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

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Industrial Policy in Russia in 2000–2013: Institutional Features and Key Lessons

Conceptual and practical issues of the development of industrial policy have attracted, and continue to attract, the attention of experts and politicians. In the 2000s, especially after the world financial crisis, and in the period of remaining uncertainty over further developments, a discussion of best practices, reasons for the failure and the capabilities and features of a new industrial policy became quite popular in both developed and developing countries.

The subject of the formation and implementation of a state industrial policy in Russia has become particularly relevant in recent years as it has become obvious that an innovative model of development is needed. Additional impetus was provided to this theme by the recent discussions at the highest political level of issues related to Russian economic diversification, the increase in high-tech industries and the creation of high flying jobs in both the traditional and new sectors.

In this regard most of the focus of this article is on assessment of the experience in industrial policy implementation in Russia, and a determination of the key lessons including an analysis of two examples of industrial policy – the nano-industry and the automotive industry¹.

The industrial policy: terms and features,
evolution of models and change in government attitude

Industrial policy has always attracted greater attention from decision-makers, the business elite and experts. There are many reasons to look at industrial policy, although they can be very different, ranging from an accentuated need to compensate for specific market failures and the initiation of certain structural changes to the relatively neutral coordination of different policies.

The many discussions conducted by the State on the implementation of industrial policy and the objective difficulties of assessing the actual effect of such policies on economic development have resulted in uncertainty over the concept of industrial policy. In this regard we provide some basic definitions of industrial policy in our opinion:

(1) industrial policy in general is a set of State measures to support or avoid certain shifts in structure²;

(2) industrial policy is an attempt by the State to promote the flow of resources to those sectors which are considered by the State as important for future economic growth³;

(3) industrial policy is aimed at specific sectors (and the companies being parts thereof) in order to achieve results which are considered by the State as effective for economy as a whole⁴.

With changing attitudes to industrial policy, its preferred forms and the definitions thereof have also been transformed. Currently the following definition is deemed to be operational for

¹ This paper is prepared on the basis of research conducted by the authors by the state order of the Russian Presidential Academy of National Economy and Public Administration in 2013.

² Price, C.V. (1981). *Industrial Policies in the European Community*. MacMillan for the Trade Policy Research Centre.

³ Krugman, P., Obstfeld, M. (1991). *International Economics: Theory and Policy*. New York. HarperCollins Publishers.

⁴ Chang, H.J. (1994). *The Political Economy of Industrial Policy*. St Martins's Press.

international institutions (OECD, UNIDO): *industrial policy is a State policy which is aimed at improving the business environment or the structure of economic activity in terms of sectors and technologies and, through intervention, it is expected to provide the best prospects for economic development and social benefit when compared to the absence of such intervention*¹.

The following industrial policy attributes can be identified: activity and advancement; determination of priorities (or anti-priorities); reallocation of resources, rights, control between sectors, industries (formation of different rents); orientation towards long-term profit from the economy as a whole. A typical feature of an industrial economy is a system of objectives to change the economic structure, so that such priorities can be determined either from top (State) or from bottom (entrepreneur). It should be noted that industrial policy is not just support for the winners, but also about providing assistance to those lagging behind; it is not just a support for progressive structural changes in the economy but, on the contrary, about countering negative structural changes in the economy.

A key feature of industrial policy is that it combines different tools, including those which are generally typical of other functional policies (tax, customs, monetary, etc.) without any original tools of its own. This creates difficulties in distinguishing such terms as ‘industrial policy’, ‘structural policy’, ‘sectoral policy’ and ‘competitive growth policy’.

There are many different classifications of industrial policy: by nature of the priority – the sector, industry, market, or area of technology; by directivity – export expansion or import substitution; by the nature of the targeted objects – traditional and new business, large companies or small and medium-sized enterprises; by the sources of reallocated assets – budget, development institutes, business tools; by participants – Russian and foreign investors; by style of formation and implementation – state or national (partnership between governments, businesses, community), etc.

As to *industrial policy models* it should be noted that there are no firm views. Generally there are two models of industrial policy: *vertical* and *horizontal*.

In general, the vertical policy provides support, rendered by the State to individual companies and (or) industries (picking winners), with selectivity of the measures being implemented. *The vertical model of industrial policy* is aimed at the development of certain sectors and the establishment of industrial priorities. It is characterised, most of all, by the problem of the identification of future winners, the active use of the mechanisms of direct support and the creation of special conditions through preferences and protectionism.

Horizontal policy is generally connected with structural changes in the industry (supporting research and development, deregulation, promotion of competition), but is indifferent to the measures implemented. *Horizontal industrial policy* relies mostly on multiple channels of influence, innovations, the formation of new sectors and companies, and is less oriented towards direct reallocation of rental income and more towards reduction in the barriers to growth.

With all the conventions of such comparisons, some experts are of the opinion that currently three models of industrial policy can be determined: vertical, horizontal and, finally, *industrial policy in an open economy*². The peculiar feature of this last model is that it creates the conditions for quasi-rents (to obtain which, companies have to apply their best efforts), a focus

¹ Pack, H., Saggi, K. (2006). Is there a case for industrial policy? A critical survey. World Bank Research Observer, 21 (2): 267–297; Warwick, K. (2013). Beyond Industrial Policy: Emerging Issues and New Trends. OECD Science, Technology and Industry Policy Papers, No. 2, OECD Publishing.

² Kuznetsov, Y., Sabel, C. (2011). New Open Economy Industrial Policy: Making Choices without Picking Winners. PREMnote, 161. The World Bank.

on maintaining communication between agents (matching winners) and extending the sphere of search networking. However this model does not solve the problem of how to achieve (accumulate) a critical level of changes.

Considering the *history of practical implementation* of industrial policies in different countries it should be noted that this type of policy has always been met with a mixed reception in different part of the world, with periods of ‘enthusiasm’ replaced by periods of ‘disgrace’. From the perspective of the *evolution of perceptions of industrial policy in the world* and approaches to the implementation thereof¹ it seems appropriate to distinguish four stages (*Table 8*).

In the 50s – 60s many states saw their public policy priorities in industrialisation, the compensation of market failures, the protection of new emerging sectors and the potential for the public sector. In the 70s – 90s the existence of problems in the realisation of industrial policies became more obvious: governmental failures, distortion in the competitive sphere and the rent-oriented behaviour of agents could be witnessed. As a consequence, from the very beginning of the 80s there has been a domination by the ideology that includes such priorities as trade liberalisation, privatisation and direct foreign investments. Substantial attention has also been paid to the realisation of structural programmes.

Until the early 90s, active measures had been undertaken within the context of industrial policy. These related to the direct influence and support of “champions”. Amid globalisation, the development of TNCs and the reallocation of industrial factors in the 90s, there was a change in emphasis of industrial policy – it became more connected with the creation of the conditions necessary for capital reflow into separate sectors in order to improve the investment attractiveness of those sectors.

Table 8

Major stages in the evolution of perceptions of industrial policy in the world

Stage	Priorities of state policy	Distinctive features of industrial policy	Attitude towards industrial policy
The 50s – 60s	Industrialisation, import substitution, emerging public sector management	Tough, vertical policy, compensation of market failure, high level of selectivity	Fast increase in popularity of industrial policy in different states
The 70s – 90s	Trade liberalisation, privatisation, attraction of direct foreign investments, laissez-faire	Limited application, renunciation of tough instruments (protection of markets, support of national champions) in favour of mild ones (terms for capital reflow)	Governmental failures, distortion in business sphere, seizure, rent-oriented behaviour, globalisation, substantial doubts about the necessity to implement industrial policy
2000–2009	Reindustrialisation, development of stable innovation, perfection of national innovation systems	Mild, horizontal policy, compensation of system failures contribution to acceptance of knowledge, guarantee of dynamic benefits, guarantee of demonstration effects, self-disclosure	Market failures and government failures, ecology, Chinese and Indian factors, lagging factor, influence of evolutionary theory of growth, reconsideration of the government’s role in the concept of industrial policy

¹ Aiginger, K. (2007). Industrial Policy: A Dying Breed or A Re-emerging Phoenix. *Journal of Industry, Competition and Trade*, 7(3):297–323; Aghion, Ph., Boulanger, J., Cohen, E. (2011). Rethinking Industrial Policy. *Bruegel Policy Brief*, 04/2011; Naudé, W. (2010). Industrial Policy: Old and New Issues. *UNU-WIDER Working Paper No. 106*.

2010 – Present	Protection of national sectors, guaranteed employment, search for new resources of sustainable growth	Technological industrial policy, cluster-based industrial policy, stimulation of interagent links, partnership support, accumulation of critical changes, design of competition- and innovation-friendly sectoral policy that can increase the quality of growth	Ideological crisis of the Washington Consensus, new post-crisis realism, strengthening and clarification of the government's role, search for new models of industrial policy, experimental construction of new industrial policy
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The 2000s was a period of some reconsideration of the government's role, a balanced assessment of market and government failures and also a period of intensified attention towards stimulation of innovation and the development of national systems of innovation. During the first half of the 2000s, after a period of serious disappointment with the results of past industrial policy, it again gained governmental popularity including attention from the authorities within the EU. This was connected to several factors¹, in particular to the increased risk of deindustrialisation as a result of the displacement of production to the countries that could exploit retardation factors (low wages, the lack of strict environmental controls etc.), unfair competition and of weak economic growth in Europe. In this situation the typical market programmes (privatisation, deregulation) were already not leading to any significant results, especially when taking into consideration evolutionary growth theory, indicating that the significant factors of influence are education, interaction and the acceptance of knowledge; manifested through technological dynamism and the emergence of new technological industries.

Globalisation has weakened the potential of vertical industrial policy and its traditional instruments such as tariff-rates, subsidies and demands within local markets. At the same time there has been an increase in demand for a “new” industrial policy focused on the compensation of strategic “market failures” and moreover on supporting innovation and the development of education. During the acute phase of the world financial crisis (of 2008-2009) an actual expansion of the appliance of industrial policy instruments took place; at the same time as the implementation of protectionist and preferential methods were being reinforced.

On the whole, during the 2000s, there was an *active process of convergence of industrial policies and innovation policies*: the former became horizontal while the latter, by contrast, became vertical and specialised, with the latter also becoming the most important component of industrial policy. During the post-crisis period, with unstable world economic development and contradictory lessons from past crises, *industrial policy was hailed more as a systemic component for coordinating governmental policies*.

At all stages in the evolution of the perception of industrial policy a lot of attention has been paid to a comparison of the benefits and risks connected to the realisation of industrial policy². However all the arguments on one side, as a rule, have always managed to come across as no

¹ Aiginger, K. (2007). Industrial Policy: A Dying Breed or A Re-emerging Phoenix. Journal of Industry, Competition and Trade, 7(3):297–323.

² B. Kuznetsov (2001). Is an industrial policy necessary for Russia? Report for the seminar Development Strategy of the Institute for Complex Strategic Research and Higher Business School of the MSU, Moscow; Rodrik, D. (2004). Industrial Policy for the Twenty-First Century. CEPR Discussion Paper No. 4767; Pack, H., Saggi, K. (2006). Is there a case for industrial policy? A critical survey. World Bank Research Observer, 21 (2): 267–297; Warwick, K. (2013). Beyond Industrial Policy: Emerging Issues and New Trends. OECD Science, Technology and Industry Policy Papers, No. 2, OECD Publishing; Aiginger, K. (2007). Industrial Policy: A Dying Breed or a Re-emerging Phoenix. Journal of Industry, Competition and Trade, 7(3):297–323.

less weighty than those of the other and vice versa. It goes without saying that today there are already a great many examples of industrial policies which have been implemented in different countries at different times. Examples of the most successful industrial policies usually include countries such as Brazil, Finland, Japan and South Korea while the least successful attempts to implement the policy include the countries of tropical Africa and, to a certain degree, the countries of Latin America. However most conclusions and evaluations by policy experts of examples of the realisation of industrial policies differ significantly, and so it can be really difficult to understand the impact of industrial policy. As a consequence, a general analysis of industrial policy examples does not lead to unambiguous conclusions about its “value” or “harm” for economic development.

In general, *industrial policy is a very complicated instrument with attractive prospects but high levels of risk*. For the realisation of effective industrial policy, the ability of the state to implement “smart politics” is important. Furthermore a concerned reaction to independent assessments is important and a readiness publicly to admit mistakes and to draw necessary conclusions for future needs is considered even more so.

Russian industrial policy in the 2000s: conditions and specifications, factors of change, interest groups

A. Stages of formation and implementation of Russian industrial policy

In Russia, industrial policy has often been associated with vigorous and excessive state intervention in the economy, protecting the interests of particular large national companies, which is why it has been considered to be a particularly dangerous retreat from market reforms. Especially tough criticism of the industrial policy in Russia at the end of the 90s and the beginning of the 2000s was connected to an initial distrust of its effective implementation, taking into account the poor quality of the state system and the existence of many possible risks that there might have been hidden lobbying for the interests of different groups, a distortion of the results achieved and of “seized government”.

The peculiarities of Russian industrial policy and its transformation over time were, first of all, determined by such basic factors as changing budget constraints, the dominant model of relations between government and business and the major challenges for future development (exhaustion of conditions essential for the previous model of growth). Based on these facts we can specify five major stages in the development of Russian industrial policy in the 2000s. (Table 9):

1. Policy of structural reconstruction – recovery growth – mild regulatory policy–prioritisation of institutional reforms (in 2000–2003);
2. Vertical sectoral policy – strengthening of the government’s role in the economy (in 2004–2007);
3. Industrial compensation policy – crisis – direct support and preferences (in 2008–2009);
4. Technological industrial policy – post-crisis development – prioritisation of improvement of the business climate (in 2010–2011);
5. Vertical and technological industrial policies – toughening of budget limits, social commitments – prioritisation of job-creation (since 2012).

Table 9

Major stages of industrial policy in Russia in the 2000s

Период	Priorities	Peculiarities	Resources	Relationship model
2000–2003	Development of market institutions and structural reforms	Mild regulatory policy (types of taxes, natural monopolies' tariffs, exchange rates)	Regenerative growth, budgetary constraints	High level of personification, practice of meetings with big-business, business activity
2004–2008	Diversification, stimulation of innovation	Vertical industrial policy, long-term planning, creation of development institutions	Substantial budgetary resources	Byuilding «vertical», government control, institutionalisation of access, increased numbers of organisations creating industrial policy (development institutions)
2008–2009	Guarantee of social stability	Vertical compensation policy, support for large organisations, preference for manual control	Harsh toughening of budgetary constraints	Assistance, in exchange for commitments between the government and large companies
2010–2011	Search for new sources of growth, innovation, modernisation, structural privatisation)	Technological industrial policy	A period of fiscal moderation, high uncertainty	Extension and competition for access, emerging of new players, intensification of competitive bidding
2012–...	Reindustrialisation, improvement of investment climate, assistance in development of new high-tech sectors	Industrial policy to create additional jobs	Toughening of budgetary constraints, limited growth	Development of new means of communications (ASI, Open Government)

Stage №1. Policy of structural reconstruction (In 2000–2003)

The early 2000s can definitely be called one of the most significant “windows of opportunity” both in Russian politics and in its industrial policy. The period opened with the development (until May, 2000) of one of the most informative conceptual documents of socio-economic development – the «Strategy of Development of the Russian Federation until 2010. (another, informal, title is the Gref Program). Even though the document was not officially accepted, many of its terms were nevertheless implemented. The main emphasis of this Program was the development of market institutions (equal conditions for competition, deregulation, a reform of natural monopolies, a reform of the tax system, a reform of the system of power, a reform of administration etc.).

In the context of heated discussion about the choice between a strategy of liberalisation or the scenario of mobilisation of economic development in Russia, all suggestions of an industrial policy, even mild ones, were rejected during this period. This was determined by a string of additional circumstances:

- on the one hand, by the scarcity of recourses necessary for the launch of direct instruments of governmental support; on the other hand by the underdevelopment of market institutions, which explained the weak potential for the use of indirect regulatory instruments of industrial policy;
- by retention of the rather strong positions of big-business, including its political side (this was the reason why industrial policy was regarded by many experts as a serious risk of “a takeover” and as a risk of the strengthening of lobbying processes implemented by the business sphere on their own behalf).

In the context of industrial policy, the Gref Program, can include two major theses: (1) the main purpose of structural government policy is an increase in the proportion of industry sectors

producing goods with a high degree of recycling and of the service sector; (2) based on the structure of the Russian economy, we can say that stimulation of exporting sectors to investment in modernisation and developing their potential is no less important than investment into the potential of other production sectors. Nevertheless, during the period of institutional reforms, the prioritised industrial policy on domestic aircraft engineering of the 90s continued unabated, which could be explained more by political factors and by the necessity for maintaining the export of armaments and military equipment.

In spite of the rejection of industrial policy, this period of time included at least one attempt at the reconstruction and implementation a new industrial policy that resulted from the fortuitously timed appearance of the development of the ICT sector in India. In February, 2001 the need was identified for the development of the Federal Target Programme “Electronic Russias (2002–2010)” and as early as the beginning of 2002, it had already been adopted.¹ The Programme was within the Center for Strategic Developments and involved unbiased experts and business representatives (to a certain degree the discussion format copied and extended the one that had been accepted during the development of the Gref Program).

At first the aim of the Programme was declared as the creation of conditions essential for developing and enhancing the efficiency of the economy, public administration and local self-governance, to be made possible through the adoption and mass distribution of information and communication technology; to ensure the rights for free search, receipt, transmission, production and dissemination of information and for expanded specialist training. It was *a rare example, for Russia, of horizontal industrial policy* oriented towards the development of the ICT sector through limitation of the effects of irrational administrative barriers and through the creation of conditions for additional demand. Nevertheless, since 2004 the Programme has changed direction - towards supporting the government in improving public sector efficiency.

A comparison of the initial version of the Federal Target Programme and its updated version of 2006 shows that some principal parts of the Programme have been excluded, in particular the part on the development of the information industry and the ICT sector. Such strong metamorphoses of the Federal Target Programme “Electronic Russia” are partly connected to the fact that the urgent character of realisation of a “cash-strapped” industrial policy in 2004-2005 decreased significantly while the reduction of administrative barriers turned out to be a very “sticky” task that demanded a great deal of effort but was of little benefit for administrative purposes. The Ministry of Economic Development switched its attention to other more ambitious goals. A further reason was that, during the first stage of the Federal Target Programme, no strong consolidated interest group was created amongst participants in the ICT market (due to the typology of such markets – which generally consist of small companies), so the further modification of the Programme into an ordinary departmental programme of the Ministry of Communications and Mass Media was considered to be a natural and evolutionary process.

An integral feature of industrial policy (the decisions on which can be associated with industrial policy) at the beginning of the 2000s was the focus on extremely large companies and towards the position of the large owners. In connection with an intensive process of industrial integration and the formation of industrial holdings, the interests of major owners, who supported the ideas of industrial policy, were broadened. This was the reason why more attention was directed towards the creation of the necessary conditions for internal capital

¹ Approved by the Resolution of the Government of the Russian Federation No. 65 as of 28 January 2002.

reflow. In October of 2001 the Russian Unity of Industrialists and Entrepreneurs initiated a discussion on scientific-industrial and investment policies. In December of the same year a Working Group “The Russian Unity of Industrialists and Entrepreneurs” was created; it was responsible for industrial and investment policies (later it was reorganised into the Committee of The Russian Unity of Industrialists and Entrepreneurs). In April of 2002 there was discussion of the project “The Concept of Russian Industrial Policy”; among the most important statements, the following points can be underlined: a transition from sectoral policy to a policy of support for competitive companies; prioritisation of the knowledge economy; transition from a governmental to a national industrial policy. Later, at the end of 2002, the Russian Unity of Industrialists and Entrepreneurs made a decision to renounce the concept of industrial policy (it was declared that such an approach was out of date) and to pursue the policy of developing a national, competitive economy. However, the idea of the necessity for “national champions” still remained quite popular.

Stage №2. Vertical sectoral policy (2004–2007)

The second stage was generally characterised by a significant strengthening of the role of the state in the economy and the move towards a vertical industrial policy. That transition was based upon the following factors and preconditions:

- creation of a vertical power structure, reduction in the power of influence of big business on government, target project-planning for structural changes in the economy;
- alleviation of budget restrictions, extension of the resource potential of the state;
- stabilisation of the business environment, the fulfilment of obligations, and, as a consequence, the opening-up of long-term project implementation opportunities.

From 2005 onwards, the state began to play a significantly more active role in implementing long-term planning instruments together with working out different development strategies, initially, sectoral strategies, and the formation of a complex of industry-specific FTPs (federal target programmes) for science and technology. In that period, special attention was paid to determining target development figures and to indicators of the efficiency and effectiveness of budgetary expenditure, as well as to extending private co-financing. There was a significant shift towards implementing a *sectoral industrial policy*, including policy in respect of the sectors dominated by private companies: in 2007–2008 (before the crisis), seven sectoral development strategies were established: for the development of the metal industry, forestry, the chemical and petrochemical industry, shipbuilding, the vehicle construction industry, nuclear power engineering and the electronics industry.

In the absence of other instruments and tools, *the federal target programme*, which already existed and was subject to the applicable regulations and standards, became the main instrument. However, the agencies still mainly considered it as a means of “extracting” additional resources from the budget in order to deal with their current, rather than their strategic, issues. The obscure wording of the targets and, inconsistencies in both the expenditure and the expected results led to the low efficiency of this tool.

From 2006 onwards, there was a revitalisation of the work towards *creating vertically integrated institutions in the state sector*, in particular, in the MIC (military industrial complex), aircraft building and shipbuilding, the large institutions: the United Aircraft Corporation and the United Shipbuilding Corporation were founded, in 2006 and 2007, respectively. All this was related not only to solving the problems of how to decrease the administrative burden of managing many separate enterprises, but also a desire of the state and the sector ministries to

extend the influence of their direct instruments over the development of particular industrial sectors.

In 2005–2007, there was a significant increase in the imbalance between the updated priorities of social and economic development (economic diversification and the transition to innovative development) and the state's instruments for their completion. The brake on initiatives to improve the economic policy instrument, and the low efficiency of the then existing management tool, led to a shift away from improvement of the indirect instruments of reflation and the development of the institutional environment, to an expansion and strengthening of the mechanisms of direct state influence. Additionally, the unsatisfactory quality of the administrative system, the focus of the system on dealing with current issues, and problems with forming and implementing a system of measures to develop new sectors of the economy, introduced a need for the formation of additional measures for implementing state policy. Consequently, several decisions were made which were significantly outside the framework of the standard controls and which extended both the opportunities and the risks for the implementation of industrial policy. Among those decisions, were the *creation of the Investment Fund (2006)*, *the formation and capitalisation of development institutions (2007)*, and *the creation of state corporations (2007)*.

In 2007, there was a change of direction *towards an intensive formation of financial development institutions and an extension of their resource base* in the context of the policy decision¹ to use a part of the National Welfare Fund (approximately Rb 300bn) for the capitalisation of several development institutions (the Development Bank, the Investment Fund, the RVC (Russian Venture Company) and others). It stands to reason that there were multiple causes for the decision to capitalise the development institutions, but one of the probable causes was a desire to strike a certain compromise against the background of, on the one hand, growing pressure from the supporters of a significant increase in state investments in the economy, and, on the other hand, opposition to the increase in the level of public expenditure, from the supporters of macroeconomic stability². In this regard, the state's investment of a part of the accumulated funds into development institutions “tied” those funds into their further use for investment, without, however, meaning that it should lead to a sharp increase in public expenditure.

The most remarkable element of the industrial policy of 2007 was the *creation of large state corporations*. Two of these state corporations, Vneshekonombank and Rosnano were established as financial development institutions to compensate for “market failures”; two other state corporations, Rosatom and Rostekhnologii (Rostec) were established to restructure state property, consolidate state assets and to increase the competitive advantage of certain industrial sectors (the nuclear industry, MIC, the car industry and air transportation). The creation of these state corporations was significantly outside of the general principles of state control.

Vneshekonombank (Bank for Development) and Rosnano became two of the most important instruments for the implementation of industrial policy. However, if Rosnano was still close to horizontal policy – shaping the nanotechnology industry, technological priorities and the capitalisation of new high-tech companies, then *Vneshekonombank* was significantly closer to

¹The message of the President of the Russian Federation to the Federal Assembly of the Russian Federation as of 26 April 2007.

² D. S. Ivanov, Yu. V. Simachev, M. G. Kuzyk (2012). Russian financial development institutes keep time? *Economical Matters*, No. 7. P. 4–29. Russian Financial System Institutes Development: Achievements and Problems http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2264360

vertical policies. This follows, both from its focus on support for large projects (the cost of the projects it supported was not less than Rb 2bn), and from the system of the “key” sectoral priorities initially established for its activities (in particular, the space and aircraft industries, shipbuilding, the machine, wood, nuclear and electronics industries and the MIC). Thereafter, Vneshekonombank’s priority list only expanded¹.

Without delving into the pros and cons of state corporations as tools of state industrial policy, please note that, materially, the introduction of this approach was an acknowledgement of the state’s incapability or unwillingness to look for the best practice in public-private partnerships, and a concentration of structural policy within the public sector of the economy (with the growth of this sector). The latter caused a decrease in the state’s interest in solving the problems of the investment climate.

Amid the majority of the other industrial policies, between 2004 and 2007 *there is quite an interesting example of an industry sector specific policy connected with the development of the automotive industry* – which we shall examine in more detail in the next section. Firstly, it was a relatively successful example; secondly, it was not related to the implementation of any budgetary programmes; and, thirdly, there was a special focus on attracting foreign investors and the creation of new companies.

Of course, *this period was not focused only on vertical industrial policy, because several important system measures were also taken, which were closer to horizontal industrial policy, although they were not the main ones at that stage. In 2004, the Kyoto protocol was ratified*, which contributed to the development of less resource-intensive and environmentally-cleaner manufacturing. In 2005, the UST (uniform social tax) rate was reduced, which was particularly important for the development of “the new economy” of relatively small, science-based companies. Finally, in 2006, the Strategy for the Development of Science and Innovation in the Russian Federation for the period until 2015 was approved², which evidences an increase in the significance of innovation for enhancing competitiveness.

The search for additional tools to implement horizontal innovative industrial policy began as early as at the end of the first stage and continued during the second stage. The most famous large scale experiment was the launch by the Minpromnauki (Russian Ministry of Industry, Science and Technology) in 2003 of *innovation projects on a national scale*. These got the unofficial title of “megaprojects”. The experiment involved the competitive selection of large modernisation and development projects for the manufacture of new innovative products by private companies, with support from the state. In exchange for the commitment to a significant (manifold) increase in the manufacture of new products, the state provided funds for meeting the costs of research and development and for putting the new products and technologies into production. By November 2006, 13 megaprojects worth a total of Rb 8.58bn were under way, however there was little further development of the megaproject experiment.

¹Thus, in November 2008 in the conditions of economic crisis burning out rapidly, to these priorities was added one more – the agricultural sector (Order of the Government of the Russian Federation No. 1697, as of 19 November 2008), and within a year additional technological priorities were determined for Vneshekonombank – strategic computer-aided technologies and software, information and communication systems, medical equipment and pharmaceuticals (Order of the Government of the Russian Federation No. 1783-p, as of 26 November 2009).

²Approved by the Inter-Departmental Commission for Science and Innovation Policy (Minutes No. 1 as of 15 February 2006).

Another experiment in the sphere of industrial policy instruments was the introduction of the “special zones” mechanism (an attempt to repeat the successful experience of China). In July 2005, the Federal Law “On Special Economic Zones in the Russian Federation” was adopted, in accordance with which two types of SEZs (special economic zones) were determined – industrial production zones and technology development zones. However, due to contradictions between the governance processes and restrictions on the regulatory plan, these zones were not highly attractive for investors.

Stage №3. Antirecession compensatory industrial policy

This stage in the development of industrial policy in Russia is connected with the very severe economic crisis of late 2008 – 2009. On one hand, the crisis made the state turn from strategic to tactical objectives, including a transition to “manual control”, on the other hand, it made the state once again review its development priorities and the opportunities to finance a large-scale economic restructuring.

In that period, its industrial policy became especially selective¹, although some measures were implemented quite successfully, aimed at decreasing the administrative pressure on business. However, the majority of the measures then taken were connected with compensating for the recession in the most vulnerable sectors and with support for big strategic companies². Among the main sectoral priorities of the industrial policy in that period were car and farm machinery building, the military-industrial complex, agriculture, the transportation industry and housing construction.

During the crisis, the activities of the development institutions were limited in terms of resources (for example, with regard to Rosnano) or re-focused on solving anti-recessionary problems (Vneshekonombank). There were several anti-recessionary measures, which were, although, a forced, but significant derogation from market economy principles, in particular, several measures connected with the substitution of private demand with public demand, with support for the continuation of the activities of operationally unprofitable enterprises, with protectionism towards certain sectors, with attempts at administrative price control and with the redistribution of losses and but lacking transparency in the reciprocal obligations of the state and the owners³.

Note that the process of adoption of long-term sector strategies for development had been so well established in the practice of the state administration that it was retained during the period of the severe crisis, in particular, some additional sector strategies were adopted (on the development of the fisheries industry and of the pharmaceutical industry) in 2009.

The lessons from the crisis have been learned at the highest political level, and they have led to diverse consequences. On the one hand, as far back as in the first half of 2009, efforts were made to determine a package of measures aimed at stimulation of innovative development, to determine the directions of further reductions in state involvement in the economy. In June 2009, the first session of the Committee on Modernisation and Technological Development of the Economy of Russia took place, and this determined the strategic technology priorities: the

¹M. Yu. Gorst, A. V. Daniltsev, B. V. Kuznetsov, M. G. Kuzyk, Yu. V. Simachev, A. A. Yakovlev (2009). Assessment of crisis response measures to support the real economy. *Economic Matters*, No. 5. P. 21–46.

²Yu. Simachev, D. Ivanov, B. Kuznetsov, M. Korotkov, M. Kuzyk. (2012). State anti-crisis support for large and systemic companies: directions, features and the Russian experience. Science editor A. D. Rodygin. M.: Delo.

³Yu. Simachev, M. Kuzyk. (2012). State anti-crisis support for Russian companies: assistance and limitations *Journal of New Economic Association* No. 1. P. 100–125.

energy economy and energy efficiency, nuclear technology, information technology, space technology and telecommunications, medicine and the pharmaceuticals industry, and nanotechnologies. On the other hand, the importance of the measures for “manual control” of the economy was remarkable.

Stage №4. Post-crisis policy learning and technological industrial policy (2010–2011)

The diversity and divergence of the lessons which the authorities had learned from the crisis *determined the specific nature and instability of the industrial policy ideology in the post-crisis stage (2010–2011).*

In the Guidelines for Action of the Government of the Russian Federation for the period until 2012, approved in November 2008¹, the next priorities were determined – this time they were in the high-tech and backbone industries. In spite of the fact that these priorities had been determined before the crisis, there was no reappraisal of their contents in the post-crisis era. The adoption of the next sectoral strategies of development still continued (mostly in a variety of engineering subsectors).

At the same time, *the state became more active in its search for and implementation of new instruments of horizontal policy*², which included, as we see it, technological platforms, associated grants for stimulating partnerships between companies and universities, the development of innovative trends in the system of procurement for public use, the development and adoption of programmes of innovation-driven growth in big state companies, support for the formation of regional innovation clusters, etc. However, the critical barriers to increasing the effectiveness of many of those new instruments were the problem of their “seizure” by the traditional interest groups, the problem of the appearance of obstacles to the extension of best practice and the problem of restrictions on the accumulation of the “critical mass” needed for stable self-sustaining changes.

In general, beginning from late 2009, *not only a declarative but also a practical strengthening of the technological and innovative direction of industrial policy* became more prominent and this was connected with a significant change in the global competitive environment, a global reappraisal of the role of the state in the economy, especially with regard to innovation, a critical appraisal of the results of the classical sectoral industrial policy and the fact that the “field” for such a policy in the modern context had become much smaller.

The shift from the vertical sectoral industrial policy to a technological industrial policy was, to a certain extent, associated with the search for new factors for the growth and extension of influence of various interest groups from the spheres of science, technology and education. In late 2011, after some lengthy refinement of the approvals procedures, the Strategy for Innovation and Development of the Russian Federation for the Period Until 2020 was at last adopted³.

Stage №5. “Search” industrial policy

It is our belief that, beginning in 2012, a new stage in the development of the industrial policy of Russia opened. It happened because of a further understanding by that time of the

¹Approved by the Order of the Government of the Russian Federation No. 1663-p as of 17 November 2008.

²Yu. Simachev, M. Kuzyk. (2013). Russian policy for innovations stimulation: evolution, achievements, problems and experience. Source: Russian economy in 2012. Tendencies and perspectives. Edition 34. M.: Gaidar Institute Press. P. 521–571.

³Order of the Government of the Russian Federation No. 2227-p as of 8 December 2011.

upcoming tightening of the budgetary resources policy, together with the accumulation of major social commitments, and with the changing conditions for the implementation of Russia's industrial policy after its accession to the WTO (World Trade Organisation).

The task of *searching for new sources of growth, including those based on different types of industrial policy* became especially significant in that period. These were developed about the need for a *reindustrialisation* of the Russian economy (which were to a large extent inspired by the example of Europe), the creation of new high-tech jobs and a massive improvement in the business climate. In January 2012, saw the first declaration at the highest political level of the necessity for an industrial policy¹ – amongst other priorities (it was stated that the priority list was open for additions and detailing) the named list included pharmaceuticals, high-tech chemistry, composite and non-metallic materials, the aircraft industry, information and communication technologies, nanotechnologies, nuclear industry and space.

In May 2012, amongst others, two principal long-range objectives were determined²: by 2018 to increase of the proportion of products from high-tech and knowledge-intensive industries in the gross domestic product by a factor of 1.3 in comparison with the level of 2011; the creation or modernisation of 25m high-level jobs by 2020. We have the impression that after that there was an effort by government to distribute the “share of responsibility” for fulfillment of the objectives and for ensuring regular monitoring of the current indicators between all the ministries and agencies on a voluntary basis. Discussion of state programmes, strategies and budgetary programmes was more oriented towards an appraisal of their contribution towards achieving the “basic” target.

In 2012–2013, a further component of the strategies for development was adopted – concerning the medical industry, the integrated power grid of Russia and the baby products industry. The transformation of the contents of industrial policy priorities continued, whilst, in the state programme, the “Development of Industry and Increase in Its Competitive Advantage”³, the number of priorities reached 14, and they were classified from a sectoral point of view in accordance with three market types – new markets; traditional industries, the products of which were oriented to user demand; and traditional industries where the products were geared towards investment demand. Furthermore, state programmes were also approved concerning the development of the aircraft industry, shipbuilding, the electronics and radio industry, pharmaceuticals and the medical industry, the atomic energy industrial complex and other sectors⁴. In sum, *the notion of “priority” lost its initial value as an instrument for the concentration of efforts in specific directions.*

In that period, it probably became evident that there was a degree of crisis as a result of the implementation of the many approved sectoral development strategies. It was apparent that the state programmes had also not yielded the expected results, simply becoming an additional bureaucratic superstructure for the different FTPs and other mechanisms of federal budget expenditure.

In July 2013, action plans were adopted for development of the five sectors (industries) *in a new format – the format of road maps* (biotechnology and genetic engineering; information

¹ V. Putin. We need new economy // Vedomosti, 30 January 2012.

² Decree of the President of the Russian Federation No. 596 On Long Term State Economic Policy as of 7 May 2012

³ Order of the Government of the Russian Federation No. 1535-p, as of 29 August 2013

⁴ List of State programmes of the Russian Federation (Order of the Government of the Russian Federation No. 1950-p, as of 11 November 2010)

technology; engineering and industrial design; production of composite materials; optoelectronic technology and photonics). As a result one can see an emphasis on practical measures until 2018 with many target indicators for them. Please note that the adoption of road maps indicates the first *significant shift of attention of the state towards the development, initially, of, new and promising high-tech industries, as well as service industries.*

B. Demand for industrial policy and main interest groups

The following were explicitly (or, more often, implicitly) declared as the tasks for industrial policy:

(1) economic tasks

- ensuring long-term stable economic growth based on diversification of the economy;
- increasing the volume of exports of goods with high added value;
- the creation of new sectors of economy based on multidisciplinary technologies;

(2) social tasks

- creating additional jobs with the help of structural economic reforms;
- ensuring full-employment at the largest enterprises;
- solving employment problems in the regions, including the monotowns.

In spite of all the concerns related to the “introduction” of industrial policy, there were always new issues demanding a certain choices to be made by the state – for some priorities reducing or raising the tax burden, changes in customs duties; determining the conditions for accession to foreign economic regimes (the WTO and the Customs Union), transitional periods and compensation to domestic producers; emphases on saving some sectors during the period of the crisis; investment priorities with adequate resources, and expanding the role of the state as an investor (directly or through development institutions).

It may be noted that during the 2000s, with the many variations and manifestations of industrial policy, the strongest and the most acceptable argument for an industrial policy was the creation (and sometimes – saving) of jobs in the economy, in other words, *social tasks were and remain a definite priority.*

Meeting the challenges of industrial policy involves the redistribution of rents within the economy, which could then be used for:

- expanded dialogue with various interest groups, the expansion of support groups and the formation of new sources of development;
- the formation and consolidation of new, interest groups for modernisation;
- working with population’s request for justice – for the redirection of some of the rents (natural resource rent or monopoly rent) in order to solve social problems; and
- demonstrating the fulfillment of strategic tasks and of some political tasks, worthy of the power being wielded.

The aiming of industrial policy at bringing about a change in the distribution of rental income in the economy, added to the opportunities for appealing to long-term and potentially advantageous political tasks. Accordingly this defended the necessity for providing certain sectors with support and preferential treatment, and resulted in the high level of attractiveness of this policy for different interest groups.

For the period from 2000 to 2003, the discussion of industrial policy was apparently, more concerned with ensuring a change in the structure of the Russian economy, but *the driving force behind those discussions was, primarily, big business, the strongest consolidated industries: metallurgy, the energy sector, mining industries and railway transport.* In fact, it was a vertical

industrial policy which was discussed, but that aspect appeared during discussion of the changes in functional policies – tax policy and customs policy. In the same period, businesses were mostly arguing with one another. One of the lines of those especially acute contradictions between big companies during that time was the service tariffs of subjects of natural monopolies, the necessity and conditions for accession to the WTO and the exchange rate policy of the Central Bank.

If in early 2000s, business was still relatively dominant in its interaction with the state, after that, state interest groups and their rivalry determined the development and “design” of industrial policy (Table 10). We see four main interest groups – “budgetary”, “structural”, “industry sector specific” and “science-and technology”. The peculiarity and advantage of such a classification is in the fact that such groups are always present, and they all have a positive agenda of social and economic development. Their positions and influence vary greatly, depending on changes to budgetary restrictions, with the level of social support for the population and with the lessons learned by the authorities during times of crisis, big and small.

Table 10

Conventional State interest groups projected onto industrial policy

(1) “Budgetary”	(2) “Structural”	(3) “Industry sector specific”	(4) “Science-and-technology”
Main positions of interest groups			
1	2	3	4
Ensuring macroeconomic stability	Diversification, development of new sectors	Ensuring social stability and control of the current situation and market prices	Ensuring transition towards an innovation-driven growth model
Neutrality of control, improvement of the investment climate	Extension of exports and incentives for high-tech production	Retention (strengthening) of direct influence on the development of certain industries and sectors which are “sensitive” for the population, and development of the economy in general	The “proposition of innovation” through logic, extension of cutting-edge aspects

Cont’d

1	2	3	4
Restricted opportunities for the use of additional income for increasing current budget expenditure	Increase of expenditure for economic development, new programmes	Large investment programme implementation, ensuring significant progress in innovation	Increase in expenditure for science and education, forcing the state sector to cooperate
Restriction of new initiatives	Extension of PPP (private-public partnership), different agreements between business and state	Reform of large companies, integration, forming of “national champions”	Foundation of national laboratories, research universities, development of scientific and production partnerships
Attitude towards industrial policy			
In general – cautious, but hostile in the case of additional budgetary commitments	Positive towards horizontal policy, Cautious towards vertical policy	Neutral towards horizontal policy, Positive towards vertical policy	In general, positive, and in the case of technology industrial policy – especially positive
Strengthening of the position of interest groups			
In the case of tightening of budgetary restraints	In the case of a reduction in traditional sources of economic growth	In the case of social tension	Decrease in the competitive advantage of traditional products

In the period from 2004 to 2008, we can mark the following general shifts in the composition and positions of Russian interest groups:

- strengthening of state interest groups (due to the “vertical” and general strengthening of the state); reduction in the identity of the interest groups on the basis of their “origin”, association with “security forces” and “technocrats” or by “thematic” trends;

- strengthening of the competition for distribution of resources between the power elites; increase in the role of rivalry between the controlling bodies of the interest groups (mutual grounds for claims – lobbying for the interests of certain business groups; and inappropriate use of funds);
- formation and strengthening of interest groups oriented towards research, education and technology; rapid development of interest groups representing the development institutions (general opposition to outside pressure, “self-regulation”, “innovative elevator”);
- strengthening of the positions of business associations, extension of their interaction with the state bodies for project development and the evaluation of the structural changes.

With the issues of implementation of industrial policy in Russia, there has always been “competition” between the vertical and horizontal policies (*Table 11*).

Table 11

Features of traditional (vertical) and new (horizontal) industrial policy

Traditional (vertical) policy	New (horizontal) policy
Industry sector specific priorities	Technological priorities
Existing sectors and industries	New industries and creative economy sector
Production	Services and production
Import substitution	Exports and new demand
Big and very big business	Newly developed small and medium-sized business
State sector and state development institutions	Private sector and foreign investors
Integrated structures and holdings	Science and technology networks, clusters and subcontracting chains
Existing interest groups	Search for new participants
Rent redistribution	Future changes to rent redistribution
Investments and public initiatives	Innovations and private initiatives
Sectoral development strategies, target budgetary programmes and “assembly” at sector level	Multiplicity of instruments, quasi-fiscal nature and “assembly” at company level
“Discretionary” decisions	Decision rules

The traditional (vertical) industrial policy generally attracts representatives of the state, especially where an industry sector specific interest group is involved. This shift in attention may be explained, amongst other things, by the following:

- the critical nature of issues of employment at large enterprises from the perspective of social stability;
- the ease of direct interaction and influence on the state sector from the perspective of the control of socially-sensitive prices;
- under conditions of scant mutual confidence between the state and business, the existence of reciprocal obligations, of the personalisation of big business and of enforcement opportunities provide advantages when focusing on big business;
- the consequences of decision making in the context of a vertical policy can be better modelled and assessed, and the effects appear with a smaller delay; and
- where the learning mechanisms are weakly-developed the propensity for discretionary decision-making is inevitable in the course of implementation and adjustment of the mechanisms of industrial policy.

In 2009–2011, there was some *extension of the access to and institutionalisation of new interaction channels, as new instruments appeared aimed at extension of the representation of new interest groups*. However, the process of progress towards a technological industrial policy was accompanied by the continued existence of principles of verticality in its formation, among which were the following:

- (1) a focus on the interests of the major players, as a result of the expansion of their membership through the academic, scientific and technology sectors;
- (2) weak competitiveness of the state institutions, in some cases features of monopolization of viewpoints on possible approaches and evaluation are observed;
- (3) limited attention towards the demonstration effect and the transfer of best practices, an emphasis on the use of public (quasi-public) resources;
- (4) a relative openness to proposals, but a closed approach to decision-making procedures and the appraisal of results; and
- (5) personification, non-transparency of “exchanges” during redistribution, and the use of informal arrangements.

In the context of an underdeveloped system of “horizontal” assessment and the comparison of proposals from different interest groups, with a distribution of responsibility between different players this increased *the risks of inconsistency and opportunism in the formation and implementation of industrial policy*.

C. General assessment of characteristics and problems in the development and implementation of Russian industrial policy

Based on an analysis of the processes of formation and implementation of Russian industrial policy in the 2000s, we can draw the following general conclusions.

1. Russian industrial policy of the 2000s predominantly consisted of efforts to prevent negative structural changes and to compensate for the losses of domestic producers. This policy was largely related to attempts to use the technological advances obtained as far back as in Soviet times. Only in recent years are there signs of a proactive agenda when industrial policy began to turn to the promotion of progressive changes in the structure of the economy and to the development of new sectors, knowledge and skills. The innovation policy has also changed, more and more prominence being given to the formation of new competencies and areas of expertise.

2. The system of priorities in Russian industrial policy has been continuously transformed. In most cases this has involved an extension of those priorities; in which regard the priorities have stopped fulfilling their meaningful function of encouraging concerted action of the state and business. The selection and shift of priorities occurred mainly outside of the broad dialogue between “society – state – business” and were more ad hoc.

Russian industrial policy is mainly connected with the domestic market, which raises the risks of protectionist barriers, the substitution of private demand with public demand aimed at supporting selected priorities of government and an ongoing multiplication of the problems and expenses connected with inappropriate startup solutions.

3. In 2004–2008, the process of renewal of interest groups was rather weak. That can be attributed, amongst other things, to the process of formation of “vertical of power” structures and the strong influence of traditional interest groups on the feedback channels. The access channels were poorly institutionalised, and access itself was strongly personalised.

The predominantly latent character of the industrial policy implemented by the state often led to discrepancies between the declared tasks and the real ones, and this extended the opportunities for rent-focused behavior and indirect lobbying for the interests of particular businesses and owners. The significant advantages for lobbying by the traditional interest groups reproduced the vertical model of industrial policy, combined with its low predictability and episodic nature.

4. Instrumental Russian industrial policy gravitated toward the allocation of funds, while the regulatory instruments were considered ineffective. The traditional direction of support within Russian industrial policy is the promotion of domestic demand, including the active use of FTPs and public procurement, the fixing of different quotas and preferences for certain groups of producers. The ideology of Russian industrial policy was materially attributable to the building of state capitalism, which was why there was also a niche for the instruments of consolidation of state ownership in that ideology.

5. The existence of rent from large natural resources allowed “defraying” of the costs of the contradictory industrial policy, where decisions were first made in favour of one interest group and then in favour of another. In comparison with horizontal policy, a vertical policy is less able to use a demonstration effect and its implementation requires a significantly larger volume of public expenditure. In view of the scantiness of budgetary resources and of the opportunities for their redistribution (a general reduction of budgetary mobility), there was increased demand for an effective industrial policy, a policy of using demonstration effects.

6. In recent years, the process expanding access began, but predominantly with regard to alternative proposals and, to a substantially lesser extent, with regard to decision making. Although the access for new interest groups is being extended, civilised competition between interest groups and between state institutions, remains limited.

In 2009–2011, there were signs of a transition from sectoral industrial policy to a technological industrial policy; however, Russian policy still retains signs of verticality. This predetermines ongoing fundamental risks in the implementation of the policy, including the risk of its “seizure” by factional interest groups. The process opens up access ahead of the transformation of the industrial policy from a vertical to a horizontal one. Where there is an underdeveloped system of “horizontal” comparison of the proposals from different interest groups and the distribution of responsibility between the different players, this raises the risk of inconsistency and opportunism in the formation and implementation of such an industrial policy.

7. The insufficient quality of state institutions limits significantly the opportunities for an effective industrial policy to be pursued in Russia, both vertical and horizontal. The difficulties for Russian state institutions in implementing industrial policy are attributable, in particular, to the limited feedback channels; the skills-shift of state officials from the technocratic (industry-specific and scientific-and-technical) to economic ones (financial, management and institutional); and limits choice by virtue of the domination of traditional interest groups and the ineffectiveness of agreements.

8. A system for evaluation of the performance of industrial policy is virtually absent. The processes involved in its adoption are characterised by the non-transparency of the groups of potential beneficiaries and political bias in the appraisals. The procedures for identifying and disseminating best practice in implementation of industrial policy are quite limited.

Analysis of examples of the formation and implementation of industrial policy in development of the automotive and nanotechnology industries

To analyse the Russian practice of adoption and implementation of industrial policy, we have chosen two fundamentally different sectors which have become a state focus from the perspective of the significant efforts and resources used, which has allowed a consideration of the different approaches to adoption of the policy and its model.

The first sector – car-making – is assumed to be a low level medium-tech sector¹. It is characterised by a significant size, the existence of big and very-big companies and a permanently high level of interest from the state, not least because of the high social significance of those enterprises providing employment for a substantial part of the population, not only in population centres, but also in individual regions.

The second example is connected with the efforts which the state has made in recent years concerning the accelerated development of a new hightech area – the nanotechnology industry, which is based on the creation and commercialisation of nanotechnologies – a domain considered by the state as an area with the greatest priority. In that context, this direction is characterised not only by an increased focus from the state, but also by the large-scale expectations (declared in official documents) with regard to its influence on the economic structure, living standards of the population and national security.

A. Car manufacturing industrial policy

Industrial policy preconditions: automotive industry state and mechanisms of development

The implementation of the state policy in the automotive industry of Russia and emerging market countries is determined by very similar launch environment:

- growing demand for cars in the domestic market;
- the limited scale of national car plants in comparison with the international manufacturers;
- technological leadership of international car makers and limitations of technology transfer;
- international restrictions on implementation of the state policy, including the WTO's trade-policy standards.

As the income of the population grows, *the demand for cars for personal use grows, too*. This demand may be additionally extended at the cost of customer lending. The prices of the cars purchased in emerging markets tend toward the figures of developed countries – the demand is switched to models identical to those of more mature markets. The growth of the economy as a whole also encourages the growth of road haulage and of passenger bus services. The sales growth in the vehicle markets of the developing countries consistently exceeds that of the developed markets. The international automotive companies obtain from 10 to 55% of their profits in the markets of the developing countries where they account for from 15 to 40% of the sales volume.

The modern technological conditions of the automotive industry are characterised by the high *cost of introduction of R&D (research and development) for the development of an own-product* (new platforms and models of cars, and new key components). These expenses are worth making only if a certain minimum production volume can be achieved, estimated at the level of 1million cars per year. Those car companies which do not exceed this bar do not get obtain the economies of scale of the high-volume market segments and are niche producers.

Therefore, we can see the intrinsic difficulties of the domestic producers in countries with developing economies. These companies, as a rule, do not achieve the production volumes necessary for a full-scale financing of R&D and the independent development of new car models.

¹ See, for example, I. Frolov. 2010. Capabilities and problems of modernisation of Russian high technology complex. <<http://viktorvoksanaev.narod.ru/h14tt.pdf>> ; V. Spitsyn. 2010. Aspects of innovative development of high technology and medium technology sectors of Russia. <<http://sun.tsu.ru/mminfo/000063105/342/image/342-166.pdf>>.

Taking into consideration the spare capacity in their domestic markets, international car manufacturers prefer low-cost options for entry to the markets of developing countries – through imports or the organisation of assembly plants with low added value. A deeper *localisation of manufacturing* is performed with the purpose of cost reduction and access to markets defended by tariff barriers. In the first case, the most significant factors for the international car manufacturers are the investment climate and the long-term competitive advantage of production inside the country. In the second case, the creation of import-substituting production depends on the initial level of the tariff protection, the prospects for growth in demand on the internal market and on the behavior of competitors which are also considering localisation of their manufacturing.

In the context of the implementation of international trade agreements, the opportunities of developing countries with regard to tariff protection of their domestic markets are reduced, as the trade limitations which are connected with obligatory investments and localisation of manufacturing are abolished or eased. Under these conditions, where the interests of the state, domestic and international producers meet, there are the foundations for the formation of different types of **corporate alliances** for industrial cooperation. The role of the state policy is to choose an acceptable approach to integration into the global car market, which would ensure the growth of the competitive advantage of the domestic automotive companies or the achievement of other declared goals, taking into consideration the interests of the users of the products of vehicle manufacturing.

Systemisation of state policies

The importance of the automobile sector for the economy determines the diversity of the measures of providing state support. There are differences in the set of measures used by developed countries, where there are large domestic car manufacturers, which compete in the global market, and by developing countries, which are creating their own national automotive industries. These differences are determined by the level of maturity of the market and the need for auto-mobilisation, as well as by the resources of the state to support the sector.

For *developing countries* with a large potential demand, the task of utmost importance is the localisation of the manufacturing of foreign models and the preservation of high levels of the trade barriers. For *developed countries*, the tasks of prime importance in the area of state policy in the automotive industry are the preservation of the international competitive advantage of production, including at through development and mastering the manufacturing of new innovative products whilst restructuring wasteful production. Developed countries show almost no use of tariff protection measures for their national markets because of the large gap in the quality of the products from international manufacturers and the manufacturers from developing countries.

There were also essential differences in the measures which were taken in automotive industry *before and during the 2008–2009 financial crisis*. The volume and nature of measures for the support of car manufacturers which were taken in the developed markets as part of their implementation of anti-recessionary measures, could have provoked a wave of criticism, if the measures had been taken in developing countries for the development of their national automotive manufacturing in the period before the crisis (there was violation of competitive conditions, the subsidising of domestic producers, etc.).

Table 12 shows the main measures aimed at state support of the automobile industry applied in Russia and abroad, classified by the types and purposes of their application.

A separate area of state policy, which is not specially considered herein, is the support for the development and implementation of fundamentally new types of power units for vehicles (electric and hybrid engines) and other deep innovations which demand large changes in the infrastructure (for example, the creation of a network of electric charging points), in the existing business models of the market participants and in consumer behaviour.

Table 12

**Measures aimed at support of the development of the automotive industry
by directions of control and instruments applied**

Purpose	Measure Types					
	Budget expenses	State support of lending	Customs tariff	Taxes	Technical regulation	Other control measures
1	2	3	4	5	6	7
1. Stimulating Demand for Cars	<ul style="list-style-type: none"> State subsidies in the case of trading in of an old car for a new one – so-called “scrappage schemes” (*) Certain tax and levy recovery for buyers (*) Public procurement of vehicles 	<ul style="list-style-type: none"> Temporary credit lines for financial intermediaries in automobile lending (*) Interest rate subsidies for loans to purchase automotive equipment 		Variation of tax rates: <ul style="list-style-type: none"> For vehicles (included in the car’s price) Transport fuel taxes Taxes and fees related to car use (transport tax) 	<ul style="list-style-type: none"> Prohibition or restrictions on certain vehicle types (obsolete engine types, left-/right-hand-drive models, etc.) 	<ul style="list-style-type: none"> Certain measures aimed at restriction on or extension of the use of cars in cities (for example, small cars and electric cars)
2. Development of New Car Manufacturing Plants	<ul style="list-style-type: none"> Production infrastructure and industrial site preparation Grants for production development (*) 	<ul style="list-style-type: none"> Loan financing for creation of new plants and products (*) 	<ul style="list-style-type: none"> Customs tariffs cut for equipment and components 	<ul style="list-style-type: none"> Tax benefits/holidays for new plants Accelerated amortisation 		<ul style="list-style-type: none"> “Horizontal” incentives for the development of industrial production in general Requirement for the development of related industries and suppliers
including localisation of manufacturing foreign car models and their components			<ul style="list-style-type: none"> The preferential tariffs are connected with production requirements, including local purchase (*) 		<ul style="list-style-type: none"> Simplified requirements for product certification 	<ul style="list-style-type: none"> Different additional requirements for newly created plants (**)
3. Export Support	<ul style="list-style-type: none"> Marketing and advertising support and trade fair activities 	<ul style="list-style-type: none"> Export crediting (suppliers and buyers) Export risk insurance 	<ul style="list-style-type: none"> Participation in trade negotiations on access to markets of other countries 	<ul style="list-style-type: none"> Timely VAT recovery 	<ul style="list-style-type: none"> Harmonisation of foreign and national certification standards 	

Cont’d

1	2	3	4	5	6	7
4. Financial Stability of Manufacturers and a Competitive Environment	<ul style="list-style-type: none"> Financing of different production development programmes (*) 	<ul style="list-style-type: none"> Temporary provision of loans to refinance the debt market (*) 		<ul style="list-style-type: none"> Tax credit (*) 		<ul style="list-style-type: none"> Restrictions on foreign participation in capital Approval of mergers and acquisitions Controlled bankruptcy
5. Car Distribution			<ul style="list-style-type: none"> Rules for the imports of cars by high volume importers 			<ul style="list-style-type: none"> Permit for creation of a distributor network (in developing countries) Management of the contracts of dealers and manufacturers (in developed countries)
6. Rise in level of technology	<ul style="list-style-type: none"> R&D expenditures Co-Financing Transfer and commercialisation of intellectual property created by means of state financing 	<ul style="list-style-type: none"> Loans for R&D activities 		<ul style="list-style-type: none"> Reduction in most significant taxes for R&D (for example, employment tax cuts) 		<ul style="list-style-type: none"> Identify long term Technology development priorities prioritisation (foresight)
7. Environmental Requirements			<ul style="list-style-type: none"> Embargo on imports or increased import duties for automotive equipment which does not conform to the national standards 	<ul style="list-style-type: none"> Scrappage fees Tax differentiation in accordance with the cars’ emission classes 		Requirements as to: <ul style="list-style-type: none"> specific fuel consumption figures high-pollution cars certain car materials and components
8. Human resources and labour relations	<ul style="list-style-type: none"> Changes to specialist training programmes in public educational institutions Professional retraining in the case of business closure 					<ul style="list-style-type: none"> Limit of the use of temporary employment Trade unions’ rights and prevalence

	• Co-financing of retraining programmes					
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(*) Denotes anti-recessionary measures to support specific car makers in Russian and foreign markets in 2008–2009.

(**) Permitted geographical distribution of manufacturing volume, the content of technological operations, local production or the buying of certain components and parts, production technology transfers, new product development, staffing management, staff training and other requirements.

Application and results of industrial policy in the automotive industry

In the period beginning from 1998, we can see several stages in the development of state policy in the Russian automotive industry, which differ from each other in the sets of measures applied and in the main beneficiaries – the companies at which those measures were aimed.

1. The investment regimes for foreign car makers, which had been valid before 2006 (the “bonded store” regime) allowed for organising “light” assembly of foreign car models in Russia. That regime was used to organise initial assembly from prefabricated vehicle kits at plants in Kaliningrad (Avtotor) and Taganrog (TAGAZ). The first foreign car maker which independently organised car manufacturing in Russia after perestroika was Ford (at a plant in the town of Vsevolozhsk).

2. From 2005, customs duties for the import of second-hand cars were increased (including for imports by private individuals) simultaneously with the opening of an investment regime which allowed for a decrease in the duties for imported car components for organising local production facilities with a production volume of not less than 25,000 cars per year (the so-called “No. 1 Investment Programme” or “industrial assembly”). The required final level of localisation of production was, in practice, 30%. It is an extremely soft regime for the access of foreign car makers to the market, both by in production volume and by the localisation requirements

According to the Eurasian Economic Commission, as of July 2012, there are agreements with 31 companies, but only 18 of the enterprises had started car manufacture. Altogether, within the limits of the industrial assembly regime, there are 178 agreements in the car manufacturing sphere and 74 in car component manufacturing.

3. In 2008–2009, during the global financial crisis, the measures for state support were reoriented towards ensuring the financial stability of the domestic car makers (primarily, AvtoVAZ), as well as supporting the demand for cars by support for lending to individuals and the public procurement of automotive equipment at a federal and regional levels. Those steps allowed retention of financial stability in the domestic automotive companies, including AvtoVAZ; however, the effectiveness of implementation of those measures is still doubtful.

The measures aimed at providing support for demand allowed mitigation but did not prevent recession of production in the industry. In 2010–2011, other measures aimed at supporting demand were also implemented, including the an experimental payment to the buyers of new cars for their old cars handed over for scrappage.

4. Within the framework of completion of the negotiations on the accession of Russia to the WTO in 2010, some important understandings were reached concerning exceptions to the agreement of restrictions on investment measures in trade for the industrial assembly regime in the automotive industry. That allowed the introduction of a modified regime of “industrial assembly” (the so-called “No. 2 Investment Programme”) with raised demands for localisation after project completion (both in the total contribution of Russia-manufactured car component – 60% instead of 30%, and additional requirements for the localisation of engine manufacturing) and in the scale of production scale (300,000–350,000 cars per year instead of

25,000 cars). As of 2011, four such agreements were concluded, three of which were those with associations of several car makers: the Volkswagen Group Rus; the Ford Motor Company, Ford Sollers Yelabuga and Sollers-KAMA; AvtoVAZ, Avtoframos, Nissan Manufacturing RUS, Obyedinennaya Avto Gruppa, KAMAZ and Mercedes Benz Trucks Vostok; GM-AvtoVAZ and General Motors Auto.

5. The new investment regime will operate in conjunction with other state support measures declared as part of the Strategy for Automotive Industry Development in the Russian Federation until 2020 and the state programme “Development of Industry and Increase in its Competitive Advantage” (the Automotive Industry Subprogramme).

In 2014, the main areas of expenditure will be support for employment at plants under conditions of a limited demand for car industry products¹, as well as for the partial compensation of the costs related to the implementation of the environmental standards Euro 4 and Euro 5. Furthermore, subsidies aimed at financing investment projects will be financed by loans and, preferential loans for individuals for the purchase of vehicles, in addition to covering the costs for transportation of cars from the Far East.

The Russian automotive industry is characterised by a significant concentration of production with relatively few companies, which, during the period in question had quite large differences in their strategies.

The most important of such differences in the strategies of the domestic car makers may be referenced to the product line of cars being manufactured and to the nature of the partnerships with foreign automotive companies. Depending on the initial conditions of their performance in the industry, the automotive companies could choose between a continuation of the manufacture of domestic cars, the assembly of foreign models with different depths of localisation and the manufacture and development of joint models, again, with different depths of integration of the technologies of the parties involved.

Table 13

Content and timings of state policies (beginning from 1998)

Policy programme	Period	Main stakeholders	Main policies
Investment Modes Before 2006	1998–2006	<ul style="list-style-type: none"> • Importers • “Offshore” car assemblers (Avtotor, TAGAZ) • “Pioneers” (Ford-Vsevolozhsk) 	Bonded store regime
Investment Programme 1	2006–2011 (accession to the WTO)	<ul style="list-style-type: none"> • Car assemblers as partners of foreign companies (e.g. Sollers) • Foreign companies 	Industrial car assembly regime with minimum requirements
Crisis Bailout Programme	2008–2009	<ul style="list-style-type: none"> • AvtoVAZ and other domestic car manufacturers • Foreign assembly plants 	Support for demand Direct support for domestic automotive companies
Investment Programme 2	2010 – present day	<ul style="list-style-type: none"> • National consortia of companies (including consortia in partnership with large car manufacturers and manufacturers of car components) 	Exclusive localisation standards, including for large car components
Other measures of state support compatible with the WTO requirements	2010 – present day	<ul style="list-style-type: none"> • Support of incumbent companies 	Support for technical upgrading, fleet replacement and other measures

Foreign companies could choose between the import of finished cars or production startup in Russia, and in the case production startup – between independent organisation of

¹ The Strategy for automobile industry development prior to 2010 and concept of the Strategy staff assistance approved thereafter determines formally the priorities for production restructuring and for increase in labour productivity while current announced measures are aimed at the maintenance of work positions available.

manufacture at their own production facilities and the formation of alliances with Russian manufacturers. Foreign companies could also combine such production strategies.

During the stages of state policy in the automotive industry, referred to above, the profits and costs changed in connection with the implementation of the enumerated strategies of domestic and foreign car makers. Accordingly, the types of companies, which were principally interested in particular results of the implementation of state policy, changed.

Control over the then existing Russian car plants in the period from 2000 to 2008 was transferred to new owners. In 2000, the metals company Severstal and Bazovy Element Holding (which is the controlling shareholder of the United Company RUSAL) acquired control of the Ulyanovsk and Gorky Automobile Plants, respectively. The decisions might have been motivated by the unofficial support of the state with regard to diversification of production and by the necessity to develop the manufacturing sector. In 2005–2008, the state company Rostekhnologii obtained control of the AvtoVAZ plant, which was privately owned, and the KAMAZ plant, the controlling interest of which belonged to the federal and regional authorities.

There were the following “turning points” in the strategies of the Russian car companies, which were characterised by the different requirements of existing state policy, especially in the sphere of customs regulation:

- the decision to whether to develop domestic models or to transfer to the assembly of foreign models;
- the choice of which way to improve domestic models by borrowing technology from foreign suppliers; and
- the choice of foreign partners and agreements on possible technological cooperation with regard to new joint models.

According to experts, the UAZ/Sollers’ strategy is mostly aimed at foreign model assembly and is being implemented in the niche market of off-roaders, which creates interest in small-scale industrial assembly regimes.

The companies GAZ and KAMAZ initially had a greater competitive advantage over imports in the niche markets for commercial vehicles than AvtoVAZ had in private cars. Implementation of technologies borrowed from foreign suppliers in these companies seems to be sufficient to guarantee a competitive advantage for their products in comparison with imported models. These companies could also be more interested in the localisation of manufacturing automotive components than in finished products.

Finally, in the light of the specific features of business competition in the car sector, where the returns of scale manifest themselves to a greater extent, the issue of getting a new process platform and beginning manufacture in association with a foreign partner was particularly important for AvtoVAZ. On this basis, AvtoVAZ should be interested in an industrial assembly regime which allows for the launch of large-scale manufacturing.

In general, the measures taken in Russia during the period from 2005 to 2010 which were aimed at encouraging foreign investment into the car industry failed to provide improvements in the trade balance for automotive products.

In 2000, the volume of imports and exports of automotive products in Russia was quite well-balanced, and the total trade turnover amounted to about \$2.1bn. By 2010, the volume of registered imports of automotive products had increased twentyfold, which was related to the increase of imports of both finished products and car components. By comparison, Russian

automotive product exports are only about 9–12% of the import volumes (in Brazil and China the figure is 50–60%).

Reported data for ‘The Automotive Industry Development Strategy for the period until 2020’ also show that the steps taken to localise manufacturing did not make possible sufficient import substitution. From 2003 to 2008, the number of imported cars increased from 1.1m to 2.8m, while the localised production of car models increased from 200,000 to 600,000. Production of the traditional Russian models decreased by approximately 200,000 in the same period. Considering the difference in the prices for Russian cars in Russia and for cars imported into Russia, the share of imports is even greater in monetary terms in the Russian market.

As a result of the implementation of a policy of opening foreign assembly factories and a gradual localisation of manufacturing, Russia now occupies a position between the countries where the supply is formed by the production of foreign models and where the domestic producers are poorly developed (Brazil) and the countries which purposefully develop their car industries in cooperation with international automotive companies (India and China).

As a result, the current figures for Russian automotive products in the balance of foreign trade are not too promising: Russia is the fifth in the world by imports of automotive products (after the European Union, the USA, China and Canada), and it is not even among the top 15 large exporters of automotive products. Russia’s 2011 automotive product export volume was smaller than that of the RSA (Republic of South Africa) or that of the UAE (United Arab Emirates).

It is expected that the new industrial assembly investment model will bring an opportunity for improving the trade balance in respect of automotive industry products by virtue of an increase in the proportion of added value by Russian enterprises.

To summarise it is important to comment on the following.

- The target-oriented image of the automotive industry in countries with developing economies is a replication of the experience of South Korea in 1970s-1980s when it was trying to create a competitive position in the world market as a car producer. From a country perspective the achievements of this goal would be characterised by a positive surplus in automotive industry products. Nevertheless, replication of South Korea’s experience nowadays is difficult to implement due to the high level of competitiveness in the global automotive market and due to the existence of different institutional limitations, including the international trade agreements under the WTO.
- Developing countries use various opportunities for cooperation with world automotive producers: they may organise assembly plants for foreign models and the production of automotive parts within the country and do it at different levels of localisation, or they may establish mutual enterprises or purchase niche automotive producers in developed markets. Those strategies differ in the depth of technology transfer and in the contribution of the automotive industry to the added value.
- Active measures for stimulating foreign investments into the Russian automotive industry during the period from 2005-2010 did not provide any improvement in trade balance in the automotive industry. Between 2000 and 2011 the import of automotive products into Russia increased by 40 times in terms of value, while exports grew by only by 4 times. Nowadays Russia is the fifth largest importer of automotive products in the world, but it does not featured as a large international exporter state.
- In spite of the fact that import substitution is not represented in the Russian market, a corporative structure within the sector has been created and an investment regime has been

introduced under the terms of the WTO. The regime provides for deeper cooperation between national and foreign automotive producers and is helping to increase the scale of production at new plants to allow it to reach the level of foreign counterparts and to broaden its domestic production of automotive parts.

B. Industrial policy on the development of the nanotechnology industry

The process of development and realisation of industrial policy in the development of the nanotechnology and nano-industry sectors in Russia began relatively recently. During the first half of the last decade the above issues regularly became the subject and point of discussions at the level of individual ministries and agencies and also within the Government of the Russian Federation. Certainly, the formation of the National Nanotechnology Initiative in the USA was a particular “trigger” for this process.

The process of formation of Russian government policy in the sphere of nanotechnology and nano-industry was started in 2006; the President of the Russian Federation acted as its initiator and active participant: the nanosystems industry has become one of the major directions of development for science technology and engineering. The list of crucial technologies includes nanotechnologies and nanomaterials, and the corresponding issues have been raised in presidential addresses to the Federal Assembly.

In the middle of 2006 the Government of the Russian Federation accepted the *Program for Working Coordination in The Spheres of Nanotechnologies and Nanomaterials*. This document, like almost all other documents else in this sphere, was distinguished by the magnitude of its targets which were not followed by any indicators of their achievement. The Program was not provided with its own “separate” budget support. It was only indicated that the budgets of target programmes and non-Programme activities could serve as its financial resources. Funds allocated for the maintenance of institutions could also used as a financial resource for the Program. Implementation deadlines were not determined either. On the whole, the document should be recognised to be excessively generalised and declarative; but nevertheless it included a number of steps which have become key elements of government policy in the sphere of nano-industrial development.

The publication in 2007 of the *Presidential Initiative “The Strategy of Nano-Industrial Development”* was, without doubt, the initial stage of active government policy in regarded to this field. The “status” and the “ambitious character” of the document have emerged already at the level of the formulated aims and goals which concern not only the spheres of nanotechnology and nano-industry, but also the socio-economic developments in general. Just like the abovementioned coordination Program the Presidential Initiative lacked any target indicators and financial projections. But in spite of its some of its pretentiousness, this document has not become just one more composition of “catchwords and imaginings” of the government (from our point of view, its presidential status contributed to this): the President Initiative has fixed the major instruments of government policy in the sphere of nanotechnologies; the necessity for the formation and development of the national nanotechnology network has been determined; and substantive areas to support its activities have been formulated. Looking ahead we can note that the President Initiative has played a key role in the formation of government policy in the nanotechnology and nano-industrial spheres and it still remains essentially the only strategy document in the sphere of development of these sectors and branches which has been implemented almost in full, at least insofar as the formulated activities and instruments are concerned.

Perhaps the most important practical governmental step towards ensuring the development of nano-industry has been the establishment of the *Russian Corporation of Nanotechnologies* – the relevant law being passed in 2007. The high importance of this government corporation can be explained by its legal forms and targets which cross the borders of the “traditional” competence of major government sectors, and by the fact that the President of the Russian Federation and both chambers of the Federal Assembly were directly engaged in the formation of its Supervisory Council. At the same time, judging by its basic functions, this government corporation was a financial development institution of albeit with extended powers: its major functions were determined as the selection and support of three categories of project: Research and Development projects, a project which includes the introduction of nanotechnologies or the manufacture of such products together with projects on specialist training. We should underline that in 2010 this government corporation was transformed into a joint-stock company, but this transformation has not led to any significant changes in the profile of its activities. The only difference is that support for projects in the spheres of infrastructure and education has been handed to a specially established fund.

In August 2007 the Federal Target Program “*Development of the Infrastructure for Nano-Industry in the Russian Federation in 2008-2010*” was intended to support the formation of the essential infrastructure needed for the functioning of the National Nanotechnology Networks: the instrumentation and the information-analytical and methodological infrastructures of the nano-industry.

At the beginning of 2008 the composition of the basic documentation with regard to this sphere was enlarged by the state Program of *Development of the Infrastructure for Nano-Industry in the Russian Federation until 2015*. Unlike the Presidential Initiative that was, primarily, an “ideological” document; this Program was intended to become a practical basis for the realisation of integral government policy on the development of nanotechnologies and the nano-industry. Judging by the content of the Program it had a purpose at a higher level than the Federal Target Program, departmental programmes and non-program arrangements. But in practice the Program has become no more than a “superstructure” because its status has not been officially confirmed. This was the reason why the Program did not have its “own” resources – its financial provision included only those funds which were allocated under other programs and support instruments. These aspects do not mean that this document is worthless from the point of view of the “construction” of government policy: in comparison with the Presidential Initiative the Program includes a concrete and operational determination of the major stages of nano-industry development, their targets and emphasis; the Program has documented, for the very first time, clear quantitative benchmarks for nano-industry development (even though some target figures seemed, at first, to be very difficult to achieve); finally the major participants in the development of nano-industry and the sum of all the relevant instruments of government policy have been determined.

In 2008 the process of formalisation of *the National Research Center, the “Kurchatovsky Institution”* began. This is the major element of the scientific research component of nano-industry and is the central link of the National Nanotechnology Network, on which rest such functions as the coordination of scientific activities on the implementation of the Presidential Initiative. In 2010 the process was “crowned” by the adoption of a special law that established that the National Research Center is the direct responsibility of the government, which was its founder, accepted its charter and represented the government. Coupled with the fact that the

National Research Center is the main manager of budgetary funds it has obtained an extremely high status in the system of government.

Since 2011 intensity of implementation by the state of new practical steps in the sphere of nanotechnology and the development of nano-industry has decreased which is not unexpected since all the major instruments and measures stipulated by the Presidential Initiative had been implemented in one way or another. The activities which have since been undertaken are to a large extent technical.

The following *major interest groups* in the spheres of nanotechnologies and nano-industry in Russia can be identified:

The state. Since we are essentially talking about the creation of a new sector, the key player is actually the state. Its basic interests are quite clearly revealed by the targets of strategy and programme documents adopted in this field: an increase in the level of implemented research works and developments in the spheres of nanotechnologies and nano-industry; the entry of Russia into the list of world leaders in relevant field; the guarantee of successful commercialisation within Russia of the developing technologies and the creation of new high-tech manufacturing based on those technologies; a substantial increase in the amount of manufacture and export of particular products and at last an improvement in the structure of the Russian economy, the quality of life of the population and in national security. Furthermore, under increasingly stringent budgetary restraints, the aim of a rapid return on investments comes to the fore.

Scientific institutions. These are interested in obtaining funding for carrying out research and development, the evaluation of the material-technical base and the maintenance of current activities preferably on a regular basis. It is important to underline that this particular group (represented primarily by the Kurchatovsky Institute) was one of the originators of the government policy of support for the nano-industry in Russia. Which is why it is no surprise that in practice the policy to a large extent ensures the realisation of the interests of a rather narrow circle of scientific organisations, primarily, the Kurchatovsky Institute).

Higher Education institutions. In addition to their requirements as scientific organisations, these institutions are also interested in target financing of specialist training in the spheres of nanotechnologies and nano-industry. This interest is partly realised within the educational projects and programmes implemented under the authority of “RUSNANO”.

Russian Business. Business is interested in the development of promising new products and technologies which are ready for commercialisation, and also in the availability of funding for their manufacture and market launch. Currently the supported projects embrace only an extremely small part of the potential “audience”.

Foreign Business. This is also interested in the commercial use of advanced Russian nanotechnologies, as is proved by the participation of foreign investors in venture capital funds founded by “RUSNANO”. Furthermore, some individual companies are showing interest in the creation of their own production areas within Russia and, generally, in the development of the Russian market.

Venture investors. These are interested in the appearance of a significant amount of new development with a substantial potential for commercial usage, but nowadays there are some problems with this in spite of the scale of government support.

The key role in ensuring the development of funding *supply* for nano-industry belongs with the financing of the government corporation “Rusnanotech” / OAO “RUSNANO”: in general, during the period being considered this instrument of support has obtained more than a half of

the budget appropriations – about Rb 130bn; furthermore, “RUSNANO” has been given governments safeguards to the value of Rb 120bn. The annual amount of budget assignments for all other supported areas is about Rb 20bn, and one third of 120bn. has been assigned to the National Research Center, the “Kurchatovsky Institute” for the last years.

If we are speaking about the *results* of the policy being implemented by the government (Table 14), then we should say that recent years have witnessed a stable increase in domestic spending on research and developments in the sphere of nanotechnologies. There has also been some increase in the proportion of total expenditure on R&D; and it is obvious that the effect is, to a large degree, explained by large-scale government investment into the nano-industry.

Table 14

Factors in the development of the spheres of nanotechnologies and nano-industry

	2008	2009	2010	2011
1	2	3	4	5
Internal spending on research works and developments in the sphere of nanotechnologies, million Rub	11,026	15,113	21,284	26,086
The proportion of domestic spending on research works and developments in the sphere of nanotechnologies, of the total domestic expenditure for research and development, %	2.6	3.1	4.1	4.3
The amount of organisations implementing research works and developments in the sphere of nanotechnologies	463	465	480	485
The proportion of organisations implementing research work and development in the sphere of nanotechnologies, as a percentage of the total number of organisations implementing research work and development	12.6	13.2	13.7	13.2
The number of researchers implementing research work and development in the sphere of nanotechnologies	14,873	14,500	17,928	21,166
The proportion of researchers implementing research work and development in the sphere of nanotechnologies, as % of the total number of researchers	4.0	3.9	4.9	5.6

Cont'd

1	2	3	4	5
The value of innovative goods, works and services connected with nanotechnologies, million Rub	582	1,074	52,921	63,029
<i>Indicators of the Development Program for Nano-Industry in the Russian Federation until 2015</i>				
<i>Domestic spending on research works and the development promising directions in nano-industry, mln. rub</i>	<i>10,300</i>	<i>14,300</i>	<i>20,000</i>	<i>28,000</i>
<i>The number of researchers implementing research works and developments in the sphere of nano-industry</i>	<i>10,300</i>	<i>10,600</i>	<i>10,900</i>	<i>11,200</i>
<i>Sales of products of nano-industry, million Rub</i>	<i>20,000</i>	<i>80,000</i>	<i>155,000</i>	<i>240,000</i>

These figures can be regarded as evidence of development dynamics of the Russian nano-industry, but based on these it is difficult to judge how appropriate such resources dynamics and effort are for the industry. Some understanding can be gained by the comparison of these figures with similar indicators from the Program for Development of Nano-Industry: if the planned and actual values of the amount of spending on research work and development are fairly similar and the number of researchers is higher than the indicators shown, this means that the actual realisation of nanotechnological products is significantly higher (by several times) than the planned realisation.

So, the government policy implemented in the sphere of nano-industry has significantly more impact on the “input” characteristics (financing of the R&D, the number of researchers) than the results of product realisation. The significant obstacle on the path of development of the nano-industry is represented by an unavailability of a substantial number of developments for commercialisation, including very promising ones. As a result there is no stable “flow” of

innovational projects; while the projects which are being realised are rare and do not lead to any significant economic effects.

C. Special features of used approaches, achieved results and problems

These examples allow us to distinguish two fundamentally different approaches to the realisation of industrial policy (*Table 15*). The situation with the automotive industry addresses the support of a large traditional sector with an inclination for attracting investments from leading foreign companies, the creation of new production areas with a larger degree of localisation. All these are combined with the support for national automotive manufacturers (primarily to retain jobs). Industrial policy in the sphere of nano-industry has the aim of guaranteeing the formation of a new globally-competitive high-tech sector, important for the national economy; the major policy directions here include creation of the necessary infrastructure (including financial), the guarantee of advanced promotion of the research work and developments, and at the same time, a rush to increase in the volume of manufacture of nanotechnology goods.

The instruments used by the government also varied significantly: the policy used for the automotive industry was based on the application of customs and tariff regulation, stimulating demand for the products of the national vehicle manufacturers (including, importantly, the Russian production areas of foreign companies) as well as assigning various budgetary funds to specific enterprises (primarily to AvtoVAZ). To support the nano-industry, a new large-scale development institution, RUSNANO, was founded; a special Federal Target Program was instigated to create the essential research and informational infrastructure; the National Research Center, with an appropriate profile, has been set up to provide government funding for research and development.

When talking about the results of these measures, it should be mentioned that the simultaneous attraction of several leading world automotive producers to Russia, their creation of stable alliances with Russian companies, the organisation of a string of new production facilities and, as a result, an improvement in the general culture of production and, last but not least, the significant progress of industrial development in separate regions are obvious signs of the successful support of the automotive industry. On the other hand, the policy, as implemented, has not provided any improvement in the balance of trade in automotive industry products, and has not led to any significant development of its own private research and development competences; besides which, the original players still operate in the market alongside the new, retaining their ‘competitiveness’ primarily through government support.

Table 15

**Special features and outcomes
of industrial policy**

	Automotive industry	Nano-industry
The Sphere of Political Realisation	A traditional middle/ high-tech branch, rather large	An entirely new high-tech sector, with significant promise for the economy
The Beginning of Realisation	1998 (2006 – activation)	2007
Initiator interest group	Structural	Scientific-technological
Emphasis	<ul style="list-style-type: none"> • Attraction of foreign investments • Support for cooperation • Creation of new manufacturing, localisation • Import substitution • Promotion of employment 	<ul style="list-style-type: none"> • Creation of infrastructure • Advanced promotion of research work and developments • Commercialisation, production of new high-tech goods

Political Type	Vertical	Horizontal with vertical elements
Key Instruments and Measures	<ul style="list-style-type: none"> • Customs regulation • Stimulation of demand • Financial support of existing manufacturers 	<ul style="list-style-type: none"> • RDE «Kurchatovsky Institute» • RUSNANO • FTP «Development of Nano-Industry Infrastructure...» • Budget financing of R&D
Strong Sides, Success	<ul style="list-style-type: none"> • Foreign investments • Creation of new products • Cooperation of Russian and foreign manufacturers • Improvement of manufacturing culture 	<ul style="list-style-type: none"> • A new institution of innovation stimulation • «Planned» increase in spending on R&D and the number of researchers • Launch of new high-tech products
Weak Sides, Problems	<ul style="list-style-type: none"> • weak influence on import substitution, deterioration of the balance of trade • Retention of ineffective companies • The lack of significant progress in development of research and constructor competences 	<ul style="list-style-type: none"> • The limited amount of beneficiaries • Weak demonstrative effect • Deficit of new perspective projects • Orientation towards government support, scarce inflow of private resources • Relatively low rates of production growth

Industrial policy in the sphere of the *nano-industries* has created conditions for the creation of a large and active functioning institution for the support of innovation, which can pay attention, not only to project financing, but also to infrastructural development and the development of educational programmes; and thanks to large-scale government investments “as planned” the indicators of the value of R&D are rising; there are some examples of the launch of new industries and the development of new products and technologies. At the same time the circle of beneficiaries from such support is quite small and progress is piecemeal in nature and therefore does not provide significant demonstrative effect; the actual production volumes of nanotechnological products are still far from those which were expected. Moreover, in contrast to the policy measures used to support the automotive industry, the measures in support of nano-industry have not brought a significant inflow of private investment. At the same time the major players and interest groups are focused on the receipt and use of government resources. All these factors lead to the inevitable question of whether the achieved local successes have been worth the invested governmental funds.

Some general lessons of industrial policy implementation in Russia

There have been many attempts to implement industrial policy in Russia in one way or another. It's most likely that such an approach will remain: industrial policy is inevitably attractive for politicians as an understandable and clear mechanism of communication with society, as an instrument for the reallocation of rents and for interaction with economic interest groups. Basically this instrument can be useful from the perspective of the “packaging” into ‘industrial policy’ of the “standard” measures used to improve the investment climate, and for the optimisation of governments regulations and aggregation of different policies directed towards fairly clear and measurable goals.

In this connection it is quite useful to identify *some lessons for the future* based on the existing but diverse manifestations of industrial policy. We shall try not only to point out existing faults, but also to identify causal relationships for the sustained repetition of certain imbalances in the formation and realisation of industrial policy.

Lesson 1. A negative attitude towards particular alternative policies, or the activities of government in specific spheres should not be “taboos” preventing us from studying the appropriate issues. The fact that for a long time in Russia it has been as if there were no “kind of” industrial policy and this has led to the quality, formation and implementation of industrial policy and the culture of its research have remained at a rather low level.

In any case, there is no government policy which is entirely neutral in its effect on different business groups, sectors and markets. So it is a matter of choice, whether it is appropriate to use the heterogeneity of influence purposefully or not. Nevertheless it is necessary to understand the reasons for this heterogeneity and to assess the real beneficiaries in the group during the implementation of particular measures.

Lesson 2. World experience has evidenced that the requirements for industrial policy and its opportunities (especially instrumental ones) change significantly with time. Such policies in each country and at a given time need new ideas and solutions; it is extremely difficult to replicate the success of the industrial policies of various countries.

In this connection ex-post assessments of industrial policies are valuable from the perspective of determining not only the necessary (“right”) content and direction, but, to a greater extent the principles on which the policy should be formed, controlled and refined. For industrial policy in particular, both “politics” and proficient state management are of special importance (these are the methods for the creation and exercise of policy).

Lesson 3. It is usually that the most important element of industrial policy is a system of priorities, yet, in Russia no system of clear and reasoned priorities has been established. We cannot but agree from this that branch and sectoral priorities have changed and been supplemented many times, as a result, not fulfilling any consolidation role in the efforts of government and business. Such isolation from the system of priorities of real economic policy and the lack of at least some attempts by the government to understand and estimate progress in the realisation of one or another priority has significantly undermined the trust of strategic investors and of society in every further “serving” of government priorities.

However we do not believe that it is necessary to make special efforts to define priorities or even regard it as an urgent step.

We can notice that each new cycle of enhanced attention to industrial policy in Russia usually begins with a discussion of priorities, and here, on the whole, is also where it ends. Priorities have been perceived by the majority of players as a kind of “rubricator of directions” within which public money can be required. Politically it is rather difficult to limit the sprawl of process priorities – it is hard to deny the priority of a particular sector, especially under the widespread perception that major governmental resources should be spent within the framework of priorities.

Practice shows that a transition from industrial to technological priorities will not change the situation beyond recognition – there are some “sacred” priorities in the field of science and technology, at the same time other interest groups emerge with pledges which are even longer and more difficult to verify.

Lesson 4. *A significant problem is the attempt to maximise all the advantages of industrial policy but only at the level of the national economy.* The majority of Russian industrial policy initiatives have focuses on the domestic market which means that structural changes, primarily through import substitution have been implied. This greatly increased the risk of protectionist barriers being set up, limitation of competition, replacement of private demand with governmental ones for the support of selected priorities and as a result a multiplication of problems and costs of inappropriate starting decisions.

However on a global basis, the most successful industrial policy examples are focused on the conquering export markets. Let us underline the fact that globalisation does not diminish, but on the contrary, increases, the significance of the need for a policy of building global chains of value formation, and the extension of modern competences, of choosing strategic partners and forming a range of technological alliances. Taking into account Russian`s accession to the WTO there is a need for different “leaner” and more effective instruments for supporting exports.

There is also a serious problem of *correctly assessing the accumulated scientific and technological potential and identifying appropriate ways to apply it*. The relevant assessments and perceptions are often overstated, taking into consideration the fact that they are based on perceptions which were relevant 20-30 years ago and on the supposition that business demands for technology have not really changed. The aim of using the legacy of past decades has become a political problem, blocking some new approaches and the development of cross-border technological cooperation. Note that in the development of the automotive industry it was easier for the government to orientate towards world brands and the attraction of foreign investors as a consequence of the lack of a strong private car industry, combined with a public perception of the low competitiveness of the quality of the domestically produced cars.

In our view, under current conditions the implementation of industrial policy without the participation of foreign partners (financial and technological) and without definite and sufficient conditions for the free entry and withdrawal of major players, is doomed only to simulate achievement, to have strong informational asymmetry and to form antagonist images of what is actually happening in society and in public governance.

Lesson 5. Industrial policy which does not *rely on the supply of demonstrative effects, competition between companies and investors and on independent objective assessment is, on the whole, possible but inefficient*. An emphasis on the primary usage of state resources heightens the risk of rent-oriented behaviour and limits the possibility of adequate evaluation. There are usually not enough resources to support all the priorities and initiatives and, as a result, reasons appear for “limited responsibility” together with requests for the assignment of additional resources in order to achieve better results (in the future).

The implementation of industrial policy detached from institutional changes, especially in the organisation of individual sectors, results in both significant limitation of the possible positive results and high risks of excessive distortions in the market environment. *For successful realisation of industrial policy it is fundamentally important to have a high quality institutional environment and positive dynamics of change*. Note that an independent factor may also be the expectations of some business change. This largely determines the scale of demonstrative effects.

Lesson 6. A significant obstacle to improving the efficiency of industrial policy is the limited access for new interest groups to participate in the development and evaluation of the results achieved. While the government is trying to form new instruments and to use new factors and interest groups in development, the traditional interest groups quickly “capture” these new instruments and contribute to their adjustment for their own purposes.

An analysis of individual cases of Russian industrial policy has shown that the stability of changes and movements is critically dependent on the *rapid formation of new interest groups* (or reorientation of existing groups towards modernisation). The consolidation of new interest

groups is more likely in emerging sectors, where the traditional groups are not yet strong enough to carry out the “seizure” of industrial policy instruments. However the government often unintentionally prevents the creation of new interest groups and the accumulation of a “critical mass” when it engages new charismatic representatives of such groups into the organs of the state.

In conclusion, it is important to underline that ideological bias and categorical judgments on industrial policy, and a lack of pragmatism and questioning are significant obstacles on the way to ensuring the relevance and improved rationality of such policy. Both globally, and in Russia, there has been an increase in the number of prerequisites (or ‘risks’ – depending on your point of view) for the implementation of industrial policy its the current stage of development – in a period of deep transformation of perceptions about the 90s and the role of government in economic development. In this connection *critical and verifiable exchange of reasoned assessments and opinions concerning the issue of how industrial policy should be implemented, and what results can be achieved, are really fundamental; but most importantly, what should not be undertaken during implementation of the policy.*