threats. Such efforts will simply create disorder.
Determination of the main directions of research and development.	Like in the previous case, it could have been possible to accept the legitimacy of this ARF function if other RF official bodies, and first of all the Russian Academy of Sciences, were not assigned the same task, and if the lists of major research directions were not to be approved by Russia's most senior officials. In Russia, major domestic research directions have never been compared with foreign ones, including major research directions in the USA, and the extent of Russia's lag in these matters has not been properly analyzed. Nevertheless, the Law on the ARF totally ignores these issues.
Organization of a search for innovative scientific & technological ideas and advanced engineering & technological solutions, and the subsequent issuance of orders for their development, approbation and follow-up.	The Law on the ARF does not specify the search area. It does not mention the possibility and advisability of including in the list of potential performers of the advanced research ordered by the ARF those individuals and organizations that have not previously participated in any defense-oriented research carried out by the Russian Academy of Sciences, or by the other (non-governmental) organizations of engineers and scholars, which are not part of the Russian defense-industrial complex.
Turning ideas into projects, including RF Armed Forces modernization projects.	The Law on the ARF does not mention that it is necessary to ensure that innovative ideas should not be kept secret, and that non-traditional R&D performers should also be involved in implementing advanced research projects.
Financing of research-based events and research projects.	It is extremely important that data on the spending of budget funds should be absolutely transparent. Naturally, transparency should be limited to spending, and it should not be extended to the content of research projects and to their scientific and technological parameters.
Management, on behalf of the Russian Federation, of rights to the results of intellectual activity (RIA).	The Law on the ARF ignores the rule (adopted in many states) that the developers (or authors) of new knowledge products and technologies should be granted a patent right (unless otherwise established) to the civilian (economic) use of these innovations.

1 <http://transcript.duma.gov.ru/node/3671>.

The Most Important Provisions of the Law on the ARF	Comments
Development of a three-year program of the ARF's activities, and its annual adjustment.	The development of such a program should be coordinated with the development of the state budget and the state defense order.
Conduct of a search for and a selection of the projects to be included in the list (this task should be implemented by the ARF's Science and Technology Council), and the drafting of expert conclusions as to the selected projects, their deadlines, and the financial resources needed to implement these projects.	It seems advisable that the range of potential performers of the most important advanced research projects should be extended, and that each phase of such projects should be implemented under a separate contract granted on the basis of a previously conducted public tender. Frequently, expert conclusions on the research projects that have failed to be selected are also very important. The same is also true of the explanations of the reasons for their rejection.
Management of rights to the results of the RIA carried out by the ARF's order, and also to the results of the RIA acquired by the ARF. Transfer of such RIA to the federal bodies of executive authority (FBEA) and the Rosatom corporation or a legal entity designated by them, to be used by these organizations in the interests of national defense and state security.	The Law on the ARF totally ignores the issue of RIA accumulation, including the creation of the relevant databases that should be widely available to specialists, although this issue is extremely important and implies the need for fairly heavy funding. Moreover, the Law does not contain any norms regulating the transfer of RIA. It contains no provisions as to who should be responsible for such transfers, including the responsibility for the exclusion of some potential users of the RIA that can be used for multiple purposes, including civilian ones.
Transfer of such RIA to other organizations, whatever their form of organization and legal status may be, to be used by these organizations to promote the innovation development of the corresponding branches of the RF economy.	The Law does not address, and therefore does not solve the crucially important issue of potentially dual-purpose RIA. It is not clear which experts should make decisions as to whether the results of one or other type of intellectual activity should be deemed to be potentially dual-purpose. Whether or not this means that, if the results are deemed not to be associated with the interests of national defense and state security, they should be made available to the general public, remains unclear.

However, bearing in mind the negative experience of many other Russian foundations frequently mentioned by MPs at the above-mentioned State Duma session, and the equally negative experience of the state corporations and companies created under the slogan 'Acceleration of Russia's Innovation-Based Scientific and Economic Development', we can hardly expect any miracle.

In particular, it is worrisome that the Law on the ARF ignores the issue of direct participation of military science experts in all of the Foundation's activities, including the determination of R&D themes and the assessment of R&D results. It should also be noted in this regard that it is precisely the military department that is traditionally interested in its forces being armed with the most advanced weapons. To attain these ends, the military department should prepare top-quality specialists and to equip its firing ranges, testing grounds and research laboratories with cutting-edge equipment.

In Soviet times, many representatives of defense industry were forced to take into account the expert opinion of military specialists from military higher educational establishments and research institutes fitted with laboratory equipment and sometimes even with pilot production facilities. Therefore, some defense industry bosses did their best to deprive their military competitors of access to the scientific specifics of R&D and defense engineering. Their motto was: 'We will produce not what the customer wants, but what he needs'. And they succeeded in doing so. Military research institutes and higher educational establishments were deprived of research laboratories on the pretext of cutting costs. Thus, military specialists participation in R&D projects was now limited to taking part in tests and to carrying out mathematical modeling on the basis of initial data provided by defense industry.

In contemporary Russia, the situation in the R&D field continued to steadily deteriorate. Most of the changes that took place in the field of military science and education, especially those initiated by former RF Minister of Defense Anatoly Serdiukov, have been frequently called – not without reason – the wrecking of applied research in military engineering.

For some time after Anatoly Serdiukov's dismissal, many people were under the impression that the situation had changed for the better. It was the statement made by the new RF Minister of Defense, Sergei Shoigu, at the expanded meeting of the Collegium of the RF Ministry of Defense on 27 February 2013 that sounded alarm bells. He said: 'We must determine the performance characteristics and the quality of weapons, as well as their delivery time, and not the designations and

the prices of titanium, aluminum, cable products and other components¹. Experts believe that the Ministry of Defense's participation in pricing is of principal importance.

Also, 2012 saw a very peculiar 'adjustment' of the actual volume of completed work to the state defense order: over the course of 2012, the latter was repeatedly amended – but all the alterations were aimed at reducing both the quantity and the quality of the ordered weapons and equipment. Many VIPs in Russia's defense-industrial complex (DIC) are of the opinion that the RF Ministry of Defense should order only such weapons that the DIC is capable to produce.

Bearing in mind all these circumstances, the author believes that it would be extremely dangerous if defense industry specialists and the DIC get the right not only to obtain scientific knowledge and participate in the development of the science base, but also to shape Russia's military economy as a whole, and even to determine pricing. It is necessary to hold a public 'ideas competition' and organize responsible non-departmental control over the results of the ARF's activities.

This is especially true of the R&D initially placed in the 'high-risk' category, because in this case, if the actually obtained results are unexpected and do not correspond to the initially planned ones, such an outcome should not be deemed to be a failure. And this is also true of weapons development. It is noteworthy that recently appointed General Director of the ARF, Andrei Grigoriev, sees the Foundation's first task as threat forecasting. In a recent interview with *The Military-Industrial Messenger*, Andrei Grigoriev said that '5 to 10-year forecasts will be prepared by the General Staff, while threats beyond the 15 to 20-year time horizon represent a field where we must cooperate and work together'².

But all perceivable threats to Russia's national security have already been stated in the corresponding Strategy and in the Military Doctrine! Perhaps it would be more advisable if the Advanced Research Foundation should embark on a search for fresh ideas in the field of natural sciences and breakthrough technologies?

Also, the Foundation should ignore neither the needs of the RF population and the Russian economy, nor the urgent need for innovation of numerous enterprises of various ownership types.

It would be regretful if the Russian DIC decides to follow the worst Soviet traditions rather than to set its sights on the systems that can ensure rapid advances in science and technology, as well as the subsequent successful introduction of these achievements into the military sphere and the national economy as a whole. One of the examples of such systems is the DARPA. Whether domestic or foreign, positive experiences must always be taken into account.

Dmitry Rogozin may be right in stating that Russia's defense-industrial complex is capable of pulling the Russian economy into the future: *'Today, the armaments program makes it possible for the State to kick its addiction to oil and natural gas. This can be achieved by restructuring the 'Oboronka' [the Russian slang for the Military Industrial Complex] along the lines of defense industry innovation. At the same time, the transfer of technologies, if organized cleverly and methodically, will make it possible for these lines to be extended to the civilian sector of the economy'*³.

Yes, such a possibility does exist. However, bearing in mind the Soviet epoch of huge commodity deficit, as well as the fact that Soviet consumer products lagged behind those of the West both in quantity and – most importantly – in quality, we can confidently say that to organize *'the transfer of technologies ... cleverly and methodically'* would by no means be enough for the cutting-edge scientific and technological achievements to spill over into the *'civilian sector of the economy'*. In order for these ends to be attained, it is crucial that both the ARF's managerial bodies and all subjects of its activity should be responsibly interested in attaining them. However, the Law on the ARF totally ignores this issue – a fact that can have dire consequences⁴.

However, it is still too early to make any final judgment on the matter before the issuance of all the subordinate acts necessary for the ARF to begin functioning. And we must wait for the first results of its activities. But it can be said that the materials of the military industrial conference that took place on 20 March 2013 inspire some cautious optimism in the expert reader. ●

1 http://function.mil.ru/news_page/country/more.htm?id=11650595@egNews

2 Grigoriev A. *Rabotat' na operezhenie*. [We Must Always Keep an Eye on the Future and an Eye on the Present] // *Voенно-Promyshlennyyi Kur'er* [The Military-Industrial Messenger]. 10–16 April 2013.

3 *Lokomotiv rossiiskoi ekonomiki* [The Locomotive of Russia's Economy] // *Voенно-Promyshlennyyi Kur'er* [The Military-Industrial Messenger]. 8–9 March 2013 (No 9).

4 Tsybmal V.I. *Lokomotiv' ili 'bronepoezd' – vybor za name*. [It's Up to Us to | Chose between the 'Locomotive' and the 'Armored Train'] // *Kompetentnost'* [Competence]. 2007. No 6.