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“A Study of Russian High-tech Industrial Policy”

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Introduction

Recently the role of the high-tech industry¹ has been increasing within the economy and society as a whole. The high-tech industry is a base for innovations; and its existence stipulates the basic development of science and technology in each country. Results of research and development in the sphere of high-tech industries by virtue of their influence on other industries make it possible to increase the competitiveness and technological level of the entire industry. It is also the source of new types of industries. For instance, a tremendous growth in computer science and changes in communication technologies in the beginning of the 1990s resulted in the so called "information revolution", which at present is associated with information and knowledge accumulation. Hence, the high-tech industry significantly influences almost all spheres of society in all countries. So, it is not surprising that much attention has been paid to the promotion of such industries.

In Russia, however, the concern over a decline of high-tech industries is mounting. Thanks to the recent high oil prices, Russia has maintained high economic growth rates, but it has intensified its dependence on the resource-sector industry. Most of its investments are intended to flow to the resource-sector industry as opposed to manufacturing, including machinery. Moreover, from the beginning of the 1990s, the expenditure of R&D has been reduced considerably, and is still at a very low level. In 2004, the expenditure on R&D amounted to only 1.16% of GDP, and in 2005 even lower - 1.07%². One can no longer say that Russia is a leading country in science and technology as the USSR used to be.

At present, when the developmental lag in high-tech industries has become considerable, the Russian government has taken a course of action for large-scale assistance of these high-tech industries, thereby trying to prevent a deeper lag. High-tech industries lead other industries and raise the international competitiveness of the whole nation, just as machinery and electronic industries have in the past. The developmental lag in the high-tech industries foreshadows not only the weakness of the productive capacity of Russia, but also destroys the potential for economic development to some extent. Only by developing high-tech industries will Russia be able to reach a new stage in its development and diversify its industrial structure. On this basis, the Russian government has begun to implement a stimulation policy of development of high-tech industry.

In the present paper, the policy of promoting the aircraft industry, an example of Russia's policy of promoting the high-tech industry, will be considered in detail. Some problems connected with the policy formation of the industrial development of the aircraft industry will also be analyzed. In addition, future prospects of Russia's industrial policy for high-tech industry stimulation will also be considered.

1. Russian Industrial Policy

After the financial crisis of 1998, by virtue of high oil prices, Russia managed to increase its exports considerably, and as a result, it achieved high economic growth. In 2006, Russia's GDP exceeded the highest level of GDP that the Soviet Union registered in 1989. Russia has continued to maintain high economic growth, but its industrial structure still remains unchanged. The GDP growth rate in 2005 amounted to 6.4%, and 6.7% in 2006, but the growth in manufacturing industries was 5.7% and 4.9% respectively. The output of industrial products by such industries as machinery and metal-work manufacturing was not only lower than that of developed countries, but also has not reached the level of industrial production of countries with a transitional economy, such as China and countries of East Europe³. The structure of the Russian economy represents a certain type of monoculture, and is primarily based on exports of oil and natural gas.

Recently, concern about the weakness of "monoproductive" economy, which is subject to instability due to price changes in energy products, is being expressed in scientific, political and business circles. In particular, small and medium enterprises, mainly dependant on domestic market, have started to express their disaffection to the former government policy, which was mostly oriented to the stimulation of export industries, requesting measures of domestic market stimulation to be taken. The government itself gradually began to realize the necessity of its active participation for a higher achievement of economic growth, as well as its own responsibility in this sphere by making changes in the way that economic development based on the «domination of market instruments of economic regulation» had been chosen before. Such a request on economic policy correction had been accepted by the government, and as a result, its role has been increased by implementing industrial policy, so the government aims to increase industrial efficiency and diversify the industrial structure⁴.

Concerns that economic growth based on resources will be maintained are also expressed within the government. In particular, the government is cautious that such a structure, often called "monoproductive" (resource monocultural), will contribute to solidify the lag of the growth of the Russian economy in the world. Such a cautiousness toward the problem was obviously shown in two drafts of documents prepared by the

Ministry of Economic Development and Trade in 2007 — «Medium-term forecast of social and economic development of Russia for the period of 2008-2010», (April 2007, hereinafter — the "medium-term forecast") and the «Conception of social and economic development of Russia for the period of 2008-2020» (October 2007, hereinafter — "conception"). A course of action for a competitive recovery of manufacturing industry is specified in these documents, and special attention is paid to industrial policy, which has been out of the scope of the government⁵.

Moreover, on February 8, 2008, the president of Russia made a speech, «Strategic development of Russia until the year 2020», in which he stressed that the economic structure dependent on primary sectors of industry must be changed by stimulating the central elements of "the knowledge economy" — high-tech industries (in particular, the aerospace industry, ship-building, energy, IT, and medical services). The intention to increase efficiency of these economic structures expressed in this speech is being developed in a political course of action taken by a new president — D.A. Medvedev⁶.

Hence, in recent years, many requests on reforming of industrial policy in Russia are being advanced by different layers of society, and the government is trying to actively respond to them by implementing a new economic policy. And in this paper, some basic principles of industrial policy are being considered on the basis of the above-mentioned documents of the Ministry of Economic Development and Trade.

The basic principle of Russian industrial policy can be defined as a stable maintenance of high economic growth and a diversification of industrial structures by the formation of high-tech industries and improvement of competitiveness of manufacturing industry in combination with the export of resources. Some other aims, that is, the achievement of an efficiency level of industry of developed countries and technology transfer, are also defined.

As a "medium-term forecast", the following measures for realization of these aims are specified as follows:

- the development of human capital
- an improvement of investment climate
- the diversification of the economy
- the development of infrastructure by combined efforts of public and private sectors
- administrative power reform
- the development of public-private partnership mechanisms
- a concentration of investments in priority sectors of industry
- the formation of new regional centers for economic development

Special attention is paid to the problem of machinery development (auto industry). Plans on volume output increases by reorganization and modernization of national auto

manufacturers, and growth in exports by increasing assembling productions are specified. For realization of these plans, it is necessary to decrease customs duties on imported equipment, and to stimulate the process of importation of industrial equipment as well as to create preferential regimes for domestic producers of capital equipment.

Moreover, for a long-term strategy, the problem of diversification of the Russian economy will be especially important in the near future due to a depletion of resources; therefore it is necessary to transform to a structure of industry based on high-tech and knowledge-intensive industries. It is expected that machinery will be developed as one of the main export industries, which has the potential to replace primary sectors of industry. Among other high-tech industries to be developed, nanotechnology, nuclear power, ship-building, aerospace, and software are specified. The following measures are to be taken in order to reach such a specialization of high-tech industries:

- an increase of the expenditure on R&D
- quality improvements of human capital by investing in education, and an increase of insurance
- the effective use of natural resources
- the establishment of venture markets and systems for the protection of property rights

With respect to the diversification of the economic structure by stimulating the machinery sector and the development of other high-tech industries, alongside with attracting foreign investment, the restructuring of industry is being implemented under the auspices of the government. For example, most machinery plants belonging to the state or with a share of state property, mainly producing military and dual-use products, were united into the state corporation, «Rostekhnologii (Russian Technologies) ». Some financial recourse from the export of oil and gas accumulated in the Reserve Fund and the National Welfare Fund are being invested into «Rostekhnologii». It is expected that this state corporation will perform functions of restructuring and will accelerate high-tech industry development, as well as improve the technological level of enterprises. A considerable amount of investment may be invested into this state corporation⁷.

Hence, at present, measures of industrial policy being taken by the Russian government, relying on advantages from extractive industries, at the same time are referred to a gradual achievement of more efficient industrial structure by stimulating high-tech industry development. In accordance with such a scenario of development, preferential measures are being taken in relation to high-tech industries, and large state financial resources are expected to be invested into them. The fact that newly established state corporations and holdings receive considerable state financial support

is of some interest. In Japan, for instance, in the post-war period, industrial policy was aimed to stimulate the participation of private enterprises, with government authorities in charge of implementation of such policies tried to guide companies to "most favorable" development; and by doing so, the base for protection of domestic industries was created⁸. In contrast, the Russian government directly gets involved in industries, trying to create a "most favourable" industrial structure from its perspective. These are the specific features of industrial policy in Russia. The second section of the paper measures industrial policy being implemented in one of the high-tech industries — the aircraft industry — will be considered. In the third section, the author will evaluate them.

2. The Russian Policy on the Development of the Aircraft Industry

(1) The Russian Aircraft Industry

After the Second World War, as a political and military tension increased with European countries and the U.S., the Soviet Union tried to strengthen its economic power; in particular, great efforts were made towards the creation of an aircraft industry that allowed the Soviets to become a powerful country, producing one fourth of the aircrafts manufactured in the world. Both civil and military purpose aircrafts produced in the Soviet Union were widely used inside the country and in Eastern Europe, as well as were exported to third world countries⁹.

But the end of the Cold War and the collapse of the Soviet Union resulted in Russia's losing its status as a leading producer of aircraft in the world. The Russian aircraft industry incurred a defeat because of arms reduction as well as because of political and economic instability as the result of the political collapse.

For instance, one of the measures to a transition to a market economy was the separation and privatization of aircraft manufacturing enterprises, which resulted in very small companies appearing on the market. Together with privatization, enterprises stopped using the system of interaction with each other in technological and economic spheres that had been created during the Soviet era and so the aircraft industry declined. Moreover, state orders drastically decreased, and state crediting schemes of enterprises disappeared. Demand for aircrafts from the private sector also declined. After the collapse of the Soviet Union, many carriers appeared, but due to a shortage of financial resources, they could not widely renew their aircrafts' park¹⁰. On the other hand, such large carriers including «Aeroflot» or «Transaero» started actively using foreign aircraft models due to the low level of competitive advantage of domestic aircrafts (that is, low economic efficiency, less comfortable, etc). In addition, after the end of the Cold War, the Eastern Block collapsed, and as a result, the demand for Russian aircrafts from

Eastern Europe also decreased. Hence, the production of aircrafts also declined. In 1998 the output of the aircraft industry decreased to 20% of the level of 1991¹¹, with an especially sharp decline in civil aircraft manufacturing (Table 1).

Table 1 Manufacture and Import of Civil Aircrafts in Russia

	1995	2000	2001	2002	2003	2004	2005	2006
Total quantity of civil aircrafts produced, including:	65	25	20	10	13	19	29	14
Passenger planes	28	9	10	4	5	14	28	8
Total sum of import of civil aircrafts (million rbls.), incl.	190	558	165	235	357	448	497	1576
From CIS countries	84.8	51.3	48.3	28.0	40.4	26.8	60.1	90.9
From other countries outside CIS	105	507	117	207	317	421	437	1485

Source: *Grazhdanskaya Aviatsiya v Rossii 2007*, Federalnaya Sluzhba Gosudarstvennoi statistiki, str.22. (*Civil Aviation in Russia in 2007*, Federal Service of Statistics, p.22)

The decline in production was also due to the low level of technological equipment used in the aircraft industry. The deterioration of business performance in the aircraft industry caused by the decline in production resulted in staff reduction, an advanced age of technological personnel engaged in technological development, and a slowdown in the development of new aircraft models: An especially sharp decline was seen in the development of civil aircraft models. In the U.S. and Europe, from the beginning of the 1990s, so called new generation aircrafts were already used, but in contrast, in Russia, models developed at the decline of the Soviet Union were being employed. Moreover, while the U.S. started developing fifth generation military aircrafts, Russia tried to improve the existing models (most of them are aircrafts of the fourth generation developed in the latter 1970s). Hence, from a technological point of view, the Russian aircraft industry fell behind Europe.

To summarize, it is worth mentioning that the chaos in production of the aircraft industry caused by the economic and political instability in Russia in the 1990s, decreased the demand for aircraft in combination with technological backwardness, and resulted in a considerable deterioration of competitiveness for the Russian aircraft industry both in domestic and foreign markets (Table 2).

Table 2 Competitiveness of the Russian Aircraft Industry

	Share of the market at present	Share of the market in the future	Level of technology
Military aircrafts	Strong	Uncertainty	Decreasing
Civil aircrafts	Strong	Uncertainty	Decreasing

References: Made by the author on the basis of — Salnikov, V.A., D.I.Galimov, "Konkurentssposobnost Otrastei Rossiiskoi Promyshlennosti; Tekushchee Sostoyanie i Perspektivy", *Problemy prognozirovaniya*. - 2006. - № 2, str.66-8. (V.A. Salnikov, D.I. Galimov «Competitiveness of Russian Industries: Present Condition and Perspectives for Development», *Problems of Forecasting*. - 2006. - № 2, pp.66-68).

(2) Measures on the Development of Aircraft Industry of Russia

The data presented above indicates that the Russian government could not take effective measures for restoring the aircraft industry in the 1990s. The necessity of restoring this sector was well understood on the state level. Since 1993, several discussions have been held, but due to a lack of financial resources, no specific measures have been taken. The government gave a priority to a quick transition to a market economy, which promoted the privatization of the aircraft industry, but this measure did not achieve its goals. Moreover, for a long period after the end of the Cold War, measures on state defense connected with the demand and supply in the military industry were not be well defined, and this also indirectly influenced the difficulty in taking measures to recover the aircraft industry.

This situation began to change from 2000. Favourable conditions for the exportation of resources contributed to the improvement of the state budget, and the Putin Administration, which placed an emphasis on economic security, began. These two factors resulted in a growing interest with respect to the problems of industrial policy both inside and outside the government, and the problem of diversification of the overall economic structure began to be actively discussed. Under these circumstances, the aircraft industry began to get attention as a "strategic sector of the industry", which would contribute to an increase in efficiency in other branches of the Russian industry. Both government and business understood that if no measures were to taken, the aircraft industry would not recover.

As was shown in the first section of the paper, the government simultaneously restructured the industry by facilitating the process of integration and unification of enterprises in "strategic sectors" has implemented large-scale investments in attempting to create enterprises which are competitive on the world market. Similar actions are also being taken in the aircraft industry. For instance, the core part of such a policy is the facilitation of both unification and restructuring of enterprises of the aircraft industry,

the creation of aircraft development and production to be competitive on the world market, as well as including cooperation with European countries, China and India. The above-mentioned measures should allow Russia to become a world centre of aircraft manufacturing.

This course of actions was specifically represented in the Federal Target Program «Development of civil aircraft industry in Russia for the period of 2002-2010 and up to 2015», in October 2001. The following measures are to be taken in accordance with it:

- The development of aircraft competitive in both domestic and foreign markets, promoting the technological renewal of models used by Russian carriers.
- The support and development of domestic industrial and scientific technologies in the aircraft industry.
- The promotion of restructuring aircraft manufacturers.

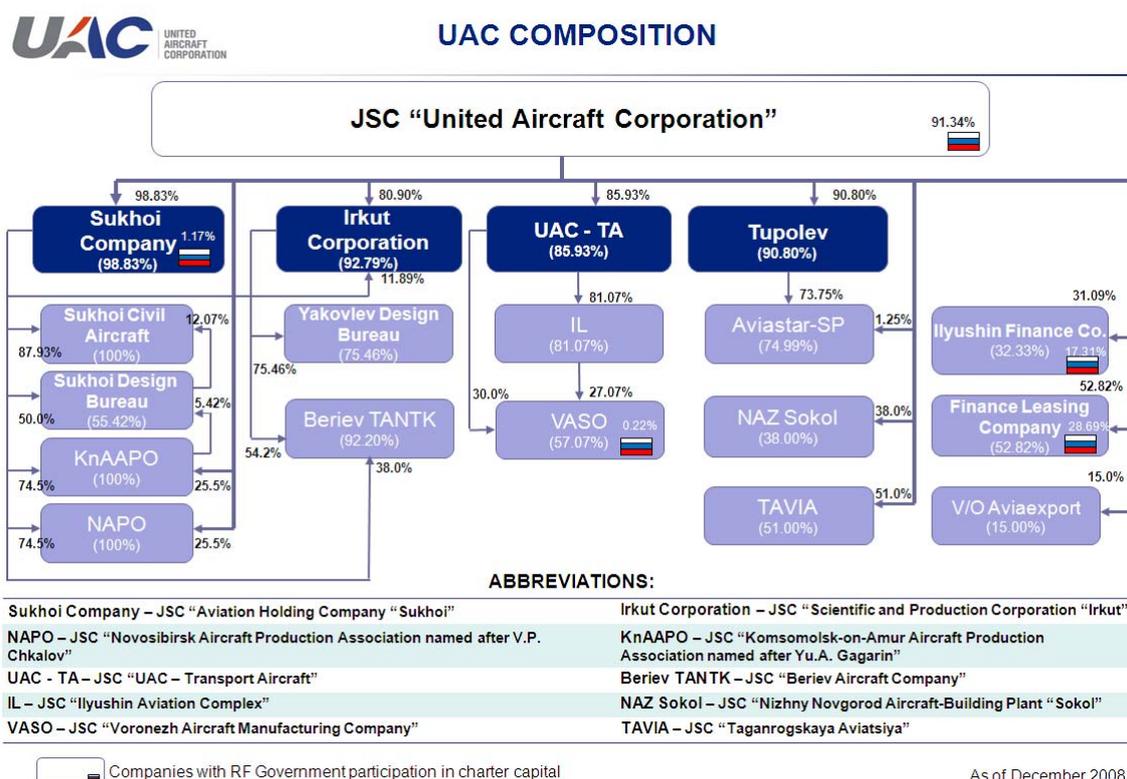
On the base of this program, the Ministry of Industry and Energy prepared a draft of the bill, «Conception on establishment of United Aircraft Corporation (Ob'edinennaya aviastroitel'naya korporatsiya) »; and Russian aircraft manufacturers were united to «United Aircraft Corporation» (further UAC). This corporation was established by the president's decree, in February 2006, «About United Aircraft Corporation». Also, in February 2005, the Ministry of Industry and Energy created a draft of «Strategy of Aircraft Industry Development in Russia up to 2015». The basic measures of this strategy are as follows:

- An increase of investment to the aircraft industry by an active public and private partnership.
- participation in planning an international division of labor and international industrial cooperation, as well as the promotion of investment cooperation with all foreign countries.

The central element of this consequent policy is the establishment of UAC (for details, see Picture 1). UAC was established in the form of a joint stock corporation on the initiative of the Russian government, and it includes at present the main aircraft manufacturers of the country, with the government holding 91.34% of its shares¹². High-ranking officials of the government and the top management of the state financial institutions are included in the board of directors and management team¹³. The main goals of the corporation in accordance with the government policy were determined at the meeting of the board of directors held on December 2, 2008. The management policy of UAC is specified in «The Main Provisions of the Development of the Open Joint Stock Corporation "United Aircraft Corporation" for a Period up to 2025» and includes the following three elements — diversification of management and stable development, improvement of competitiveness, and globalization of the corporation. By

maintaining its ability to realize the full development of aircraft as well as by gradual improvement of its competitiveness, the state corporation might become an enterprise capable of meeting the demand of aircraft not only within Russia, but also from abroad. The corporation is aimed to reach the third largest in the world after the U.S. and EU in the production of aircraft.

Picture 1 The Structure of United Aircraft Corporation (UAC) (as of December 2008)



Source: web-site of UAC

http://www.uacrussia.ru/common/img/uploaded/files/UAC_Composition.PNG

In order to fulfill these goals as priority projects, it plans to develop new market niches (development and manufacture of regional jet planes, renewal of super-heavy transport airplanes, modern airplanes (passenger planes of the next generation of average length of haul), transport planes of the next generation, military planes of the fifth generation, etc.). In relation to any of these projects, a priority is given to international cooperation developments and the transfer of technology¹⁴ alongside with that special attention is paid to UAC, which is supposed to develop as an enterprise engaged in a systematic integration of full aircraft development. The following results are expected to be realized from these projects:

- A 10% share on the world market and a 50% share of domestic civil aircrafts is

expected to be reached by 2025; military aircrafts — 12-15% of the world market.

- annual sales revenue is expected to increase from 4 billion dollars to 12-14 billion dollars by 2015 and up to 20-25 billion dollars by 2025.

- the enhancement of production efficiency, achievement of a profitable level of leading aircraft manufacturers¹⁵

- the capitalization of UAC is expected to increase from 100 billion rubles at present to 400 billion rubles by 2015, and up to one trillion rubles by 2025.

In order to realize these projects, the government has invested around 96.72 billion rubles into UAC. Moreover, «Sberbank» provides UAC credits with a concessionary interest rate¹⁶. Also, under provisions of the Federal Target Program, «Development of civil aircraft industry in Russia for the period of 2002-2010 and for a period up to 2015» for the period from 2002-2005 it was to invest into aircraft industry state financial resources 12.8 billion rubles (including extra-budget financial resources, 37.57 billion rubles was invested), and for the period of 2006-2015 18.82 billion rubles (including extra-budget financial resources 33.84 billion). Investments mostly flow into research and development.

Hence, the following measures for the development of Russian aircraft industry can be considered most important:

- (i) A concentration of efforts on developing new models by the creation of UAC, which includes main aircraft manufacturers; the creation of plans for priority project financing
- (ii) An active involvement of the government into UAC activity, as well as control of fulfillment of the Federal Target Program and other related plans.
- (iii) The modernization and effectivization of the aircraft industry by controlling international joint research and development, as well as by transfer of technology from European countries.

3. Evaluation of Measures for Development of the Russian Aircraft Industry

As was already reviewed in section two of this paper, measures for development of the Russian aircraft industry include the establishment of UAC by combining domestic aircraft manufacturers, to which wide-scale state financing is made for research and development and for modernization in this sector of the industry. It is also intended to improve the technological capacity of the Russian aircraft industry by technological cooperation with foreign countries. And by developing the aircraft industry, a further aim is to diversify and create a more efficient industrial and economic structure.

In order to assess these measures of developing the aircraft industry taken by the Russian government, it is necessary to stress the way in which the aircraft industry in

general influences the economic welfare of society. Unfortunately, it is rather difficult to do so due to the fact that these measures were put into action only recently. Still, it is possible to evaluate the measures of development of the aircraft industry by examining the following points:

- (1) Weighing the advantages and disadvantages of choosing the aircraft industry as an industry in which it is necessary to take measures of development.
- (2) The evaluation of the efficiency of measures taken.

(1) The aircraft industry as an object for taking measures on the development of industry:

In Japan, as in many other developed countries, it is considered that the aircraft industry might become a primary industry in the next generation along with machinery, household appliances, and the electronic industry. This is connected with the fact that aircraft industry itself is formed by the concentration of high-tech equipment in such sectors of industry as nonferrous metals processing, new materials, machine-tool manufacturing, electronics, and software technology¹⁷. Moreover, the aircraft industry can be considered a driving mechanism for the improvement of the technological level of the entire manufacturing industry; therefore special consideration is given to it. In practice, high technology developed or used in the aircraft industry expands to other sectors of industry¹⁸.

Since the aircraft industry aims to diversify and enhance the efficiency of the economy, it was chosen as the sector of industry where measures of development were thought necessary to be taken; one can assume that this choice was a natural one. However, specific characteristics of the aircraft industry development brings into question the potential of this sector of industry to be a driving force for structural change of the entire industry. In the former Soviet Union, the aircraft industry (at that time together with other sectors of the munitions industry) was developed within other frames of economic planning. All enterprises engaged in research and development of aircraft were under the control of the Ministry of Aircraft industry that was a type of "control tower", whereby orders were immediately implemented. Such a system of management based on the principle of "vertical separation", enterprises could not interact with each other, and as a result of, the exchange and transfer of technologies was limited. Moreover, in such conditions of instability of planned economy and the necessity of military build-up enterprises tried to produce as many products as they could¹⁹, it was often said at that time "from nails to rockets" (even within frames of one industry), as a result of interaction with other enterprises was rather limited.

Such peculiarities of the aircraft industry have been inherited by Russia for a long

time after collapse of the Soviet Union. The development of related industries supporting the aircraft industry was very low, both in scale and a technological level was inferior to that of the U.S. and Europe. In Russia, the number of supporting industries is limited; therefore, it is possible to suppose that the development of the aircraft industry may not result in a rising level of development in other sectors of industry. By expanding supporting industries, it will become necessary to pay close attention to the activation of processes of technology transfer into other types of business as well. But it is rather difficult to answer the question whether measures being taken by the Russian government will result in such a development scenario²⁰.

(2) Measures for development and effectiveness of their usage:

The primary direction of development of the Russian aircraft industry is the unification and merging of enterprise, as has been presented above with the example of UAC. There are different opinions towards the establishment of this state corporation.

Among positive opinions, the following ones can be mentioned²¹:

- (i) The establishment of UAC will contribute to the restoration of connections between enterprises in economic and technological spheres that was lost in the 1990s.
- (ii) The improvement of the situation of "excessive competition" between "small enterprises"²², and the implementation of a suitable investment policy which will make it possible to facilitate industry modernization.
- (iii) There are no "strategic investors" in Russia that could provide necessary financial resources, except for the government. It created UAC and invested state financial resources from the first stage. By so doing, it is expected to improve the investment climate and facilitate the flow of private sector funds.
- (iv) State control over UAC will provide a "suitable" system of management without paying attention to statements of shareholders with respect to increasing dividends.
- (v) The aircraft industry is closely connected with a defensive capability and is considered to be a "strategic sector"²³. To decrease the influence of foreign capital's inflow into this sector of the industry, it is necessary to induce investment from the state budget²⁴.
- (vi) The concentration of powers and financial resources at UAC will help to turn this state corporation into a kind of "pseudo-state agency" ("nationalization" of industry)²⁵. This will put the policy into operation more effectively and flexibly than previous ministries and agencies.

The following can be considered as negative²⁶:

- (i) The creation of a state holding company by the government will result in appearing as a huge public sector which hinders the activity of foreign investors.

- (ii) The concentration of aircraft manufacturers in UAC will result in creating a monopolist in this sector, therefore there will not be a "moderate competition" in the domestic market, and there is a possibility that the aircraft industry will lose its vitality²⁷. Moreover, UAC consists of many affiliated enterprises following their own interests, so there is a potential danger that these individual interests will become more important than interests of the entire holding company; therefore, it will become difficult to make decisions²⁸.
- (iii) High-ranking officials of the government form the majority of the board of directors of UAC; therefore, there is a potential risk that the corporation will be dominated by their interests.
- (iv) The restriction of foreign capital into this sector of industry due to its close liaison with defense industry of the country may cause a limitation of technology transfer from abroad.
- (v) The establishment of a state holding company implies the enforcement of state control, but in reality the management will be vested with great power, and in this sense state control will be weakened. State property can finally be privatized which will result in the creation of an additional new "state oligarchy".
- (vi) The ability of a management team to work efficiently is also a question of concern. As was specified in (v) above, in the case of decreasing of state control, the government will not be able to influence management decisions. It may seem paradoxical, but even as a state corporation, UAC may not become an instrument of state policy.

Both positive and negative considerations with respect to the establishment of UAC were presented above, and only time will show which of them will become close to reality.

Apart from the problem of choice connected with creation of UAC as one of the measures of industry development, a problem regarding the efficiency of industrial policy should be pointed out: there is a lack of consistency in the implementation of such a policy. In Russia, it often happens that ministries, departments, and even officials themselves cannot agree upon policies, so there is no mutual understanding of decisions being taken. As a result, consistent policy is not implemented. There is a similar situation with respect to implementation of industrial policy in the aircraft industry as well.

In fact, when these measures with respect to the development and protection of the aircraft industry were consistent, decisions of direct or in-direct restrictions of foreign aircrafts were made. However, a stimulation policy that made the usage of Russian aircrafts a priority by carriers had been implemented. Alongside with this policy, import

duties on foreign aircrafts were decreased in Russia²⁹, and the largest carrier «Aeroflot» (51% of the shares belong to the Russian government) is actively placing orders for modern designs of planes from the U.S. and EU. Other companies except «Aeroflot» have incurred financial difficulties and cannot place many orders for domestic aircraft³⁰.

Therefore, a lack of consistency in the implementation of policy is related to the problem of mutual understanding and often coupled with an inability of ministries and departments to reach an agreement on some key problems. The confliction of various opinions between different ministries illustrates the point. For instance, the establishment of UAC and the Ministry of Industry and Energy, at that time actively insisting on the creation of state corporation, could not easily reach a timely agreement with the Ministry of Economic Development and Trade, which resulted in a considerable delay in the decision making process with respect to the establishment of this state corporation³¹. Furthermore, the Ministry of Economic Development and Trade in charge of negotiations with the WTO made a decision to decrease custom duties that was strongly criticized by the Ministry of Industry and Energy which was trying to protect domestic aircraft manufactures. Hence, there are many conflicting lines of authority within the government that hinders the process of decision-making and on-time dynamic implementation of suitable policy.

In addition, one of the reasons different ministries and departments could not reach an agreement is that the linkage between the aircraft industry and the defense industry perceived different avenues within the government. As was stated in section two, discussions with respect to restructuring the aircraft industry inside the government began from 1993, but at that time this problem was closely integrated with the defense capability of Russia, reforming the entire munitions industry and accepting new measures of military doctrine since no particular measures with respect to protection or development of the aircraft industry were taken³². It is difficult to see agreement within the government over policy and effective measures. Since the aircraft industry is closely integrated with national defence, there is widespread opinion that close attention began to be paid to questions of national defence from the Putin administration, and at times that attention was focused on economic security³³. In such a situation, there is a possibility that in the implementation of such a policy, emphasis will be placed on the national defence of the country, and there will be decisions made far removed from economically rational ones.

Conclusion

Recently, Russian industrial policy aims to enhance the efficiency of the entire industry by stimulating high-tech industrial development, where high-tech industries are

an important part of this industrial policy. The specific feature of Russian industrial policy in high-tech industries is the creation of state corporations and holdings controlled by the government, as well as the implementation of national projects with their participation in the economy as seen appropriate from the government's point of view. Market mechanisms (e.g. the creation of shareholding companies) are used but limitedly, therefore it is possible to conclude that measures of this policy are under strict control of the government. Such an understanding of industrial policy was inherited from the Soviet times and is also connected with specific features of Russian industry in general, which could not create private independent private companies.

These problems seem to be common to industrial policies in other sectors of the high-tech industries. In this paper, the aircraft industry, a representative high-tech industry was reviewed: an analysis of a core part of industrial policy connected with the creation of UAC was made. UAC was established under the auspices of the Russian government and included the main domestic aircraft manufactures. This state corporation became a receiver of great state financial resources and was implemented as a state policy in the sphere of aircraft industry. Its establishment is a component of industrial policy in this sector of industry. Similar mechanisms are also being created in other sectors of high-tech industries. For instance, in the ship-building industry «United Shipbuilding Corporation (USC) », and in the nuclear industry — there is state corporation «Rosatom», and in machinery — «Rostekhnologii» were created.

In addition, as was specified in the third section of the paper, doubts are raised as to whether it will be possible for the plan of the government to be realized. First, is the issue of the ability of UAC. Can it perform its functions properly? Second, due to the close linkage of aircraft industry with national security and the defense industry of Russia, there is a potential risk that the interest of industrial policy will be directed to the latter at the expense of the broader economic point of view.

These problems also exist in other sectors of high-tech industries. Other state corporations can also encounter these problems similar to that of UAC. Shipbuilding and the nuclear industry are closely connected with national security and defense capability, an implementing industrial policy in these sectors of industry is unlikely to avoid conflict.

Hence, one can conclude that for a successful implementation of industrial policy of Russia formed by the Putin Administration and continued its development through the policies of Medvedev, including high-tech ones, it is necessary to resolve various problems. Temporary solutions to these problems do not indicate that policies taken would be realized as expected by the government. Change in the economic situation both inside and outside of the country will greatly influence such a policy. The global

financial crisis caused by problems in the U.S. real estate market, a decline in oil prices, will definitely influence the economy of Russia. There is a possibility for Russia to implement the chosen policies based on wide-scale financing of "pseudo-state agencies" created in different sectors of industry without attracting foreign currency from resource exports as it has in the past. There is still a possibility that a policy of industry stimulation implemented by the Russian government in high-tech industries will not reach its goals.

References

- 1 High-tech industries are industries in which the share of production expenses of research and development is high. In accordance with the classification of the OECD, high-tech industries include the following: aerospace industry, office and computer equipment, electronics, medicine and pharmaceuticals, precision and optical instruments. For further details refer to the report of the Ministry of Education, Culture, Sports, Science and Technology of Japan «FY2007 White Paper on Education, Culture, Sports, Science and Technology».
- 2 Varshavskii, A.E. "Strategicheskie Problemy Razvitiya Vysokikh Tekhnologii V Rossii", Lvov, D.S. i G.B. Kleiner (eds.) *Rossiya v Globaliziruyushchemsya Mire: Modernizatsiya Rossiskoi Ekonomiki*, -M.: Nauka, 2007, str.319. (Varshavsky A. E. "Strategic problems of high technology development in Russia", in Lvov D.S. and Kleiner G.B. (eds.) *Russia in the globalizing world: modernization of the Russian economics*, – Moscow: Science, 2007, p.319.)
- 3 Silvestrov, S.N. "Globalizatsiya: Politiko-Ekonomicheskie Vyzovy dlya Rossii", Lvov, D.C. (eds.) *Rossiya v Globaliziruyushchemsya Mire: Politiko-Ekonomicheskie Ocherki*, -M.: Nauka, 2004, str.39. (Silvestrov S.N. "Globalization: political and economic challenges" in Lvov D.S. (ed.) *Russia in the Globalizing World: political and economic essays* – Moscow: Science, 2004, p.39.)
- 4 KAYA Tosihiko *Stock company «Russia»*, Publisher «Japanese economic newspaper», 2007, pp.2-24.
- 5 The Ministry of Economic Development and Trade has been implementing a policy of liberalization of the economy for a long time, and recently some special economic zones have been created where preferred tax conditions are used and funds for investing into special projects from the state budget have been formed, e.g. a new course of economic policy is formed. .
- 6 In his speech president Medvedev used four key-words all stating with «I» for the development of the Russian economy — institutional system, infrastructure, innovations, and investments.

- 7 KUBONIWA Masaaki "Long-term perspectives for the development of the Russian economy", *Foreign Trade and Taxation*, March 2007.
- 8 In Japan, state agencies actively participate only in those sectors of industry which are closely connected with the reputation of the country or in sectors towards which the society has a significant interest (KOMIYA Ryutaro, OKUNO Masahiro and SUZUMURA Kotaro (eds.) *Industrial policy of Japan*, Tokyo University Press, 1984, p.10). In Russia, the government participates in sectors that are considered to be «strategic» ones and connected with national security and the defense capability of the country.
- 9 Passenger planes made by the Soviet Union were inferior to American and European models, but at that time Eastern Europe countries had no other choice but to use them.
- 10 From 1993 until 2000, 2735 planes of Russian make were abandoned, but only 32 new planes were put into operation. Varshavskii, A.E. ukaz. soch., str.332. (Varshavskij A. E. "Strategic problems of high-tech industry in Russia", Lvov D.S. and Kleiner G.B. (eds.) *Russia in the global world: modernization of the Russian economy*, – Moscow: Science, 2007, p.332.)
- 11 Bagrinovskii, K.A., M.A. Bendikov, E.Yu. Khrustalev, *Mekhanizmy Tekhnologicheskogo Razvitiya Ekonomiki Rossii: Makro- i Mezoekonomicheskie Aspekty*, Tsentralnyi Ekonomiko-Matematicheskii Institut –M.: Nauka, 2003, str.138. (Bagrinovski K.A., Bendikov M.A., Khrustalev E.U. *Mechanisms of technological development of Russian economy*, Central Economics and Mathematics Institute - Moscow: Science, 2003, p.138.)
- 12 In the future the government's share is expected to increase to 75%+1 share.
- 13 Ivanov S., Deputy chairman of the government is a member of the Board of Directors. For details about the Board of Directors refer to http://www.uacrussia.ru/ru/corporation/guidance/sovet_directorov/
- 14 The project «Sukhoi» SSJ was developed together with Italian «Alenia», French «Sneema», American «Boeing», it is of higher priority than the project Tu-334. Both models are regional jet planes. The development of Tu-334 started in 1986, and the first plane was manufactured in 1999, although mass production was not carried out. The development of SSJ started in 2001, and the first model was produced in 2008. At present, some preparation is being done for commencing mass-production. In addition, some development of military planes of the fifth generation is underway together with India.
- 15 For example, an affiliate company of «Sukhoi» — «KnAAPO» plans to use LEAN-technologies for SSJ production.
(<http://www.aviaport.ru/news/2008/10/21/159579.html>)

- 16 The interest rate of «Sberbank» for UAC is 11.75% annually. For enterprises in the military industry, it amounts to 14-16%.
(<http://www.aviaport.ru/digest/2008/11/28/162105.html>)
- 17 Usually the number of details for one plane amounted to 3 million which is 100 times higher than per unit of an automobile. Moreover, the accuracy of details range from 10 to 100 times higher than auto manufactures (Research Institute of Economy, Trade and Industry, *Hishyo — Official guidance for aircraft industry*, 2008, p.12).
- 18 For example, titanium, hydrocarbon components, antilock brake system (ABS) for automobiles, etc. are used.
- 19 Unlike European enterprises, Russian plants manufacture simultaneously with the final assembly of planes. Plant «Aviastar - SP» in Ulyanovsk city is a case in point.
(<http://www.aviastar-sp.ru/>)
- 20 In February 2008, UAC adopted a strategy for development for the period up to 2025, but did not mention the development of allied sectors of the industry. It presumes to establish a company which will handle materials supply.
(<http://www.aviaport.ru/digest/2008/11/24/161744.html>)
- 21 Dementev V. "K Diskussii o Roli Goskorporatsii v Ekonomicheskoi Strategii Rossii", *Rossiiskoi Ekonomicheskii Zhurnal*, 2008, №1-2. (Demetiev V. "Role of State Corporations in the Economy of Russia", *Russian Economic Magazine*, 2008, №1-2.)
- 22 The range of activity of Russian aircraft producing companies is still insignificant and inferior to enterprises of European countries and the U.S. Sales revenue of the largest enterprise «Sukhoi» in 2004 amounted to 1.2 billion dollars compared to 52.4 billion for «Boeing» and 39.4 billion for «EADS» (the parent company «Airbus»).
Ezhгодnik SIPRI 2006, pp.393-399.
- 23 The Federal Law of the Russian Federation «Procedures for Foreign Investments in the Business Entities of Strategic Importance for National Defense and State Security» dated April 29, 2008. The aircraft industry is included in the list of strategic sectors; and the volume of foreign investments shall not exceed 25%.
- 24 The intent is not to abolish foreign investments. The aim is to create a system in which the Russian side will have the leading role in research and development of new models. For instance, in the affiliated company of UAC «Sukhoi Civil aircraft» Italian «Alenia» possesses 25% +1share.
- 25 For details about statism in Russia, refer to MIZOBATA Satoshi «Forming and Restructuring of Capital in Russia», *Hikone-Ronsho* (Shiga University), № 359, February, 2006.
- 26 Dementev V., ukaz. soch.; Tsvetkov V., E. Prudius, S. Melnikov, "Gosudarstvennaya Monopolizatsiya Rossiiskoi Ekonomiki: Ozhidaemye Rezultaty i Vozmozhnye Posledstviya",

Vestnik Instituta Ekonomiki, RAN, 2007, №2. (Dementiev V. *op. cit.*; Tsvetkov V., Prudius E., Melnikov S. "The State Monopolization of Russian Economy: Expected Results and Possible Consequences", *Bulletin of Institute of Economics of Russian Academy of Sciences*, 2007, №2.)

27 There is also an opinion that "moderate competition" might be reached by an enforcement of "Russian champions" to compete with foreign companies after restructuring the industry.

28 In UAC, two affiliated companies — «Sukhoi» and «Tupolev» are engaged in development of almost identical models, and there is a double of financing.

29 A decrease of custom duties on imports of foreign aircrafts was an important stage in the negotiation process with the WTO.

30 Numerous carriers which are a part of «Rostekhnologii» will be united into the company «Russian Airlines», and will become the second one after «Aeroflot». «Rostekhnologii» will try to enforce «Rosavia» to make orders for domestic aircrafts, but whether it will be possible to do the same with «Russian airlines» is still open to question. *Kommersant*, October 22, 2008

(<http://www.kommersant.ru/doc.aspx?DocsID=1045266>)

31 OTOWA Itaru "Present Condition and Perspectives of Development of Russian Aircraft Industry", *Monthly Report on Foreign Trade of Russia and East Europe Countries* (Japan association for trade with Russia and NIS), December, 2005.

32 *ibid.*

33 Kuznetsiv B.V. Russia economic policy 2008-2020/ 27th conference of Comparative Economics Society 23.09.2008, Kyoto University.