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The review provides a detailed analysis of main trends in Russia's economy in 2012. 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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Russia's Innovation Promotion Policies: Their Evolution, Achievements, Problems and Lessons

Introduction: A General Framework for Elaborating and Estimating an Innovation Policy

Innovations, science and technology, and innovation policies represent the limited range of fields where, as believed by a majority of eminent contemporary economists and analysts, it can be possible and even reasonable for the government to interfere. The only arguable aspects are, in the main, the scale, forms and limits of government interference and the experts also discuss and explore the world's best practices and the principles underlying each specific policy¹. The necessity of government interference in order to promote innovations is proclaimed (explicitly or implicitly) by two basic concepts of economic development – the neo-classical and evolution theories.

*The neoclassical economic theory*² explains the need for public funding to be allocated to research and development by the phenomenon of market failures, when public benefits from investing in science and technologies turn out to be greater than the rate of return received from similar investment by private investors³. It is a well-known fact that the companies experiencing financial difficulties are forced to reject some potentially profitable innovation projects because of the existence of information asymmetry and the risk that the cost of credit may increase⁴. Along with these problems, some constraints are also associated with the attraction of venture capital in order to bridge the financial gap typical of R&D^{5,6}.

In the early 1990s, some proponents of the neoclassical growth theory, while studying endogenous technological changes⁷, demonstrated that the government's subsidizing of R&D activities urges companies to spend more on this particular field of research, thus creating a

¹ See, for example, Goldberg, I., Gobbard, G., Racin, J. Igniting innovation: rethinking the role of government in emerging Europe and Central Asia. World Bank, Washington DC.

² Nelson, R. (1959). The Simple Economics of Basic Scientific Research. *Journal of Political Economy*, 67 (3), 297-306; Arrow, K. (1962). Economic Welfare and the Allocation of Resources for Invention. In R. Nelson (Ed), *The Rate and Direction of Inventive Activity* (pp. 164-181). Princeton University Press.

³ It is noteworthy that Arrow (see the previous note), when speaking of the necessity for the government to implement certain measures to compensate for market failures, also points out the following two fundamental issues: (1) how to guarantee that the investment is cost-effective, and (2) how to identify such market failures?

⁴ Hall, B. H. (2002). The Financing of Research and Development. *Oxford Review of Economic Policy*, 18 (1), 35-51.

⁵ Hall, B. H., Lerner, J. The Financing of R&D and Innovation. In Hall, B. H. and N. Rosenberg (Eds) *Handbook of the Economics of Innovation*, Elsevier-North Holland.

⁶ It is noted that more than half of the money allocated to R&D is spent on the remuneration of researchers, whose work generates intangible knowledge (that, more often than not, cannot be codified). As a result, the principal gains for the companies are associated with the development of their human resources, but the investors are faced with an increased risk of losses if the personnel involved leave (or change) their place of employment.

⁷ See, for example, Romer, P. (1990). Endogenous Technological Change. *Journal of Political Economy*, 98, S71-S102; Segerstrom, P., Anant, T., Dinopoulos, E. (1990). A Schumpeterian Model of the Product Life Cycle. *American Economic Review*, 80, 1077-1092; Grossman, G., Helpman, E. (1991). Quality Ladders in the Theory of Growth. *Review of Economic Studies*, 58, 43-61; Aghion, P., Howitt, P. (1992). A Model of Growth Through Creative Destruction. *Econometrica*, 60, 323-351.

positive effect in terms of economic growth. Later on, a number of theoretical models were created¹, which assessed the effects of subsidies allocated to R&D and their influence on long-term economic development.

Evolutionary economics² regards innovations as a complex phenomenon fraught with high risks and requiring a broader access to knowledge, while the most important definitive feature of the innovation processes becomes the interaction between their participants. So, one of the most important factors that sustain the performance of an innovation system is the support provided by the State to the development of interactions, connections, and networks. It can be recalled that the success achieved in introducing and implementing R&D on a broad scale in the newly industrialized countries was based on intensive multi-disciplinary personnel training, in large groups, and the positive effects of this educational activity tend to accumulate with time³. It is the neutral and mass-scale support of R&D activities in the early phase of their development that later on makes it possible to identify genuine market failures whenever they occur, with due regard for their sectoral specificity, and thus to elaborate a more selective policy for promoting innovations.

Within the framework of the evolutionary approach, failures are usually perceived to occur in the field of education – 'learning failures'⁴, which can be interpreted as constraints imposed on the learning potential and its use – both at the level of each individual agent and at the level of group agents. In this connection, there arise such issues as lack of proper coordination between agents, underdeveloped institutions for coordinated knowledge generation and distribution, their inadequate adjustment to and lack of timing with the ongoing technological changes, the difficulties of codification (lack of standards and platforms), barriers in knowledge perception, etc.

As both these approaches have been strongly influencing the process of elaborating economic policies in many countries, at present there exists a sort of a *framework consensus with regard to the innovation promotion mechanisms: they are viewed, on the one hand, as devices that help to lower the risks and to spread more evenly the innovation costs; and on the other – as stimuli for developing interaction networks, training methodologies and the generation of new collective knowledge*. Both these approaches to elaborating an innovation policy (see *Table 10*) are mutually supportive, with an increasing trend towards focusing on the evolutionary model of economic growth.

Table 10

A Tentative Framework for Innovation Policy

¹ See, for example, Howitt, P. (1999). Steady Endogenous Growth with Population and R&D Inputs Growing. *Journal of Political Economy*, 107, 715-730; Segerstrom, P. (2000). The Long-Run Growth Effects of R&D Subsidies. *Journal of Economic Growth*, 5, 277-305.

² Metcalfe, J. S. (1994). Evolutionary economics and public policy. *Economic Journal*, 104 (425), 931-944; Edquist, C. (1997). System of innovation approaches - their emergence and characteristics. In Edquist (ed), *System of Innovation. Technologies, institutions and organizations*, London.

³ Teubal, M. (1996). R&D and technology policy in NICs as learning processes. *World Development*, 24 (3), 449-460; Teubal, M. (2002). What is the systems perspective to Innovation and Technology Policy (ITP) and how can we apply it to developing and newly industrialized economies? *Journal of Evolutionary Economics*, 12 (1), 233-257.

⁴ Bach, L., Mats, M. (2005). From economic foundations to S&T policy tools: a comparative analysis of the dominant paradigms. In M. Matt & P. Llerena (eds), *Innovation Policy in a Knowledge-Based Economy: Theory and Practice*. Springer Verlag.

Innovation policy's specific features	Neoclassical growth model	Evolutionary growth model
1. Key problems	Market failures – problems with redistribution of resources	Learning failures – problems involved in knowledge generation and distribution
2. Main object	Science, technologies, innovations (STI)	Skills, use, interaction (DUI)
3. Policy character	Mission-oriented policy – orientation strictly to final results, to direct influence; assessments of needs and replenishment of lacking resources	Diffusion-oriented policy) – orientation to spreading changes, practical examples; learning as part of policy implementation
4. Estimation of results	Numerical effects, direct effects, changes in resource management	Qualitative effects, behavioral effects, learning effect

Hypothetically, an innovation policy can be mission-oriented or diffusion-oriented; the former is more compatible with the neoclassical model, and the later fits the evolutionary approach¹. However, when taken in practical terms, a policy is usually based on a compromise between the two models, with a certain degree of balance achieved in both dimensions – (1) horizontal or vertical; (2) mission-oriented or diffusion-oriented.

Over recent decades, the conditions for implementing innovations have changed dramatically – both in the developed countries and in the transition economies. Among the alterations that occurred in the sphere of *innovations on a global scale in the past few decades, the following ones can be pointed out:*

(1) global competition results in a shorter product life cycle and imposes tough constraints on the timelines for new product development;

(2) the global nature of the innovation activity and the inevitable specialization and international partnership make it impossible to keep all added value in one given country;

(3) the increasing complexity of new production technologies makes it difficult, even for biggest companies, to maintain their leadership on world markets - thus giving rise to new motives for specialization;

(4) interdisciplinary studies are becoming an important factor of a successful implementation of innovations, while the rising costs of research and development and the need for different specialization results in an increasing cooperation on all levels – corporate, inter-country, and in the emergence of technological alliances;

(5) the channels for transmitting new knowledge and technologies are broadening, thus creating opportunities for accelerating the process of spreading technologies across economies by means of better regulation;

(6) the transmission and perception (or acquisition) of knowledge on an individual level becomes a very relevant component in the process of spreading innovations, and so the requirements to human resources are significantly upgraded;

(7) the role of innovations in dealing with contemporary social challenges is also becoming increasingly prominent, and the innovation fields like ecology, health, nutrition are viewed as priorities for sustainable social development.

Against the backdrop of all these fundamental shift, inevitably, *the attitudes of many national governments to the task of supporting innovations have undergone a certain transformation* – in view of the increasing globalization and international competition the formerly neutral approach gave way to a more active direct involvement of government agencies in promoting the innovation processes, with a more accurate 'tuning' of the relevant instrument to the specificities of each sector, market, or technological shifts. In the innovation policies of

¹ Bach, L., Mats, M. (2005). From economic foundations to S&T policy tools: a comparative analysis of the dominant paradigms. In M. Matt & P. Llerena (eds), *Innovation Policy in a Knowledge-Based Economy: Theory and Practice*. Springer Verlag.

different countries, the following common directions of the ongoing transformation can be identified:

- (1) a generally enhancing role of the government in promoting and supporting innovations; a switchover to an integration policy in the fields of science, technology, education and innovation; an increasing focus on the development of necessary networks and the promotion of interaction between the different participants in the innovation processes;
- (2) a shift from the model based on supporting the supply of innovations towards the one based on promoting a demand for innovations; an increasing number of governments applying a broad range of mechanisms for innovation promotion; a departure from the principle of neutrality in elaborating an innovation policy, and a diffusion of boundaries between the innovation and industrial policies;
- (3) an increasing inter-country distribution of best practices of innovation support, an increasing scale of inter-country transfers of the 'sets of instruments' for promoting innovations, with an emphasis on learning and deriving lessons from experimenting in the framework of an innovation policy;
- (4) the imposition of tougher budget constraints and, consequently, an increasing role of regular evaluation of the performance of various instruments innovation-promoting instruments.

A predominant trend in the current approaches to the task of stimulating innovations is to view them as a fundamental factor of sustainable economic development; in this connection, the *focus of the ongoing discussion has shifted onto the issue of how to select the most effective and appropriate instruments to be applied in government innovation policies.*

In principle, there exist a broad variety of instruments for the support of innovations that have already been tested in many different countries. These are tax exemptions, targeted loans, government subsidies, and a multitude of other things. Nevertheless, both the new industrial countries (for example, in Latin America) and those with developed market economies (such as EU members) *are still continuing an active quest for and discussion of new instruments for promoting innovations*¹ - the instruments that could yield most effective results with only minimum distortions in the existing market environment.

On the basis of an analysis of the practices of implementing different innovation promotion mechanisms, the following specific features can be pointed out²:

- the advantages of *tax instruments* in promoting innovations is that they may be applied to a broad range of economic agents (without any special constraints), their neutrality, and no need for any special procedures of expert's estimation;
- the attractiveness of *financial instruments* applied in the support of innovations (credits, subsidies, grants) consists in their ability to concentrate the available resources within the framework of the most promising projects, the projects of the highest significance from the point of view of benefits to society; besides, they allow better opportunities for measuring the projects' cost-effectiveness and for exercising proper control over the expenditures allocated to innovations.

¹ DEMAND. (2002). STI Report: tax incentives for research and development – trends and issues. Paris: DEMAND; DEMAND. (2006). Government R&D Funding and Company Behavior. Measuring Behavioral Additivity. Paris: DEMAND; DEMAND. (2012). DEMAND Science, Technology and Industry Outlook 2012. DEMAND Publishing.

² DEMAND. (2002). STI Report: tax incentives for research and development – trends and issues. Paris: DEMAND.

On the basis of available data for the EU countries it was demonstrated that, by comparison with tax exemptions, government co-financing of companies' expenditures on R&D produced a more long-term effect¹. The advantages of subsidies towards R&D activities are also associated with their potential to 'compensate', for companies, the market uncertainties that they are faced with in their business activity². Thus, while tax exemptions are better from the point of view of expanding the ongoing innovation projects, subsidies conduce to the launch of new, more long-term projects. Besides, the companies - recipients of grants more often act as innovators on an international level and are more successful in commercializing their products than the companies that are encouraged only by means of tax exemptions³.

On the whole, *tax exemptions and subsidies, in terms of their effectiveness in prompting innovations, each have their own specific advantages and drawbacks*. It is not by chance that the group of independent experts participating in the preparation of the European Commission's Report⁴ recommended that different 'instrument packages' should be applied in promoting the innovation activity.

The cost-effectiveness and feasibility of different instruments for innovation support represent one of the key issues underlying the government innovation policies in many countries, especially under the conditions of toughening budget constraints. It is noteworthy that one of the directions in which the countries reacted to the changed conditions for the implementation of innovations in the post-crisis period has been a shift in the principles applied in the estimations of an innovation policy's results.

A policy implemented in the field of science and technologies usually aims at achieving certain goals set on a rational basis within a certain framework. From this it follows that, on the one hand, some of the ongoing changes may depart from the policy's established goals, while on the other, such 'unexpected' changes may either be compatible or incompatible with the model framework applied in determining those goals⁵. Therefore, there emerges *the task of a regular identification and estimation of the 'incompatible' changes and the continual re-definition of the model framework itself*.

An increasing attention has been focused on estimating an innovation policy as a learning instrument, and on finding the best ways for its implementation. In fact, something that has been good for one country may become counter-productive in terms of innovations on another, and so the identification of problem areas must go hand-in-hand with certain experimenting aimed at providing solutions to the existing problems, as well as with an expansion of learning processes⁶.

¹ Guellec, D., y Van Pottlesberghe, B. (2003). The impact of public R&D expenditure on business R&D. *Economics of Innovation and New Technologies*, 12 (3), 225-244.

² Czarnitzki, D., Toole, A. A. (2007). Business R&D and the interplay of R&D subsidies and product market uncertainty. *Review of Industrial Organization* 31(3), 169-181.

³ Berube, C., Mohnen, M. (2007). Are Firms That Received R&D Subsidies More Innovative? CIRANO Working Paper 2007s-13, CIRANO.

⁴ ECR. (2003). Raising EU R&D Intensity – Improving the Effectiveness of the Mix of Public Support Mechanisms for Private Sector Research and Development. Report to the European Commission by an Independent Expert Group.

⁵ Bach, L., Mats, M. (2005). From economic foundations to S&T policy tools: a comparative analysis of the dominant paradigms. In M. Matt & P. Llerena (eds), *Innovation Policy in a Knowledge-Based Economy: Theory and Practice*. Springer Verlag.

⁶ Rodrik, D. (2008). The New Development Economics: We Shall Experiment, but How Shall We Learn? Working Paper Series rwp08-055, Harvard University, John F. Kennedy School of Government; Chaminade, C., Lundvall, B., Vang, J., Joseph, K. (2009). Designing innovation policies for development: towards a systemic

By now, the world has already accumulated vast experience in estimating the effects of different innovation-promoting instruments on the performance of companies. Some progress has been observed in the development of general methodologies of estimating the effects of policies implemented in the field of science, technologies and innovations¹. However, such issues as the time shifts of the effects of various applied mechanisms, the composition of the potential externalia, the heterogeneity of influence, and the multiple character of influences still retain their importance.

A basic factor in the estimation of innovation policies has become the concept of additionality, which implies identification and analysis of those effects that would have been non-existence in absence of the instruments of government support. A practice has already been developed² for making such an estimation on the basis of four types of effects existing at a company's level: (1) changes in resources, (2) direct results of innovations, (3) changes in a company's competitive capacity, (4) behavioral changes.

In the framework of the first group of effects, among other things, the changes in the volume of corporate expenditures allocated to R&D are considered. The second group of effects includes the increment in the number of patents taken by companies, the output of new products and the resulting growth in sales. The third group incorporates indicator like productivity growth, the scale of business activity and market share.

The effects belonging to the fourth group (the so-called behavioral additionality³) stand somewhat apart from the others. These effects are much closely linked to the intrinsic factors that have to do with the specificity of a company's organizational structure, the interests and motivations of different related parties, the individual standpoints of a company's owners, a company's potential for acquiring new knowledge and learning new technologies, etc. - that is, something that cannot be easily formalized. In the framework of the fourth group of effects, the changes in the attitudes of a company's owners to innovations, the transformation of companies' innovation strategies, the re-estimations of the importance of external interactions and partnerships with other organizations in the course of implementing innovations are usually analyzed.

It is due to the existence of the behavioral factors that the links between the first and second groups of effects are non-linear and versatile. The importance of the estimation of behavioral changes is also associated with the fact that the logic behind the government's interference in the form of an organized innovation policy implies a necessity to compensate not only for market and systemic failures (the market ones – support of research; the systemic ones –

experimentation-based approach. In Lundvall, B. et al. (eds.) *Handbook of Innovation Systems and Developing Countries*. pp. 360-379.

¹ See, for example, Crespi, G., Maffioli A., Mohnen, P., Vazquez, G. (2011). *Evaluating the Impact of Science, Technology and Innovation Programs: a Methodological Toolkit*. SPD Working Papers 1104, Inter-American Development Bank, Office of Strategic Planning and Development Effectiveness.

² See, for example, Hall, B. H., Maffioli A. (2008). *Evaluating the Impact of Technology Development Funds in Emerging Economies: Evidence from Latin America*. NBER Working Paper 13835, National Bureau of Economic Research, Inc.

³ The concept of behavioral additionality was first formulated in 1995. It was then noted that the additionality concept is an important instrument capable of boosting up the results of government support in the sphere of research and development, but that it must be geared not only to direct effects, but also to the behavioral ones. Thus, in particular, when applied to big companies, behavioral additionality may be linked to changes in the principles of composing the portfolios of research projects and corporate technological strategies. Behavioral changes determine the external (from the point of view of a given company) positive effects based on the distribution of best practices among other companies.

support of cooperation and networks), but also for failures in companies' receptability¹ - that is, support of changes in their behavior.

The estimation of behavioral additionality is increasingly becoming a typical component of the overall estimation of the performance of different instruments applied in promoting innovations. So, the following characteristic features of the practice of estimating the innovation instruments can be noted:

(1) regularity of estimations, inter-country comparison of the results is a well-developed practice in the EU countries; the practice of estimating the influence of new innovation promotion mechanisms in Latin American countries, in the new industrial countries;

(2) long periods of observation (more than 10 years), availability and maintenance of detailed official statistics in the relevant fields, openness of the official assessment procedures applied in the records of new effects;

(3) complexity and heterogeneity of the estimations (for example, the replacement effect), the existence of considerable time lags in the emergence of final effects (4 – 6 years), marked heterogeneity of the influences of different promotion mechanisms; the existence of significant econometric problems; preparation and presentation of methodological recommendations concerning the principles of estimation and the associated problems;

(4) openness, public access to the results of estimations; practical use of the results of estimations in the decision-making at the government level – distribution of best practices, learning the lessons; decision-making with regard to discontinuation, adjustment, or expansion of various programs and mechanisms applied in the promotion of innovations.

The Main Instruments and Development Phases of the Government Innovation Promotion Policy in the 2000s

The government policy aimed at promoting innovations that was implemented in Russia in the 2000s was by no means uniform. It involved many different instruments and measures, abounded in various initiatives that often appeared to be poorly substantiated and sometimes even downright eccentric. At the same time, it must be admitted that, over that period, the innovation policy became significantly better elaborated - even if its progress was by no means always smooth and based on the choice of best decisions and practices. In our opinion, with some reservations, we may distinguish five main phases in the development of that policy, which were largely determined by the availability of government resources, as well as by the varying views of the ruling elites as to the most important goals of economic development during different periods and the necessity of innovations for providing adequate economic solutions:

2000 – 2002: the phase of 'small deeds' against the backdrop of limited resources;

2003 – 2005: the phase of activation and diversification against the backdrop of stable economic growth;

2006 – second half of 2008: the phase of big decisions and initiatives;

late 2008 – 2009: the phase when the anti-crisis agenda was predominant;

from 2010 onwards: the phase of a quest for 'new quality'.

2000 – 2002

¹ Gok, A., Edler J. (2011). The Use of Behavioral Additionality in Innovation Policy-Making. MBS/MIoIR Working Paper 627, The University of Manchester.

Approximately until 2003, *in conditions of relatively tough budget constraints, the issues relating to innovations remained 'in the periphery' of the government's policy. Due to the low innovation activity of businesses, the demand for any relevant government measures was insignificant.* The government policy instruments that emerged during that period were, as a rule, relatively inexpensive, and their effectiveness was low. A typical example is the creation of the Venture Innovation Fund¹ – the government's 'fund of funds' designed to promote the development of a system of venture financing in Russia. The amount of government contribution in the fund's capital was limited to Rb 100m (of which, according to available data, only Rb 50m was actually transferred), while its investment activity began only a few years later. Besides, over the period under consideration, a new basic law was enacted in the field of standardization, certification and technical regulation². However, the process of elaborating, on its basis, the necessary technical regulations began much later – the first relevant document was issued in late 2005³, and that activity became more or less regular only in 2008.

However, alongside the aforesaid steps undertaken by the government (not very successful – at least initially), we cannot overlook another development – namely, that in 2002 the Russian Bank for Development (*RosBR*)⁴ (which had previously been specializing mainly on issuing loans to industrial companies in accordance with the priorities set by the RF Government) began to implement the *и* program of financial support to small and medium – sized and enterprises (SME). It was organized as a two-tier structure: first, the bank issued the money to its regional partners, which then issued loans to SME – to cover, among other things, the cost of renewal of their fixed assets. Soon – and it is still true today – the implementation of that program became not only the bank's core activity, but also the main instrument of rendering government financial support to SME.

It must also be noted that, over the period under consideration (which, however, is also true of the previous and later years), one important instrument for channeling government financing allocated to applied R&D projects were federal target programs, among which there were some specialized programs in the field of science and technologies: the Federal Research and Technology Target Program for the years 1996–2000 'Research and Development in the Priority Directions of Development of Science and Technologies for Civil Purposes'⁵, the Federal Research and Technology Target Program 'Research and Development in the Priority Directions of Development of Science and Technologies' for 2002–2006⁶, the Federal Target Programs 'National Technological Base' for 1997–2000⁷ and 2002–2006⁸), and also some sectoral programs. However, these programs did not envisage any financing to be allocated to the implementation in industry of the results of completed R&D projects.

2002–2005

Stable economic growth, followed by softening of budget constraints, created the necessary preconditions for further development of the government policy, which now could address

¹ The RF Government's Regulation of 10 March 2000, No. 362-r.

² Federal Law of 27 December 2002, No. 184-FZ 'On Technical Regulation'.

³ The RF Government's Decree of 12 October 2005, No. 609 'On Approving the Technical Regulation "On The Requirements As to the Emission of Pollutants by the Motor Vehicles Put in Operation in the Territory of the Russian Federation" '.

⁴ At present the Russian Bank for Small and Medium Enterprises Support (SME Bank).

⁵ Approved by the RF Government's Decree of 23 November 1996, No. 1414.

⁶ Approved by the RF Government's Decree of 21 August 2001, No. 605.

⁷ Approved by the RF Government's Decree of 13 August 1996, No. 986.

⁸ Approved by the RF Government's Decree of 8 November 2001, No. 779.

those directions and sphere that previously were de facto considered to be of secondary importance. In combination with the government's increasing attention to the 'quality' of growth, this was transformed in *a strong impetus to innovation activities and an expansion of the available set of relevant instruments*.

The first real sign of the government's changed attitude to innovations was the launch, in 2003, of a number of government-level innovation projects, or *mega-projects*, which was at that time a step forward in the field of innovations that was unprecedented over the entire period of Russia's post-Soviet history. The key features of the mega-projects, which set them apart from all the other instruments previously applied in government innovation policy, were as follows:

- very impressive costs – up to several billions of rubles, of which government funding covered approximately half, on a non-refundable basis;
- long periods established for implementing the projects – 3–5 years, and so the framework of one project could encompass all the different phases of the innovation cycle – from the development of new products and technologies to putting them in operation;
- the mandatory requirement that the product's sale should be launched within the project's framework, and the sale volume was to be fivefold the amount of the aggregate budget financing allocated to the project.

Because of these specificities, the implementation of the mega-projects took place on a 'singular' basis – over the decade whilst that instrument was being applied, only about 30 projects were launched, half of which covered the period of 2003–2005.

In 2004, a number of significant alterations were made to the already mentioned Federal Research and Technology Target Program 'Research and Development in the Priority Directions of Development of Science and Technologies'¹, which envisaged, among other things, support of the activity aimed at 'commercializing' the results of completed R&D. The new version of the programs mapped some measures designed to ensure the funding of the mega-projects implemented 'under the auspices' of the RF Ministry of Education and Science², as well as some large-scale venture projects.

In 2004, the Foundation for Assistance to Small Innovative Enterprises in Science and Technology began to implement the program 'Start', which envisaged the allocation of grants in order to finance R&D carried out in the framework of innovation projects implemented by newly created small enterprises over a period from 1 to 3 years. As it happened in the case of the Russian Bank for Development's support of SME, this program soon became the Foundation's core activity - and at the same time the main instrument for allocating government financial support to small innovation companies.

In 2005, the legal foundation for the creation and operation in Russia of special economic zones was adopted³, one of their types being that of a technology implementation zone, and a

¹ The RF Government's Decree of 12 October 2004, No. 540 'On Introducing Alterations in the Federal Research and Technology Target Program 'Research and Development in the Priority Directions of Development of Science and Technologies' for 2002–2006, and Recognizing as Null and Void Some Acts of the Government of the Russian Federation'.

² Initially, the mega-projects were supervised by the RF Ministry of Industry and Science; after its abolition in 2004, this direction of government support was taken over by the RF Ministry of Education and Science and the RF Ministry of Industry and Energy.

³ Federal Law of 22 July 2005, No. 116-FZ 'On Special Economic Zones in the Russian Federation' and No. 117-FZ 'On the Introduction of Alterations to Some Legislative Acts of the Russian Federation in Connection with the Adoption of the Federal Law 'On Special Economic Zones in the Russian Federation'

number of rather significant tax exemptions for their residents, including the free customs zone regime, the guarantees that the current tax regime was not to be worsened, the possibility to apply a reduced rate of profit tax, a preferential procedure for writing off the expenditures on R&D, the possibility for accelerated depreciation of fixed assets, temporary exemption from property and land taxes, etc. In late 2005, the RF Government formalized its decisions concerning the creation of four technology implementation zones: in Tomsk, St. Petersburg, Moscow (at Zelenograd), and Moscow Oblast (at Dubna).

The year 2005 saw the onset of the process of creating regional venture funds as part of measures designed to support small-scale entrepreneurship, to be implemented by RF subjects and co-financed from the federal budget¹. At present there exist 23 funds in 21 RF subjects.

And finally, in 2005 the legal foundation was laid for the mechanism of subsidizing, by Russian exporters, of part of the interest paid on the loans attracted in order to develop exports of highly processed products².

2006 – second half of 2008

The period of 2006–2008 was marked by *high government activity in the field of innovation support, and – as a result – regular implementation of new measures and instruments, which often required substantial resources (including in the form of lost budget revenue)*. In this connection, two directions of that government policy are especially noteworthy: the launch of a number of tax instruments for innovation promotion, as well as the creation and capitalization of some big financial development institutions:

- in 2006, the Open-ended Joint-stock Russian Venture Company (RVC)³ was established with the purpose of promoting the creation, in Russia, of a national venture investment industry modeled after a 'fund of funds. RVC's capital was fully formed by the government and amounted to Rb 30bn. It should be noted that this particular development institution was evidently created with due regard for the experience gained during the previous attempt at launching a government 'fund of funds' – the Venture Innovation Fund. In 2007 and 2008, with the participation of the RVC, 7 venture funds were created;
- from 2006, a depreciation premium was introduced, whereby enterprises were granted the right, when calculating the amount of tax on profit, to write off up to 10% of their capital investment in new fixed assets and the technological upgrading and modernization of fixed assets⁴;
- the period for writing off the expenditures on R&D whose results are applied in production processes was shortened first from 3 years to 2 years (from 2006)⁵, and then to 1 year (from 2007)⁶;

¹ The relevant rules were established by the RF Government's Decree of 22 April 2005, No. 249 'On the Conditions and Procedure for the Allocation of Federal Budget Funding Earmarked for the Government Support of Small Entrepreneurship, Including Peasant (or Farmer) Economies'.

² The RF Government's 6 June 2005, No. 357 'On the Approval of the Rules for Compensation from the Federal Budget to Russian Exporters of Industrial Products of Part of their Expenditures on the Payment of Interest on Credits Received in 2005 from Russian Credit Institutions'.

³ The RF Government's Regulation of 7 June 2006, No. 838-r.

⁴ Federal Law of 6 June 2005, No. 58-FZ 'On the Introduction of Alterations to Part Two of the Tax Code of the Russian Federation and to Some Other Acts of the Russian Federation's Legislation on Taxes and Levies'.

⁵ Federal Law of 6 June 2005, No. 58-FZ.

⁶ Federal Law of 27 July 2006, No. 137-FZ 'On the Introduction of Alterations to Part One and Part Two of the Tax Code of the Russian Federation and to Some Legislative Acts of the Russian Federation in Connection with the Implementation of Measures Designed to Improve Tax Administration'.

- from 2006, it was envisaged that the expenditures on R&D that had yielded no positive result could be written off in full¹ (previously – 70%); from 2007, the period for writing off such expenditures was shortened to 1 year² (previously – 3 years);
- in 2007, the USSR Bank for Foreign Trade was reorganized into the State Corporation ‘Bank for Development and Foreign Economic Affairs’³; simultaneously, the capital of the newly created entity was augmented by an additional contribution of Rb 180bn, as well as shares issued by two specialized banks – *RosBR* [Russian Bank for Development] and *Eximbank Russia*. It was established that one of the main directions of the State Corporation's investment activity was to be the implementation of innovation-oriented investment projects⁴. It should be noted that the reorganization resulted in some significant changes in *Vneshekonombank*'s activity, and first of all in terms of quality of the development institutions. Thus, over the period of 2007 - 2008, the volume of investment credits increased more than 4-fold;
- in 2007, the Russian nanotechnologies corporation (State Corporation *Rusnanotech*) was established with the purpose of developing the innovation infrastructure and implementing promising projects in the fields of nanotechnologies and nanoindustry⁵. The government's contribution to the corporation's capital was money in the amount of Rb 160bn. The financing of projects by the newly created state corporation was started in 2008;
- from 2008 onwards, the enterprises were granted the right of accelerated depreciation (with a coefficient of up to 3) of their fixed assets used strictly for their activity in the field of science and technology⁶;
- from 2008 onwards, the following types of activity were made exempt from VAT: the performance, by organizations, of research and development involving the creation of improvement of products or technologies, if this activity results in the development of an engineering structure or technical system, new technologies, sample models of machines, equipment, or materials;
- the transfer of exclusive rights to inventions, useful models, industrial samples, software, databases, integral microcircuit topologies and know-how, as well as the rights to the practical application of the aforesaid results of intellectual activity on the basis of a licensing agreement⁷;
- from 2008, the costs taken into account under the simplified system of taxation were to include:
 - the cost of acquisition of exclusive rights to the aforesaid results of intellectual activity, as well as the rights to their practical application on the basis of a licensing agreement;
 - the cost of patenting and/or the price of the legal services associated with legal protection of the results of intellectual activity;
 - the cost of R&D⁸.

¹ Federal Law of 6 June 2005, No. 58-FZ.

² Federal Law of 27 July 2006, No. 137-FZ.

³ Federal Law of 17 May 2007, No. 82-FZ 'On the Bank for Development'.

⁴ the RF Government's Regulation of 27 July 2007, No. 1007-p.

⁵ Federal Law of 19 July 2007, No. 139-FZ 'On the Russian Nanotechnologies Corporation'.

⁶ Federal Law of 19 July 2007, No 195-FZ 'On the Introduction of Alterations to Some Legislative Acts of the Russian Federation in the Part of Creating Favorable Tax Conditions for the Financing of Innovation Activity'.

⁷ Federal Law of 19 July 2007, No. 195-FZ.

⁸ Federal Law of 19 July 2007, No. 195-FZ.

In addition to all these directions of innovation policies, a number of other measures, in some or other way associated with innovation promotion, were introduced during the period under consideration:

- within the framework of the priority national project 'Education', over the period of 2006–2008, innovation-oriented higher educational establishments received support as part of special innovative educational programs that envisaged fundamental and applied studies and students' participation in the implementation of real projects in various sectors of the national economy. The recipients of that support were 57 higher educational establishments across Russia;
- The Federal Target Program for the Development of Education in 2006–2010 envisaged, in particular, the financing of measures designed to create networks of innovation-oriented higher educational establishments, as well as to form a segment of the national innovation system on the basis of higher educational establishments¹;
- in 2006, it was decided to establish the Open-ended Joint-stock Company 'Russian Investment Fund for Information and Communications Technologies' (*Rosinfokominvest*)² for the purpose of making investment in promising innovation projects carried out by companies specializing in information and communications technologies (ICT); in 2007, the fund's creation was effectively completed. It differed from the other government financial development institutions created over the period under consideration (RVC, *Vneshekonombank* in the form of a state corporation, *Rusnanotech*) in that its capital was relatively small – Rb 1.45bn. Its another distinctive feature was that, by early 2012, it had not yet begun to work towards its main goal - investing in companies³;
- in 2006, the Program 'Creation in the Russian Federation of Technoparks in the Hi-tech Sphere' was adopted⁴ in accordance with which, from 2007 onwards, a number of RF subjects began to receive annual subsidies earmarked for the implementation of that specific goal⁵. Initially, that program was geared for a five-year period – from 2006 through 2010, and envisaged the foundation of technoparks in Moscow Oblast, Novosibirsk Oblast, Nizhnii-Novgorod Oblast, Kaluga Oblast, Tyumen Oblast, the Republic of Tatarstan, and St. Petersburg; at present, the period of its implementation is prolonged until 2014, and the list of regions where technoparks are to be created has been extended - it now includes the Republic of Mordovia⁶, as well as Kemerovo Oblast⁷, Penza Oblast, Samara Oblast and Tambov Oblast⁸;

¹ Approved by the RF Government's Decree of 23 December 2005, No. 803.

² Decree of the Government of the Russian Federation of 9 August 2006, No. 476 'On the Establishment of the Open-ended Joint-stock Company "Russian Investment Fund for Information and Communications Technologies'.

³ It should be noted that in the aforesaid Decree of the RF Government it is envisaged that the fund's charter must contain a provision whereby the fund has no right to allocate financing to projects until the moment when the Russian Federation's stake in its capital is decreased to 51% (at present, 100% of the fund's stock is in federal ownership), but in the current wording of the fund's charter (approved by Order of the RF Ministry of Communications and Mass Media of 4 May 2010, No. 69) there is no such provision.

⁴ The RF Government's Regulation of 10 March 2006, No. 328-r.

⁵ The RF Government's Decree of 20 December 2007, No. 904 'On the Procedure for Allocating Funding from the Federal Budget Earmarked for the Creation of Hi-tech Technoparks'.

⁶ The RF Government's Regulation of 12 September 2008, No. 1326-r

⁷ The RF Government's Regulation of 25 December 2007, No. 1912-r

⁸ The RF Government's Regulation of 27 December 2010, No. 2393-r

- an undertaking of fundamental importance was the launch, in 2007, of the presidential initiative 'Strategy of the Development of Nanoindustry', personally initiated by the RF President. It should be acknowledged that initially the Strategy attracted rather little attention¹. In fact, the document adopted in this connection, in addition to outlining the main principles of the government policy in that sphere (which in itself was significant), also determined all the key activities of the RF Government related to the development of nanoindustry: the establishment of the Russian Corporation of Nanotechnologies, the implementation of the Federal Target Program 'Development of the Nanoindustry Infrastructure in the Russian Federation in 2008–2010'², and the organization of a national research center in that field (to be discussed in more detailed later in the text);
- in 2007, the implementation of the Federal Target Program 'Research and Development in the Priority Directions of Developing Russia's Scientific-technological Complex in 2007–2012'³, was started, to replace the completed Federal Research and Technology Target Program 'Research and Development in the Priority Directions of Developing Science and Technologies', which had been implemented in 2002–2006. The new program continued the support of mega-projects via the RF Ministry of Education and Science. Besides, in its framework, a fundamentally new (for Russia) innovation policy instrument was applied in the co-financing of the innovation projects implemented in the interests of the business community. The key feature of that instrument that distinguished it from all the previously applied ones was that the themes of the R&D projects to be financed by the government were determined directly by the related businesses on the basis of their own interests and needs, while the government confined its role to determining, on the basis of contests, the entities to be changed with the task of the performing the relevant work (with due regard for the opinion of the beneficiary company, which participated in the expert estimation of the submitted applications). However, in spite of the strong interest demonstrated by the business community, that instrument was applied on a limited scale and for a rather short period of time: in 2007–2010, the government granted support to only about ten project of this type, and since 2011 they have been allocated no financing whatsoever⁴;
- in 2008, a pilot project was launched whose aim was the organization, on the basis of the Russian Research Center 'The Kurchatov Institute', of a fundamentally new entity (at least, its idea was new for Russia) – the national research center (NRC) 'The Kurchatov Institute'. The NRC's task is to ensure speedy implementation of newly developed scientific innovations, carry out complete R&D cycles, including the creation of industrial samples, in two priority directions of research in the field of science, technologies and technical equipment in the Russian Federation: the industry of nanosystems and nanomaterials, on the one hand, and power engineering and energy saving, on the other; besides, the NRC is delegated the functions of a coordinator of research within the framework of the presidential initiative 'Strategy of the Development of Nanoindustry';

¹ The RF President's Assignment of 24 April 2007, No. Pr-668.

² Approved by the RF Government's Decree of 2 August 2007, No. 498.

³ Approved by the RF Government's Decree of 17 October 2006, No. 613; at present, the period of the program's implementation is extended to 2013 (by the RF Government's Decree of 6 April 2011, No. 253).

⁴ Decree the RF Government's of 6 April 2011, No. 253.

- and finally, in 2008 (5 years after the adoption of the Law 'On Technical Regulation'), the process of elaborating technical regulations was launched on a broader scale – over that year, a total of 6 documents were adopted¹.

Late 2008 – 2009

In the second half of 2008, when the onset of the *financial crisis urged the RF Government to launch a large-scale anti-crisis program, the innovation policy – as could well be expected – became a secondary priority, and so a considerable portion of the resources previously earmarked for these purposes was spent elsewhere*. At the same time, however, it would be incorrect to state that during that period the government was totally disregarding the innovation promotion instruments; on the contrary, in some of their aspects these instruments became even more strongly the focus of attention, and not only from the point of view of the ratio between the volume of investment and the results achieved, but also in terms of their orientation to true innovation.

Here are a few rather typical examples of the acts and measures undertaken in late 2008 and 2009:

- large-scale cuts in the amount of budget expenditures earmarked for the fields of science, technologies and innovation within the framework of several federal target programs (in particular, the Federal Target Program 'Research and Development ...');
- temporary withdrawal, from the State Corporation *Rusnanotekh*, of a considerable portion of previously allocated resources (Rb 66.4bn);
- the introduction of several new mechanisms for subsidizing, for the Russian enterprises operating in different sectors, in particular the motor-car manufacturing and transport engineering, the cost of interest on loans granted to them for their technological upgrading²; for the military-industrial complex - the cost of implementation of hi-tech innovation and investment projects³, etc.;
- the launch of the Program 'Anti-crisis' by the Fund for the Support of Small-sized Entrepreneurship in Science and Technology;
- large-scale involvement of *Vneshekonombank* in implementing anti-crisis measures simultaneously in several directions: refinancing of foreign loans taken by Russian borrowers – companies and banks, and secured by strategic assets; the issuance of unsecured long-term subordinated loans to Russian credit institutions⁴; the functions of the RF Government's

¹ Technical Regulation 'On the Requirements to Motor and Aircraft Petrol, Diesel and Vessel Fuel, Fuel for Jet Engines, and Fuel Oil' (approved by the RF Government's Decree of 27 February 2008, No. 118); Federal Law of 12 June 2008, N.o 88-FZ 'Technical Regulation on Milk and Dairy Products'; 'Technical Regulation on Oil and Fat Products', of 24 June 2008, No. 90-FZ; 'Technical Regulation on Fire Safety Requirements' of 22 July 2008, No. 123-FZ; 'Technical Regulation on Fruit and Vegetable Juice Products' of 27 October 2008, No. 178-FZ; 'Technical Regulation on Tobacco Products' of 22 December 2008, No. 268-FZ.

² The RF Government's Decree of 30 March 2009, No. 262 'On Approving the Rules for Allocating Subsidies from the Federal Budget to Russian Automobile and Transport Engineering Organizations to Compensate for Part of the Interest Paid on the Loans received in 2008–2009 from Russian Credit Institutions, as Well as from the International Financial Institutions Created Under the International Treaties Signed by the Russian Federation and Aimed at Technological Upgrading'.

³ The RF Government's Decree of 30 March 2009, No. 265 'On Approving the Rules for Allocating Subsidies, in 2009–2011, from the Federal Budget to the Organizations of the Military-industrial Complex to Compensate for Part of the Interest Paid on the Loans received from Russian Credit Institutions for the Implementation of Innovation and Investment Hi-tech Production Projects'.

⁴ Federal Law of 13 October 2008, No. 173-FZ 'On Additional Measures Designed to Support the Financial System of the Russian Federation'.

agent in dealing with the issues related to the granting of government guarantees to the strategic enterprises operating in the framework of the military-industrial complex and the companies included in the special list¹; and acquisition of problem-ridden financial and credit institutions for the purpose of their recovery.

It should be noted that *Vneshekonombank* was performing its crediting and financial functions within the framework of anti-crisis measures almost exclusively at the expense of the additionally allocated government resources. For that reason, over the period under consideration, the scale of its 'core' activity as a state corporation acting in the capacity of a bank for development, instead of showing any signs of decline, increased even further – thus, over the course of the year 2009, the volume of investment loans was increased from Rb 130bn to Rb 230bn. Besides, in 2009, *Vneshekonombank* made an additional contribution to its affiliation Russian Bank for Development's charter capital in the amount of Rb 10bn, and also issued to the Russian Bank for Development loans in the amount of Rb 30bn earmarked for the implementation of a program for the support of small and medium-sized and enterprises (SME), and so in 2009 the RBD's credit portfolio increased threefold.

Against the backdrop of the active implementation of the RF Government's anti-crisis program and the resulting redistribution of budget expenditure, the government innovation policy's emphasis shifted towards those measures and instrument that required no additional budget expenditures. In this context, we can mention the following ones:

- the adoption of a number of new technical regulations;
- the drawing-up of the list of main directions for the fundamental and applied studies to be carried out by the NRC 'The Kurchatov Institute'², and the involvement of three other research institutes in the creation of the NRC³;
- legislative formalization of the procedure for transferring the government's rights to uniform civil, military, special or dual technologies, with the purpose of their practical application⁴;
- softening, in principle, of the legislative norms designed to regulate the creation, by budget-funded research institutions and educational establishment, of economic societies (or implementation companies), the transfer to them of the results of intellectual activity for subsequent practical application⁵.

This does not mean, however, that the government over that period was avoiding any new spending obligations with regard to innovations. Thus, in late 2008, it launched a pilot project aimed at creating two national research universities (NRU): the National Research Nuclear University (MEPhi) on the basis of the Moscow Engineering Physics Institute (State Universi-

¹ The RF Government's Decrees of 14 February 2009, No. 103 'On Granting, in 2009, of the Government Guarantees of the Russian Federation against the Loans Taken by the Organizations Selected in the Procedure Established by the Government of the Russian Federation for Carrying Out their Core Production Activity and Capital Investment', and No. 104 'On Granting, in 2009–2010, of the Government Guarantees of the Russian Federation against the Loans Attracted by the Strategic Organizations of the Military-industrial Complex'.

² The RF Government's Regulation of 27 October 2008, No. 1561-r.

³ The RF President's Edict of 30 September 2009, No. 1084 'On the Additional Measures Designed to Implement the Pilot Project of Creating the National Research Center 'The Kurchatov Institute'.

⁴ Federal Law of 25 December 2008, No. 284-FZ 'On The Transfer of Rights to Uniform Technologies'.

⁵ Federal Law of 2 August 2009, No. 217-FZ 'On Introducing Alterations in Some Legislative Acts of the Russian Federation with Regard to Issues Relating to the Creation, by Budget-funded Research Institutions and Educational Establishments of Economic Societies for the Purpose of Practical Application (or Implementation) of the Results of Intellectual Activity'.

ty), and the National University of Science and Technology MISiS on the basis of the State Technological University *Moscow Steel Institute*¹. In 2009, the programs for the development of these two NRUs were approved², whereby it was envisaged, among other things, that the university should be allocated additional budget resources (Rb 200m each in 2009).

Almost simultaneously with this pilot project, the procedures for elaborating the 'general' legal norms designed to regulate the national research universities were initiated. In early 2009, some alterations were introduced in legislation on education whereby the specific category of a 'national research university' (NRU) was defined³. In mid-year, the procedure for a contest-based selection of the development programs submitted by the universities applying for the NRU category was defined, as well as the procedure and terms for the financing of the relevant programs⁴. In 2009, by the results of a contest (i.e., outside of the framework of the pilot project), 12 universities were placed in the NRU category, and for each of them a corresponding development program was approved. In this connection, it must be specifically emphasized that, within the framework of that direction of the government policy, some of the experience accumulated previously in the course of implementing the support measures intended for the innovation programs approved for higher educational establishments was used.

Strange as it may seem, the 'economical' approach practiced by the government with regard to both the already assumed and the potential new obligations to allocate budget expenditures to the support of innovations had very little effect on the scale of applying the mechanisms like tax incentives designed to decrease the size of budget revenue. Since early 2009, the government introduced three rather significant (as demonstrated by the subsequent practice) tax exemptions:

- for the R&D projects (including those that yielded no positive results) included in the special list approved by the RF Government⁵, a special procedure for writing off some of the costs incurred during the period of their actual implementation was introduced, with an upward coefficient of 1.5⁶;
- the exports into the territory of the Russian Federation of technological equipment that had no domestically manufactured analogues (again in accordance with the special list approved by the RF Government⁷ were made exempt from VAT⁸;

¹ The RF President's Edict of 7 October 2008, No. 1448 'On Implementing the Pilot Project of Creating National Research Universities'.

² The RF Government's Regulations of 13 July 2009, No. 915-r, and 30 July 2009, No. 1073-r.

³ Federal Law of 10 February 2009, No. 18-FZ 'On Introducing Alterations in Some Legislative Acts of the Russian Federation Issues Relating to the Activity of Federal Universities'.

⁴ The RF Government's Decree of 13 July 2009, No. 550.

⁵ The RF Government's Decree of 24 December 2008, No. 988 'On Approving the List of Scientific Research and R&D Projects, the Taxpayer Expenditures on Which, in Accordance with Item 2 of Article 262 of Part Two of the Tax Code of the Russian Federation Are to Be Recorded as Part of Other Expenditures, in the Amount of Actually Incurred Costs, with a Coefficient of 1.5'.

⁶ Federal Law of 22 July 2008, No. 158-FZ 'On Introducing Alterations in Chapters 21, 23, 24, 25 and 26 of Part Two of the Tax Code of the Russian Federation, and Some Other Acts of the Russian Federation's Legislation on Taxes and Levies'.

⁷ The RF Government's Decree of 30 April 2009, No. 372 'On Approving the List of Technological Equipment (Including the Wear and Spare Parts Thereto), the Analogues of Which Are Not Manufactured in the Russian Federation, the Exports of Which into the Territory of the Russian Federation Is not to Be levied by Value Added Tax'.

⁸ Federal Law of 26 November 2008, No. 224-FZ 'On Introducing Alterations in Part One and Part Two of the Tax Code of the Russian Federation and Some Legislative Acts of the Russian Federation'. In fact, this norm

- for capital investment in fixed assets with a useful life of more than 3 years, but no more than 20 years, a depreciation premium of 30%¹ was introduced (in addition to the previously existing 10% premium applicable to all fixed assets).

It is noteworthy that only the first of these tax exemptions had been formalized as a legislative norm before the crisis progressed into its acute phase. The other two exemptions were introduced in the context of the anti-crisis policy.

And finally, another important point is that, over the period under consideration, the creation of financial development institutions and funds was managed at the level of the relevant institutions, without any direct participation on the part of the government:

- the Russian venture company, with the minority participation of the Fund for the Support of Small-sized Entrepreneurship in Science and Technology, established the RVC *Seed-Fund*², with the purpose of supporting innovation projects in the early phases of their implementation;
- the management of the State Corporation *Rusnanotekh* decided that it must take part in the creation of a number of specialized venture funds:
- the Skolkovo-Nanotech Fund supervised by the Skolkovo Moscow School of Management, for investing in small-scale venture projects launched in the field of nanotechnologies³;
- the nanotechnologies and innovations fund, with the participation of *VTB Group* (as a co-investor) and *Draper Fisher Jurvetson* (as a managing partner) for investing in promising nanotechnological projects in Russia and abroad and for attracting international and Russian investors;
- the Russia-Kazakhstan nanotechnologies venture fund for promoting the development of nanotechnologies in the national economies of both countries;
- a sectoral fund for implementing nanotechnologies in metallurgy (*NanoMet*);
- a fund for low-budget projects in the field of nanotechnologies;
- an international fund (in a foreign jurisdiction) for attracting big international institutional investors into the Russian nanoindustry, as well as gaining access to state-of-the-art foreign nanotechnologies.

From 2010 onwards

As the signs of post-crisis growth were becoming more visible, the issues of sustainable development and modernization of the national economy began to play an increasingly prominent role on the government level (in response to the evidently negative impact of the world financial crisis on the Russian economy due to its low degree of diversification and the low competitive capacity of the processing industries). In late 2009 – early 2010, this phenomenon manifested itself in the active revival of government innovation policy - this time with an emphasis on the need to expand the range of active participants in the innovation process, including through the involvement in it of higher educational establishments, as well as the devel-

came into force only from Q3 2009, because the government decree necessary for its enforcement (see previous note) was adopted only in Q2.

¹ Federal Law of 26 November 2008, No. 224-FZ.

² The stakes held by the RVC and the Fund for the Support of Small-sized Entrepreneurship in Science and Technology in the capital of the newly created entity are 99% and 1% respectively.

³ To avoid misunderstanding, it should be noted that the participant in that project (in the capacity of a managing partner) is not the innovation center 'Skolkovo', but Moscow School of Management with the same name (Skolkovo).

opment of cooperation and network interaction in the innovation sphere. In this connection, one cannot overlook the consecutive character of many of the implemented measures and the directions along which innovations were being promoted.

In the context of the current phase of government anti-crisis policy, we must first of all mention the set of measures designed to promote the research and innovation activity of Russian higher educational establishments:

- in 2010, the mechanism of support for joint projects involving the creation of new industrial entities between Russian companies and higher educational establishments was launched and began to function effectively¹. It became the first domestic counterpart of *matching grants* - the instrument that has already become widespread in the developed and new industrial countries, and gained a good reputation. This mechanism had certain similarities with the one that had first been applied three years earlier within the framework of the Federal Target Program 'Research and Development ...', whose aim it was to render support to R&D projects launched in the interests of businesses (which was quite logical because the new mechanism incorporated some of the experiences and features of the old one). However, the mechanism for supporting joint projects had some individual specificities, which largely determined its 'new quality': first, in contrast to the instrument of 'business projects', which implied the selection of project participants by the government (although with due regard for the opinions of the beneficiary companies), the higher educational establishments to be nominated for the participation in the joint project were from the very start selected by the initiator company; secondly, the government financing for R&D was not channeled directly to the higher educational establishments, but indirectly - through the company. So far, this mechanism has been applied in rendering support to approximately a hundred projects. It should also be noted that, in late 2012 and early 2013, two new contests for the selection of joint projects were announced. This time, the R&D may be carried out not only by higher educational establishments, but also by state research institutions;
- in 2010–2012, the government was rendering support to programs that envisaged the development of innovation infrastructure at higher educational establishments². These envisaged, in particular, the creation of a broad range of infrastructure objects (business incubators, technoparks, technopark zones, innovation technology centers, engineering centers, certification centers, technology transfer centers, collective use centers, scientific and technical information centers, innovation consulting centers, etc.), and their provision with state-of-the-art equipment and software; the evaluation and legal protection of the results of intellectual activity, the exclusive rights to which were held by higher educational establishments; consulting services of foreign and Russian experts in the sphere of transfer of technologies, creation and development of small-sized innovation companies, including the involvement of their faculty in elaborating the norms, methodologies and practice necessary for the creation of such companies. Within the framework of this direction of activity, support was provided to approximately 80 programs;

¹ The RF Government's Decree of 9 April 2010, No. 218 'On the Measures of Government Support of the Development of Cooperation between Russian Higher Educational Establishments and the Organizations Implementing Comprehensive Projects Aimed at Creating Hi-tech Industries'.

² The RF Government's Decree of 9 April 2010, No. 219 'On Government Support of the Development of the Innovation Infrastructure at Federal Establishments for Higher Professional Education'.

- the process of selecting and rendering support to national research universities across Russia was continued: in 2010, this category incorporated another 15 higher educational establishments; by late 2011, their development programs had been approved.

A significant impetus was given to the process of creating a legislative environment for the establishment of technology implementation companies by research institutions and higher educational establishments:

- from 2011, the property regulation opportunities for budget-funded institutions were expanded, including the right to transfer their property to their newly or previously established companies: now, budget-funded institutions were allowed to independently dispose of all their property, with the exception of immovable property and especially valuable movables, as well as large-scale deals or deals with related interest¹;
- in 2011, a procedure was established for budget-funded institutions to lease out their property to the technology implementation companies created by them without a tender, on condition that the latter should be forbidden to sublease that property, or in any other way transfer their rights to that property to third parties²;
- from 2011, the technology implementation companies established by budget-funded institutions were granted the right to apply the simplified system of taxation, in spite of the presence in their capital of stakes held by other organizations in amounts in excess of 25% (of course, on condition that the technology implementation companies conform to all the other criteria established by the law – in terms of the amount of their proceeds, number of personnel, etc.)³;
- for the period from 2011 through 2019, reduced rates of the insurance contributions to government off-budget funds were introduced for the technology implementation companies established by budget-funded institutions⁴.

Over the period under consideration, some significant developments and changes occurred in the system of government financial institutions and funds. In particular, the process of creating 'second-tier' institutions was continued on a noticeable scale. Thus, in 2011, *Vneshekonombank* founded four new affiliations, and at least in two of these cases the initiative to create these affiliations came from the government:

- on the RF President's initiative, the Russian Direct Investment Fund (RDIF) was established, whose goal it was to attract, on the basis of co-financing, foreign investors for the participation in projects aimed at developing and modernizing the existing ones and at creating new production capacities in the key industries of Russia's national economy;
- by decision of the RF Government¹, after introducing necessary alterations in the legislation on *Vneshekonombank* and some other acts², the Russian Agency for Export Credit

¹ Federal Law of 8 May 2010, No. 83-FZ 'On Introducing Alterations in Some Legislative Acts of the Russian Federation In Connection with Improving the Legal Status of State (or Municipal) Institutions'.

² Federal Law of 1 March 2011, No. 22-FZ 'On Introducing Alterations in Article 5 Federal Law 'On Science and Government Science-and-Technology Policy' and in Article 17.1 of the Federal Law 'On the Protection of Competition'.

³ Federal Law of or 27 November 2010 r. No. 310-FZ 'On Introducing Alterations in Article 346.12 of Part Two of the Tax Code of the Russian Federation'.

⁴ Federal Law of 16 October 2010, No. 272-FZ 'On Introducing Alterations in the Federal Law 'On Insurance Contributions to the Pension Fund of the Russian Federation, the Social Insurance Fund of the Russian Federation, the Federal Fund of Compulsory Medical Insurance of the Russian Federation and Territorial Funds of Compulsory Medical Insurance' and in Article 33 of the Federal Law 'On Compulsory Pension Insurance in the Russian Federation'.

and Investment Insurance (EXIAR) was founded in order to provide insurance support to exports of Russian goods and services, Russian investment abroad, as well as to support exports-oriented small and medium-sized businesses (SME);

- the specialized Fund for the Development of the Far East and Baikal Regions was established, whose goal it was to participate in the elaboration and implementation of regional and urban development projects, and to increase the investment attractiveness of the Far East and the Trans- Baikal region;
- the VEB-Innovations Fund was created for issuing loans and making investments in the hi-tech projects launched by the Skolkovo Fund (for more details on the latter, see below).

The Russian Venture Company established 4 new funds in the period under consideration period:

- The RVC Biopharmaceutical Investment Fund (RVC *Biofund*), oriented to investment in biopharmaceutical innovation companies, as well as the companies rendering laboratory, information-analytical and consulting services to companies operating in the biotechnological, pharmaceutical and medical industries;
- The RVC Infrastructure Investment Fund (RVC *Infrafund*), for making investment in the infrastructure companies rendering consulting, expert, analytical and services to innovation companies;
- two funds in foreign jurisdiction for cooperation with international venture investors.

The State Corporation *Rusnanotekh* (from 2011 – Open-ended Joint-stock Company RUSNANO) continued the process of organizing and co-financing venture funds; it was decided to establish the following funds:

- Kama Fund One – a regional fund for the development of innovation projects in Perm Krai;
- a pre-IPO fund for investing in rapidly growing innovation companies planning to launch IPOs or attract strategic investors;
- four funds with foreign participation and/or in foreign jurisdiction, to ensure the transfer of new technologies into Russia.

By early 2010, five venture funds created with the participation of the State Corporation *Rusnanotekh* / Open-ended Joint-stock Company RUSNANO had begun their investment activity.

Besides, it is important to note the following changes in the operation of that development institution:

- the creation of a number of specialized affiliated companies, including affiliations in foreign jurisdictions (the Metrological Center RUSNANO; RUSNANO-Inform; the *Rusnanotekh* Forum Fund; RUSNANO Capital AG; RUSNANO USA, Inc.; RUSNANO Israel Ltd.);
- the launch of projects aimed at creating nanotechnological centers, as well as the project envisaging the establishment of a Technologies Transfer Center jointly with the Russian Academy of Sciences;

¹ See, for example, 'The Main Directions of the Anti-Crisis Acts of the Government of the Russian Federation for 2010 (approved at the RF Government's meeting as of 30 December 2009, Protocol No. 42).

² Federal Law of 18 July 2011, No. 236-FZ 'On the Introduction of Alterations to Some Legislative Acts of the Russian Federation for the Purpose of Improving the Mechanism of Insurance of Exports Credits and Investment Against Entrepreneurial and Political Risks'.

- the transformation of the state corporation into a joint-stock company, the separation of its activities aimed at supporting educational projects and projects in the sphere of infrastructure into a separate juridical person – the Fund for Infrastructure and Educational Programs¹;
- the allocation of additional government financing, as well as commercial credits - but with active government participation: in 2010–2011, the State Corporation *Rusnanotekh*/ Open-ended Joint-stock Company RUSNANO received from the government more than Rb 50bn, in the form of property contribution, as payment to cover an additional issue of shares, as well as subsidies; another sum of approximately Rb 67bn was attracted in the form of bond loans and loans issued against government guarantees.

In 2010, the Russian Bank for Development began the implementation of a new program oriented to the support of innovation and modernization projects launched by small and medium-sized businesses. The distinctive features of that program, in addition to its declared orientation towards innovations, were, firstly, somewhat higher ceilings for the amount of support, and secondly, the possibility to apply, alongside the mechanisms of loans against projects, also the mechanism of investment in the capital of small and medium-sized enterprises (the latter being implemented by the Bank's affiliated asset manager 'Modernization Innovation Development', created in 2010).

In 2010, a number of development institutions – *Vneshekonombank*, *Rusnanotekh*, the Russian Venture Company, the Russian Bank for Development and the Fund for the Promotion of the Development of Small Forms of Enterprises in the Scientific and Technical Sphere – signed an agreement on cooperation² whereby they intended to organize a efficient exchange of information on the projects in progress in order to 'transfer' prospective projects between institutions.

The year 2011 saw a 'revival' of the Russian Foundation for Technological Development³ as an effectively operating innovation policy instrument: the Foundation announced that it was going to compile a portfolio of R&D projects for providing them with financial support (in the form of targeted loans). In this connection, priority was granted to applied research and development carried out within the framework of technological platforms (see later in our overview), or carried out as part of the modernization projects being implemented by industrial enterprises, the construction of new enterprises or the manufacture of new products by the already existing enterprises.

In the sphere of tax incentives for the innovation activity, in addition to a number of 'narrow specialization' measures (which include the already described instruments of tax support applied to the technology implementation companies established by budget-funded institutions, as well as the tax exemptions granted to residents of the Innovation Center *Skolkovo*, which will be discussed later on), the following alterations are noteworthy:

¹ Federal Law of 27 July 2010, No. 211-FZ 'On the Reorganization of the Russian Nanotechnologies Corporation'.

² The other parties to that agreement were OPORA RUSSIA, the Russian Venture Capital Association, the Moscow Interbank Currency Exchange, and the Federal Agency for Youth Affairs.

³ The off-budget fund created in 1992 for the support of applied R&D (the RF President's Edict of 27 April 1992, No. 426 'On the Urgent Measures Designed to Safeguard the Scientific and Technical Potential of the Russian Federation'). By 2008, the Fund became effectively dysfunctional due to the inadequacy of the norms determining its status.

- from 2010, the possibility of accelerated depreciation (with a coefficient up to 2) is envisaged with regard to fixed assets belonging to a high energy efficiency class, or those included in the list of high energy efficient objects approved by the RF Government¹;
- from 2012, in the form of a law, the list of expenditures on R&D to be taken into account for the purpose of taxation is established, with the possibility of writing them off in a one-time procedure. Besides, organizations are granted the right to make reserves against their future expenditures on R&D, and a ceiling is established for this type of deductions²;
- from 2012, the new equipment being put in operation, if it belongs to a high energy efficiency class or included in the aforesaid special list of high energy efficiency objects, is made exempt from tax on property for a period of three years since its registration³.

By way of summing up the discussion of the 'traditional' directions and measures of government policy, it should be noted that, over the period under consideration period, the pilot project aimed at creating the NRC 'The Kurchatov Institute' was in progress, new technical regulations and standards were introduced, and so on.

In addition to all these developments, in recent years, a number of new instruments and areas of development have been introduced in Russia's innovation policy.

Firstly, in 2010, on the RF President's initiative, a very ambitious project (at least ambitious in its idea) was launched, aimed at creating in Russia a fundamentally new and unique piece of innovation infrastructure – the Innovation Center *Skolkovo*⁴. In its initial phase, it was officially declared to be Russia's analogue of the Silicone Valley. To illustrate the scale of this project, it is sufficient to mention the unprecedented tax exemptions granted to the participants in the Innovation Center, which were very significant and versatile in their nature - in fact, much higher than the exemptions established for the residents of special economic zones. Thus, for the period of ten years since the date whereon a company acquires the status of a participant of the Innovation Center, or until its annual proceeds exceed the threshold of Rb 1bn, and the subsequently accumulated profit exceeds the threshold of Rb 300m, the company is to be exempt from the payment of VAT, tax on profit, tax on property, and the insurance contributions the RF Social Insurance Fund and the RF Compulsory Medical Insurance Fund; to the rate of its contributions to the RF Pension Fund, a downward coefficient is to be applied⁵. It should also be noted that the Innovation Center's asset manager was to allocate financing to innovation projects in the form of grants.

Secondly, in 2010, Russian's innovation policy was augmented by a new instrument that, for a long time, has already been successfully applied in the EU, – technological platforms. In this connection, on the basis of foreign best practices, the technological platforms for Russia are defined as a communications instrument designed to intensify the efforts aimed at the cre-

¹ Federal Law of 23 November 2009, No. 261-FZ 'On Energy Saving and Energy Efficiency Upgrading, and on the Introduction of Alterations to Some Legislative Acts of the Russian Federation'; the RF Government's Decree of 16 April 2012, No. 308 'On the Approval of the List of Objects with High Energy Efficiency, for Which no Energy Efficiency Classes Are Envisaged'.

² Federal Law of 7 June 2011, No. 132-FZ 'On the Introduction of Alterations to Article 95 of Part One, to Part Two of the Tax Code of the Russian Federation in the Part of Creating Favorable Tax Conditions for Innovation Activity, and to Article 5 of the Federal Law 'On the Introduction of Alterations to Part Two of the Tax Code of the Russian Federation and to Some Legislative Acts of the Russian Federation'.

³ Federal Law of 7 June 2011, No. 132-FZ.

⁴ Federal Law of 28 September 2010, No. 244-FZ 'On the Innovation Center Skolkovo.

⁵ Federal Law of 28 September 2010, No. 243-FZ 'On Introducing Alterations in Some Legislative Acts of the Russian Federation in Connection with the Adoption of the Federal Law 'On the Innovation Center Skolkovo.

ation of promising commercial technologies, new products (or services), at the attraction of additional resources for funding research and development with the participation of all related parties (businesses, scientists, government agencies, civil society), and the improvement of the normative legal base in the field of science, technology and innovations¹.

Technological platforms are expected to provide solutions to a broad range of problems:

- to boost the influence of the business community and society's demand for innovative technologies on the choice of directions for scientific and technological development and the speed of their progress/';
- to identify new opportunities for scientific and technological modernization of the existing sectors and the creation of new sectors in Russia's national economy;
- to determine the basic directions for improving sectoral regulation, for more rapid distribution of promising technologies;
- to promote innovations, support research in the field of science and technologies and boost the processes of companies' modernization, with due regard for the specificities and individual variants of development in different industries and sectors of the national economy;
- to expand scientific and industrial cooperation, and to establish new partnerships in the innovation field;
- to improve normative legal regulation in the sphere of scientific research, innovation and technological development.

Each technological platform must have its own coordinator – an organization responsible for the organizational and informational backing of the interaction between the platform's participants.

The sphere of activity of the technological platforms should include:

- the development of a strategic research program that will set medium- and long-term priorities for research and development and build the mechanism of cooperation in the fields of science and industry;
- the elaboration of learning programs, the directions and principles for developing standards and certification systems, and the implementation of measures designed to set up an innovation infrastructure;
- the development of a program for practical implementation and distribution of advanced technologies in the relevant sectors of the Russian economy, which will determine different mechanisms and sources of financings, as well as the responsibilities of different participants in a technological platform;
- the creation of an organizational structure necessary for smooth interaction between enterprises, research institutions and educational establishments.

In order to ensure efficient communication between technological platforms and the government, the latter must elaborate a list of technological platforms. The federal bodies of executive authority must provide the technological platforms included in that list with adequate institutional, organizational and consultative support.

Within the framework of technological platforms, proposals must be prepared for improving the regulation procedures in the sphere of science, technologies and innovations. The results achieved by a technological platform must be taken into account when planning and im-

¹ The Procedure for Drawing-up the List of Technological Platforms (approved by decision of the Government Commission on High Technology and Innovations as of 3 August 2010, Protocol No. 4).

plementing the measures of government support designed to promote socio-economic development and activities related to science, technologies and innovations.

Towards the end of 2012, the list approved by the government consisted of 30 technological platforms.

Thirdly, in 2010, 47 biggest companies operating in the public sector were assigned the task of elaborating and approving programs for innovation-oriented development in the medium-term period (5–7 years). The recommendations for the elaboration of such programs¹, among other things, contained the following requirements:

- the programs were to envisage a set of measures designed to boost the development and implementation of new technologies, innovation products and services at the world state-of-the-art level;
- the programs were to be integrated in companies' business development strategies, be conducive to their modernization and technological progress on the basis of a significant improvement of the main productivity parameters, including a significant (more than 10%) reduction in the level of production costs without any deterioration of the product's useful or ecological properties; significant economy of energy resources involved in the production process – no less than 5% per annum, until the average level was achieved typical of foreign companies operating in the same industry; a significant improvement of the consumer characteristics of the products; a significant boost in the level of labor productivity – no less than 5% per annum, again until the average level was achieved typical of foreign companies operating in the same industry; and an improvement in the production, waste recycling and waste disposal processes from the point of view of environment protection;
- the programs were to envisage some measures designed to ensure an efficient interaction between the relevant companies and leading higher educational establishments, namely: the choice of 'core' higher educational establishments and the specific areas (in science of technologies) and scope of joint research (or development, or implementation); the elaboration, in cooperation with higher educational establishments, of research programs envisaging, among other things, the mechanisms for exchanging scientific, technical and marketing information, joint research in the field of scientific and technological forecasts, the creation of a system for research (or development, or implementation) management at a relevant higher educational establishment with due regard for the forecasted needs of companies or entire industries; the implementation of programs, in coordination with higher educational establishments, for improving the quality of professional education and personnel training in hi-tech industries, with the participation of companies in the process of upgrading curricula and plans, the participation of their staff in training programs, the development of a system of on-site and field practice for graduate and postgraduate students and faculty members of higher educational establishments, as well as continual training systems for the staff of commercial companies; and the creation of organizational mechanisms for interaction with higher educational establishments;
- the programs were to set priority directions for the cooperation of companies with research institutions, elaboration of joint plans of studies in the field of science and technol-

¹ Recommendations for the elaboration of innovation-oriented development programs for joint-stock companies with state stakes, state corporations and federal state unitary enterprises (approved by decision of the RF Government's Commission on High Technology and Innovations as of 3 August 2010, Protocol No. 4).

ogy, and scientific research aimed at creating priority technologies and products that would be competitive on the world market, as well as measures designed to ensure fruitful interaction with innovation-oriented small and medium-sized and enterprises;

- participation of companies in the creation and operation of technological platforms was to be ensured.

By late 2011, the process of elaborating the programs for innovation-oriented development of biggest state companies was in the main completed.

Fourthly, in 2012, on the RF President's initiative¹, the government innovation policy was extended to yet another target for support – regional innovation clusters. In some of their features (an association of different participant, primarily research institutions, educational establishments and industrial enterprises; functioning under a coordinator organization; elaboration of strategic development programs), clusters are similar to technological platforms; they differ, in the main, in their focus on developing territories, and not technological fields.

In mid-2012, on the basis of a contest, the list of 25 territorial innovation clusters was approved². In this connection, the distinctive feature of this direction of government policy - by comparison with the majority of previously initiated measures - was that no specific form of support had been determined prior to the selection of clusters to be supported; only some proposals had been put forth, but their scale was impressive:

- to support the implementation of measures envisaged under the cluster development programs within the framework of federal target programs and government programs of the Russian Federation;
- to involve government development institutions in the implementation of the cluster development programs;
- to encourage big companies with state stakes to participate in rendering support to the clusters implementing innovation-oriented development programs;
- to introduce in the territories where clusters are based the same tax exemptions as established by legislation for the Skolkovo project.

Table 11

Main Phases in the Development of Government Innovation Policy in the 2000s

Period	External conditions	Key instruments and measures	Policies' specificities
1	2	3	4
2000 – 2002	Hard budget constraints, the task of innovation promotion is in the periphery of government policy	<ul style="list-style-type: none"> • Creation of the Venture Innovation Fund • Adoption of the Law 'On Technical Regulation' • The Russian Bank for Development launched its programs of supporting SMEs via its regional partners 	Emphasis on relatively low-cost and/or self-financing institutions
2003 – 2005	Softening budget constraints, stable economic growth, increased attention to its 'quality'	<ul style="list-style-type: none"> • Launch of key innovation projects of nationwide importance • The Fund for the Promotion of the Development of Small Forms of Enterprises in the Scientific and Technical Sphere launched its <i>Start</i> program • Initiation of the process of creating regional venture funds • Adoption of the Law 'On Special Economic Zones in the Russian Federation'; adoption of the decisions on creating 4 technology implementation SEZ • Creation of a mechanism for compensating Russian exporters for the interest paid on the loans attracted for exports development 	Intensification of the government's activity, application of different instruments, including those requiring significant expenditures

¹ Assignment issued by RF President on the basis of the results of the State Council of the Russian Federation's Presidium's meeting held on 11 November 2011 (Protocol No. Pr-3484GS of 22 November 2011)

² Assignment issued by the Chairman of RF Government as of 28 August 2012, No. DM-II8-5060.

2006 – 2008	High budget revenue, innovation promotion – among the main directions of government policy, an attempt to 'peg' relevant resources to each key direction of development	<ul style="list-style-type: none"> • a 10% depreciation premium is introduced with regard to new fixed assets put in operation and the technological upgrading and modernization of fixed assets • Shortened the period for writing off the expenditures on R&D • The possibility of accelerated depreciation of the equipment applied in scientific and technological research • The R&D aimed at creation and improvement of new products and technologies and the transfer of rights to the results of intellectual activity are made exempt from VAT • The price of acquisition and practical application rights to the results of intellectual activity, the cost of patenting and the legal services associated with legal protection of the results of intellectual activity are to be included in costs under the simplified system of taxation • The Russian Venture Company is created • <i>Vneshekonombank</i> is transformed into a state corporation, with additional capitalization • The State Corporation <i>Rusnanotekh</i> is created • The Russian Investment Fund for Information and Communication Technologies (<i>RIFICT</i>) is created • As part of the National Project 'Education', support is provided to innovation educational programs launched by higher educational establishments • Onset of support of R&D in the interests of businesses • Launch of the program for the support of hi-tech technoparks • The presidential initiative 'Strategy of the Development of Nanoindustry'; the launch of the pilot project for organizing the NRC 'The Kurchatov Institute' • Onset of active elaboration of technical regulations 	Focus on long-term development, creation and capitalization of big government financial development institutions, tax incentives, onset of active support of research and innovation activity conducted by higher educational establishments
late 2008 – 2009	Economic crisis, shrinkage of the resources allocated to innovation promotion, increasing attention to the results of implemented measures	<ul style="list-style-type: none"> • Budget expenditure cuts in the field of science, technologies and innovation in the framework of a number of FTPs • Part of resources is temporarily withdrawn from the State Corporation <i>Rusnanotekh</i> • <i>Vneshekonombank</i> is involved in implementing the set of anti-crisis measures • <i>RosBR</i> receives additional resources for its support of small and medium-sized businesses • Alterations are introduced in legislation, whereby the establishment of technology implementation companies by research institutions and educational establishments and the transfer to them the results of intellectual activity are made easier • Start of the process of selection and support of national research universities • A preferential procedure for writing off expenditures on R&D in accordance with the list approved by the RF Government is introduced (with a coefficient of 1.5) • Exemption from VAT of imports, into the territory of Russia, of 	Applying innovation policy instruments/ resources as part of anti-crisis measures; focus on the use of instruments requiring no additional budget expenditures; flow' of the process of creating new development institutions and funds onto the level of these functioning institutions

cont'd

1	2	3	4
		technological equipment that has no Russian analogues, in accordance with a special list approved by the RF Government <ul style="list-style-type: none"> • a 30% depreciation premium is introduced for capital investment in fixed assets with useful life of more than 3 years, but no more than 20 years • The RVC <i>SeedFund</i> is established by the RVC Decisions on the participation of the State Corporation <i>Rusnanotekh</i> in the foundation of a number of venture funds	
2010 – 2012	Improving situation in the economy, attempts to draw lessons from the crisis, innovation is one of the government's declared priorities	<ul style="list-style-type: none"> • Onset of support of joint projects launched by companies and higher educational establishments and aimed at creating new production sites ('matching grants') • Onset of support of the innovation infrastructure development programs launched by higher educational establishments • <i>Vneshekonombank</i>, on the RF Government's initiative established the Russian Direct Investment Fund and the Russian Export Credit and Investment Insurance Agency • The Russian Venture Company established several specialized 	Emphasis on expanding the range of active participants in the innovation processes, promotion of the innovation-oriented research activity of higher educational establishments, development of cooperation

		funds <ul style="list-style-type: none"> • The State Corporation <i>Rusnanotekh</i> is transformed into the Open-ended Joint-stock Company <i>RUSNANO</i>; the Fund of Infra-structural and Educational Programs is created • The Russian Bank for Development (<i>RosBR</i>) began to implement the program of support of modernization and innovation • Resumption of the activity of the Russian Foundation for Technological Development (RFTD) • The technology implementation companies created by budget-funded institutions are allowed to apply the simplified system of taxation, • The opportunities for institutions to allot property are expanded • The possibility of accelerated depreciation of energy-efficient equipment is determined, a three-year period of exemption from tax on property is granted to it • Introduction of one-time procedure for writing off expenditures on R&D • Onset of the creation of the Innovation Center <i>Skolkovo</i>, unprecedented tax exemptions are introduced for its participants • Technological platforms are created • Big state-owned companies elaborated and approved their innovation development programs 	and interaction networks in the innovation sphere; increasing attention to the improvement of the investment climate
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By way of summing up our 'progressive' overview of the government innovation policy of the 2000s, we should like to make the following statements:

- on the whole, over the period under consideration the government was practicing a proactive approach to shaping up and implementing its innovation policy, which consisted in continual initiation of new measures and instruments, while the pattern of problems and imbalances that were to be removed by means of those measures remained practically unchanged from year to year. At the same time, many of these instruments rather distinctly reflected the interests of different government and business entities, the 'centers of influence' for which these instruments were means to expand the range of resources and powers available to them, increase their importance, and so on, while the 'innovation agenda' per se was becoming only a secondary priority;
- in the course of mapping and implementing the measures that shaped the government innovation policy, little consideration was given to the achievements and general experience (including negative experience) accumulated whilst implementing the already existing innovation promotion mechanisms; the few examples of the practical use of such experience described above (the RVC, national research universities, joint projects launched by higher educational establishments and commercial companies) were singular events, rare and far between. As a consequence, within the innovation policy's framework, there occurred little distribution of best practices - instead, previous mistakes were reproduced with impressive regularity. And the innovation policy's consecutive character in recent years that we have noted is by no means an indicator of the government's altered approach to its elaboration. Rather, is the evidence of the fact that the government has run out of any new ideas, and is unable to suggest anything that is not based on its previous experiences;
- the improvement and 'fine tuning' of the already operating innovation promotion instruments was outside of the area of the government's immediate focus, and so any activity there was carried on, as a rule, as a 'last priority' - that is, irregularly and with considerable delays;
- over the period under consideration, the government adopted a number of programs and conceptual documents that either directly addressed the innovation development issue, or were aimed at developing some related fields. Among the most significant and fundamen-

tally elaborated documents of that type, we should point out the Strategy for the Development of Science and Innovation in the Russian Federation in the Period Until 2015¹, the Concept of Long-term Socio-economic Development of the Russian Federation in the Period Until 2020,² and the Strategy for the Innovation Development of the Russian Federation in the Period Until 2020.³ Each of these documents determined some basic goals, directions and phases of innovation development in the framework of the specified timelines, and the two Strategies mapped some specific planned acts and measures. However, in spite of the indisputable importance of each document, their well-substantiated content and official status, none of them could enrich the government innovation policy with any new properties - first of all, in terms of a comprehensive and consecutive approach to its implementation. Perhaps the only exception was the presidential initiative 'Strategy of the Development of Nanoindustry', because the provisions stipulated therein - when set against the general background - were implemented on a relatively full scale and a comprehensive basis. However, its specificity was that, firstly, addressed only one sphere of technological development - however broad, and secondly, the bulk of the measures envisaged by that strategy and implemented in the main later on, had been planned prior to its adoption;

- in spite of the comprehensive nature of the government innovation policy and its detailed elaboration in the 2000s, it still lacks one feature of key importance that could ensure its success: a mechanism for estimating, on a regular basis, the results achieved in the course of its implementation, from the point of view not only of its direct, but also indirect effects. It is currently being estimated and assessed only from the point of view of the instruments involved. Moreover, each instrument is viewed separately and, as a rule, in terms of the direct results of its implementation.

Specific Features of the Instruments Applied in the RF Government's Innovation Promotion Policies, and Their Influence on the Enterprises Operating in the Real Sector

The distinctive features of the innovation policy currently implemented in Russia are the huge number (in fact, many dozens) and the wide range of the applied measures, which include almost the entire variety of instruments available to the government – from 'simple' co-financing of projects to the organization of interaction platforms for all the parties involved in the process. As it would be evidently unrealistic to attempt a detailed examination of every individual measure of government innovation policy, for our empirical analysis⁴ we have selected a sample of approximately twenty 'typical examples' reflecting all the major directions of government support for innovations (tax incentives, co-financing of projects, development institutions, etc.). In this connection, the important factors that determined the selection of government measures for our sample were, firstly, the degree of attention that they attract at the government level (the fact of their being regularly mentioned in official documents, public

¹ Approved by the Interdepartmental Commission on Scientific and Innovation Policy as of 15 February 2006, Protocol No. 1.

² Approved by the RF Government's Regulation of 17 November 2008, No. 1662-g.

³ Approved by the RF Government's Regulation of 8 December 2011, No. 2227-r.

⁴ The analysis is based on data provided by two surveys of the directors of more than 60 Russian industrial enterprises conducted in 2011 and 2012, by order of the Interdepartmental Analytical Center, by the Center for Market Research of the HSE Institute for Statistical Studies and Economics of Knowledge (ISSEK).

speeches and comments of high-rank officials) and among the expert community, and secondly, their relatively recent introduction in the current practices.

Most often, enterprises take advantage of the tax instruments applied in promoting innovations, among which, in its turn, the most popular instrument is the depreciation premium (*Fig. 5*). Among non-tax measures, the most widespread are the subsidies covering part of the interest to be paid on the loans attracted in order to ensure the technological upgrading of production processes or the development of exports, budget funding allocated to innovation projects within the framework of FTPs or other government programs, and the funding allocated via government financial development institutions. If we look at the cost-effectiveness of these measures – the ratio of companies positively influenced by some or other instrument to the total number of its 'users', the leaders will be the joint projects launched by companies and higher educational establishments in accordance with Decree No 218, the possibility to write off, with an upward 1.5 coefficient, the expenditures on R&D entered in the government's list; and the exemption from VAT of the exports into Russia's territory of technological equipment that has no domestically manufactured analogues. On the other 'pole', among the least effective instruments, there will be the exemption from tax on profit established for the monies transferred by organizations to the funds for the support of science, technological research and innovation activity; the acquisition of rights to civil, special or dual-purpose technologies; technological platforms; and the financing of innovation projects via venture funds created with the government's support.

More often than others, the following companies are allocated government support: those in a good financial situation; those with a sufficiently high level of technologies; and relatively new companies. The companies that are usually overlooked by the government innovation policy are as follows: 'technological outsiders'; financially troubled enterprises; companies that do not export their products; and companies with state stakes.

The usage of government innovation promotion instruments generally does not depend on companies' sectoral distribution, or on their size. At the same time, a positive effect of government policy measures on innovation activity is more typically displayed by big companies.

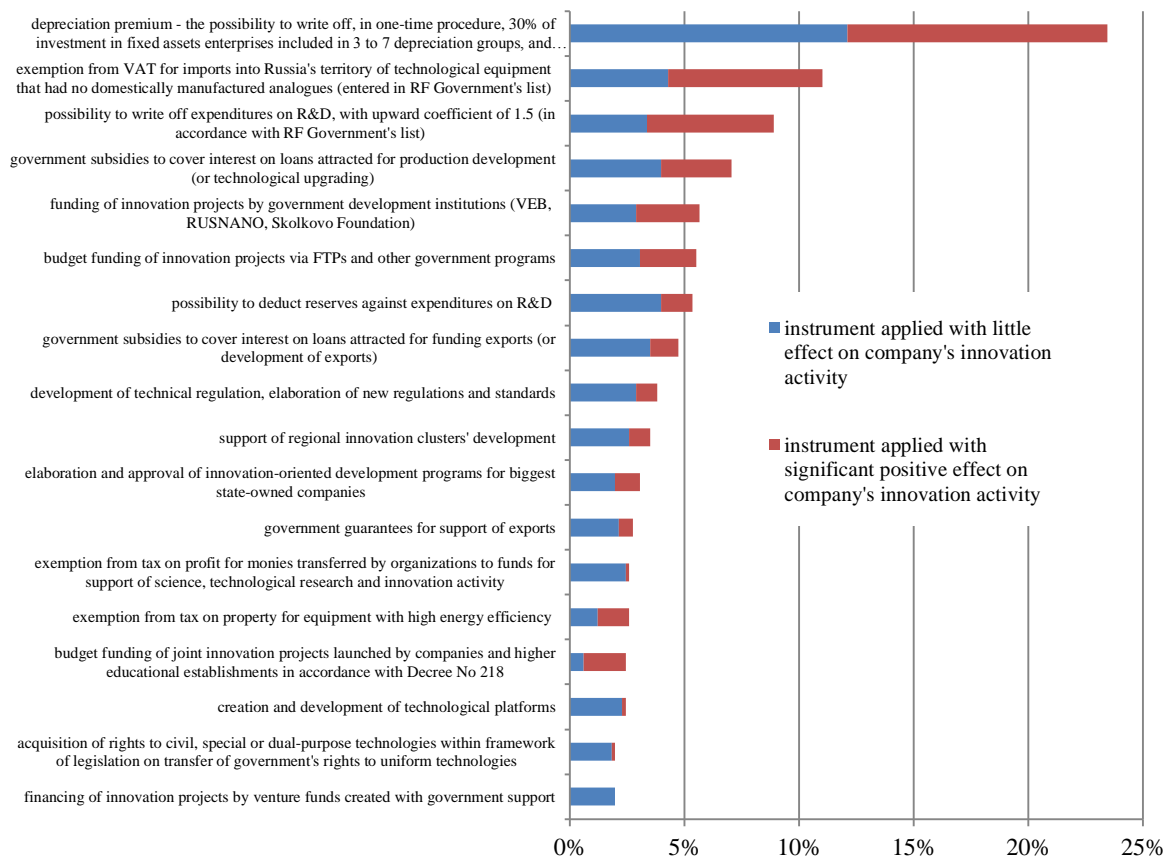


Fig. 5. Application, by Companies, of Different Innovation Promotion Instruments, and Their Influence on the Innovation Activity; as % of the Sample's Total

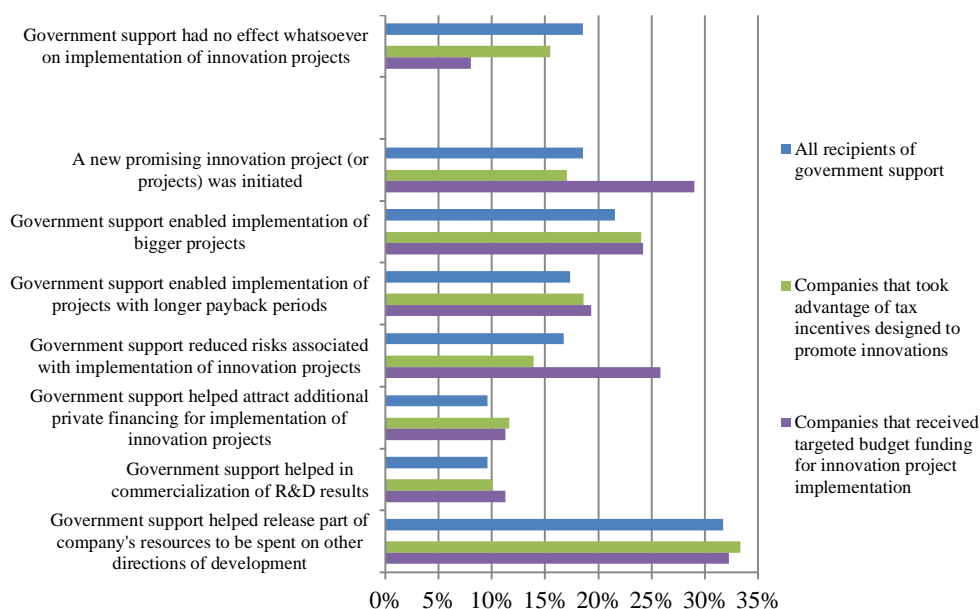


Fig. 6. Effect of Government Instruments for Promoting Companies' Innovation Activity

As for the effect of government innovation promotion measures on companies' innovation activity (Fig. 6), it should be noted that, most often, the fact of allocation of government sup-

port releases part of companies' resources, which may then be spent on other directions of development. Among the effects of government support, the least frequent are the attraction of additional private financing and the commercialization of the results of R&D. In the situation when budget funding is allocated to enterprises, this results in private resources (including an enterprise's equity) being ousted by government resources (the 'crowding out' phenomenon).

Direct budget funding - more often than tax incentives - results in the initiation of new projects, as well as lowers the risks associated with the innovation activity.

As far as the effects of government innovation policy at the level of individual companies are concerned (*Fig. 7*), it can be concluded that government support most often results in increased investment in new equipment, and most seldom - in the development of cooperation between the fields of research and production. In this connection it is important to note, with regard to specific support instruments, that the strengthening and further development of that type of cooperation was boosted, first of all, by the 1.5 upward coefficient established for writing off the expenditures on R&D in accordance with the RF Government's list, while no such effect was noted when the 'routine' cooperation promotion mechanism was applied, namely the support of joint projects launched by commercial companies and higher educational establishments. Another noteworthy fact is that the overall level of companies' competitive capacity is significantly boosted by only one of the instruments under consideration – budget funding allocated to innovation projects within the framework of FTPs and other programs.

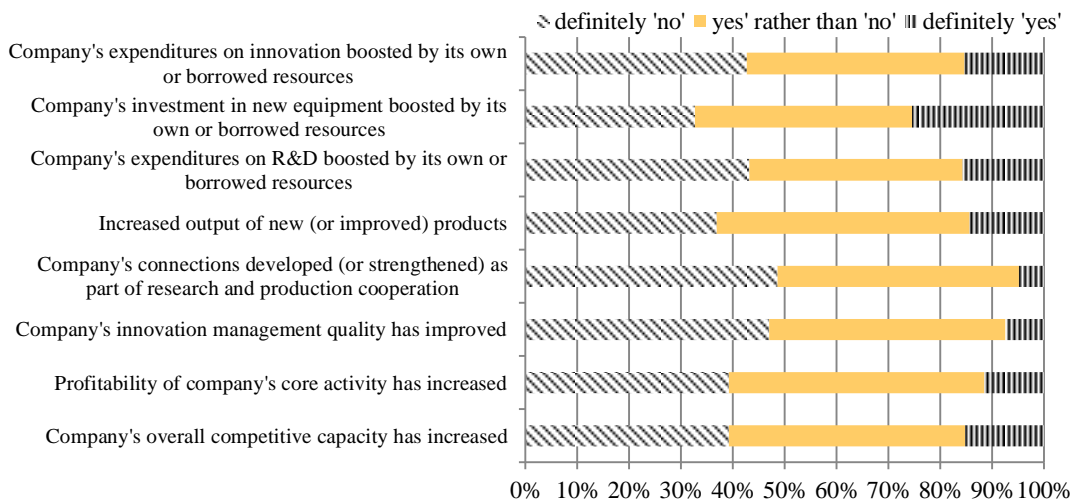


Fig. 7. Major Effects of Government Support at the Level of Companies

On the whole, the effect of the government policy instruments discussed here is much more frequently associated with a positive dynamics of the upfront features of business activity – the output volume, exports, and rising rate of return - rather than with improving labor productivity and increasing the share of innovation products in the total output volume.

The main drawback of the government innovation policy, according to heads of enterprises, is that the latter continue to bear all the risks associated with the implementation of innovation projects - even when provided with government support. In this connection, however,

it is important to note that the scale of this problem is, in fact, grossly overestimated by those who in recent years have not had the experience of using government support.

The most serious problems associated with the application of innovation promotion tax mechanisms are the vagueness of the existing regulations and the inadequate parameters of the existing tax exemptions (their size etc.); those associated with the instruments based on budget funding allocated to innovation projects consist in the complexity of procedures of applying for support, including the necessity to prepare voluminous documentation and the excessively tough requirements for the recipients of government support, the composition of their expenditures, and so on; and those associated with the financial support allocated via development institutions include both of the drawbacks of budget allocations coupled with an insufficiently fair procedure of selecting the recipients of support.

By way of summing up the material discussed in this subsection, we should like to enumerate briefly the main features of the most frequently applied instruments of government innovation policy, dividing them (with a certain degree of arbitrariness) into positive and negative ones:

innovation promotion instruments based on tax incentives:

on the plus side:

- ensure the broadest possible involvement of innovation companies;
- offer a totally objective approach to selecting the recipients of support;
- constitute no significant barriers, easily accessible;
- imply a reasonable level of administrative costs;
- generally neutral.

on the minus side:

- difficulties in application, due to vagueness of the existing regulations;
- due to the formal criteria and base for application (which is inevitable), these measures may be applied to companies that in reality have nothing to do with innovation activity;
- risks of disputes with tax agencies, additional audits;
- more oriented to the expansion of the projects already under way than to the initiation of new projects;
- have little relation to the end results of innovation implementation;
- difficult to estimate the final effect of the application of these instruments.

targeted budget funding allocated to innovation projects:

on the plus side:

- conduces to the launch of new innovation projects, reduces the risks involved;
- makes possible the support of projects that are less profitable in terms of commerce, but more promising from the point of view of long-term development or social importance;
- makes possible the execution of control over the ways of spending the allocated support;
- oriented to the end results of innovation implementation;
- ensures a broad spectrum of positive effects for the recipients of support, including their increasing competitive capacity;

on the minus side:

- is fraught with high costs of the selection of recipients of support;
- does not rule out a subjective approach to selecting the recipients of support, gives rise to corruption risks;
- is associated with high entry barriers, excessive requirements to the recipients of support;

- excessive bureaucracy;

the activity of government development institutions:

on the plus side:

- distinctly project-oriented;
- most effective from the point of view of the external co-financing of projects;
- allows support of more important and promising, although less commercially profitable projects;

on the minus side:

- the highest degree of subjective attitude to the selection of recipients of support;
- is associated with high entry barriers - both in terms of complexity of the procedures involved and the excessive requirements to the recipients of support;
- in actual practice, there is a tendency to allocate support to more commercially attractive projects, to the detriment of their other prospects.

General Assessment of Russia's Innovation Policy

Over the last five years, evident progress has been achieved in the development of Russia's innovation policy. Its signs have been visible in several areas.

Firstly, some significant positive changes in the general understanding of the idea of innovation policy and its comprehensive character occurred at the government level. During the post-crisis phase, new strategic documents¹ were adopted with regard to innovation development, which rather adequately reflected the whole scope of changes to be introduced, as well as their complexity and in-depth nature.

Secondly, the range of available innovation policy instruments had been radically expanded, some new instruments for boosting demand for innovations have emerged, while at the same time, over recent years, the quality of the procedures of practical application of some of the innovation promotion mechanisms - in particular tax mechanisms - has dramatically improved. The system of government development institutions has been demonstrating a dynamic evolution. Thus, Russia's innovation policy today incorporates dozens of different mechanisms - nearly the entire arsenal of instruments known from the experience of other countries.

Thirdly, the openness of government agencies to the ideas of improving the innovation policy, has become much greater, while the period of 'digesting' new ideas prior to their implementation in actual practice has considerably shortened – to between six months and a year. A number of initiatives have been launched in order to create networks for identifying and supporting new partnerships, which can result in consolidating new interest groups.

Fourthly, the access for different interest groups to the process of shaping and estimating innovation policies has been made easier, and it has acquired certain features of institutionalization in the form of relevant commissions and task forces. The government is expanding its interaction with medium-sized businesses and new sectoral associations, and is making active attempts to improve the quality of regulation, and involve the business community in that process.

In spite of the significant achievements in the general development of Russia's innovation policy, and especially its instruments, so far there have occurred no more or less visible and

¹ See, in particular: *Strategy for the Innovation Development of the Russian Federation in the Period Until 2020* (approved by Regulation of the RF Government as of 8 December 2011, No. 2227-r).

sustainable positive shifts in the innovation sphere at the macrolevel (Table 12). The share of organizations implementing technological innovations is still low, and the fluctuation of that indicator over the period of 2006–2011 remained within the range of 9.3 to 9.6%; the role of non-governmental sector in financing research is very limited - moreover, between 2007 and 2010 the share of the entrepreneurial sector in domestic expenditures on research and development declined from 29.4% to 25.5%, and only in 2011 it somewhat increased - to 27.7%; and finally, the share of innovation products in total output demonstrated bi-directional movement (in different years) in the range of 5.5 to 6.1%.

Table 12

**Some Innovation Activity Indicators in Russia
at the Macrolevel**

Indicators	2006	2007	2008	2009	2010	2011
Domestic expenditures on research and development, % of GDP	1.07	1.12	1.04	1.25	1.16	1.12
Federal budget allocations to civil science, % of GDP	0.36	0.40	0.39	0.56	0.53	0.58
Share of government funding in domestic expenditures on research and development, %	61.1	62.6	64.7	66.5	70.3	67.1
Share of the entrepreneurial sector in domestic expenditures on research and development, %	28.8	29.4	28.7	26.6	25.5	27.7
Share of organizations implementing technological innovations, % of total number of organizations*	9.4	9.4	9.6	9.4	9.3	9.6
Share of innovation goods, work, or services, % of total volume of goods, work, and services delivered *	5.5	5.5	5.1	4.6	4.9	6.1
Share of expenditures on technological innovations, % of total volume of goods, work, and services delivered *	1.4	1.2	1.4	1.9	1.5	1.5

*) The extracting and processing industries, the production and distribution of electric energy, gas and water.

Sources: SU-HSE (2012). *Nauka. Innovatsii. Informatsionnoe obshchestvo: 2012. Kratkii statisticheskii sbornik.* [Science. Innovations. Information Society: 2012. Brief Statistics Collection], Moscow; SU-HSE. (2012). *Indikator nauki: 2012. Statisticheskii sbornik.* [Science Indicators: 2012. Statistics Collection] Moscow; SU-HSE. (2012). *Indikator innovatsionnoi aktivnosti: 2012. Statisticheskii sbornik.* [Innovation Activity Indicators: 2012. Statistics Collection]. Moscow.

To a certain extent, this can be explained by the inadequacy of the set of indices applied in official innovation statistics, the inertia of those statistics, and the inevitable limitations in the reflection of ongoing qualitative changes. However, microeconomic research so far has not revealed any stable upward trend in the level of innovation activity across the national economy, if a comparison is to be drawn between the period before the crisis, immediate pre-crisis and post-crisis periods. In principle, it can be noted that the share of companies investing in new equipment has evidently increased, but at the same time no significant positive changes were observed in companies' demand for the results of research and development projects (see *Table 13*).

The share of companies acting as strategic innovators demonstrated little changes over the past 7 years, while the 'depth' of companies' innovation activity (estimated by the level of expenditures on technological innovations and research and development projects) remains very low.

Of course, there did occur some positive changes and qualitative shifts, their presence can be gleaned from data yielded by formalized questionnaires and in-depth interviews conducted at the level of individual companies, market segments and sub-industries.

Table 13

Some Innovation Activity Indicators in Russia at the Microlevel¹

Some parameters of enterprises' innovation activity (based on microeconomic studies) *	2005	2007	2011
Share of enterprises continually involved in innovation activity, as part of their strategy aimed at boosting their competitive capacity, % of sample	35	39	38
Share of enterprises investing in new equipment, % of sample	63	74	78
Level of investment in new equipment, % of proceeds (median value for the group of enterprises within the sample investing in new equipment)	5	4	3
Share of enterprises allocating financing to R&D, % of sample	45	39	42
Share of enterprises allocating financing to R&D at a level above 5% of proceeds, % of sample	10	7	1.5
Share of enterprises whose output contains new, upgraded products, % of sample	.	60	53
Share of new, upgraded products, % of proceeds (median value for the of group of enterprises within the sample issuing such products)	.	10	3

*) The table is based on the analysis prepared by the Interdepartmental Analytical Center on the basis of results of surveys of the directors of medium-sized and big enterprises operating in processing industries, conducted in 2005, 2008, 2011 (more than 500 respondents in each survey).

Among the most important changes in the innovation behavior of Russian companies that occurred over the post-crisis period, the following ones can be pointed out:

- the increasing 'polarization' of companies in terms of their innovation activity and level of technologies, *emergence of noticeable groups of companies competitive on a global scale* (high heterogeneity of companies - including those operating inside one industry); considerable divergence of companies by the level of their innovation activity, increasing heterogeneity of economic forms in a number of sectors;

¹ Hereinafter, when references are made at microeconomic studies, these are understood as the results of research projects carried out by the Interdepartmental Analytical Center with the purpose of studying the specific features of the innovation behavior of Russian companies. The information base for these studies were the data yielded by the questionnaires answered by approximately 500 directors of enterprises operating in the processing industries, in the course of surveys that took place in 2005, 2008, 2009, 2011 and 2012. The results of these projects are reported in several publications, in particular in Kuznetsov, B., Kuzyk, M., Simachev, Yu., Tsukhlo, S., Chulok, A. (2006). *Osobennosti sprosna na tekhnologicheskie innovatsii i otsenka potentsial'noi reaktsii rossiiskikh promyshlennykh predpriatii na vozmozhnye mekhanizmy stimulirovaniia innovatsionnoi aktivnosti*. [Specific Features of Demand for Technological Innovations, and Estimation of the Potential Reaction of Russian Industrial Enterprises to Possible Mechanisms Designed to Foster Innovation Activity]. *Modernizatsia ekonomiki i gosudarstvo*. [Modernization of the Economy and the State] Ed. by E. G. Yasin, 1. SU-HSE; Zasimova L. S., Kuznetsov B. V., Kuzyk M. G., Simachev Yu. V., Chulok A. A. (2008). *Problemy perekhoda promyshlennosti na put' innovatsionnogo razvitiia: mikroekonomicheskii analiz*. [Issues of Industry's Switchover to the Path of Innovation Development: Microeconomic Analysis. / Series Nauchnye doklady: nezavisimyi ekonomicheskii analiz. [Scientific Reports: Independent Economic Analysis, No. 201. M.: Moscow Public Science Foundation (MPSF); Simachev, Yu. (2009). *Ili naidi dorogu, ili prolozhi ee sam* [Either Find the Road, Or Build It Yourself]. *Priamye investitsii* [Direct Investment], 11. P. 18-22; Kuznetsov, B., Simachev, Yu. (2009). *Konets sveta otkladyvaetsia*. [The Doomsday Is Postponed]. *Expert*, (049–050). P. 58-61; Simachev, Yu., Kuzyk, M., & Kuznetsov, B. (2010). *Otsenka vozdeistviia razlichnykh antikrizisnykh mer na predpriatii obrabatyvaiushchei promyshlennosti* [Estimation of the Effect of Different Anticrisis Measures on Enterprises in the Processing Industry]. *Economicheskaiia politika*, 1. P. 122–134; Ivanov, D. S., Kuzyk, M. G., Simachev, Yu. V. (2012). *Stimulirovanie innovatsionnoi deiatel'nosti rossiiskikh promyshlennykh predpriatii: vozmozhnosti i ogranicheniia*. [Promotion of the Innovation Activity of Russian Industrial Companies: Possibilities and Limitations]. *Foresight*, V. 6, No. 2. P. 18–42; Simachev, Y., Kuzyk, M., Ivanov, D. (2012). *Fostering innovation in Russian companies in the post-crisis period: Opportunities and constraints*. MPRA Paper No. 41284, University Library of Munich, Germany; Kuznetsov, B., Simachev, Y. (2010). *Impact of economic crisis on innovation behaviour of industrial firms in Russia*. MPRA Paper No. 43675, University Library of Munich, Germany.

- *the presence, in some sectors (in particular, machine-building) of rather numerous groups of companies equipped with state-of-the-art technologies; most frequently, these companies have the following features: (1) participation of foreign investors in their capital; (2) a rather short business history ('aged' less than 10 years);*
- *innovation-active companies are characterized by a positive dynamics of expenditures on technological innovations;*
- *an increasing demand for new products across the economy, the population being the main driving force behind that demand, while the government, within the framework of government purchases, so far has created no significant incentives for the production of innovation goods (or services);*
- *an increasing demand among companies for research and development, including the demand for new product development, with the increasing globalization of that demand.*

Moreover, there exist some preconditions for the increasing interest of companies in research and development, which are as follows:

- *the potential for improving the traditional products is shrinking, the implementation of technologies for manufacturing new types of products is becoming increasingly important;*
- *the consumer market is displaying an increasing demand for products with new properties;*
- *enterprises have already in the main solved their most urgent problems associated with the renewal of depreciated fixed assets;*
- *there exist some signs that the access of successfully operating big Russian companies to advanced technologies is diminishing (the range of tradable technologies is becoming narrower);*
- *the supply of innovation technologies by a number of universities has emerged, including engineering services based on the use of their qualitatively new equipment and test sites;*
- *the broadening views of companies' directorates as to the areas of research and development necessary for increasing the competitive capacity of their businesses.*

Nevertheless, in spite of some real positive changes occurring on the microlevel, so far there have been no significant shifts on the macrolevel. Probably the reasons for this situation are the lack of a sufficient number of positive examples set by innovation businesses, the institutional environment unfavorable for rapid growth, and the increasing scope of innovation companies in the Russian economy.

On the one hand, the motivation for introducing innovation at the level of companies is evidently insufficient: since 2005, the number of companies with no obstacles for implementing innovations has been clearly multiplying – 6%, 15% and 21% in 2005, 2008 and 2011 respectively, but approximately half of those of them that had no obstacles in 2011 were not engaged in any innovation activity.

On the other hand, the government, whilst improving its innovation policy practices, at the same time implements certain measures in the framework of other policies (also associated with rational tasks), which sometimes impose significant restrictions on the distribution of innovations across the economy. In the OECD's review of Russia's innovation policy¹ it is noted, in particular, that a low level of competition leads to technological backwardness in many sectors and broadens the gap between profitability and productivity; meanwhile, government expenditure allocations to science and technologies continue to exert little influence on the amount of money invested in innovation technologies by businesses. On the whole, the

¹ DEMAND. (2011). DEMAND Reviews of Innovation Policy: Russian Federation 2011. DEMAND Publishing.

influence of the existing different exemptions and preferences, as well as government protectionist measures on the situation in the business community is negative.

On the basis of microeconomic and institutional studies, the (rather arbitrary) balance of achievements and constraints in the innovation sphere over the last 5 years may be presented as follows (*Table 14*).

Table 14

Comparison of Major Achievements and Problems in the Implementation of the Innovation Policy in 2007–2012

Advantages and specific features of the government's innovation policy	Conditions, constraints and motivations for innovation at the level of companies
1. Pre-crisis period: 2007 – 2008	
vast budget potential; innovation is an important direction of government policy; increasing investment activity of the government; adoption of long-term strategies, target programs in the field of science and technologies; growing budget allocations to innovation; tax incentives for innovation; creation of big development institutions, venture funds	stable conditions for economic activity, a reduction in the tax load on businesses; limited areas of competition with foreign companies; risks of property takeovers and negative motivation for expanding the scale of business activity; predominantly the adaptive innovation model, without significant allocations to R&D; narrow circle of genuinely innovation-active companies
<i>Major constraints: large-scale application, by the government, of rough direct mechanisms in the support of innovations, introduction of strong distortions in the market environment</i>	
2. Crisis phase: 2009–2010	
dramatic shrinkage of budget potential; compensatory orientation of the anti-crisis measures; temporary protective measures, promotion of domestic demand; selective support of big and superbig companies; innovation at the top of the declared policy's agenda; establishment of commissions on modernization, technologic development; setting modernization priorities; launch of big innovation projects in a 'manual' mode	hard financial constraints for companies; dramatic lowering of the predictability of conditions for economic activity; concentration of innovation activity in the sphere of big businesses orientation of the innovation activity of businesses towards bringing down costs
<i>Major constraints: 'confiscation' of potential advantages from innovation-active companies (expansion of market shares as a result of departure of inefficient competitors, potential for attracting additional qualified workforce) due to the government policy's focus on social stability to the detriment of economic performance</i>	
3. Post-crisis phase: 2011 – 2012	
considerable budget constraints, welfare-oriented budget; innovation is one of government policy's priorities; significant alterations to regulation; new innovation promotion instruments, but weak institutional development of the business environment multiple 'experiments with no consequences' and learning projects	uncertainty, low predictability of government policy; multiple 'innovation signals' from the government; businesses wait and focus on completing their current projects; imitation of innovation activity by some enterprises; orientation of some companies to receiving rent in the innovation sphere; increasing importance, for businesses, of the task of mastering new products (services)
<i>Major constraints: uncertainty of the conditions for economic activity; postponement of a number of key economic decisions by the government; considerable slowdown in the institutional development of the business environment</i>	

The period prior to the crisis saw the emergence of a significant group of companies with a highly dynamic innovation activity, which laid the foundation for the expectations of the appearance of the 'second echelon' in economic development as a result of growth of medium-sized hi-tech companies. However, in the *pre-crisis period* when considerable resources were available, the government began to actively promote the demand for innovations, while at the same time evidently paying too much attention to direct promotion mechanisms in the form of FTP. As a result, significant part of the resources was from the very start orientated towards relatively big companies operating in the traditional industries. Besides, the amount of government investment in the economy was increased alongside the development of infrastructure; however, the increasing government purchases had little to do with applying higher requirements to the quality of the products or services being purchased. As a consequence, companies began to seek more attractive and less risky directions (outside of the innovation

field) for expanding their activity. On the whole, over that period, while government direct expenditures on economic development were increasing, in the business community the motivation for looking for ways of generating rent was inevitable on the rise.

During the *crisis* period, the budget constraints imposed on innovation companies quickly became much harder, which resulted in a decline of innovation activity - first of all with regard to investment in new equipment. At the peak of the crisis, budget expenditures and some innovation policy instruments were partly reoriented to compensate some of the businesses for the losses resulting from the crisis. The government, whose main priority was now to maintain social stability, significantly restricted the flow of resources to innovation-active competitive companies, and reallocated resources instead to the support, on a large scale, of big companies, many of which had been performing badly even before the crisis¹. The informal requirements that were now applied by the government to the behavior of big companies became a significant obstacle to the ongoing restructurization processes in the business sector. The business environment generally became worse due to the active implementation of all kinds of quotas and preferences designed to support domestic producers, as well as protective measures on the domestic market².

However, that period also saw a re-evaluation of the role of innovations in boosting the competitive potential of Russia's national economy, and so a number of 'new wave' innovation measures had already been proposed and discussed by 2009.

The *post-crisis* period was characterized by some very controversial trends both in the government policy and in the behavior of businesses. The government had drawn several diametrically different lessons from the crisis situation: on the one hand, the 'manual management' practice was estimated to be positive, while on the other, it was considered to be necessary to reduce the government's direct participation in the functioning of the economy, and to improve both the investment climate and the interaction with businesses.

The distinctive feature of Russia's innovation policy in the post-crisis period became the initiation of comprehensive mechanisms for the support of cooperation between the different participants in the innovation processes, the creation of networks and partnerships in the innovation sphere, and the promotion of research at universities³. However, the activization of innovation policy in the post-crisis period has been too versatile and multi-vectored; big businesses, with their habit of responding to the signals displayed by the government, are faced with certain difficulties when mapping their strategic plans. The decision-making with regard to some fundamentally important directions of government policy has been started only recently, and in some areas the final decisions have not yet been elaborated (tax policy, pension reform).

The results of microeconomic studies also point to the negative influence on innovation growth of the lack of stability in companies' economic environment and the low predictability of government economic policy. Thus, at present, the most relevant factors that hinder the in-

¹ See, in particular, Simachev Yu. V., Ivanov D. S., Korotkoe M. Yu., Kuznetsov B. V., Kuzyk M. G. (2012). Gosudarstvennaia antikrizisnaia podderzhka krupnykh i sistemo-obrazuiushchikh kompanii: napravleniia, osobennosti i uroki rossiiskoi praktiki [Government Anti-crisis Support of Big and System-forming Companies: Directions, Specificities and Lessons of Russia's Practice. Ed. A. D. Radygin. Delo Publishers, RANEPa.

² Simachev, Yu. V., Kuzyk, M. G. (2012). Gosudarstvennaia antikrizisnaia podderzhka rossiiskikh kompanii: pomoshch i orranicheniia [Government Anti-crisis Support of Russian Companies: Aid and Restrictions]. Journal of the New Economic Association. No 1. P. 100-125.

³ Dezhina, I., Simachev, Y. (2012). Partnering universities and companies in Russia: effects of new government initiative. MPRA Paper No. 43622, University Library of Munich, Germany.

novation activity of companies are, on the one hand, the unstable conditions for economic activity, which increase risks and reduce the planning horizon; and on the other, the internal bureaucratization of the business processes inside companies, which makes them less open and receptive to innovations¹.

Alongside the basic institutional factors that work against the process of innovation development in the Russian economy, *there also exist a number of sectoral-level constraints* (it should be noted that the removal of those constraints is a task that usually belongs to domains beyond the framework of 'standard' innovation policy):

(1) *the sector of superbig companies with substantial innovation potential and - with a high level of direct government participation in some companies.*

Due to the political and social importance of some of these companies, the government follows a policy of direct influence on their behavior. They are asked to behave in compliance with the socially acceptable norms, but the companies, in their turn, fight for certain exemptions and preferences. On the whole, the situation is characterized by low transparency and predictability, which results in a lower motivation for these companies, their owners and managers, to implement innovations,;

(2) *the traditional hi-tech sectors with a relatively high level of innovation activity.*

The factors that restricts the effect of innovations and their rapid distribution across these sectors are their traditionally vertical structure coupled with very insufficient unification and standardization. When applied to this sector, the general competition promotion measures can work only on a very limited scale;

(3) *new, relatively rapidly developing sectors with horizontal organization and predominantly small and medium-sized businesses.*

The development of these sectors is very sensitive to the entrepreneurial climate and the quality of administration (for example, customs or tax administration). The companies operating in these sectors are highly mobile, and so in view of an unfavorable situation may relatively easily move their business activity to other countries. The specificity of these sectors and their development potential are not easily understandable for the government.

On the whole, in recent years Russia has been witnessing an intensive *cooperation between innovation and industrial policies*, while at the same time there have been some reverse trends, when the innovation policy loses neutrality and becomes more oriented to the specificities of different sectors and markets, and the industrial policy becomes more horizontal and shifts towards dealing with technological development issues. Among the positive changes that occurred with regard to the elaboration and adjustment of Russia's innovation policy, the following ones can be noted:

- broadening access of different interest groups to the elaboration of the innovation policy and relevant proposals, the development of a system of consultative and coordinating bodies under the RF President and the RF Government to deal with the innovation and industrial policy issues;
- large-scale expansion of the representation and general strengthening of the influence of the interest groups linked to development institutions, educational establishments and research organizations;

¹ Simachev, Y., Kuzyk, M., Ivanov, D. (2012). Fostering innovation in Russian companies in the post-crisis period: Opportunities and constraints. MPRA Paper No. 41284, University Library of Munich, Germany.

- creation and development of instruments designed to encourage the search for new 'players' in the innovation sphere and the formation of partnerships (technological platforms, innovation clusters, tied grants).

However, there still remain the following attributes of a classical vertical policy (with its specifically high costs and risks in conditions of underdeveloped institutions):

- orientation to the interests of biggest players, even when their composition is made more complex by involving other entities from the sphere of science, education and technological development;
- weak competition between government institutions, in some cases there are the signs of monopolistic approaches and estimations;
- limited attention to the effect of demonstrations and sharing of best practices, focus on the use of government (or quasi-governmental) resources;
- relative openness to proposals, but closeness (non-transparency) of the processes of decision-making and estimation of achieved results.

Conclusions and Lessons for the Future

1. In recent decades, innovations have been increasingly referred to as a very important factor that determines economic development and adequate solutions to social problems. As inter-country competition is getting more intense, the requirements to the quality of innovation policies implemented by national governments are becoming tougher. These processes trigger the elaboration of new innovation promotion instruments and the methods of estimating the influences of different mechanisms applied in supporting the innovation activity. The international exchange of best practices of innovation support is growing in scale, and the role of inter-country transfer of innovation promotion instruments is becoming more prominent.

In many countries over the past few years, the general view of the government's role in promoting innovations, of the directions and forms of support of innovation activity have undergone a fundamental change. At the same time, in conditions of shortage of budget resources, governments are focusing their efforts on the regular assessment of the influences of various innovation promotion instruments on economic development and the identification of their long-term effects. This serves as a basis for continual improvement and adjustment of the mechanisms of incentives for implementing innovations.

All these phenomena determine the current serious challenges that Russia will need to adequately respond to by elaborating a reliable innovation policy, capable of boosting the competitive potential of domestic businesses and ensuring sustainable long-term socio-economic development.

2. Russia's current innovation policy represents an active process of elaborating new innovation promotion instruments. However, the impressive scale of experimenting within the innovation policy's framework has so far been inadequately followed by formulating the achieved results and using them as lessons for the future. It can be noted in this connection that, due to the limited number of estimated effects we often tend to overlook not only failures, but also the good examples of successful development. The process of adjusting successful instruments to the scale and level of their implementation is limited, and the adaptation of the functioning mechanisms to a changing environment occurs even less frequently.

The process of decision-making with regard to the innovation policy mechanisms and the argumentation it is based upon are not very transparent, and so there appears to be little sense in such experimenting, while its unpredictability is indeed high.

It should be admitted that the issue of the outcomes of Russian innovation policy, of the efficiency of the rather broad variety of currently applied promotion mechanisms, in the post-crisis period has been raised at the government level with sufficient clarity, but no adequate answers have been provided so far, while the results of independent estimations may turn out to be dubious and disappointing for certain ministries. This imposes significant restrictions on any real progress in the organization of independent expert's estimations of the innovation promotion measures being implemented in Russia.

3. To reveal the existing best practices, it is important to determine the approaches to estimating the mechanisms applied in promoting innovations. In this connection, we may point out two major drawbacks of Russia's innovation policy: (1) excessive emphasis on monitoring the numerical indicators of allocated resources, and (2) expectation of short-term positive effects.

At present, the targets for innovation policy implementation are based in the main on the expected changes in resource management (for example, increased allocation of companies' money on R&D), while much less attention is paid to the end results of innovation activity (productivity growth, broader segments of world market taken over by hi-tech products, etc.). At present, many potential effects are overlooked by the applied estimation methods, and so the existing possibilities for identifying and distributing best practices in the framework of Russia's innovation policy are limited. The direct resource-based numerical targets in some cases produce a situation when a company implements its innovation activity only formally, which results in imitation of progress in the innovation sphere. What is usually being overlooked in the existing estimations is the spectrum of behavioral effects associated with different promotion mechanisms. However, it is these effects that are most sustainable and contagious in the entrepreneurial environment.

As for the expectations of the influences of different mechanisms on the end results of companies' activity, such changes take place with a significant lag, and so any early conclusions (made after 1–2 years after their implementation) of the functioning of new instruments and their comparison in order to select the best approach on their basis are by no means always reasonable and appropriate. Patience is necessary, and support must be provided on a stable basis for a relatively long period of time, so that the better performing companies could perceive lower future risks and reflect this circumstance in their plans, which will then be oriented to further expansion of their innovation activity.

4. There has been a significant progress in the expansion of the arsenal of innovation promotion instruments. However, in addition to all these achievements, it is also necessary to broaden, in practical terms, the notion of an innovation policy. So far it has mostly been associated with the classical linear model – science, technologies, innovation. But in the framework of innovation-oriented development – especially in its current phase – the central role is being increasingly taken over by policies based on accumulation and absorption of knowledge, network interactions and transfer of skills, and development of search networks, and so the importance of measures aimed at human capital development is increasing manifold.

At present, the range of companies in some or other way influenced by the government's innovation promotion measures is rather broad – thus, the positive influence of such measures was noted by the majority of directors of innovation-active companies included in the analyzed sample. Contrary to the widespread beliefs, the measures implemented by the govern-

ment are mostly oriented to the support of successful companies rather than the 'outsider' businesses.

However, among the currently applied innovation promotion instruments, only a few are designed to boost the rate of companies' development. Besides, these measures are not, on the whole, orientated towards supporting new businesses. A considerable number of the existing instruments (backed by sufficient resources) are intended mostly for the traditional sectors. The actual results of the use of innovation promotion instruments could indeed be better but for the low quality of their administration.

The ongoing changes in the outlooks of the business community with regard to the ways of technological modernization (and we believe that this process will be sped up even further) determine the need for elaborating some new, 'clever' innovation promotion mechanisms that could be adjusted to or even anticipate the ever-increasing demand of companies for new technologies.

5. When comparing the advantages and problems associated with the use of the major groups of innovation promotion instruments in Russia, we should like to stress the following points:

(1) Tax incentives have no significant barriers for access, and are generally neutral. However, they are predominantly associated with the resource component of innovations, and so do not create strong stimuli for development.

(2) Budgetary mechanisms are more closely linked to the end results of innovation activities than tax mechanisms. At the same time, companies can gain only limited access to budgetary mechanisms due to the complexity of the selection procedures and the voluminous reporting documentation required from them. For the dynamically developing medium-sized companies the bureaucratic costs are too high, and for big companies the amount of support is too modest to be of any real significance.

(3) Quasi-budgetary innovation promotion instruments (first of all, the government development institutions) have at least one important advantage – they are project-oriented, sometimes to a degree of boosting the rate of companies' development. These instruments are subject to somewhat less regulation than budgetary mechanisms, but at the same time they usually shift the bulk of the risks involved onto the recipients of support.

(4) Regulatory and communication-based innovation promotion mechanisms (in particular, improvement of technical regulation, promotion of the development of networks and partnerships) so far belong to the group of least developed mechanisms, although in recent years some improvement has been noted in that sphere. A significant potential for their development is created by the rising demand for advanced technologies and by the evident need to coordinate the behavior of innovation companies in certain sectors, as well as by the emerging new links between science and industry. However, the risks associated with failures to fulfill the proclaimed technical regulation development plans are also high.

On the whole, it can be noted that there still exist some significant risks of a 'takeover' of the new instruments by the traditional interest groups and the strengthening of direct government influence within the framework of innovation promotion mechanisms, on the one hand, and lack of adequate selection mechanisms, on the other.

6. There exist no 'universally useful' innovation promotion mechanisms. A serious problem associated with the estimation of mechanisms applied in fostering innovations is the heterogeneity of their effects, which strongly depend on companies' sectoral specificity, size, property structures, business history, etc. Thus, in particular, the investment in the research and

development studies carried on in the hi-tech sectors yields higher more return than that in the low-tech sectors. At the same time, the priority for the low-tech sectors is to create favorable conditions for attracting investment needed for the modernization of their production base.

When a new innovation promotion instrument is being introduced, it is highly probable that its influences will be heterogeneous, and so it must first be applied neutrally and on a sufficiently broad scale; this will help to identify its sectoral specificity and possible market failures, thus providing a basis for its specialization later on.

7. It would be incorrect to believe that a low level of innovation activity is associated exclusively with lack or shortage of resources or improper adjustment of the innovation promotion mechanisms. On the basis of the available results of studies it can be argued that there is insufficient motivation for innovation at the level of companies.

The most serious barriers in the way of innovation development are unstable conditions for economic activity and low predictability of government policy. Thus, one of the most important priorities is to ensure regulation stability, because even positive alterations in the regulation procedures usually give rise to uncertainty and increase risks, especially in case of long-term innovation projects. On those markets where the need for changes is strongest, their potential positive influence reveals itself in the framework of procedures designed to assess the effects of regulation. In fact, the process of planning and introducing adjustments in regulation must be transparent for the business community.

8. The pressure exerted on big companies by the government for the good cause of encouraging their innovation activity may, in fact, result only in their formal imitation of innovation activity. The most negative outcome in this case seems to be the tuning of companies' internal innovation systems to the government's preferences (which can be especially true of companies with state stakes). By doing so, they will become less capable of interacting with other (generally speaking – more important) participants in the innovation processes – individual inventors, research centers, universities, small-sized hi-tech companies, etc.

9. A considerable (if not the principal) part of the barriers in the way of innovation development in the Russian economy are not linked directly to innovation policies. Instead, they have emerged due to the inadequate quality of the institutional business environment: distortions in the competitive environment caused by the existence of different quotas and preferences; the government's support of poorly performing companies; constraints on the growth of small and medium-sized companies; the possibility for some companies to take advantage of the fact of their social welfare orientation. It is necessary to note that, both at the time of crisis and in face of newly emerged 'mobilization' strategies, the government cannot resist the temptation to resort to some protective measures, introduce the mechanism of direct support for some selective industries and sectors, markets, or technologies, initially declaring them to be only temporary and of relatively short duration. However, as a rule, it eventually turns out that these 'temporary' measures later on display an amazing viability and adaptability to various new situations, and a lot of political effort is required to finally abolish them.

Any distortions in the institutional business environment significantly reduce the demonstration effects of the operation of successful innovation companies, as well as the attractiveness and, consequently, distribution of the relevant business behavior models across the economy. In principle, any acts aimed at improving the general environment may go hand in hand with support of individual projects, thus making it possible to better perceive the existence of real regulation-related problems. However, such support must from the very start be oriented to the achievement of demonstration effects, encouragement of new or relatively young com-

panies in need of distribution of their risks, as well overall systemic improvement of the business environment.

10. It is not really a productive approach to directly counterbalance the problems existing in a less than perfect business environment by boosting the stimuli for innovation, because the availability of additional resources does not reduce the existing risks. On the contrary, such measures can only further increase companies' motivation for seeking sources of rent in the innovation sphere and imitate the innovation behavior model.

The mechanisms of support must not create excessively beneficial conditions for the support recipients. Rather, it is necessary to develop an innovation-friendly regulation, and the government must truly share the innovation risks with businesses and be ready sometimes to lose some of its resources allocated for the support of innovations - that is, to really assume responsibility for some of the risks borne by businesses.

The granting of support must be combined with sufficiently serious responsibilities assumed by its recipients, which must be subject to qualitative control. It is fundamentally important to shift the emphasis from the selection of the best candidates for the allocation of support (a task that would be very difficult for the government to accomplish) to the procedures of monitoring the process of implementation of the relevant projects, with a subsequent selection, in a regular basis, of those who have achieved the best results.

11. An excessively vigilant search for 'market failures' and the ways to compensate for them may result in inevitable 'government failures' in the actual practice of this activity. This kind of risk becomes even more significant in absence of adequate independent assessment of the influences of different measures, or if the government's potential for administering complex mechanisms is limited, or if the government has limited ability to abolish unreasonable initiatives, especially in face of powerful lobbying by the traditional interest groups. In this situation, it is necessary to impose some reasonable constraints on the number of large-scale big initiatives launched by the government in the innovation sphere, make more versatile the composition of major innovation policy 'actors' (regions, development institutions, business associations), introduce special procedures for regular monitoring of the applied instrument, as well as their regular adjustment on the basis of independent estimations.

12. The process of elaborating and implementing an innovation policy in Russia is itself in need of in-depth modernization; in this connection, the following aspects can be pointed out:

(1) a search for new instruments, measures and initiatives must always be supplemented by clearing off any old, outdated or obsolete measures and mechanisms, with the abolition of any wasteful areas and inefficient support mechanisms. This approach will also be useful if applied to the estimation of target budget-funded programs in the field of science and technology, the activity of development institutions, and the use of different tax incentives for promoting innovations;

(2) to adequately implement a state-of-the-art innovation policy, it is necessary to develop some 'clever' instruments, while at the same time looking for highly reputed individuals and organization capable of implementing such instruments in actual practice. The effects of such instruments cannot be based on direct numerical indicators alone - it is also very important to pay attention to the indirect qualitative effects. It is necessary to create appropriate conditions for conducting studies in several 'sessions', implement pilot projects to test the new instruments and adjust their 'design', and later on, at the time of assessment, to determine the steps necessary for adjusting these instruments;

(3) it is imperative to develop appropriate ways for communicating with the business community prior to the actual elaboration and use of new instruments. The classical problem is that a succession of new instruments is put forth, but support is sought (and received) always by the same few organizations. It is important to work with businesses and with different segments of the business community, so that they could really believe in the possibility of partnering with the government. It quite often happens so that those businesses that have never had any experience with government support instruments perceive much more negatively the potential risks and problems associated with their use. It is necessary to identify and publicize the available positive examples, which will conduce to better and more significant positive behavioral effects;

(4) in order to ensure progress in creating the motives for the spread of best practices, it is feasible to further broaden the spectrum of innovation promotion institutions and mechanisms, encourage competition between the institutions, and conduct regular assessment of the achieved results on the basis of external independent estimates. The latter appears to be especially important for two reasons. Firstly, any attempts to redistribute resources and to shift accents in the innovation policy are likely to be met with increased resistance on the part of the traditional interest groups; and secondly, consideration must be given to the existing mistrust in society of any new innovation promotion initiatives put forth by the government. This can result in lesser 'flexibility' of the innovation promotion instruments, as the desire to make them more attractive in the eyes of the public will inevitably result in 'roughening' of the practiced approaches.