

FINANCIAL PERFORMANCE AND TECHNOLOGICAL MODERNIZATION OF RUSSIAN HI-TECHNOLOGY COMPLEX AND THEIR ROLE TO BOOST ECONOMIC GROWTH

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Abstract

The government defense order is currently a determining factor on the development of the Russian high-technology production sector and in particular of its core the military-industrial complex. At the same time, high-technology exports remain a second factor contributing to the high-technology sector growth, while civil high-technology production for domestic markets is affected by stagnation due to limited production capacities. As export contracts profitability is much higher than that of the works on the government defense order it is they that are becoming the main source of financing long-term technical re-equipment of Russian high-technology enterprises. However in the long-term perspective, the exports volume will most likely notably decrease. It is appear that the current situation dictates the necessity for the government high-technology sector financing reform to make technological retooling and production capacities growth less dependent on export contracts, as well as to stimulate the development of the domestic market, which is now neglected in favor of export expansion.

Key words: *Russian economy, Russian hi-technology sector, Russian military-industrial sector, Russian arms and military equipment export, Russian government financing of defense industry*

INTRODUCTION

The high-technology sector's share in the Russian economy is rather small. As of the end of 2013, the high-technology industry generated around 4% of the GVA of the total GDP of Russia. For comparison, the share of the extraction sector in Russia's GVA is almost 10.9% [1]. However, currently the place and role of the high-technology complex of Russia's economy is defined not so much by its share in the industry as by the scientific industrial potential concentrated in the sector's enterprises. For example, all enterprises and scientific organizations of the military industrial complex forming the core of Russia's high-technology sector are characterized by [2]:

- High research intensity;
- Technological specificness requiring constant updates and development of cutting-edge technologies;
- Special requirements for product quality;
- Necessity of redundant (mobilization) production facilities.

Therefore today the especially urgent task for Russian economy is to develop the high technology complex by forming on its base a high-powered main body of technologies, capable to provide new cutting-edge technologies to create and distribute them to other areas of economic activity.

Let us begin with some preliminary commentary about Russian high-technology complex structure, which can be divided into high-technology production sector and high-technology services sector. It should be noted that the OECD classification of high-technology complex is based on the existing structure of high-technology industries of the advanced countries different from the Russian economy due to historical factors [3]. The Russian economy has inherited many peculiarities of the USSR economy. As an example, more than 60% of high-technology medical equipment manufacture in the Russian industry as well as manufacture of almost all the precision, optical and electronic equipment, and a number of chemical, pharmaceutical, industries are concentrated in the military industrial complex [4]. Thus, specifics of the Russian industry is that currently all defense production sectors

and the radio-electronic complex, nuclear industry, manufacture of arms and military equipment as well as aerospace industry are parts of the high-technology production sector (though with different science-consuming factor and technology level). Russian high-technology complex also includes high-technology services sector (types of telecommunication, internet services, data transfer services, air carriage by advanced aircrafts, aerospace support services etc.) which is beyond consideration in this paper.

THE MAIN COMPONENTS OF DEMAND FOR RUSSIAN HIGH-TECHNOLOGY SECTOR

During the last 15 years the high-technology complex has been one of the most rapidly developing in the Russian economy. It showed very high growth rates even during the 2008-2009 crises. The gross output of the Russian high-technology industry grew by over 2.4 times from 2001 to 2012. At that, the total Russian machine building output¹ increased only by 2.1 times, while the industrial output as a whole grew but by 1.6 times. The yearly average growth of the high-technology sector output during this period has been about 8% as opposed to 3.9% for industrial production in general.

The data on the dynamics of the high-technology industry in the 2000s compared to the Russian industry as a whole and the machine-building complex is shown in fig. 1.

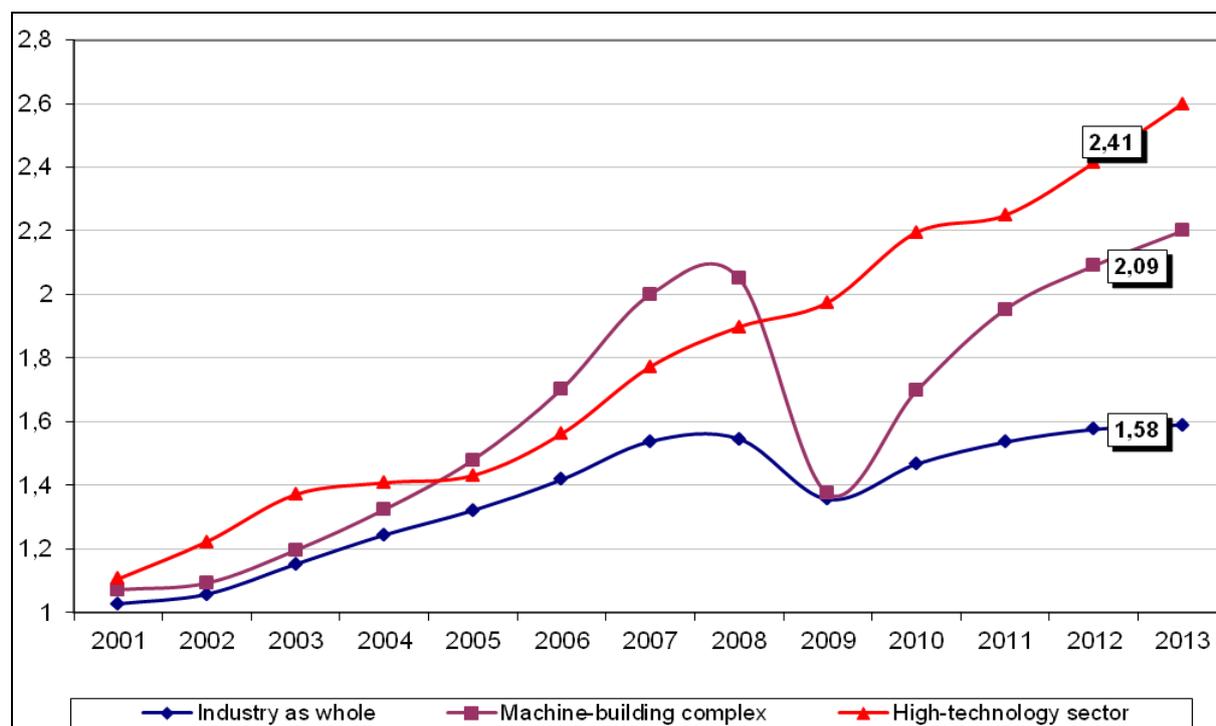


Fig. 1. High-technology industry dynamics compared to other types of economic activities in 2001-2012 by progressive total (compared to 2000)²

From 2005 to 2012 the gross output of the Russian high-technology industry (taking into account technological and pharmaceutical products) increased by 1.75 times. At that, the core of the high-technology industry including the military industrial complex and nuclear industry grew almost by 1.8

¹ The machine building complex after Russia's transfer to the Russian National Classifier of Economic Activities (OKVED) in 2005-2012 the machine building complex is understood as a sum of three types of activity; "production of machines and equipment" (DK), "production of electrical, electronic and optical equipment" (DL) and "production of transportation means and equipment" (DM).

² Sources: Rosstat, TS-VPK agency, the author's calculations.

times. The largest share in the high-technology output falls on commercial airspace production (43.6%) and "complex technical products" unit (includes military equipment and shipbuilding) - 28.6%. The share of radioelectronic products constitutes 14% while the nuclear industry accounts for 13.6% [1].

Especially rapid growth of gross high-technology output in 2007-2009 was demonstrated by the nuclear industry, while since 2010 - by the airspace and radio-electronic industries. At that, in the aircraft and radioelectronic industries the main growth was achieved due to military production, a significant part of which was exported. In the shipbuilding industry growth was shown mainly by military shipbuilding while the civil shipbuilding output decreased.

The share of arms and military equipment in the total Russian export volume is 3%, however, it accounts for over 60% of the Russian high-technology export estimated at 5% of the GDP [5].

The following main sources of money forming the income of high-technology enterprises may be singled out:

- domestic demand for military-industrial complex product, which is formed by the state defense orders³ as well as funds within the framework of state high-technology industry support through other channels from the federal budget, namely federal target programs⁴, enterprise subsidies, anti-crisis packages, etc.;
- the external demand for high-technology products, both military and civil. Nominally divided into arms and military equipment exports, civil military-industrial complex product exports and nuclear industry exports;
- domestic demand for high-technology commercial civil products not directly connected with state purchases.

The relative shares of these components are given in fig. 2. It shows a rather stable tendency of increase of the share of products manufactured by high-technology enterprises with direct or indirect state financing and respective decrease of the share of products produced by export contracts.

³ A government defense order in Russia is a legal document providing for supplying products to state federal needs to maintain a necessary level of defense capacity and security of the Russian federation.

⁴ A federal target program in Russia is a resource, term and contractor-tied complex of research and development, experimental and design, production, socioeconomic, organizational and economic and other activities ensuring efficient fulfillment of target tasks and requiring state support. There are some federal target high-technology programs going.

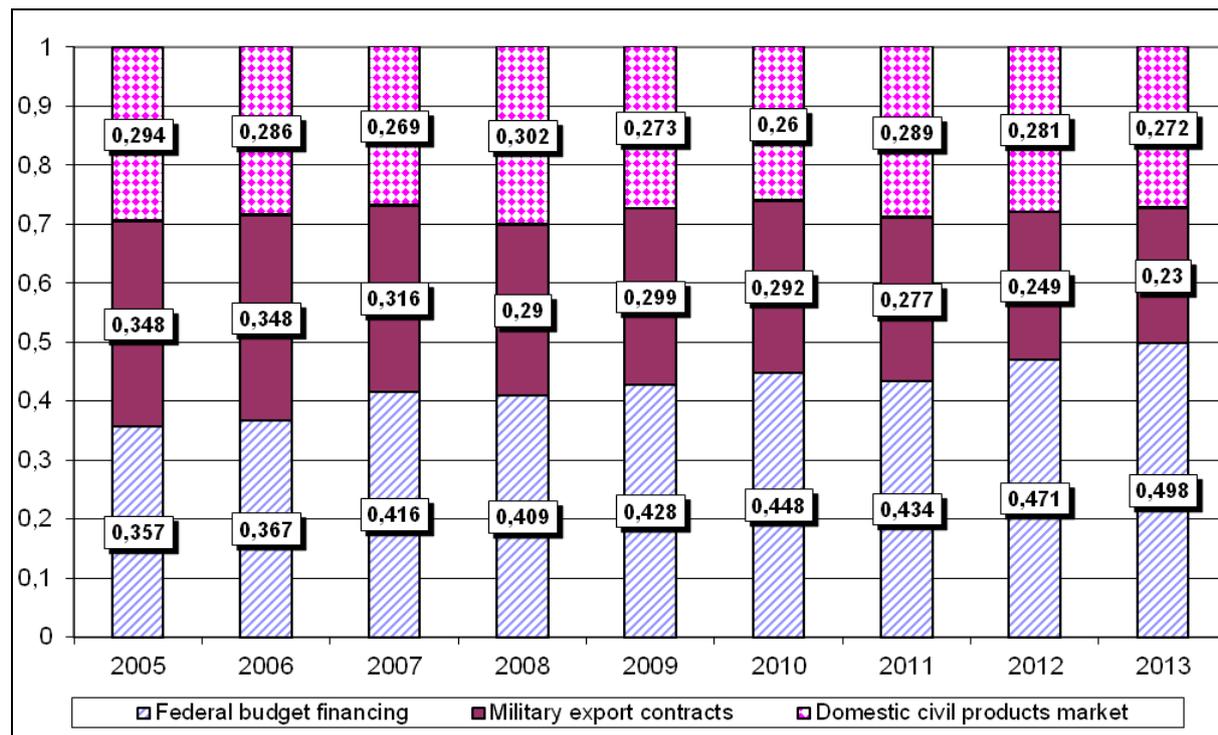


Fig. 2. Changing shares of the main components of demand for Russian high-technology sector products (in %)⁵

During the period from 2006 to 2012 the financing within the scope of government defense orders increased almost by 2.3 times. Furthermore, since 2011 the growth rates of the state defense order are continuously ahead of other components of Russian high-technology demand. The financing of federal target high-technology programs has grown almost by 1.3 times [6]. The key feature of the 2011-2014 periods was using a mechanism of state-guaranteed credits. Taking into account massive crediting of state enterprises in 2013-2015, the state defense order has significantly increased in 2011-2020 as well. Yet such a financing scheme led to additional debt service costs for enterprises. In part they will be subsidized from Russia's federal budget. However, the subsidies are considered by the federal budget as a part of the government defense order, though actually aren't a component of it. This means that these funds may not be used to purchase equipment or update arms and military equipment products or for R&D. Nevertheless, the cost of the respective government defense order contracts will grow.

As shown in fig. 2, the share of Russian civil high-technology product sales on the domestic market has stabilized in the recent years. It is most likely due to the fact that the existing production and technological capacities is practically exhausted, since it was created in the USSR and after its fall almost no new factories have been built and the existing production facilities haven't been developed. Thus, the domestic civil sales growth rate will now mostly depend on introducing new production capacities and increasing competitiveness of civil products made by defense enterprises.

As seen in figure 2, the total nominal USD export of high-technology products has grown by almost 2.5 times in 2005-2012. However, taking into account the gross exchange rate growth during the same period and inflation, one gets a real increase of income in rubles of companies for exporting arms and military equipment by only 10%. The "leap" of the export contract share in 2009 is mostly explained by the national currency's devaluation due to the financial and economic crisis. In total from 2005 to 2012 there has been a decreasing trend in the importance of export contracts for Russian high-technology industry development - from 34.8% to 24.9% despite an absolute growth of current prices -

⁵ Sources: Rosstat, TS-VPK agency, the author's calculations.

from \$10.8 bln to \$23.4 bln. [5] Thus, each year the income from arms and military equipment exports is becoming less and less important source of income for the Russian military industrial complex.

While considering the issues of financing and sources of income of the Russian high-technology industry, one should note that the package of direct state support is formed mostly by the government defense order and federal target programs. The government defense order is formed yearly for another year and planning period based on suggestions from state orderers and developed with help from federal executive bodies and agencies. Furthermore, the government defense order has a highly inert and non-transparent pricing system, for instance, the change of component and material prices is not taken into account. As a result, the profitability of such contracts is very low or even negative for the military-industrial complex companies. This drawback should be partially compensated by "localized" high-technology industry support through federal target programs and direct subsidizing of some enterprises for specific goals and tasks. However, the issue and distribution of these funds is, as a rule, strictly regulated and connected with overcoming a number of bureaucratic barriers and difficulties. Moreover, financing both through the government defense order and the federal target programs is temporary, since the contracts are signed for a specific current financing volume (i.e. for the current financial year or for a planned period of two years at best).

Export contracts, on the other hand, as a rule are concluded for a longer term with a specified advance payment schedule, and their profitability is much higher than that of the works on the government defense order. As a result, it is they that are becoming the main source of financing long-term technical re-equipment of Russian high-technology enterprises. However, having export contracts as a main source of income, most companies become highly dependent on Russia's current place in the global arms markets and the tendencies of its development. It is this share on the global arms markets as well as maintaining the signed export contracts that significantly influence when and how modernization and technical re-equipment of the Russian defense complex production facilities takes place.

ARMS EXPORT AS A FACTOR OF RUSSIAN HIGH-TECNOLOGY PRODUCTION SECTOR DEVELOPMENT

From 2005 to 2013, Russia was assigned a very stable second place under the rating conducted by the Center for Analysis of World Arms Trade (CAWAT) in terms of volume of identified (i.e. accounted for) arms export, while only the US boasted a higher rating position. The volume of US identified military exports in 2013 will amount to \$23.56 bln or 35.7% of the entire world military exports volume. Over the period of 2009-2013, the US exported arms for a total of \$92.93 bln (38.22% of the world market) [7]. The corresponding figure for Russia in 2013 was \$13.391 bln or 20.3% of the world supply. Throughout 2009-2013, Russia's identified military exports totaled \$42.174 bln (17.34% of the world market). Analysis of the Russian military supplies compared to the entire world market is indicative of a slow growth of the Russian share throughout 2005-2012: from 18.7% to about 20% in 2013. [6].

Considering identified export volume data with the employment of the method used by the Center for Analysis of World Arms Trade (CAWAT), it should be noted that it does not take into account space industry products as well as any repair, maintenance and spare parts supply contracts.⁶ For the majority of large world arms suppliers, this "unaccounted" segment is within the range of 3 to 5% of identified exports. For Russia, this figure is significantly higher (about 10-12%), which can be explained by the specifics of spare parts supply, service and repair contracts.

⁶ The count only includes identified supplies of the main conventional arms types, according to the UN register classification. Maintenance, repairs, spare parts supply and minor contracts, the data on which is fragmentary, are not fully included in the calculations (only the officially confirmed data is included). Manufacturing of military and dual-purpose space vehicles and services related to their launching are not included in the calculations because this category is not featured in the UN conventional weapons register.

As a result, the actual volume of Russian military exports is significantly higher, which is confirmed by the official data of Russia's Federal Military and Technical Cooperation Service, according to which the volume of Russian military exports in 2013 amounted to \$15.7 bln. Thus, 27% of the world military exports are supplied by Russia [5].

According to the assessment of the Center for Analysis of World Arms Trade (CAWAT) (based on signed and published contracts), a rapid growth of the world arms market is expected in the next three years. Its volume in 2014 should reach \$75 bln, while its volume in 2015 should be \$95 bln. [5]. In 2016, should the world economy suffer no new shocks, the world arms exports volume might reach \$102 bln.

The results of the 2012-2013 fiscal period show that Russia has managed to break the emerging decreasing trend in the volume of new contracts compared to the actual arms exports volume and thus stabilized the current portfolio of Russia's defense enterprises' orders. The total exports order volume, by the end of 2013, amounted to a record high value in excess of \$49 bln [6]. Based on the current order portfolio, Russia, according to the author's calculations, should retain a stable position on the world arms markets throughout 2014-2016 (fig.3).

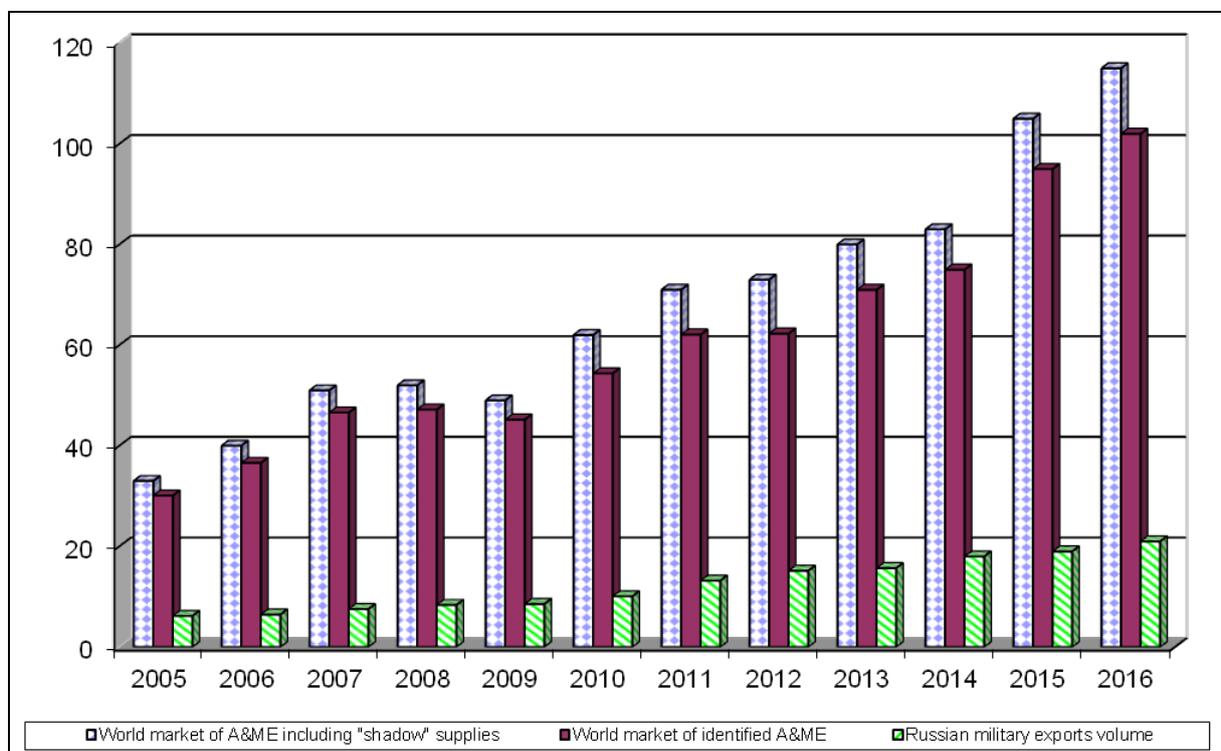


Fig. 3. Russia's military exports compared to the world volume throughout 2005-2012 and forecasting for 2014-2016 (\$ bln, current prices)⁷.

Arms supplies plan of the major defense concern of Russia "Rosoboronexport" also suggests that by 2016, the share of Russia in the world arms market should remain at about 19-20%. This means that Russia will retain the second largest share in the world arms export of and military equipment, after the US. Key importers of Russian military products will remain India, Iraq and Vietnam while defense sales to China and Algeria markedly decrease [7].

However despite the expected world market growth, over the coming years, Russia will not be able to significantly increase its military exports volume. This is due to a number of objective

⁷ Sources: Rosstat, TS-VPK agency, the author's calculations. A&ME = arms and military equipment.

trends emerging in the world arms market. However, primarily, it is explained by the limited production capacity of Russian enterprises, especially in such market segments where a rapid growth is anticipated (particularly, helicopter engineering) [1].

Furthermore, in the long-term perspective, the exports volume will most likely decrease due to the political situation. In particular, the forced rapprochement of Russia and China, under the pressure of US sanctions in connection with the Ukrainian crisis, may decrease the purchases of Russian arms and military equipment by India - China's main geopolitical rival in the region. At the same time, increasing supplies to China is fraught with its own risks since the Chinese are very quickly at mastering the technologies provided to them and, at the earliest opportunity, they opt for domestic production by "cloning" of the imported products, thus giving up their external purchases.

CONCLUSION

According to the preliminary forecast estimates, in 2014-2016. Russian high-tech sector will grow to 9-10% per year [1]. At that, the government defense order during this period will be a determining factor on the development of the high-technology production sector and in particular of the military-industrial complex.

The current tendencies give rise to the expectation that throughout 2014-2016, Russian arms exports will ensure 20% of the Russian high-technology sector growth (30% together with all high-technology exports). At the same time, high-technology exports will remain a second factor contributing to the high-technology sector growth, in terms of its significance, after the government defense order, since civil high-technology production will be affected by stagnation or might even decrease due to crisis trends perceivable in the Russian economy.

Meanwhile, the orientation towards export expansion as a factor promoting high-technology sector growth seems doubtful. On the one hand, export contracts provide high-technology enterprises with the required volume of available funds needed to modernize and expand production capacity. Yet on the other hand for enterprises, being oriented solely on export orders it might lead to the shrinkage or even degradation of domestic market. Furthermore, the focus on export expansion means that the Russian high-technology sector will be more and more integrated in the global market and will thus stimulate the development of the transnational sector of the Russian economy. However until the time the government defense order pricing is overhauled and direct government support of defense enterprises efficiency is increased due to reducing bureaucratic barriers, the public financing will not be able to completely substitute for export receipts.

Thus the current situation dictates the necessity for the state high-technology financing reform to make technological retooling and production capacities growth less dependent on export contracts as well as to stimulate the development of the domestic market.

Nevertheless, merely reforming the government high-technology financing system is not sufficient. The author believes the key problem is that, over period of the 1990-s and the first half of the 2000-s, the high-technology production sector has largely (with the exception of a few enterprises primarily engaged in manufacturing of final products designed for exports) lost its scientific, technological and production potential. Several production technologies representing the high-technology sector are a whole generation backward compared to the state-of-the-art foreign developments. Thus, the development of the high-technology sector and growth of the Russian economy depends on the government efforts to finance the retooling and modernization of the production and technical facilities for military-industrial complex and nuclear industry [8].

It is required to make a transfer to an essentially different policy of stimulating the Russian high-technology sector development. The goal of the new active policy should be the high-technology manufacturing integration with a number of civil machine-building subindustries and turning it into "a donor" of cutting edge production technologies for the Russian industry [8]. An important

step in this direction should be adopting a set of measures, not later than by 2015-2016, to increase competitiveness of civil high-technology products sold on the domestic market.

All in all, the key trend of technological modernization for the Russian economy should be solving of the country re-industrialization task and restoration of its industrial and technical base. This is related to the fact that formation of a efficient high-technology sector that would be rather independent on the global high-technology markets is impossible without maintenance and reinforcement of advanced productions technical basis and machine building. Thus Russian high-technology production sector should be used as a basis for development, initial implementation and adaptation of critical foreign technologies to renew the machine building industry and build new high-technology industries based on a new technical basis [9].

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