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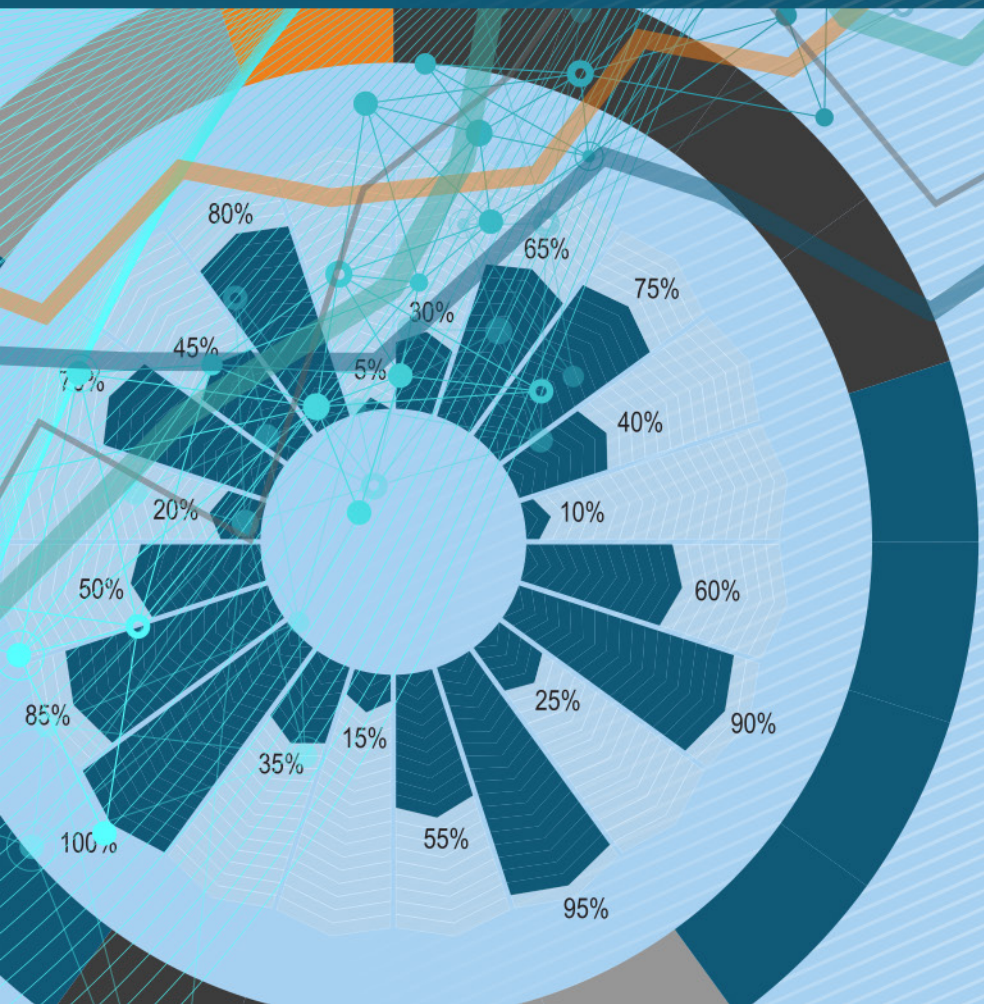

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Competitiveness of the «economic man» in the XXI century

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Abstract. The article analyses the evolution of the «economic man» in terms of the formation and development of the industrial economic system. According to our hypothesis, as the system that demanded an «economic man» transforms into some other system, the «economic man» himself must also transform into a new being; otherwise, his competitiveness will either be undermined or lost. There are three stages of this transformation: individual, national and, supranational. The author observed the transition from the complete rationality of the «economic man», guided by a purely market equilibrium, to the pseudo-market (social) equilibrium of the «socio-economic man». It is absolutely reconciled with the principle of partial optimization (satisfaction). Note, that the effectiveness is the criterion of its sustainability. As a result, it allows us to conclude the ability of the «economic man» to maintain competitiveness in the XXI century, but only through his transformation from full rationality to limited one, from purely economic to socio-economic-ecological one. Also we made a forecast concerning with the increase in the rationality of non-economic goals of cooperation, mutual benefit, the coupling of knowledge and technology to spiritual, moral, cultural and ethical principles and norms. All mentioned actualizes M.I. Tugan-Baranovsky's prediction on the fate of political economy, made more than a hundred years ago.

Keywords: competitiveness, «economic man», rationality, efficiency, the principle of full optimization, the principle of limited (partial) optimization, market equilibrium, pseudo-market equilibrium, stability of the economic system.

JEL codes: B10, B20, D62, E10, F63

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Introduction

The term «economic man» is strongly associated with Adam Smith is almost 250 years old (Smith, 2016). Its existence is related to the emergence, formation and development of the capitalist socio-economic formation (in the terminology of the formational approach), or the industrial economic system (in the terminology of the civilizational approach). Therefore, it is possible to conclude that as the system presented a demand for an «economic man» transforms into some other system. indeed, the «economic man» himself is also transformed into a new being (and, perhaps, it will no longer be quite a person with a new adjective reflecting his essence, but a kind of humanoid being)? As regard to the appearance of a possible rival, the «economic man» will not lose its competitiveness, in particular, in the globalized and digital XXI century?

And if we look back, will it not turn out that there has always been an «economic man», just for the time being the demand for him was not manifested in society due to the dominance of relations of non-economic coercion and, consequently, the main character for a long time remained an «extra-economic man»? As an argument, we can refer to the mainstream understanding of the subject of economics as the search and choice of the most rational use of limited resources. Since all resources sooner or later reveal their limitations, the question of effective treatment of resources is the universal economic issue. So the rational «economic man» is also universal? At least until this resource limitation is overcome. But in this case, the subject field of theoretical economics will become impoverished, and the world will transform beyond the economy – into a kind of post-economic space. Then the «non-economic man», reborn with the beginning of the capitalist era

into an «economic», evolves into a «post-economic man»?

Overall, the article is devoted to the search for answers to the designated challenges.

Main part

The «economic man» in the industrial economic system formation epoch (XVIII-XIX centuries)

Homo economicus (from Latin, – «economic man», or «rational man») is a person freed from personal, non-economic, dependence and makes his own free choice, guided by the results of his economic activity. By A. Smith, he seems to be guided by someone's invisible hand, his own selfish goals. As a result, the whole society wins. A. Smith's arguments are quite convincing and it is difficult to disagree with them. Indeed, the baker, who bakes fresh buns, thinks that offered on time fresh buns, tailored to the tastes of customers, will bring him more profit. Baker's activity is very useful for the society, too. It is not necessary to prevent the «economic man» from being guided by a mysterious «invisible hand», i.e. perfect competition (Smith, 1976).

Later neoclassical marginalism of A. Marshall with his famous «Marshall cross» (Marshall, 1993) considered the criterion of efficiency as a purely market equilibrium, allowing the consumer to maximize the overall utility, and the producer – profit. If an equilibrium quantity of products (Q_E) is produced and sold by the equilibrium market price (P_E), then limited resources are spent rationally. These signals of pure market equilibrium guided the «economic man» (Fig. 1).

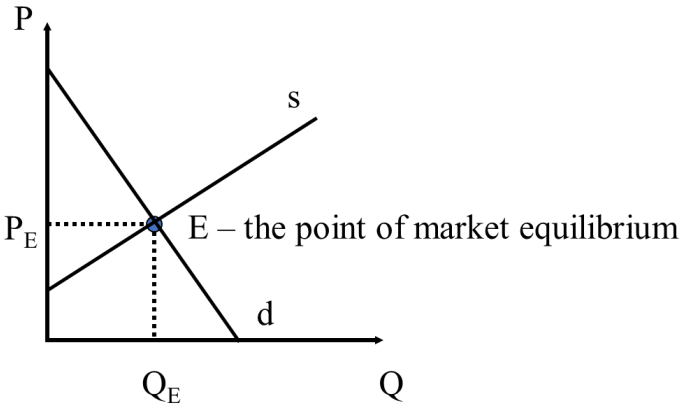

Figure 1. Marshall 's Cross

Source: composed by authors

Indeed, the further adjustment of this version of rationality was based on the graphical interpretation of the market equilibrium.

The «economic man» of the mixed economic system era (XX century)

With the evolution of a purely market system (note, we use this term, focusing not on the dominance of the free enterprise system, but on the insignificant role of the state in the economy), the criterion of efficiency also evolved into a mixed system. Also we should note the emergence of monopolies in the last third of the XIX century as a factor of the great influence on the competitiveness. Thanks to J.M. Keynes (Keynes, 2007), economics provides the thoroughly understanding the market mechanism and its disability to ensure macroeconomic equilibrium with total use of resources. The main reason is its inability to analyse the external effects properly.

Previous classical (neoclassical) economic schools ignored it because they were guided by the thesis «supply creates its own demand». According to J.-B. Say's theory of the three production factors, each owner of a factor of production, selling it, bought «his» share of the national product, equivalent to the income received for the realized factor of production (Say, 2000). By this model, the market monitored all the factors and formed the right price signals for the «economic man». The challenges of economic development made the economic science of the XVIII-XIX centuries to emerge and form the industrial economic system. Moreover, we considered this issue 10 years ago (Rodina, 2012). Economics dealt with this challenge.

However, the XX century, focusing on the problems of the effective operation of the already formed

industrial structure of society, faced the growing consequences of the so-called «invisible hand of the market». It was impossible for this form of economics to impossible to realise, that what is good for the «economic man» increasingly became bad or, at least, problematic, for the society. But we do not agree with Smith's faith in the «invisible hand». Because of there are fields of economics which are not corresponding to this theory. For instance, there is an issue of the influence this «invisible hand» during the pandemic.

Ignoring the discrepancy between rationality at the level of the individual and society can lead to the economical misunderstanding. Therefore, the revolutionary paradigm appeared. J.M. Keynes put forward the thesis «Demand breeds supply». Since the market itself is unable to assess externalities (they are external effects for it, although they really affect the welfare of so-called third parties), it provides distorted price signals to the «economic man».

The issue of externalities has revealed the need to take into account social (quasi-, pseudo-market) equilibrium. For instance, Yaroslavl has high anthropogenic impact on the environment: there are more than 14 thousand objects of polluting sources . For example, producing the economically demanded goods (gasoline, diesel fuel, kerosene, jet engine fuel and heating oil, base, compression, transmission and industrial oils, bitumen, paraffin wax products, aromatic hydrocarbons), PJSC «Slavneft-YANOS» releases large volume of hydrocarbons, carbon monoxide, carbon dioxide, various sulphur compounds, nitrogen oxides, solids, etc. into the atmosphere. It has a noticeable negative impact on the environment. It also generates a negative externality in the form of additional costs for caring the people health, preserving green areas and parks, and maintaining metal and other structures in proper conditions.

For instance, the internal (private) production costs of 1 liter of diesel fuel for the Arctic zone of the highest grade will be conditional 300 mu (monetary units). Then, in terms of the market, Q_E liters of this fuel will be produced and sold at a price not lower than 300 mu (Fig. 2).

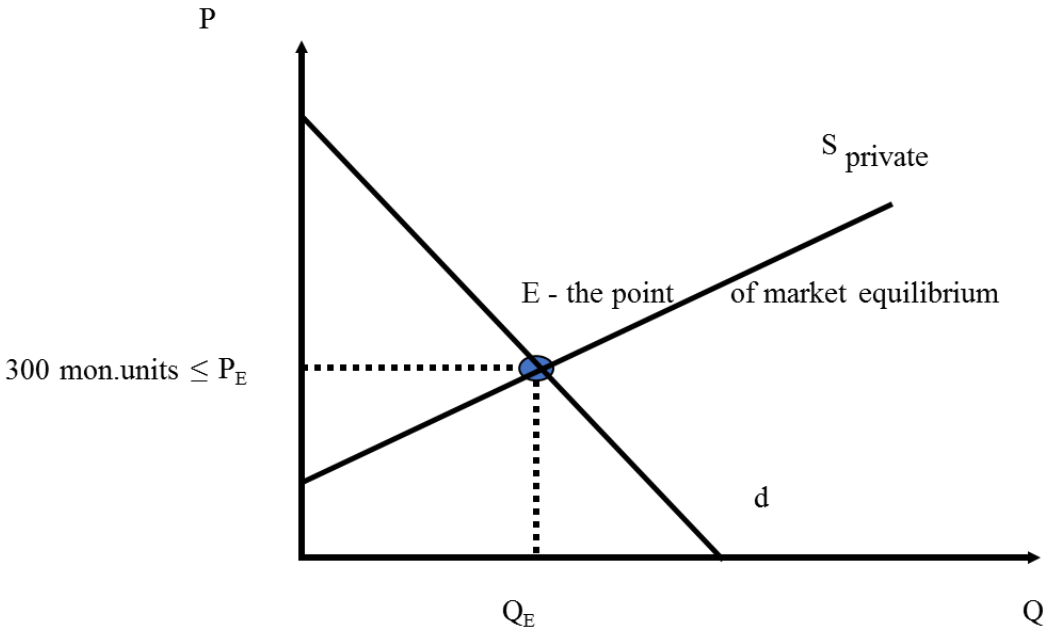

Figure 2. The Arctic fuel market excluding negative external effect
Source: composed by authors

However, the negative externality is a conditional 60 mu for every liter of Arctic fuel produced. In terms of the society, it increases the cost of production, shifting the supply curve to the left and forming a new equilibrium point E'. It is not a market, but a social (pseudo-market) equilibrium, according to which society cannot afford to produce Q_E liters of fuel and sell it at a price not lower than 300 cu. It's too costly. The rational volume of production is Q', and its price is not lower than 360 mu (Fig. 3).

On the other hand, assume that a farmer in the Rostov region of the Yaroslavl region drained a swamp to expand chicory crops. He achieved the result. However, at the same time, the soil agrophysical properties of the neighbouring farmer improved, since the elimination of the swamp favourably affected soil formation and

fertility outside the plot of the farmer-initiator of land reclamation. In this case, there was a positive externality in the form of additional income of a neighbour farmer. The market, establishing market equilibrium, in this case, unlike the previous one, underestimates the amount of reclamation work that the society recognizes as effective (Fig. 4).

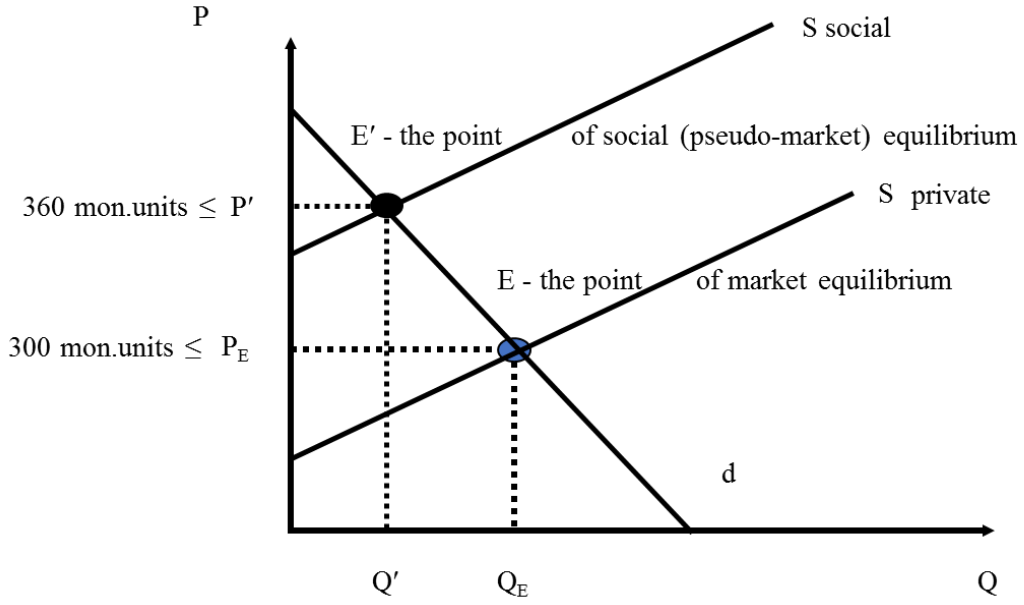

Figure 3. The Arctic fuel market taking into account the negative external effect
Source: composed by authors

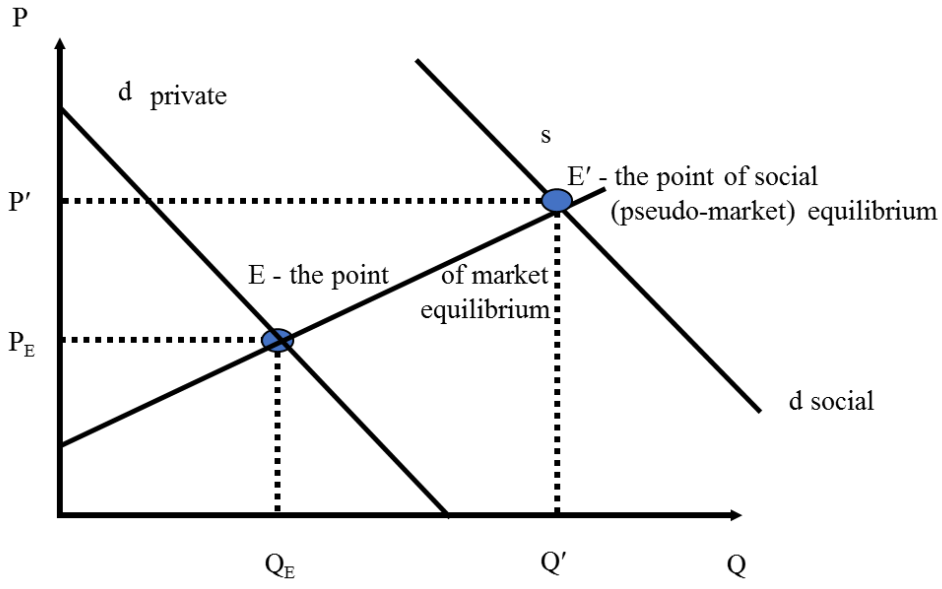

Figure 4. The market of land reclamation taking into account the positive external effect
Source: composed by authors

Thus, in the case of negative externalities, overproduction of goods occurs (and vice versa in the case of positive ones), but in both cases resources are spent inefficiently. The point of market equilibrium stop sends to society the real market signals about a rational approach to the allocation of factors of production. The functions of a rational signalizer are transferred to pseudo-market equilibrium. Since the market is unable to shift the economy towards this equilibrium. This mission is assigned to the government. The government provides one of two types of corrective measures: either a direct administrative method, or an indirect method of the taxation. The second method is also ambivalent: the problem is solved either through Pigou's tax (the main issue is to determine who is responsible for the damage and punish the infringer, and ideally to

help the victim of the negative externalities and encourage the initiator of the positive externalities) (Pigou, 1985). Also it could be solved through Coase's theorem (the main issue is not to find the guilty party and force him or her to compensate the losses, proprietary rights, which will help internalize the externalities, i.e., to transform externalities into internal costs. i.e., convert external losses into internal costs) (Coase, 2007; Coase, 1960).

However, the initial orientation towards maximizing utility or profit remains, although it undergoes a marked adjustment, which separates, separates both the market and social criteria of efficiency. The «economic man» at the micro level remains committed to the laissez-faire principle, while society at the macro level is interested in his transformation into a «socio-economic man». «As a result, for many decades of the XX century, economics was in a state of schizophrenic duality: if the actors in microeconomics were rational, then irrational economic agents in macroeconomics» (Kapelyushnikov, 2017).

The «Economic man» in the era of globalization (XXI century)

The processes of globalization and socialization led to the awareness of the global ecosystem vulnerability and the impossibility of the infinite influence sphere expansion in a limited space. The focus of the «economic man» on optimization (through maximizing utility or profit) was replaced by the recognition of the market regarding externalities fiasco, and then by the choice of limited rationality. Taking into account information and cognitive limitations, the principle of optimization was replaced by the principle of satisfaction (Auzan, 2017; Tumin, 2019).

Assume the situation of a consumer product choice in terms of two criteria – Q and P (for example, quality and price). The consumer has 9 possible options (letters «a» – «i»). Guided by the traditional understanding of the classical «economic man» optimality, then out of nine options, we will choose the option «a», which combines the most affordable price with the highest quality of products (Fig. 5).

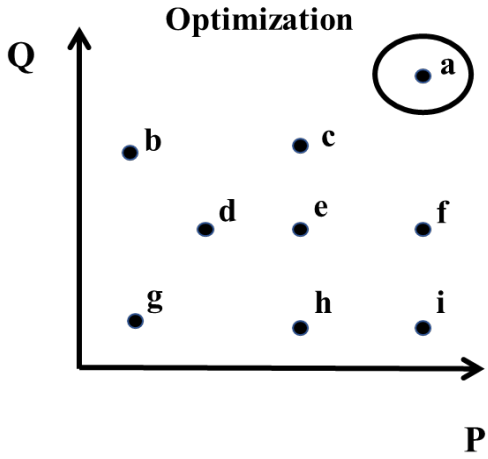

Figure 5. Choice by optimization principle

Source: composed by authors

Assume the consumer, instead of maximizing utility, will be satisfied with the acceptable for him, but not necessarily the maximum, level of product quality and availability of its price (denote them as Q' and P', respectively). Then the number of options chosen reduces from 9 to 5: «a», «c», «d», «e», and «f». Option «b» is rejected according to the criterion of price availability; options «h» and «i» – according to the level of product quality; and option «g» does not suit the consumer according to both criteria at the same time: it is too expensive and has a poor quality. The closest position to the minimum acceptable combination of price and quality is option «d»; the buyer will be satisfied with limited optimization instead of maximum (Fig. 6).

In 2015, the UN General Assembly issued the document «Transforming our World: the 2030 Agenda for Sustainable Development», which formulated 17 Sustainable Development Goals for the period 2016-2030. Goal No. 12 proclaims «transition to rational models of consumption and production». The term «rational model» in this context means «sustainable model», which is based on awareness of responsibility for future

generations in the global scale. «In addition to the well-known eco-oriented components, SDG12 includes such developing modern trends as the well-known sharing (joint consumption) and the less well-known concept of slowing down the rhythm of life (slow living), which has received the greatest development in the generation Z segment» (Tolkachev, 2022).

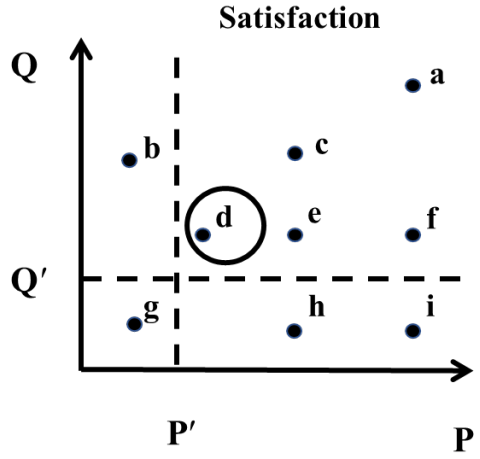

Figure 6. Choice based on satisfaction

Source: composed by authors

We dwell on the values of those who were born 10-25 years ago, i.e. nowadays they are either teenagers or university graduates. Thanks to IT-technologies development, these people, so-called, the first «digital generation», have an opportunity to do their work without leaving home, thereby spending more time with families. The unexpected result of combining these possibilities was economy. It significantly distinguishes the youth of the XXI century from the generation of their parents, as well as grandparents – generation X (born in 1965-1980) and partly Y (born in 1981-1996), who had their consumer's habits according to the consumer society behaviour. On the one hand, the work of the eBay platform – an electronic analogue of the «flea market» (existed in Russia until March 2022), the Craigslist electronic advertising site (operates in Moscow and St. Petersburg), foodsharing, carsharing, and other-sharing are all examples of the collective use of goods and services, practically a form of public cooperatives and joint consumption, barter, and rent instead of ownership. On the other hand, it is the spread of the concept of the rhythm of life slowing down (slow living), which is based on consciousness of the choice of goods and services, especially the schedule and some kinds of food:

- avoiding fast and inexpensive food,
- avoiding of the mass market,
- choice of slow travel, allowing people to communicate with the family, local residents, and their culture.

Thus, rationality is the result of the interaction of natural and social systems.

The second stage, unlike the first, raised the problem of rationality from the individual to the social level. And the third, unlike the second, focused on the maximizing consumption. It deprives producers of the possibility of an extreme increase goods and services output and profits maximizing. There is an opinion, that the next stage will overcome the limits of the economy. And could link rationality with non-economic goals based «on cooperation, mutual benefit, mutual understanding, respect for national sovereignty, on the conjugation of knowledge and technology to spiritual, moral, cultural and ethical principles and norms» (Glazyev, 2022). Then economic rationality will be replaced by the «rationality based on the criteria of reason and culture» (Kolganov, 2022). However, this raises at least two issues.

Firstly, we can get trapped in terms of tautology (the term «rationality» derived from Latin. ratio – mind).

Secondly, if the non-economic goals of cooperation are laid in the foundation of rationality, the M.I. Tugan-Baranovsky's point of view: «Part of political economy will turn into a theory of economic policy, and

part of it will become part of a more general science of society – sociology,» (Tugan-Baranovsky, 1917) could be confirmed (Rodina, 2019).

Conclusions

According to the study, we reveal the fail of the classical «economic man» competitiveness in the XXI century. Ludwig von Mises also considered the ability to adapt to changes as a criterion of rational behaviour (Mises, 2005). The «economic man» adapted to the changes in his almost 250-year existence. However, this adaptation greatly transformed him from full rationality to limited, from purely economic to socio-economic-ecological one.

The XVIII-XIX centuries were the periods of appearance and formation of an industrial economic system (classical economic school), which needed a theoretical understanding of the optimization principle. The criterion of efficiency was proclaimed as a purely market equilibrium, which oriented the consumer to maximize the overall utility, and the producer – profit.

In the XX century, under the conditions of a mixed economic system (neoclassical and Keynesian schools), the criterion of efficiency get the understanding of pseudo-market (social) equilibrium while maintaining an orientation towards maximizing utility and profit.

In the XXI century, globalization led to consciousness of the global ecosystem vulnerability (a new institutional school). As a result, the principle of full optimization was replaced by the principle of partial optimization (satisfaction); sustainability has become the criterion of effectiveness.

Thus, the «economic man» transformed from the individual level – through the national – to the supranational. This allowed him to remain competitive, but only through his own total transformation.

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The work was done on a personal initiative.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHORS' CONTRIBUTION

Galina A. Rodina – conceptualization, project administration, writing – original draft.
Natalia S. Brillante – formal analysis, writing – review & editing.

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Theoretical and methodological approaches to the definition of the state export potential concept in terms of its change and assessment

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Abstract. The research considers need to increase the export potential of the Russian Federation in the current geopolitical and economic situation. On the one hand, the threats caused by the complex effect of anti-Russian Western sanctions as part of processes aimed at redistributing spheres of influence in the world. But, on the other hand, the emerging opportunities for expanding partnerships (primarily economic) with friendly countries. These countries and Russia are steadily converging and striving to unite in the conditions of the collective West growing irresponsibility. The purpose of this research paper is to investigate the concept of national export potential in terms of theory and methodology in order to improve the processes of its change and the procedures for assessing a country's export potential. The novelty of the research results is the specification of the state export potential concept, highlighting the distinctive features of this particular concept for the benefit of its measurement and assessment. The practical significance of the results obtained is the possibility of applying the revised state export potential concept when implementing the processes of its measurement, assessment, and search for ways of its enhancement.

Keywords: theoretical and methodological approaches, state export potential concept, change and assessment.

JEL codes: B10, B20, D62, E10, F63

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Introduction

In the context of the ongoing events related to the redistribution of spheres of influence in the world, the elements of which at the present stage are anti-Russian Western sanctions, Russia has an objective need to increase the export potential of the country. The implementation of this trend, on the one hand, is quite complex and problematic, and, on the other hand, is necessary and realistic today, if we consider the current crisis geopolitical conditions not only as a set of threats (dangers), but also as a set of emerging new opportunities (Fig.1).

Thus, the need to increase the export potential of the Russian Federation in the current geopolitical and economic situation is due to:

- threats caused by the complex action of anti-Russian Western sanctions as part of the processes aimed at the redistribution of spheres of influence in the world and weakening the power of our country;
- the emerging opportunities to expand partnership relations (primarily economic) with friendly countries which will increase Russia's economic power. The friendly countries and Russia are steadily converging and striving to unite in the conditions of the collective West growing irresponsibility.

These circumstances predetermined the relevance of the research.

The purpose of this research paper is to investigate the concept of national export potential in terms of theory and methodology in order to improve the processes of its change and the procedures for assessing a country's export potential.

Figure 1. Interpretation of the crisis in Chinese as a combination of emerging dangers and opportunities
Source: Tebekin, 2021

Methodological base of research

The following well-known scientists studied the issue of the export potential: Andreeva & Malysheva (2003), Budarina & Basalaeva Yu.A. (2021), Kosmin, Kuznetsova & Kosmina (2019), Koshelev (2022), Petrov-Rudakovsky (2015), Safin (2016), Sergienko & Zubarev (2022), Sukhikh & Katz (2015), Fokina & Belyakova (2014), Yakushev (2015), etc.

The following researches formed the methodological base of the work (Allayarova, 2022; Tebekin, 2020) etc.

Results

To consider the content and essence of the «state export potential» as an economic category, it is necessary to define the basic categories of its components – «potential» and «export».

The term «potential» in its etymological meaning derived from the Latin word potentia, – «strength».

We summarized the existent definitions of «potential». The results are presented Table 1.

Table 1 – Results of summarizing the existent definitions for «potential»

Definition	Source
"Potential (from Lat. potentia – power), in a broad sense – means, reserves, sources available and able to be mobilized, put into action, used to achieve a certain goal, implement a plan, solve a task; the capabilities of an individual, society, state in a certain area: economic potential (means), production potential (means)"	The Great Soviet Encyclopedia
"The totality of available means, capabilities in any area, for example, the military potential of a country – the totality of its economic, moral, political and military resources for waging war"	Big Economic Dictionary
"A general term meaning the ultimate possibility or ability of some activity, the implementation of some actions, etc. It can be talked about the production potential of a country or region	Economic and Mathematical Dictionary: Dictionary of modern Economics

Definition	Source
(the possible volume of production under the best possible conditions), about consumer potential and demand potential (it is important to know them when forecasting production growth), and also about innovation potential and some other similar categories»	
"Potential (from Lat. potentia – power) – sources, opportunities, means, reserves that can be used to solve a task, achieve a certain goal; the capabilities of an individual, society, state in a certain area (for example, economic potential)"	Large Encyclopedic dictionary
"The degree of power in some respect, the totality of some means, capabilities. The economic potential of the country. Military potential (resources for warfare). Nuclear potential. Internal capabilities"	Explanatory dictionary of the Russian language
"Potential (from Latin. potentia – power, opportunity). The totality of means, conditions necessary for conducting, maintaining, preserving something (new policy). The potential of war (resources for waging war)"	A large explanatory dictionary of the modern Russian language

Source: composed by authors

The analysis of domestic encyclopedic sources presented in Table 1 allows us to highlight the following characteristics of the concept of «potential».

Firstly, in the most general sense, potential is the means, reserves, sources available for mobilization, activation, achieving of a certain goal, to implement a plan, to solve a problem or to perform a specific task. In this case we consider the capacity of an individual, society, state in a particular area: economic potential (means), production potential (means).

Secondly, in a narrow sense, «potential» is a term meaning the ultimate possibility or ability of some activity, the implementation of some actions (Lopatnikov, 2003).

Thirdly, potential is the level of power in any sphere, a set of means, capabilities (meaning internal capabilities) (Ozhegov, 1994).

Thus, the definition of «potential» is based on the concept of capabilities as a set of means, reserves, sources, conditions necessary to achieve a certain effect.

This approach in the scientific literature is known as «effective», since the potential is considered as a possible achievable result in the implementation of a controlled process.

In terms of defining the concept of «state export potential», it is important to consider the applied meanings of «potential» concept. This concept is interpreted in the scientific literature on the theory of potentials in various aspects.

Thus, the researchers in the works concerning the study of the theory of potentials: Belomestnov (2017); Verenikin (2009); Karapeychik (2014); Kruglov (2006); Mochalov (1982), etc., present many definitions of potential, for example: national economic potential; economic potential; foreign economic potential; innovation potential; scientific and technical potential; natural resource potential; export potential; organizational potential; labour potential; production potential; information potential; marketing potential; educational potential, intellectual potential, etc.

Most researchers of the potential theory pay attention mainly to the economic potential. However, despite a considerable number of studies in this area, there is no uniform approach to the definition of economic potential, understanding of its essence, constituent determinants, and its relationship with categories as «national wealth», «level of economic development» among researchers.

Thus, there is no unequivocal interpretation or precise definition of «economic potential» to date.

The economic nature of «export potential» provides definite rationale for categorising it as «economic

potential».

For instance, E.V. Volkodavova (2007) in her dissertation indicates the economic potential as «a generalizing characteristic and manifestation of the combined influence of the following interrelated and interdependent sides: production potential, export potential, innovation potential, human resources potential. All these aspects or components of economic potential are interrelated, but their economic opportunities are implemented in different ways...».

According to her dissertation, M.M. Gurova (2012), analyzing the structure of the country's economic potential, concludes « the more potential the national economy possesses, the greater its export potential. In this regard, the category «export potential» appears closely interconnected with the structural elements of economic potential of the country's economic complex. Consequently, as follows, export potential is a part of the system «economic potential,» reflecting the «system-element» ratio».

The reference point of such consideration is the study of the essence of «economic potential» concept.

The Great Soviet Encyclopedia gives the most extensive interpretation of the definition «economic potential», in which the economic potential is understood as «the aggregate ability of the national economy to produce industrial and agricultural products, carry out capital construction, transportation of goods, and provide services to the population at a certain moment in history. The economic potential is determined by the number of labour resources and quality of their professional training, capacity of industrial and construction organizations, production capacity of agriculture, length of transport routes and availability of vehicles, development of non-productive industries, achievements of science and technology, resources of explored mineral resources, i.e. the elements constituting the productive forces of society in the aggregate; it depends on the size of the national wealth of the country.

According to the Modern Dictionary of Economics, «economic potential» includes: «the aggregate ability of a country's economy, its industries, enterprises, and households to implement production and economic activities, manufacture products, goods, services, meeting the needs of the population, and ensuring the development of production and consumption. The economic potential of a country is determined by its natural resources, means of production, labour, scientific and technical potential, and accumulated national wealth.

The economic and mathematical dictionary by L.I. Lopatnikov defines economic potential as «the generalized ability of an economic system to manufacture products and perform other tasks of economic and social development. This ability is determined by the state, size and dynamism of production, its infrastructure, availability of reserves, amount of natural resources and other elements of national wealth, cultural and technical level and personnel mobility».

In terms of encyclopaedically sources, economic potential is an economic category representing the ability of the economic mechanism to perform a production function (Malamanova & Starinsky, 2016). However, other aspects of economic potential are also known, but this characteristic of economic potential is considered as the most important one.

The next concept related to export potential is «export». It derives from the Latin «exporto», which means «to take out». The interpretation of the legal status and economic nature of export is quite specific – it is the export of goods from the Russian Federation without an obligation to re-import them . In terms of encyclopaedic sources given in Table 2, export is the taking out of goods, services, capital, technologies intended for sale in foreign markets or for processing in another country. Thus, the objects of export are goods, services, capital, and technology. In accordance with it, the subjects of export are individuals, legal entities, and the state.

Table 2 – Results of summarizing the existent definitions of «export»

Source	Content of concepts
The Great Soviet Encyclopedia	"Export (English – export, from Latin exporto – to take out) the export of goods and services abroad for their sale on the foreign market; the opposite of the import of goods and services is import"

Source	Content of concepts
Modern Economic Dictionary	"Export (from Lat. exporto – take out) is the taking out of goods, capital, sold to foreign buyers, intended for sale on foreign markets or for processing in another country. Export also includes the transportation of goods through another country and the export of goods brought from another country for sale in a third country (re-export). Export also includes the export of capital abroad and the provision of services to foreign partners"
Big Economic	Economic and Mathematical Dictionary: Dictionary of modern Economics
Dictionary	"Export of goods sold to a foreign customer or intended for sale on a foreign market. Export also includes the taking out of goods for processing in another country, the transit of goods through another country, the taking out of goods brought from another country for sale in a third country (re-export), etc."
Economic and Mathematical dictionary	"The export of products ('visible export') and services ('invisible exports') from one country to other ones. As a rule, these are exports performed on a refundable basis, sales for the purpose of obtaining foreign currency spent, in particular, to import goods and services required the country"
Dictionary of Financial Terms	"Export of goods, services and capital abroad for sale on foreign markets"
Explanatory dictionary of the Russian language	"Export of goods, capital, and technology abroad; counter is import"
Federal Law No. 164-FZ "On the Fundamentals of State Regulation of Foreign Trade activity"	"Export of goods from the Russian Federation without obligation to re-import"

Source: composed by authors

In general, export is an important factor for the country's economy, since:

a) export ensures the sale of surplus products which cannot be sold on the domestic market, but are in demand on the external market;

b) export ensures the receipt of currency, which is spent, in particular, on the import of goods and services necessary for the country.

The content of export potential in scientific and specialized professional literature is considered at the macro level (export potential of the state), meso level (export potential of the territory), micro level (export potential of the enterprise), as well as as a concept invariant to economic levels.

The results of systematization of approaches to the identification of the concepts of «export potential in a broad sense (invariant to the scale of the economic systems under consideration)», «export potential of the national economy (country)», «export potential of the territory (region)», «export potential of the enterprise, industry, complex» are given in Table 3-6.

Table 3 – Results of systematization of approaches to the identification of the concepts of «export potential in a broad sense (invariant to the scale of the economic systems under consideration)»

Source	Content	Approaches used
Functional direction of research		
Tokarev (1997)	"Export potential at the level of an enterprise, industry, and the economy as a whole is the aggregate ability of the national economy branches to produce industrial and agricultural products which are competitive in foreign markets, to provide services to foreign legal entities or individuals, as well as to export capital abroad at a certain historical moment"	Process approach

Source	Content	Approaches used
Zorkova (1999)	"Export potential" can be defined as an indicator of the national and regional productive forces development level, characterizing the degree (share) of their inclusion in the international division of labour"	The quantitative approach
Savinov & Migunov (2008)	"Export potential is the ability of the national economy, its sectors, industries, enterprises, and companies to produce goods and services which are competitive on the world market through the use of comparative national advantages (large-scale natural resources, favorable geographical, infrastructural, and other factors, high labor productivity, etc.), as well as new competitive advantages based on scientific and technological progress"	Process approach
Dadalko & Dubkov (2013)	"In a broad sense, export potential is the ability to produce world-class products both in terms of their consumer properties and their origin. However, there should be sales markets for these products, because, otherwise, the quality of the products does not make sense"	Commodity-marketing approach

Source: composed by authors

Table 4 – Results of systematization of approaches to the identification of the concepts of «export potential of national economy (country)»

Source	Content	Approaches used
Functional direction of research		
Kamolov (1998)	"Export potential is the ability of the economic system to produce goods, technology, and services that are competitive on world markets with the achieved level of development of resources, productive forces, science, service, and sales infrastructure and the monetary and financial support export system"	Process approach
Mirzoev (2002)	"Export potential is the ability of the national economic complex to produce and sell goods (including services, technologies, and intellectual property rights) which are competitive in foreign markets with an ever-increasing level of efficiency in the use of natural resources, the development of scientific and technical potential, productive forces, currency, financial and credit systems, as well as service and sales infrastructure support export without harming the economy while ensuring the economic security of the country" (export potential is considered as the basic one for the state development of foreign economic activity)	Process approach
Ultan & Rogovskaya (2012)	"Export potential is a tool for activating the existing and potential competitive advantages of the country's economy in the international division of labour, a mean of facilitating the country's entry to the stable economic growth"	Functional approach
Muravin (2003)	"The country export potential is the ability of the economic system to produce goods, technology, and services which are competitive on world markets with the achieved level of development of resources, productive forces, science and service, and marketing infrastructure, without harming the national economy"	Functional approach
Khokhar (2010)	"Export potential as a macroeconomic indicator is the aggregate ability to ensure sufficient, efficient, and competitive sale of goods on foreign markets, as well as the required level of service"	Market-oriented approach

Source	Content	Approaches used
Multidisciplinary endeavour of the research		
Andreeva & Malysheva (2020)	"The combination of process and resource approaches allows us to define the concept of export potential. On the one hand, as a complex of internal resources of subjects of the national economy used in the creation and production of products/services competitive on the world market. And on the other hand, in terms of the national economy as a tool to promote the realization of competitive advantages of these subjects on world markets, taking into account national interests of the country"	Process-resource approach
Andreeva & Malysheva (2020)	"The combination of process and resource approaches allows us to define the concept of export potential. On the one hand, as a complex of internal resources of subjects of the national economy used in the creation and production of products/services competitive on the world market. And on the other hand, in terms of the national economy as a tool to promote the realization of competitive advantages of these subjects on world markets, taking into account national interests of the country"	Process-resource approach

Source: composed by authors

Table 5 – Results of systematization of approaches to the identification of the concepts of «export potential of the territory (region)»

Source	Content	Approaches used
Resource direction of research		
Maltsev (1991)	"The export potential of the territory is the export base of the region, estimated by the possibilities of entry and consolidation in a particular foreign market. The regional export base is a set of export-producing (goods and services) industries, together with other enterprises in this territory manufacturing products which are competitive according to international standards, but do not ship them abroad"	Functional approach
Mikhailovsky (2001)	"... the export potential of the territory is a system of quantitative and qualitative indicators characterizing the region in terms of its position on the world commodity markets and maximizing the long-term foreign exchange earnings. However, the foreign economic potential of the region should determine the possible degree of the territory participation in the international division of labour system. Generally, the foreign economic potential is determined by the competitiveness of goods and services produced in the region on the world market and the possibilities of using technological, labour, intellectual, natural, and other resources of the territory in the structure of global cooperative relations. The degree of the region's foreign economic potential realization is characterized by its export complex"	Functional approach
Resulting direction of research		
Seifullayeva (2001)	"The export potential of the region is its real opportunities to form and maximally satisfy the needs of domestic and foreign customers in goods and services in the existing and forecasted market conditions in the process of optimal interaction with the surrounding marketing environment and rational use of available export resources"	Functional approach

Source	Content	Approaches used
Butaev (2003)	"The export potential of a region can be defined as the ability of the entire social production (enterprises, industries, and the economy as a whole) located within a given territory to produce and sell competitive goods and services on specific foreign markets under the achieved level of the economic factors development and the system of organizational and economic export support"	Functional approach
Kirsanov (2005)	"The export potential of a region is the ability of regional production (enterprises, industries, and the economy of the region as a whole) located within a given territory to produce and sell competitive in future goods and services on specific foreign markets with the existing level of development of market relations, economic factors and the system of organizational and economic support for exports"	Functional approach
Elkin (2010)	"The "export potential of the region" is considered as a category not only economic, but also as socio-economic, characterized by dialectical interaction of economic, organizational, industrial, and social relations. The export potential is an element of the socio-economic potential system and determines the ability of the region's economy to sell competitive goods (manufactured products, extracted resources) and services in specific foreign markets"	Functional approach
Saveliev (2011)	"The export potential of the region is the complex ability of an innovative export-oriented system to create and produce competitive products and services for export, promote them on the foreign market, profitably sell and provide the required service level"	Industrial approach
Prytkov & Nemirova (2011)	"In terms of its essence, the export potential of the region is the aggregate ability of the regional economic system to produce goods, technology, and services meeting international standards with the rational use of the natural resources of this region"	Market-oriented approach
	"In terms of an economics, the export potential of the region is the maximum possible volume of goods and services export competitive on the world market under the existing regional industry structure"	Commodity-marketing approach

Source: composed by authors

Table 6 – Results of systematization of approaches to the identification of the concepts of «export potential of an enterprise, industry, complex»

Source	Content	Approaches used
Resource direction of research		
Samokhin (2000)	"Export potential is a complex indicator taking into account the properties and characteristics of an enterprise and market for the possible sale of its goods; it also correlates with the requirements for a potential sales market which are determined by its nature (properties, characteristics, and features)"	Marketing approach
Gritsev (2004)	"The aggregate ability (of the industry) of an enterprise to produce competitive products for export, "promote" it to foreign markets and sell it profitably consists its export potential"	Market-oriented approach

Source	Content	Approaches used
Frolov (2004)	"The export potential of the Russian gas complex is its ability to further foreign economic (including foreign trade) activities based on the availability of export resources. The gas complex implements this ability using reserves"	Market-oriented approach
Manin (2005)	"The export potential of an industrial enterprise is the aggregate ability of an enterprise to create and produce competitive products for export, promote it on the foreign market, sell goods profitably, and provide the required level of service"	Commodity-marketing approach
Nevsky (2005)	"The export potential of industrial enterprises is the volume of competitive products in demand on the foreign market, which can be produced and sold by economic entities under the existing market conditions"	Industrial approach
Gubin (2006)	"The export potential of machine-building enterprises is a set of production, technological, scientific, labour factors determining the ability of the industry to produce high-quality, competitive products for selling on the foreign market"	Factor approach
Kruglov (2006)	"The export potential of an industrial enterprise is the real or possible ability of an enterprise, determined by the totality of its production, financial, personnel and market potentials, to provide trading activities in the foreign market under the volatile external environment factors influence"	Factor approach
Volkodavova (2007)	"The export potential of an industrial enterprise" is a dynamically changing component of economic potential, the organizational and technical structure of which, correlating with the mission and goals of the enterprise, takes into account the impact of environmental and internal factors, provides stable sales with a given level of profitability in the markets of far and near abroad"	Systematic approach
Sidorenko (2010)	"The export potential of an enterprise represents the aggregate capabilities of an enterprise available and capable of being mobilized to meet the objectives of self-preservation and development in the world market through export of consumer values, considering the impact of external environment factors"	Marketing approach
Khokhar (2010)	"The concept of export potential should be considered at the enterprise level within a single industry as the aggregate ability to produce competitive in foreign markets products"	Market-oriented approach
Gurova (2012)	"Export potential of the grain market" refers to the ability of the agrarian sector of the country's economy to ensure stable supplies of competitive products of the grain industry to the foreign market while meeting the domestic needs of the country for sustainable economic growth and strengthening national positions in the world market"	Market-oriented approach
Rusakov (2012)	"The export potential of an enterprise implies the aggregate ability of an enterprise, based on its production and economic capabilities, to sell its products abroad, to attract foreign direct investment and participate in international cooperation and industrial processes"	Systematic approach

Source	Content	Approaches used
Sychev (2012)	"An enterprise's export potential is the combination of the company's available resources and capabilities to produce competitive products, sell and serve them on foreign markets, both in the short and long terms"	Market-oriented approach
Dadalko & Dubkov (2013)	"In the narrow sense, the export potential of industrial enterprises is the current or potential ability of an enterprise, determined by the development of the totality in its production, financial, human and market potentials, to implement, under the influence of endogenous (internal) and exogenous (external) factors, activities aimed at promoting its own products or their derivatives to foreign markets, which is assessed within some socioeconomic system"	Factor approach
Karachev (2016)	"Export potential (as a poly-structural dynamic component of economic potential) is defined as the ability of an enterprise, based on available and possible resources and technologies, considering external environment factors, to ensure the production and supply of competitive products to foreign markets in the current period and in the mid-term perspective"	Market-oriented approach
Fokina (2014)	"Export potential is "the availability of scientific and technological capabilities of an enterprise to organize the production of competitive products meeting the technical requirements and standards of the international market, as well as the ability of the enterprise to adapt to continuous changes in the external environment and achieve strategic development goals"	Industrial approach

Source: composed by authors

Based on the analysis of the results of systematization of approaches to identify the concepts of «export potential in the broad sense (invariant to the scale of economic systems under consideration)», «export potential of national economy», «export potential of territory (region)», «export potential of enterprise, industry, complex» given in Tables 3-6, the research process highlighted characteristic features typical of the concept «export potential», presented in Table 7.

Table 7 – Results of the identification of features typical for the concepts of «export potential» corresponding to different scales of economic systems (macro-, meso- and micro-levels)

Indicators	Variants of the "export potential" concepts			
	Export potential in a broad sense (invariant to the scale of the economic systems under consideration)	Export potential of the national economy	Export potential of the territory (region)	Export potential of the enterprise, industry, complex
Ability to produce	+	+	+	+
Competitiveness in foreign markets (compliance with international standards)	+	+	+	+
The level of development of productive forces	+	+	+	
Degree of inclusion in the international labour division	+	+	+	

Indicators	Variants of the "export potential" concepts			
	Export potential in a broad sense (invariant to the scale of the economic systems under consideration)	Export potential of the national economy	Export potential of the territory (region)	Export potential of the enterprise, industry, complex
Comparative national advantages	+			
World-class products both in terms of their consumer properties and in terms of their origin	+			
Resource development level		+	+	+
The level of scientific and technical potential development		+	+	+
The level of the currency, financial and credit systems development (financial potential)		+	+	+
The level of service and sales support infrastructure (organizational and economic support systems) for exports		+	+	
Ensuring the country economic security		+		
Basis for the foreign economic activity development		+	+	
A tool for activating the economy		+		
A tool for sustainable economic growth		+		
Economic efficiency (profitable implementation)		+	+	+
The possibility of establishing a foothold in world commodity markets in the medium and long terms			+	+
Global cooperative relations			+	+
Maximum satisfaction of customers' needs for goods and services in the existing and forecasted market				
conditions			+	

Indicators	Variants of the "export potential" concepts			
	Export potential in a broad sense (invariant to the scale of the economic systems under consideration)	Export potential of the national economy	Export potential of the territory (region)	Export potential of the enterprise, industry, complex
Socio-economic category characterized by dialectical interaction of economic, Organizational, industrial, and social relations			+	
Availability of an innovative export-oriented system			+	
Sustainable use of the natural resource			+	
Complex indicator				+
Ability to "promote" products to foreign markets				+
Availability of resource reserves				+
Ability to provide the required level of service		+	+	+
Resistance to the variability of environmental factors				+
Ability to mobilize aggregate capabilities				+
Strengthening of positions in the global market				+
Attracting foreign direct investment				+
Ability to adapt to changes in the external environment				+

Source: composed by authors

Conclusions

Hence, the research conducted on different variants of the «export potential» concepts corresponding to different scales of economic systems (macro-, meso- and microlevel) within the framework of the performance, resource, functional and mixed research areas showed the following common characteristics.

First, the most common characteristics of export potential are the ability of an economic system to produce and sell products (goods, works, and services) competitive in foreign markets, i.e. compliance with global standards.

Secondly, the economic systems under consideration should possess the necessary resources (level of development of productive forces, scientific and technological potential, monetary and financial and credit systems (financial potential), service and supply infrastructure to support (system of organisational and economic support) export, innovative export-oriented system, and natural resource potential) as well as resource reserves.

Thirdly, export potential indicates the extent to which the economic system under consideration is included in the international division of labour, and participates in global cooperative linkages.

Fourthly, export potential represents the comparative national advantage.

Fifth, the export potential of an economic system represents the conformity of exported products with global levels, both in terms of their consumption properties and origin. Although, we should note, many countries are quite successful and profitable mediators between the exporting and importing countries.

Sixth, export potential represents the level of a country's economic security, as export potential is a tool to stimulate the economy and a means to ensure stable economic growth.

Seventh, export potential can be considered as the basic foundation for foreign economic development.

Eighth, export potential characterises the economic efficiency (profitable sales) of products.

Ninth, export potential represents the ability of the economies under consideration to gain a foothold in world commodity markets in the medium and long terms.

Tenth, export potential should be considered as a socio-economic category characterised by a dialectical interaction of economic, organisational and production as well as social relations.

Eleventh, export potential involves the sustainable use of the natural resources.

Twelfth, export potential can be considered as a composite indicator, determined by a number of factors.

Thirteenth, export potential indicates the ability of an economic system to «promote» products to foreign markets.

Fourteenth, export capacity represents the ability of an economic system to provide the required level of service for long-life products.

Fifteenth, export potential indicates the sustainability of an economic system to the variability of external environmental factors, including its ability to adapt to changes in the external environment.

Sixteenth, export potential indicates the ability of an economic system to mobilise its aggregate capabilities.

Therefore, a combination of these attributes should be taken into account when considering the development of the export potential of managed economic systems.

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CONFLICT OF INTEREST

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AUTHORS' CONTRIBUTION

Alexey V. Tebekin – conceptualization, project administration, writing – original draft.
Nelia I. Allayarova – data curation, formal analysis, writing – review & editing

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Technological sovereignty of Russia in terms of the global competitiveness: on the case study of choosing a strategy

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Abstract. The issue of ensuring technological sovereignty is becoming increasingly relevant under the sanctions restrictions. The article discusses the possible alternatives to the economic development of manufacturing industries in Russia: the strategy of inclusion into global value chains, and the concept of «technological autarky». The paper analyzes the domestic scientific papers in terms of the «technological sovereignty». On the basis of economic and food security approach understanding of Russian manufacturers' national independence from the foreign technologies and equipment import appears. The paper also emphasizes the issue of «technological sovereignty» and development of integral and sectoral indicators at the macro and sectoral level based on dependence on foreign technologies and equipment imports on the proximity to the global technological frontier. The author dwells on the mutually beneficial technological cooperation with «friendly countries», in particular with the BRICS countries, as an only alternative in the existing geopolitical realities of the «Technological autarchy» strategy. This cooperation also can include the long-term joint projects.

Keywords: technological sovereignty, value chains, technological border, economic sanctions.

JEL codes: E60, E61, E65, E66, E69

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Introduction

The socio-political problems of Russian technological sovereignty have sharply escalated under the unprecedented sanctions pressure after February 2022. For many years during the post-Soviet period, an implicit contract similar to the deal between the USSR and Germany «Gas in exchange for pipes» was in effect in a number of industries. Russia supplied mainly hydrocarbon raw materials, and technologically developed countries supplied the necessary equipment and technologies into Russia. The purpose of this article is to consider the economic development alternatives from the perspective of Russia's competitiveness in the global markets: 1) Russia's participation in global value chains or 2) orientation to the extreme form of technological sovereignty – «technological autarky» and identification of possible intermediate alternatives to these development strategies. Also, we consider the essence of the «technological sovereignty» concept and possible criteria for its operationalization as the objectives of this paper.

Notwithstanding the years of reforms, including the focus on innovative development in regulatory documents and the abandonment of the «raw material needle», the complexity of Russia's output remains fairly average as the economic complexity index shows. Thus, Russia ranks 51st[1] place out of 133 countries; its highest ranking (28th) was in 2000. The drop in the ranking is explained by the energy resources growing share in exports.

During the post-Soviet period, there have been no significant breakthroughs in technological development despite the active pro-innovation rhetoric and the availability of resource opportunities. We can consider the country's participation in the international division of labor, taking into account existing comparative advantages (in particular due to natural rent) and using the advantages of international technological cooperation as the explanations for this phenomenon. To a large extent, the theoretical basis for such a policy was based on ideas attracting some Russian policy makers from endogenous theories of

1 https://atlas.cid.harvard.edu/countries/186 (Accessed 15.05.2023)

economic growth, in particular the works of F. Aghihon and F. Howitt (Aghihon & Howitt, 2006). They took J. Schumpeter's ideas of «creative destruction» and partially combined them with A. Gerschenkron's concept of the catch-up development benefits (Gerschenkron, 2015). F. Aguillon drew attention to the innovative process described in the Schumpeterian theory which strongly depends on the position of the country in terms of the technological frontier, i.e. the global technological level (Zamulin & Sonin, 2019). Additionally, the proximity to the global technological frontier requires high costs to ensure further growth through innovation, which makes it possible to increase the pace of economic growth through investment costs (Acemoglu et al., 2006). In this regard, there is an «advantage of backwardness» for countries of catching up development. Since the transition to a new technological «frontier» requires not only much more efforts. To achieve this kind of frontier is possible by implementation or imitation of the existing technology. This approach was actively used by East Asian countries. They ensured their own development this way: from catching up to advancing development (Levin & Sablin, 2021).

In this regard, a possible way of development is a gradual expansion of Russia's participation in global value chains, and transition from low-value products to higher ones. This strategy used Canada which, according to Simachev et al., is an example for Russia (Simachev et al., 2020 p. 8). On the one hand, Canada is a supplier of raw materials on world markets, and on the other hand, it is the manufacturer of some technologically complex goods. But by these some goods production Canada is at the last stages in global value chains (GVCs). It is believed the developing countries which are not participating in the GVCs could enter the global market only if the product developed and produced by them is competitive one. It was usual for low-conversion products. Indeed, developed countries, as a rule, focused on the design of goods, as well as marketing and after-sale maintenance of production processes. IKEA is a typical example. The brand has traditionally close relations with local suppliers of intermediate resources, and provides cooperation at the production stage. But at the same time the company IKEA is an ultimate principal in terms of interaction with consumers.

These implicit and quite simple strategies of economic development were also used by the Russian authorities in the 2000s. However, its practical implementation, in our opinion, is possible under two ideal conditions. First one is the free access to the global technology market, where advanced achievements of scientific and technological progress are presented and there are no restrictions in technology transfer, engineering services, and staff training opportunities. Second is demand for products created with the help of these technologies in world markets. All its possible either in the case of foreign direct investment, when the subject of technology production and the seller of finished products is the same company (for example, a TNC or a Multinational Corporation (MNC)). In this case, the inflow of advanced production, marketing, organizational and managerial technologies to the country is possible. According to endogenous growth theories, it can promote economic development due to the effects of spillover and learning-by-doing. The second case is the situation when the companies interacting in the value chain are, according to O. Williamson, in a situation of fundamental transformation, i.e. there is a bilateral dependence of counterparties in the context of asset specificity and attitudinal contracting options.

Indeed, this strategy of «naive technological cooperation» actually began to collapse after August 2008 (the situation of «peace enforcement» in Georgia). Those time the first technological restrictions in the possibility of importing foreign technologies for dual-use products occured. However, these restrictions did not affect the key sphere of Russian exports – the oil and gas sector, in which foreign technologies and services of mainly Western engineering companies in the field of oil production, transportation and, partially, oil refining continued to be actively used. The situation has changed significantly since 2014, when sectoral sanctions affected this key area of Russian exports (Nureyev et al., 2017). Also the opportunities for importing technologies have been significantly reduced. According to our research, the impact of sanctions «is expressed in slowing down or stopping the operational processes of business functioning, as well as the need to restructure logistics chains and (or) develop their own production of previously imported components, which leads to an increase in the cost of finished products and lengthening the operational cycle of the business model» (Shkodinsky et al., 2022, p. 84).

However, despite a considerable degradation of the situation with the possibility of a global technological market access, including equipment supplies, the Russian government's attempt to ensure full technological sovereignty has not been realised. The existence of numerous programs for the import substitution development, the support of technological development, the available global technology market provided the tactics of cooperation with countries imposing restrictions on the supply of equipment and technologies to Russia. According to the HSE 2020 report «Russia in Global Production», «the key challenges for Russian structural policy are, in our opinion, not the expansion of the non-resource sector in general (which would be relatively easier to implement due to the extensive growth of sectors within the existing low and medium-sized industries), but rather the renewal and increase added value in existing non-resource sectors, increasing the depth of processing and integration into growing production chains in global production» (Simachev et al., 2020, p. 5).

This strategy of focusing on participation in international scientific and technological cooperation (as an alternative to the strategy of «technological autarky») has clearly manifested in the aviation industry. In this sphere the past decades there have been no obvious breakthroughs and the sanctions restrictions occurred in March 2022 led to a potential collapse of scientific and technological cooperation with former partners (Kapoguzov, 2022). Thus, in the production of Russian Sukhoj Superjet 100 aircraft, which were also exported to Mexico and Kazakhstan, Russia was a participant of the complex global value chains, in particular using hydraulic, braking and oxygen systems from the USA for the production of Russian aircraft, so as the life support systems and control systems from Germany.

The changed geopolitical situation focused on technological sovereignty in the conditions of the new reality at the highest level. Thus, at the Council of Legislators of the Russian Federation in St. Petersburg on April 27, 2022 President of the Russian Federation V.V. Putin defined the most and «absolutely solvable» tasks ensuring the industrial and technological sovereignty of our country in the near future[2]. Later, at the St. Petersburg International Economic Forum, there was also issue on technological sovereignty: «the cross-cutting principle of development which unites our work is the achievement of true technological sovereignty, the creation of an integral system of economic development independ on foreign institutions for critical components. We need to develop all spheres of life at a qualitatively new technological level and at the same time be not just users of other people's solutions, but have technological keys to the creation of goods and services of the next generations»[3]. At the same time, the President's speech did not concern with the import substitution, but advanced development, the creation of unique technologies and goods (S.P. Korolev's achievements in rocket engineering were used as an example).

However, at the time of the geopolitical confrontation in February 2022 the situation with some branches of Russian manufacturing industry branches is quite different in terms of the possibility of technological sovereignty. According to the HSE report «Russia in Global Production» for the pre-pandemic period (the report was presented at the April 2020 conference), a different strategy was recommended for Russia. Jn the one hand, borrowing of the best practices and available technologies in agriculture (dairy farming is especially noted) was recommended. But on the other hand, «in industries characterized by high renewability and in which Russian firms are relatively technologically developed (pharmaceutical production, certain branches of the mechanical and electrical engineering industry), stimulation, creation, and implementation of domestic breakthrough developments is the crucial one» (Simachev et al. 2020, p. 12). Meanwhile, the number of companies in non-energy sectors located on the technological border was estimated at 2%, and another 15% – as close to the technological border: «proximity is characteristic of large companies, companies controlled by foreign capital (as well as non public sector companies), innovatively active companies engaged into the personnel development» (ibid., pp. 114-122). However, the individual industries of 20% leaders in the pulp and paper exceeds the other companies more than 8 times, and in air transport by more than 6 times. The export and participation in global competition allows Russian companies to improve their competencies.

Main part

2 https://www.pnp.ru/politics/putin-zayavil-o-skoroy-indeksacii-pensiy-zarplat-i-posobiy.html (Accessed 25.11.2022)
3 http://kremlin.ru/events/president/news/68669 (Accessed 25.11.2022)

Technological sovereignty: on the issue of the content of the category

The growing technological gap, the lack of self-sufficiency in many spheres of technology, the aggravation of global contradictions and the intensification of international conflict pose serious challenges to the Russian Federation. The long-term slowdown of economic growth and the need to resist sanctions increases the importance of Russia's technological sovereignty. At the same time, the term is ambiguously interpreted in the domestic literature. At the same time, the meaning of the term is ambiguous, and there is both a substitution of concepts and closely related concepts, such as technological self-sufficiency (Prikhodko, 2021). Let us consider this issue in more detail.

However, the issue of technological sovereignty is considered in terms of the national security. Indeed, scientific and technological development are also highlighted as a strategic national priorities. By Professor V.K. Falcman, technological sovereignty is «the ability of a particular type of economic activity to provide its national economy with its products of appropriate quality, even at the expense of its imports, but subject to the mandatory condition of reimbursement of import costs at the expense of proceeds from the sale of its own exports» (Faltsman, 2018, pp. 83-84). This opinion correlates with the idea of the first variant of the strategy – the country's participation in the GVDC and its benefits in terms of the international cooperation. Meanwhile, the statistically measurable indicator is characterized by the international division of labor. The corresponding indicator for measuring the «scientific and technological sovereignty of the industry (type of economic activity) depends on «export of products as a sign of leadership» and «import of products as a form of borrowing foreign technologies» (ibid., p. 84). Generally, the indicator concerns with the international division of labor and the state of technological sovereignty (in the author's understanding) for enlarged types of activities in Russian Federation. For instance, engineering branch in the period from 2000 to 2016 had a significant gap between exports and imports, while the peak was the «pre-sanction» 2013, when exports was USD 28.8 bn, and imports USD 152.8 bn.

According to S.G. Kovalev, «the technological sovereignty of a country is the most important parameter of its reproductive security and historical future. Sovereignty is based on a system of technological processes actually or potentially possessing by the country, using them in the social production of tangible and intangible goods» (Kovalev, 2020). Semantically and morphologically, the concept of «technological sovereignty» includes «independence and the possibility of developing and applying a wide range of domestic and borrowed methods of production on the country economic territory based on government decisions» (Ibid.).

A. Afanasyev denotes the essence of technological sovereignty as «the unhindered realization of national interests in the technosphere, taking into account existing and future threats» (Afanasyev, 2022, p. 2387). Moreover, the criterion for achieving this level of sovereignty is its abstract designation as: «Independent sustainable development of the country in the technosphere as a unity of science, machinery, and technology.» The author believes in further specification of «technological sovereignty in the development of issues of «components of technological sovereignty; mechanisms for ensuring it; qualitative characteristics, and quantitative indicators for assessing the level of technological sovereignty actually achieved, etc.» (ibid., p. 2389)

The issue of technologies use and the import of dual-use products is also relevant. By V.K. Faltsman, «The modernization of the defense industry was almost entirely based on the import of machine tools. Domestic production of machine tools almost did not increase, despite the extremely low level of capacity utilization (17%)» (Faltsman, 2018, p. 86)

The technological sovereignty arise a lot of questions. For instance, S.G. Kovalev considers the desired and achievable degrees of technological sovereignty as a whole so as the individual industries and certain types of technologies; the possibilities of ensuring, achieving technological sovereignty; concepts of advanced technology achievement; conditions of support, neutrality of the external world environment; borrowing or creating own technologies; mechanism for ensuring the technological sovereignty implementation; usual mode of existing economy; using of special, targeted economic mechanisms and approaches, etc. (Kovalev, 2020, p. 35).

However, according to I. Prikhodko, «technological sovereignty is the achieved degree of localization of the global technology creation process, ensuring an impact restricting the freedom of foreign technologies usage by domestic companies unacceptable for these countries on the technological process of partner countries in the process of international technological exchange and cooperation» (Prikhodko, 2021, p. 94). Meanwhile, the author criticizes his own definition, in terms of the costs associated with restrictions on usage the patented technologies.

Thus, the ambiguity of the «technological sovereignty» interpretation requires its further methodological study. In our opinion, it has two options: the adaptation of existing methods applied to similar categories, or the development of an original methodology for assessing the level of technological sovereignty. For the first option, it seems acceptable to use the techniques and developments implemented for the category of «economic security» at the macro and meso levels (at the regional and individual industries levels). In this case, a system of threshold values of the integral indicator of technological sovereignty can be applied at the macro level. For the level of individual industries (within the framework considered by S.G. Kovalev), a situation similar to the previous interpretation of the essence of food security occurs. It correlates with the degree of self-sufficiency (independence from imports) with food[4]. Therefore, the criterion for achieving technological sovereignty is dependence on imports by industry or sub-sector in general and by a specific product group in particular. This dependence is assessed by the Ministry of Industry and Trade of Russia. Indeed, there are some attempts to quantify the dependence on equipment imports, for example, in terms with the fuel and energy complex of Russia (Sayenko & Kolpakov, 2023). Additionally, it suggests the development of a full-fledged methodology which allows assessing the diagnosis of the technological sovereignty both for individual industries and product groups. The integral indicator characterizes the degree of technological sovereignty achievement as independence from the import technologies.

Institutional alternatives to ensuring technological sovereignty

Thus, ensuring technological sovereignty in terms of this particular research raises the question of full technological autarky, when advanced technologies necessary for the production of high-value goods are created within the country or about the possibility of cooperation with «friendly countries» interested in such cooperation allowing us to transfer from global to integration value chains. But there is an issue of providing the «powerful interest» (according to S.G. Kovalev's formulation) for the transfer of advanced technologies still absent in Russian science and industry.

Meanwhile, the tasks of ensuring technological sovereignty occur at the governmental level. In accordance with the list of instructions of the President of the Russian Federation following the meeting of the Presidential Council for Strategic Development and National Projects on December 15, 2022, approved by the President of the Russian Federation on January 26, 2023, No. Pr-144, strengthening the technological sovereignty of the Russian Federation is one of the key tasks. It should be achieved in 2023 as the national development goals of the Russian Federation for the period up to 2030. In addition, on February 8, 2023, President of the Russian Federation Vladimir Putin noted the limited time Russia has to create and develop its own technologies in microelectronics, information technology, industry, transport, the development of medicines, new materials, etc. important for the country to ensure technological sovereignty.

However, the development of breakthrough technologies is associated with high uncertainty and risks, so it is extremely important to find promising options for combining resources and competencies. In this regard, the issues of the integration principles use and mechanisms of network coordination, the formation of a conceptual framework to overcome the technological gap through mutually beneficial cooperation, including at the international level, are extremely relevant. One of the promising directions for strengthening the technological independence and self-sufficiency of the Russian Federation is to increase technological sovereignty in the terms of scientific and technical cooperation with the BRICS countries – Brazil, Russia, India, China, and South Africa. Four of the five BRICS countries are top ten largest countries in the world in terms of population, area, and GDP. The leaders of the BRICS countries defined this cooperation goal as a

4 Within the framework of an alternative (updated interpretation), food security is considered from the standpoint of the «harmlessness» of food for public health.

consistent, active, pragmatic, open, and transparent dialogue. Nowadays, Algeria, Bahrain, Egypt, Iran, the UAE and Saudi Arabia have submitted applications for membership to BRICS, as well as 7 others countries declared their potential interest in participating in BRICS in 2022, and can join this partnership in future.

In 2020, the five countries supported India's initiative to adopt the BRICS Countries' Innovation Cooperation Plan for 2021-2024. The activities within the framework of the Plan are designed to intensify cooperation between the BRICS countries in the field of technology transfer to form direct cooperation between the participants of the innovation chain, as well as to ensure the sustainable development of five-sided cooperation in accordance with the new technological order. However, until now, Russia has not developed a concept or a methodological basis for solving strategic challenges on strengthening technological sovereignty in terms of intensifying scientific and technical cooperation of the BRICS countries.

The key issue concerns with the participants' incentives and desire of BRICS partners to share their advanced technological developments and know-how. For instance, China is one of the world's technological leaders in many technological spheres. However, the complicated situation with parallel technological imports for Russia through friendly countries, in conditions of serious lag in certain areas of Russia, there remains only the possibility of building technological cooperation similar to the development of a joint wide-body long-haul airliner CR929 by the Russian United Aircraft Corporation and the Chinese company COMAC. Although these kind of projects are generally long-term, they can be useful for the implementation of current tasks due to the external effects of cooperation and the possibility of applying technological developments in other areas.

Conclusions

The strategic narrative of the Russian economy development evolved from the ideology of «resources in exchange for technology» into a neo-globalist concept of Russia's participation in global value chains. During the analysis of the scientific papers, we proposed an understanding of technological sovereignty as independence from the import of foreign technologies and equipment. Indeed, the issue of developing a methodology of indicators characterizing technological sovereignty, both integral and industrial, requires further study.

Thus, despite the attempts of forced movement under the influence of sanctions towards a strategy of technological import substitution and ensuring technological sovereignty, there is no possibility of ensuring «technological autarchy» in a number of industries. it can inevitably lead to further rejection of the Russian economy from the global technological frontier and simplification of manufactured products, which is clearly manifested in the Russian automotive industry. In these conditions, almost the only available alternative to an autarkic strategy is cooperation with technologically advanced friendly countries, in particular on the basis of already existing institutional structures, such as BRICS, etc. The key idea of this systemic alternative is the need for self-sufficiency in technologies created and developed in the context of multilateral scientific and technical cooperation of the BRICS countries. The use of integration interaction principles, network coordination mechanisms, and a program-project approach will form a conceptual framework for overcoming the technological gap through mutually beneficial cooperation.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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The systematic development of mechanical engineering is a key link in increasing the competitiveness of the Russian economy

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Abstract. The competitiveness of the economy is its ability to develop steadily under the conditions of the modern intensification of the world redistribution struggle. The material basis of economic competitiveness is the developed machine-building. It forms the technical equipment of the whole machine-building industry, creates the labour means for all branches of the economy and determines the level of their efficiency. The study of Russian machine-building indicators for 2005-2022 reveals a number of negative trends and factors generating these trends. At the same time, the analysis shows an objective possibility for a significant acceleration of the machine-building development existed in the country. They consist primarily in the use of the trade balance surplus for the import of equipment and components, aimed at the technical renewal and expansion of machine-tool construction industry and further - of other machine-building industries. Using the construction and analysis of the annual inter-branch production and distribution balances of gross social product for the period 2005-2019, we reveal the interrelations in the development of the main industries. Also we found the dependence of the material and labour intensity indicators on the technical armament of labour in the industries. The calculations performed provide a basis for the conclusion stating as follows: if the current account surplus materiality were used for purchasing imported equipment and re-equipping machine-building, then within 10-15 years Russia could achieve a significant approach to technological sovereignty and overcome its dependence on imported equipment by increasing its exports. We provide the calculations for the period 2016-2020 as an illustration. In accordance with these data, the main internal factor preventing the revival of domestic machine-building is the relationship of private ownership of the means of production, and the external factor is the anti-Russian sanctions. In this regard, we propose a variant to mitigate the effect of negative factors, based on increasing the role of the state in the economy and the use of state planning.

Keywords: role of machine tool industry; indicators and trends in mechanical engineering; factors hindering the development of mechanical engineering; the relationship of the main sectors of the economy; effect of foreign trade; reserves for accelerating the development of mechanical engineering; directions of their use; the role of the state in accelerating the development of engineering.

JEL codes: E60, E61, E65, E66, E69

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Introduction

Nowadays, as the struggle of the imperialist powers led by the United States to expand their spheres of influence escalated to the adoption of the most severe anti-Russian sanctions and the instigation of a proxy war in Ukraine, the problem of Russia's economic competitiveness is more relevant as never before.

In our opinion, the competitiveness of the economy is its ability to develop steadily at a high pace and improve the quality of life of the entire population of the country in the long term, successfully overcoming external negative impacts. Ultimately, the Russian economy will be able to withstand the confrontation with the collective West in the long term only if there is a developed technical base and technological independence. It can be ensured only through the accelerated revival of domestic machine building. Indeed, machine tool construction, which «is the basic fund-forming industry». Also, the level of development «largely characterizing the level of development of machine building in the country as a whole» , its competitiveness. Therefore, the Chairman of the Government of Russia M.V. Mishustin speaking to the deputies of the State Duma, pointed out the development of machine tool construction as one of the four most important points of economic growth .

The purpose of the study is to identify reserves for accelerating the development of Russian mechanical engineering, identify factors preventing their use, and possible ways to overcome these factors.

The main hypothesis of the study is that the development of mechanical engineering is possible only in cooperation with other sectors of the economy, including foreign trade.

The object of the study is the economic system of Russia, the subject of the study are indicators of the economic activities development in their interrelation and influence on the mechanical engineering development. The analysis performed for the period 2005-2023. We use data of the official websites of Rosstat; the Ministry of Finance the Federal Customs Service, and the Bank of Russia.

Main Part

1. Advanced mechanical engineering is the basis of technological sovereignty

Any technology is, first of all, knowledge about the objects and means of labour, the ways of their use are required to obtain a certain result. If there is only knowledge, then the technology can be sold or provided for use as an object of intellectual property, but not applied.

Technological sovereignty means the use of the most important technologies in production on domestic territory. This requires certain items and means of labour, which are produced on the appropriate equipment. Nowadays, the idea appeared in the 1990s that all the equipment needed by the country could be purchased in exchange of the natural resources is not supported by the facts. Indeed, after the Crimea integration, and especially after the beginning of the Special Military Operation in Ukraine (SMO), it became obvious the revival of domestic engineering is of particular importance to achieve technological sovereignty.

During the 1990s, the Russian machine-building industry was in a deep crisis. It has not completely emerged even today. The main cause of the crisis was the transition to a market capitalist economy.

The reforms had a great negative impact on the domestic machine tool industry, which occupied leading positions in the world previously. For instance, the world's first CNC machine was created in the USSR in 1958. Their serial production was established in the 1970s. In 1991, the country produced more than half of all the necessary equipment for the mass production of CNCs. At the time of the USSR break up thousands of Soviet machines were working abroad: in Germany, Switzerland, France, Japan, etc. In 1991, there were presented about 50 units of Soviet equipment at the Paris Machine Tool Exhibition.

As a result of privatization, «the output of metal-cutting machines has decreased by several times, and CNC machines in general by dozens of times. In 2009, the production of machine tools reached the lowest level in the history of the country. By this time, many machine-tool factories were stopped, the remaining ones worked very poorly» .

The consequences of the negative trends in the Russian machine tool industry are: the dependence of the economy on the equipment and components import, the loss of the country technological sovereignty, a decrease in the competitiveness of the enterprises products, etc.

The measures of the Russian government to support the domestic machine tool industry, including the adopted ones in 2020-2022, were not insufficiently effective. Indeed, they relied mainly on methods of indirect regulation and did not create conditions for solving the entire complex of tasks for the rise of the industry. The most machine tool enterprises were unable to cope with this problem on their own.

The losses incurred have not yet been compensated. it has affected the development of mechanical engineering as a whole, although recently there has been some growth in the industry (see Table 1).

The investment decreased in all branches of mechanical engineering in the period 2014 - 2019. Since 2020, despite the pandemic, they began to increase. In 2022, the growth of investments continued, except for the production of electrical equipment and vehicles: this branch has an investment reducing up to the level of 2014.

The level of investment in mechanical engineering remained generally poor, on average about 1.7 times lower than investment in trade and repair of vehicles (see Table 2).

Capacity utilization for a number of main types of machinery production on average for 2018-2021 ranged from 12.1% (forging machines) to 62.1% (household refrigerators and freezers), averaging about 29% . It indicates significant opportunities for production growth in mechanical engineering without additional investments. However, the investments level is quite low.

Table 1 – Growth rates of production in machine–building industries for the period 2015-2022, %

Period	2015	2016	2017	2018	2019	2020	2021	2022	Average annual growth for 2015-2022
Manufacture of computers, electronic and optical products	105.8	102.8	100.2	103	110.6	103.4	107.9	101.7	104.4
Production of electrical equipment	90.7	107	102.7	105.4	101.3	99.2	106.3	96.3	101.1
Production of machinery and equipment not included in other groups	98	97.9	108.3	102.4	113.5	110	113.8	101.9	105.7
Production of motor vehicles, trailers, and semi-trailers	77	97.9	120.1	111.5	96.3	87.8	113.8	55.3	95.0
Manufacture of other vehicles and equipment	97.3	110.8	115.6	107.7	99	106.6	107.9	95.8	105.1

Source: Russian Statistical Yearbook, 2005-2022

Table 2 – The share of industries in the investments volume, %

Period	2017	2018	2019	2020	2021
Manufacture of computers, electronic and optical products	0.4	0.4	0.3	0.3	0.4
Production of electrical equipment	0.3	0.2	0.2	0.2	0.2
Production of machinery and equipment not included in other groups	0.4	0.4	0.4	0.3	0.4
Production of motor vehicles, trailers, and semi-trailers	0.5	0.6	0.5	0.4	0.6
Manufacture of other vehicles and equipment	0.8	0.9	0.8	0.8	0.9
Total in mechanical engineering	**2.4**	**2.5**	**2.2**	**2**	**2.5**
Wholesale and retail trade; repair of motor vehicles and motorcycles	4	4.4	3.7	3.4	4.1

Source: Russian Statistical Yearbook, 2005-2022

The main reasons of it are:

– Insufficient financing of the industry, lack of working capital and investment resources, own funds for R&D, high cost of credit (Mehanik, 2022).

– Depreciation of fixed assets at the level of 63-65%. First of all, technological equipment requires replacement. More than half of equipment has been in operation for 25-30 years . Shortage of modern equipment to replace depreciated ones.

– Dependence on the import of components and materials, the component base of electronics. Almost all microchips and chips in machines assembled in Russia are made abroad. It is necessary to import CNC systems from abroad. 1.5-2 years ago there were no problems with supplies, but in 2022, anti-Russian sanctions destroyed almost all logistics chains (Mehanik, 2022).

– There are practically no research institutes in Russia working in the interests of machine tool construction, although in 1991 there were about 30 of them. Today there are only 4 that barely survive. The ties of the industry with fundamental science are broken (Mehanik, 2022).

– The loss of qualified personnel, the training of engineers and workers has sharply decreased.

– Loss of the key technologies.

– The cheapness of labour, motivating entrepreneurs to use labour instead of using expensive machines (Fomin, 2022).

– The lack of investment resources in Russia as a whole for modernization and creation of modern production facilities (Fomin, 2022).

After the start of the SMO in Ukraine, the situation was exacerbated by new sanctions. If «before February 2022 nothing prevented the renewal of the machine tool fleet, now only China, Turkey and India are open to us» (Rezvanova, 2023). At the same time, certain achievements have taken place in the work of machine builders in recent years. For example, it applies to the most important sub-branch of machine tool construction – the production of metalworking equipment (see Table 3).

Table 3 – Some indicators of the metalworking equipment production in Russia

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021
The volume of sales in the domestic market, total, pcs.	16713	17962	14677	14382	18192	21108	23102	16378	19489
Including imports, pcs.	13015	13556	10635	8566	11789	13387	15192	7732	11433
Share of imports in sales volume, %	78	75	72	60	65	63	66	47	59
Product output, pcs.	4273	4670	4690	6280	6969	8317	9129	9394	9279
Export, pcs.	575	534	648	464	565	596	1219	712	1223
Export share in output, %	13	11	14	7	8	7	13	8	13
Import to export, times	22.6	25.4	16.4	18.5	20.9	22.5	12.5	10.9	9.3

Source: Mehanik, 2022

Russian weapons are also competitive, and their exports have grown noticeably. There are other types of equipment that can compete with foreign analogues, for example, an agricultural machinery.

According to experts, with an increase in investment in the industry and the creation of other necessary conditions, Russian engineering can dramatically increase the output of competitive products and strengthen the technological sovereignty of the country. However, as already mentioned, investments in mechanical engineering remain at a low level, lower than in trade and repair of motor vehicles.

At the same time, the rise of mechanical engineering is necessary not only for the industry itself, but also for the entire economy as a whole. This is evidenced by data on the state of fixed assets of Russian enterprises in the most important sectors of production (see Table 4).

Table 4 – Indicators of machinery and equipment in Russian commercial organizations in 2013 and 2021 (excluding small businesses)

	Wear rate, %		The proportion of completely worn out, %	
Period	2013	2021	2013	2021
All industries	54.6	63.4	22.1	30.2
Agriculture, hunting, and forestry	48.5	56.9	10.3	18.5
Mining	62.1	66.5	32.0	35.9
Manufacturing industries	53.4	61.9	18.8	25.6
Construction	58.1	60.5	19.5	25.7

Source: Russian Statistical Yearbook, 2005-2022

In 2013 the introduced funds investments covered about 32% of the completely worn–out equipment. It was not completely enough. In 2021 investments figures dropped up to 16.8% . Mechanical engineering uses an increasing proportion of obsolete equipment, the life circle of which has expired. Significant acceleration of the domestic machine building development is relevant not only for upgrading the technical base of the industries, but also for the timely and sufficient army supplying.

2. Assessment of mechanical engineering accelerated growth reserves

Accelerated development of mechanical engineering is possible only in close cooperation with related industries. To study the relationship of mechanical engineering in terms of the other activities, we divide all industries into nine main sectors (see Table 5). Also we classified the enlarged annual intersectional balances of GPP production and distribution of Gross Public Product for the period 2005-2019 on the basis of Rosstat data. We considered mechanical engineering products in the balance as part of the final products of manufacturing industries. The period under study was determined by the availability of relevant statistical data.

Table 5 – Sector numbers in the analysis of the interindustry balances

Sector number	Type of economic activity
1.	Agriculture, forestry, hunting, fishing, and fish farming
2.	Mining
3.	Manufacturing industries
4.	Production and distribution of electricity, gas, and water
5.	Construction
6.	Trade and repair
7.	Hotels and restaurants
8.	Transport and communications
9.	Services (all remaining activities)

Source: composed by author

All comparable calculations were in the basic prices of 2005. We studied these models in terms of mathematical statistics methods and the interrelations between sectors due to production technology, while levelling the influence of price dynamics and natural rent.

During the study we calculated and analysed the aggregated coefficients and dynamics of direct material costs and labour costs. According to the study, the vast majority of these coefficients tend to decrease, which with a high degree of correlation (R from 0.89 to 0.99) is due to an increase in the stock of labour in the relevant industry.

This result convincingly confirms the position of the theory that the increase in the technical equipment of labour is the main factor in the production process development, the growth of social labour productivity.

We calculated the matrices of total material costs and total labour intensity, based on the matrices of direct material costs (see Tables 6 and 7).

We also assess the indices of output elasticity of number of industries to fixed assets, the indices of substitution of factors of production necessary for calculations by the methods of mathematical statistics (see tables 7 and 8).

Table 6a – Assessment of direct labour intensity indices (people. years / mln, RUB)

	Direct labour intensity indices								
Sector No.	2005	2006	2007	2008	2009	2010	2011	2012	2013
1.	4.10	3.96	3.83	3.69	3.56	3.42	3.29	3.15	3.02
2.	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.34	0.34

Direct labour intensity indices									
Sector No.	2005	2006	2007	2008	2009	2010	2011	2012	2013
3.	1.00	0.98	0.95	0.92	0.90	0.87	0.84	0.82	0.79
4.	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
5.	1.83	1.84	1.85	1.86	1.88	1.89	1.90	1.91	1.93
6.	1.67	1.66	1.65	1.64	1.62	1.61	1.60	1.59	1.58
7.	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
8.	1.34	1.33	1.32	1.30	1.29	1.28	1.26	1.25	1.24
9.	2.30	2.31	2.33	2.35	2.37	2.38	2.40	2.42	2.44

Source: composed by author

Table 6b – Assessment of direct labour intensity indices (people. years / mln, RUB)

Direct labour intensity indices						
Sector No.	2014	2015	2016	2017	2018	2019
1.	2.88	2.75	2.61	2.47	2.34	2.20
2.	0.34	0.34	0.34	0.34	0.34	0.34
3.	0.77	0.74	0.71	0.69	0.66	0.63
4.	1.06	1.06	1.06	1.06	1.06	1.06
5.	1.94	1.95	1.96	1.97	1.99	2.00
6.	1.56	1.55	1.54	1.53	1.52	1.50
7.	3.16	3.16	3.16	3.16	3.16	3.16
8.	1.23	1.21	1.20	1.19	1.17	1.16
9.	2.45	2.47	2.49	2.51	2.52	2.54

Source: composed by author

Table 7a – Assessment of total labour intensity indices (people. years / mln, RUB)

Total labour intensity indices									
Sector No.	2005	2006	2007	2008	2009	2010	2011	2012	2013
1.	4.74	4.59	4.44	4.29	0.59	3.99	3.85	3.69	3.55
2.	0.56	0.55	0.55	0.54	0.54	0.54	0.54	0.54	0.54
3.	1.64	1.62	1.58	1.54	1.51	1.47	1.43	1.4	1.36
4.	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
5.	2.3	2.3	2.3	2.31	2.32	2.32	2.33	2.33	2.34
6.	2.07	2.06	2.04	2.03	2.01	1.99	1.98	1.98	1.95
7.	3.45	3.45	3.44	3.43	3.42	3.41	3.41	3.4	3.39
8.	1.58	1.58	1.58	1.56	1.56	1.56	1.54	1.54	1.54
9.	2.54	2.55	2.56	2.57	2.59	2.59	2.61	2.62	2.63

Source: composed by author

Table 7b – Assessment of total labour intensity indices (people. years / mln, RUB)

Total labour intensity indices						
Sector No.	2014	2015	2016	2017	2018	2019
1.	3.39	3.24	3.09	2.93	2.79	2.63
2.	0.53	0.53	0.53	0.52	0.52	0.52

Total labour intensity indices						
Sector No.	2014	2015	2016	2017	2018	2019
3.	1.33	1.28	1.24	1.21	1.16	1.12
4.	1.47	1.47	1.47	1.47	1.47	1.47
5.	2.35	2.35	2.35	2.36	2.37	2.37
6.	1.92	1.9	1.89	1.87	1.85	1.83
7.	3.38	3.37	3.37	3.36	3.35	3.34
8.	1.54	1.52	1.52	1.51	1.5	1.5
9.	2.64	2.65	2.67	2.68	2.69	2.7

Source: composed by author

Table 8 – Assessment of average output elasticity coefficients for fixed assets by sector (bn, RUB / bn, RUB)

Sector	1	2	3	4	8
Index	1.385	0.19	0.485	0.025	0.160

Source: composed by author

Table 9 – Assessment of average labour replacement indices by fixed assets by sector (thousand people / bn, RUB)

Sector	1	2	3	4	8
Index	2.09	0.23	0.942	0.090	0.097

Source: composed by author

The positive impact of the increase in the stock ratio on the results of production is explained not only by an increase in the physical volume of funds, but also by their renewal with more efficient means of labour with the same and even decreasing number of employees. Hence the positive effect of the capital stock growth, despite the existing underutilization of production capacities.

Indeed, there is no absolute accuracy of the results given, since they depend on the accuracy of Rosstat data (which are often, repeatedly and significantly adjusted retroactively). In terms of this issue, it was necessary to neutralize the effect of many factors, primarily price dynamics and other monetary indicators. Nevertheless, they can be used to understand the trends of the processes taking place in the Russian economy, and for assessment of the certain actions results.

Thus, an assessment of foreign goods trade effect was calculated as the difference between the labour required for the production of imported goods and the labour spent on the manufacture of exported goods. The dynamics of the effect is shown in Figure 1.

As can be seen from the graph, foreign trade gave the economy a tangible effect, saving the labour of hundreds of thousands and even millions of workers. At the same time, after 2014, under the influence of anti-Russian sanctions, this effect began to decrease and now, apparently, continues to decrease due to the reduction of the volume of import. In addition, despite the significant magnitude of the foreign trade effect in the period up to 2014, the opportunities of foreign trade for the development of the Russian economy were largely underutilized.

During this period there was a significant outflow of the economic value in three main forms: world net lending based on a significant excess of exports of goods over their imports; an increase in the reserves of the Central Bank; transfer of funds to sovereign funds. The scale of this outflow is shown in Table 10.

If the outflow of value, although in part of the current account surplus implemented for imports, the effect of foreign trade would be much higher, as shown in Figure 2. An increase in imports by 1 bn, RUB in the basic prices of 2005 gives labour savings equal to the unit total labour costs for production in the relevant

sectors of the economy. This issue takes into account the fact of purchasing the labour tools by import. It would led to the additional tangible effect both for the development of production and for the service sector.

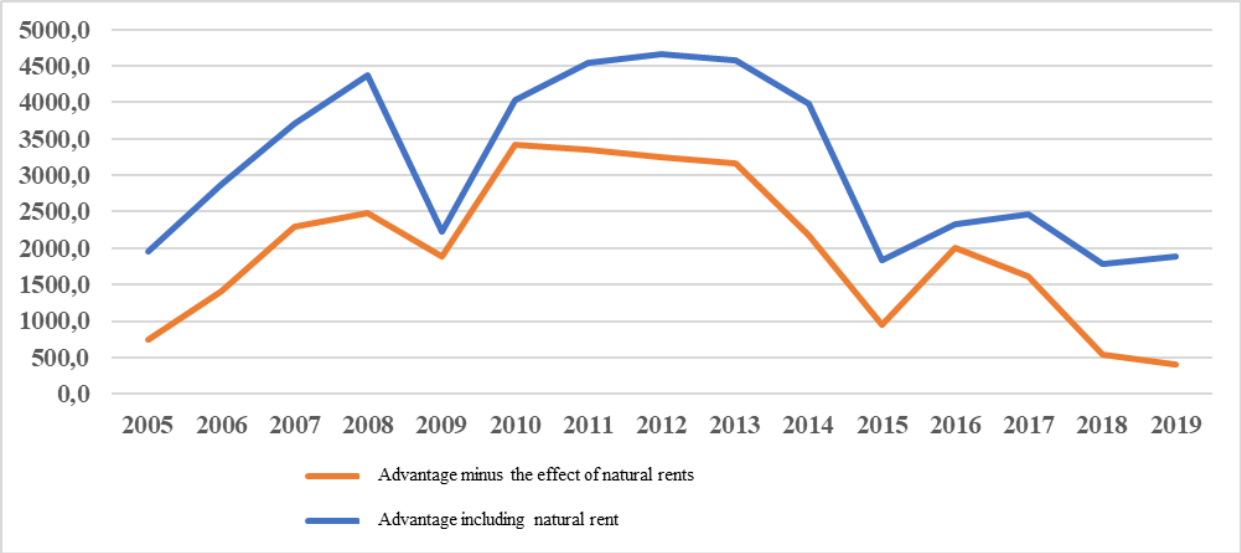

Figure 1. The effect of foreign goods trade (thousand people. years)
Source: composed by author

Table 10a – Outflow of value from the Russian economy, bn, RUB, in 2005 prices (the «–» sign means inflow of value)

Period	2005	2019	2007	2008	2009	2010	2011
Total outflow	**4261.1**	**3790**	**6566.8**	**6453.1**	**3280.2**	**-485.9**	**1350.4**
Current account	2071.8	2753.3	2569	1732	1996.3	883.1	1357.9
Increase in gold and external reserves	1562.4	927.1	2897.2	3385.9	-883.1	77.3	740.8
Contributions to the sovereign wealth fund	626.8	109.6	1100.8	1335.2	2167	-1446.1	-748.3
Manufacture of other vehicles and equipment	97.3	110.8	115.6	107.7	99	106.6	107.9

Source: calculated based on Russian Statistical Yearbook, 2005-2022; Federal Customs Service; Ministry of Finance of the Russian Federation; Statistical Bulletin of the Bank of Russia

Table 10b – Outflow of value from the Russian economy, bn, RUB, in 2005 prices (the «–» sign means inflow of value)

Period	2012	2013	2014	2015	2016	2017	2018	2019
Total outflow	**2103**	**2410.3**	**846.5**	**815**	**1687.7**	**-1006.2**	**820.8**	**3790**
Current account	1786.9	1296.6	583.3	1092.5	1845.5	228	532.4	2753.3
Increase in gold and external reserves	231.5	545.6	-385.7	-2042	45.5	229.2	533.3	927.1
Contributions to the sovereign wealth fund	84.5	568.1	648.8	1764.6	-203.3	-1463.4	-244.9	109.6
Manufacture of other vehicles and equipment	97.3	110.8	115.6	107.7	99	106.6	107.9	

Source: calculated based on Russian Statistical Yearbook, 2005-2022; Federal Customs Service; Ministry of Finance of the Russian Federation; Statistical Bulletin of the Bank of Russia

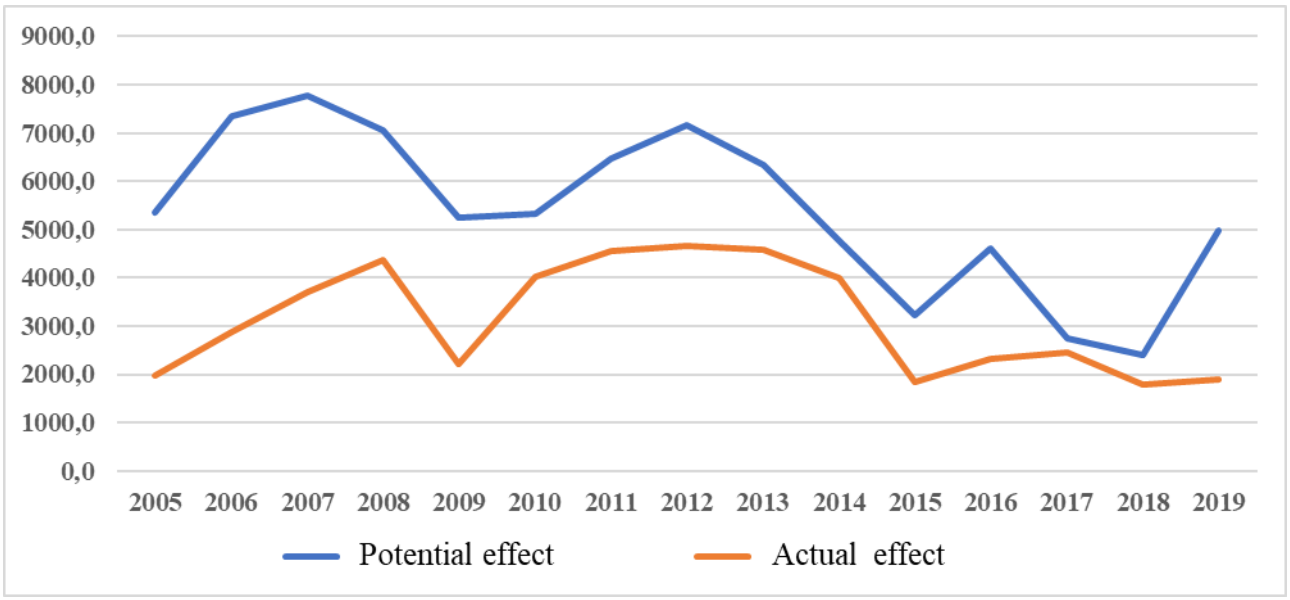

Figure 2. Assessment of the potential and actual effect of foreign trade in goods (thousand people. years)
Source: composed by author

The exports funds can be used to significantly increase the fixed assets of machine–building, primarily machine-tool construction, technological equipment modernization, through imports. It allows them to switch to import substitution of machine-building products and re-equip all sectors of the economy with domestic equipment. This particular policy allowed the Soviet Union to carry out a technical reconstruction of the national economy in the pre-war years and achieve technological sovereignty in a short period.

According to our assessment, if by 2005-2019, all or a substantial part of the current account surplus were spent on purchases of equipment abroad, then by 2017-2019, depending on the development of economic policy, domestic mechanical engineering volumes could increase to an extent enable further expanded social reproduction without the import of capital goods or enable substantial expansion of their export, reducing the use of imports. In other words, Russia, if not achieving technological sovereignty, would make a major step towards it.

In order to ensure the coordination of economic sectors, the development of mechanical engineering would be accompanied by an increase in the technical armament of labour in all other sectors of the economy. The increase in the technical equipment of labour would reduce the number of people employed in material production at a rate dependent on investment policy, and labour would be reallocated to the service sector (science, education, health care, etc.).

But, unfortunately, these purposes were not achieved. Moreover, as already mentioned, imports crowded out domestic engineering, preventing it from reviving during the period under study.

The described policy could be started lately. Assume the expected policy model of the mechanical engineering development in 2016. For instance, the trade surplus established the great opportunities for equipment imports those year: the entire current account balance of 1,845.5 bn, RUB was spent on purchase equipment in order to develop domestic engineering (Note, that here and after all monetary indices are in basic prices of 2005. Those based on the system of inter-branch balances for 2005-2019, calculated this way. Transition to the other years prices is possible using benchmark indices of intersectoral price growth. But it does not change the essence of the conclusions obtained. All calculations based on the total material costs indices assessments and output elasticity for fixed assets).

Since mechanical engineering develops only in cooperation with related industries (mining, energy, transport and communications, etc.), the additional fixed assets also required for their development.

There are two main options assuming the actual number of people employed in all industries:

1) with an increase in the volume of mining while maintaining the volume of their exports;

2) with the same volume of production, but a reduction in the export of raw materials in the amount

necessary for the social production growth.

By the implementation of option 1) in 2017, fixed assets in manufacturing industries would increase by 529.3 bn, RUB, and for adjacent companies – by 1293.5 bn, RUB. It made it possible to ensure a balanced growth of social reproduction in 2017 with an additional 5.9% increase in output in mechanical engineering with the same number of employees in all industries. In general, the total output in the economy would have increased by an additional 1.8%, and the productivity of public labour would have increased accordingly. In addition, the services sector would additionally receive equipment worth 22.7 bn, RUB.

By the implementation of option 2), the labour tools in manufacturing industries would have increased by 628 bn, RUB, and for adjacent companies – by 954.7 bn, RUB; the service sector would have received additional equipment by 262.8 bn, RUB. Production in mechanical engineering would be increased by an additional 7%, the entire output in the economy – by 2.2% to the level already achieved. But at the same time, the export of raw materials in the amount of 71 bn, RUB would have been replaced by exports of manufacturing products in the amount of 103.7 bn, RUB. Therefore, since the coefficient of raw materials replacement with processed products in exports in 2016 was 1: 1.46. It is due to the ratio of domestic prices and foreign trade prices. Reducing the export of raw materials when choosing option 2) it is necessary to increase the production of processing and related industries.

Other options are also possible. For instance, the release of employed from some industries to others ones. In this case, assessment of labour replacement indices in terms of fixed assets by sector would be used (see Table 9). It would also be possible to change the structure of imports in favour of purchasing equipment for mechanical engineering by reducing imports of luxury goods, alcohol, etc.(note, these kinds of products do not develop the economy); increase the volume of equipment of the service sector, primarily for the development of R&D, etc.

Consider the similar calculations for 2017. The possibilities of importing equipment due to the trade surplus were significantly limited to 228 bn, RUB. But even in these conditions, it would be possible to increase production in mechanical engineering. Thus, for an additional increase in the volume of mechanical engineering output in 2018 by 6.4%, taking into account the increase in equipment availability in 2017, it would require an increase in the technical base in all industries by 774.3 bn, RUB; 569.7 bn, RUB would be provided by an increase in mechanical engineering output in 2017 and 204.6 bn, RUB due to the excess of exports over imports. In addition, the services sector would additionally receive 23.4 bn, RUB for equip the sector. Therefore, the greater effect would be obtained by changing the import structure.

Continuing the same policy, it would be possible to increase the production of mechanical engineering in 2019 by an additional 8% due to the acquisition in 2018 of equipment imports in the amount of 532.4 bn, RUB. For instance, increasing the technical equipment of the industries ensures the development of mechanical engineering by 1095 bn, RUB, including the growth of domestic machinery production by 578.1 bn, RUB in 2018. At the same time, the volume of output in construction could be increased by an additional 0.5%; 15.5 bn, RUB would be sent for financing of service sector additional equipment.

Similarly using a significant trade surplus in 2019 for the import purchases of equipment, it was possible to achieve an additional increase in output in mechanical engineering total by 15% in 2020, in construction by 2.6%, etc.

A similar effect could be obtained by partially using part of the Central Bank and the sovereign funds reserves (currently the National Wealth Fund) for technology imports.

As a result, there would be an accelerated growth of mechanical engineering. On the basis of it there could be the labour productivity growth in all sectors of the economy. It would lead to a decrease in dependence on equipment imports, reduction its role in the investment process, and the equipment exports increasing. The reduction of specific material costs and labour for output would be accelerated, and its competitiveness would increase.

Of course, the assessment provided is very approximate, but the conclusions remain the same.

Russia had a huge underutilized potential to achieve technological sovereignty. The attempts to achieve the technological sovereignty at the initial stage, paradoxically, would be made by increasing imports of

equipment. It would subsequently lead to a weakening of the country's technological dependence on foreign manufacturers. Indeed, it seems to be the most desirable for our country at the moment. It is no coincidence that Western sanctions are aimed at depriving Russia of the opportunity to acquire technologies, equipment, and components.

3. Internal and external factors constraining the development of mechanical engineering

Nowadays, private ownership of the means of production is the main internal factor that does not allow the country to achieve technological sovereignty.. . According to the USSR experience, in the conditions of the public ownership of the means of production predominance and a planned economy this issue was not very urgent. Moreover, the predominance of private property destroyed the technological sovereignty of our country and became the main reason for its transformation, in fact, into a raw material appendage of the West.

As known, private capital is invested primarily into the industries providing the highest rate of return – extraction of natural resources, metallurgy, and chemical industry. The products of these industries are exported in significant volumes and provide the largest part of treasury revenues. Therefore, until now, the state has provided priority primarily to the interests of capital employed in these industries, contributing to the increase in exports of primary processing products containing natural rent.

As a result, there is a significant excess of exports over imports, a current account surplus, and net lending by Russia to the rest of the world. The value exported from the country was invested in huge amounts in foreign companies and branches, but not in the domestic economy. Hence, it causes the reduction of domestic investment, the slowdown in economic growth.

Even during the SMO, outflow of value has not decreased. Thus, according to the Central Bank for 2022, the current account surplus exceeded the level of 2021 by 1.8 times and amounted to $ 227.4 bn, USD. It was achieved primarily due to a record trade surplus. It grew 1.7 times in 2022 and reached $ 332.377 bn, USD for the first time. Exports increased by 19.9% to 591.5 bn, USD, imports decreased by 11.7% to 259.1 bn, USD . But it was neutralized with the lost effect from foreign trade, which also reached record values. Exports exist in order to buy the necessary goods abroad, and not to leave foreign exchange earnings there or in reserves. According to the forecast for 2023, the current account surplus may also amount to $66 bn, USD .

As for mechanical engineering, it mainly competes with imports, except for the production of weapons and some other types of exported equipment. Investments in mechanical engineering are much more risky and give a much lower rate of return than investments in mining, metallurgy, and chemistry. Moreover, they require significant capital expenditures on R&D, personnel training, technological renewal, production of components, etc. Notice, their payback period is rather uncertain.

For an individual private owner in this industry it is difficult to solve the full range of issues necessary to establish competitive production. It is also difficult to take a loan for updating the technical base of production, increase working capital. Therefore, as an object of capital investment, mechanical engineering is less attractive than, for instance, investments in trade or restaurant business. Many technological innovations are not implemented in the domestic engineering industry, but are transferred abroad. The similar challenges are for the creators of these innovations.

Mechanical engineering is developing mainly due to orders and other types of the governmental support, as well as through the creation and development of state corporations designed to establish cooperation and coordination in the industry and at least partially overcome the existing difficulties.

Not only imports are used to supply the country with machinery and equipment, but also foreign capital is attracted to the mechanical engineering sector. However, in many cases the degree of localisation is insufficient and creates a dependence on imported components. As a result of sanctions and the withdrawal of foreign capital during the SMO period, the problem of component shortages has sharply increased.

Trade organisations, for private gain, buy abroad not only the products the country needs to develop its economy and win the SMO, but also luxury goods for affluent (alcohol, tobacco, products, knickknacks, etc.). As a result, the foreign currency proceeds from the export of natural resources are used inefficiently.

Banks – including those with state participation – use the funds raised to a large extent not to develop

the economy but to enrich themselves through stock exchange and foreign exchange transactions, serving as one of the main channels for exporting capital from the country. A large part of the real sector of the economy is cut off from the provision of loans, which excludes their reproduction. Targeted preferential lending to specific projects through the issuance of fiat money is not used. Despite of the SMO, large companies and banks, including banks with state participation, accrue huge dividends to foreign shareholders, including those from unfriendly countries.

The main external factor hindering the development of domestic engineering is obviously the sanctions imposed by the United States and its allies aimed at depriving Russia of advanced technologies and sales markets.

Even if Russia wins the SMO, confrontation with the West will not disappear. It will continue in other forms. There will be huge costs involved into restoring the previous provision. It will increase the challenging the country's technological sovereignty.

4. Ways to overcome the factors hindering the development of mechanical engineering

In our view, in order to achieve the goals of engineering development, the main issue is to increase the volume of equipment (technology) imports primarily for the development of domestic engineering same way as described above. Of course, at present it has become much more difficult to implement, but there are options to circumvent the anti-Russian sanctions: parallel and illegal imports, copying of technologies, etc. For instance, equipment imports are already on the list of goods for parallel imports.

In order to revive Russian machine-building, it is necessary to shift from indirect influence measures (credit rates, taxes, customs duties, etc.) to state planning. State planning is designed to solve the whole range of tasks to create a competitive machine-building industry in Russia, from R&D and personnel training to finished products, and hence to ensure Russia's technological independence.

To organize this kind of planning, it is required to establish appropriate planning authorities, scientifically based forecasts of market conditions, the preparation and approval of plans containing specific tasks for performers, the responsibility of performers for the implementation of planned tasks. It should include not only the establishment of work and technical re-equipment of existing enterprises, but also the construction of new ones; not only a certain reduction in the rights of private owners in the common interest, but, if necessary, the nationalization of enterprises; planning of personnel training and R&D, export and import of engineering products, the use of foreign technologies and specialists, foreign exchange earnings, financing, lending, etc.

Also, «a systematic and complete revision of conceptual approaches to the management of international reserve assets is to be carried out» in order to increase the investment potential of the economy (Ershov, 2022).

It is necessary further and significantly increasing the governmental role in the economy. But it requires a radical restructuring of the state apparatus itself. First of all, it is necessary to establish strict personal responsibility for making forecasts and development programs, for the validity of decisions made and for their implementation. The achievement of technological sovereignty would be significantly facilitated by the nationalization of the «heights of the economy», but only if the composition of the state apparatus is updated and its work is radically restructured in the interests of the people.

One option for using the trade surplus for machinery and parts imports could be, for example, as follows. Exporting enterprises would be obliged to sell on the domestic market all or most of the foreign exchange proceeds remaining after their import purchases. These funds as the projected trade surplus are purchased by the state leasing company, which implements the state policy on import purchases of machinery according to a set plan. It is also possible for exporters to transfer these funds to the state leasing company on a long-term loan basis. Funds to finance the leasing company could be generated from

– targeted long-term government loans, participation in which would be more profitable for the population in comparison with bank deposits;
– taxes raise on the purchase of luxury goods and on excess income;
– parts of the Central Bank and sovereign funds reserves.

By purchasing machinery abroad, the state-owned leasing company leases it to companies challenged

with fulfilling government orders to produce equipment with certain technical and economic parameters and within certain timeframes. R&D should design competitive machinery proceeding to those challenges. The essential R&Ds is financed by the state in cooperation with business, and the costs are multiplied compared with the current ones. State orders, if fulfilled, should be profitable for the companies performing them. There is a policy of concessional lending to such enterprises, and where necessary, targeted financing.

State orders are formed on the basis of demand for new equipment from enterprises – consumers of equipment aimed at import substitution. In case of non-fulfilment of the state order, the heads of enterprises have personal responsibility, and enterprises are responsible for their property. In addition, the state implements a stimulating monetary and fiscal policy uses protectionist measures to support mechanical engineering.

It is also important to refuse the neoclassical economics theory, which today is the basis for teaching macroeconomics in universities and to a certain extent adopted by the government.

We try to pay attention to its incorrect statements dwells on the growth of net exports as a crucial factor of economic development (it does not matter what is exported and what is imported); or, positive effect of current account balance; or «full employment» economical investments lead only to inflation. Meanwhile, investments with the same employment can reduce the cost of labour and material resources, increase output, decrease the price level, redirect free labour resources into other fields of industry, etc. Moreover, according to the calculations of economists of the Goldman Sachs Bank, the USA, the introduction of innovations can deprive 300 million people of work (Fomin, 2022).

The theory based on AD-AS curves is false, since it does not take into account the volume and composition of the intermediate product and output, as well as inter-industry relations. The same can be said about the theory of IS-LM curves and other neoclassical theories, which are currently taught in educational institutions. It is necessary to start the teaching of political economy in terms of the modern phenomena analysis.

Conclusions

The issues of the Russian engineering industry became more complicated and require urgent solutions. There is a need in both accelerated growth and qualitative renewal of the industry's products. It will be difficult to achieve the country technological sovereignty without solving these issues.

The one of the main suggestions to solve them is increasing the import of equipment and components primarily for updating and expanding the technical base of machine tool construction and related industries. Indeed, it is possible to significantly accelerate the development of mechanical engineering in general, provide all sectors of the economy with new equipment and in the future significantly reduce dependence on imports of equipment and components, achieve technological sovereignty.

The implementation of these methods is possible only through state planning use. It is the only one capable to solve the wide range of issues: financial, and in the field of R&D and personnel training, optimize foreign trade, establish consistency in the work of related industries, ensure the sale of products, etc. State planning should include establishing the order of design and production of labour tools, in terms of their urgency and efficiency, the construction of new machine-building and related enterprises. Competitive technology will provide the basis for enterprises using it to successfully displace necessary imports, increase sales of products and investments. It will also allow the enterprises to increase revenues.

However, if the created equipment is not able to compete with imports, then the tasks of achieving technological sovereignty will not be solved (Vinokurov & Grichik, 2022). Hence there is an importance of establishing technical and economic tasks for the design and production of equipment, taking into account world achievements.

The state adjustment of the banking system in the interests of production growth allows us to solve the problems of shortage of working capital and investment resources for enterprises. Russia has everything to achieve technological sovereignty within 10-15 years. There is only a need in the cardinal chang

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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The Mobilization model of the Russian economy in the context of the special military operation and the sanctions: present and future challenges

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Abstract. The paper analyses the economic and military-political situation in Russia regarding the special military operation (SMO) in Ukraine. The paper shows possible threats to the country, escalation of the conflict, full utilization of existing industrial capacities and the need to expand these capacities as soon as possible. However, Russia's economy is still based on the principles of market liberalism. Existential threats show the country will inevitably come to the necessity of mobilizing its economic life to meet the challenges of its survival. The author considers the philosophy, theoretical content of the concept of «mobilization economy», its principles, signs and conditions of the country's transition to it. Also the paper dwells on the historical retrospective of its emergence. The existing politico-military and socio-economic situation is dictating the necessity to implement the model of market economy. It is also investigating the presence of its elements in the existing model of market economy. The author identifies the main steps for its implementation in Russia in the nearest future. The key conditions for the transition to a mobilization economy in Russia are: rejection of the monetarist liberal model of economic development; cancellation of the collateral auctions of 1995 results and nationalization of strategic enterprises and industries; updating the legal framework to ensure the fastest possible transition of the country to large-scale state regulation of macroeconomic economic activity; the revival of the national economic complex based on the restoration of the of the Russian energy unified system; restoration of the national strategic planning and management system of socio-economic development; the introduction of the country centralized management with the officials responsibility degree determination for the management decisions made and implemented; nationalization of the Bank of Russia. Therefore, we can conclude the objective regularity of mobilization transformation of the Russian economy in terms of further development and escalation during the military conflict.

Keywords: mobilization economy, existential threats, administrative regulation, import substitution, national security, industrial production, planned economy, military-industrial complex, concentration of funds, centralization of public administration.

JEL codes: E61, E65, H56

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Introduction

The long term military-political crisis occurred in February 2022 due to the need for Russia to conduct a special military operation (SMO) in Ukraine has reached to a certain tension today. Also, it has gradually led to the inclusion in it (sometimes indirectly) of the North Atlantic Alliance countries and their satellites through the open and massive supply of serious heavy weapons, large-scale participation in combat actions on the side of Ukraine of its military advisers and mercenaries. Nowadays, the coalition of countries supporting Ukraine provided it with the assistance (financial, military-technical and military), as well as supporting the economic blockade of Russia, counted forty-eight. Against Russia a lot of various sanctions were imposed (10 packages of sanctions – as of 25, May 2023 and the 11th package is ready, which is planned to be introduced in May-June 2023). These sanctions affected many industries, the financial sector, the service sector, individual corporations and companies, high-ranking individuals and legal entities, representatives of the authorities, etc. there was made an attempt to block the Russian economy and destroy it in order to ensure the coalition forces operating under the flag of Ukraine will win over Russia «on the battlefield». Meanwhile, the coalition assumed that the imposition of economic sanctions would motivate and activate the internal non-systemic and hostile opposition to an open confrontation with the authorities, social chaos and the forceful illegal overthrow of the existing Russian government. This would allow Russia's opponents to quickly separate the

country, establish their direct control over the actions of the authorities, and provide direct and unhindered access to Russian resources.

Indeed, despite all the expectations of the Western anti-Russian coalition, Russia withstood the first wave of sanctions, political, and military-technical pressure. But the situation in the military zone is tense, getting more complicated day by day. The advance of our troops has been stopped, and the Russian military contingent is forced to move to active defense. The front is significantly stretched (over 1000 km), the forces and tools are just enough to ensure the retention of the occupied new Russian territories of the Kherson and Zaporozhye regions and the borders of Novorossiya. There is no issue of serious offensive actions today.

The military-industrial complex is operating at almost full capacity, providing only the minimum needs of troops in ammunition and equipment for conducting defensive operations. The availability of reserves of industrial capacities which would ensure the accumulation of military equipment and weapons to fulfill the tasks set by the President of the SMO is a challenging task. The existing military-industrial complex enterprises are loaded at full capacity. Also there are no new companies that would ensure the increasing of military-technical potential of the country. These are the consequences of the policy of active deindustrialization of the 90s of the twentieth century and one and a half decades of the XXI century. The new equipment and military potential only are under construction or design. The lack of funds, logistics and supply of materials and machinery for the troops prevail the main SMO goals – the demilitarization and denationalization of Ukraine, the transfer to Russian jurisdiction of its historical territories of eastern Ukraine and Novorossia.

The main purpose of the anti-Russian coalition, claimed by officials of the European Union and NATO, assumes the complete overthrow of Russia as a result of victory over it, the destruction of its statehood and sovereignty, the national separation, the genocide of the Russian-speaking population, forcing it to slave labor for the benefit of the «golden billion» in as the people of the «second-class». It determines the urgent need to review and provide a rapid transformation of the Russian economy, directing it to overcome the emerging existential threats to the existence of Russia as a civilization.

However, despite the presence of these serious threats and the active opposition of the anti-Russian coalition against the Russian Federation, its economy is still based on market principles. It remains Russia at the state of great uncertainty about the future prospects of the country's development and the possibility of confronting the enemy in a protracted military-political conflict. This particular state of Russian market instability in conditions of high socio-economic and military-political risks led to the realization of the need for serious changes in the socio-economic structure of the Russian national economy and its transformation into a mobilization-type economy. All mentioned above determined the relevance of our research.

Main Part

1. Theory and philosophy of mobilization economy

The issue of providing a significant structural transformation of the Russian economy has been occurred in political and economic circles for a long time. The current crisis has only become a catalyst for those issues.

First of all, it is necessary to give the definition of the term «Mobilization Economy». Nowadays, there are many definitions of it and many researchers, both in Russia and abroad, study it. The one of the reasons is: with the beginning of Russia's SMO, rapid and sweeping changes in economic life occurred both in our country and in the countries of the anti-Russian coalition, especially, in the developed market economies (EEC countries and the US). Their main criterion is profit. Therefore, there is an inability of this economic model to provide a significant increase in production, in particular military products for their subsequent shipment to Ukraine in a short time. As a result, the EEC and the US are increasingly using directive methods to manage their economies. For instance, in the US such methods are used to prevail the inflation; in the EEC such methods are the directives to impose a price ceiling on oil and oil products from Russia.

In the Russian economy, there is an active transition to the long-term planning methods. It does not correlate with the market economic model. For instance, in Russia in June 2014 was issued Federal Law No. 172[1] , which established the foundations of strategic planning in the Russian Federation. In terms of this law,

1 Federal Law No. 172-FZ on 28, June 2014 (ed. on 31, July 2020) On Strategic Planning in the Russian Federation

there were implemented the strategy for the development of the manufacturing industry[2], an energy strategy for the period up to 2035[3], etc.

However, scientists and authors who study the mobilization principles of economic activity still cannot decide what exactly can be done to correlate with the mobilization economy, what are its scientific definitions, and what its concept includes in terms of today's realities. The one of the reasons is the liberal-market principles of building a socio-economic formation (SEF) in the Russian actively functioning capitalism. Some researches consider the mobilization economy as the economy of the GULAG, some understand it as the economy of martial law, some believe it as the state intervention into the market mechanism of the macroeconomic system functioning.

The discussion on the acceptability of the mobilization economy model for modern Russia was initiated at a round table organized by the editorial office of Nezavisimaya Gazeta in 1999[4]. The opinions of S. Glazyev (a supporter of the mobilization economy in the market mechanism), E. Yasin, L. Abalkin, A. Illarionov (in general, opponents of the mobilization economy in market conditions), and L. Abakin (allowing some of its elements) were discussed there. Indeed, there was no definite position on the concept of mobilization economy, its content and interaction with the whole market.

Nowadays, the several conceptual approaches to the concept of «mobilization economy» definition have been formed in the Russian scientific community (Ermakov, 2022).

The first approach defines the mobilization economy as an anti-crisis economy in emergency circumstances (as a kind of anti-crisis economy, by L.I. Abalkin); an economy with the predominance of state planning (Gorodetsky, 2022); an economy with the administrative allocation of resources (Grishkov, Plotnikov & Frolov, 2022); an economy with the increasing of military potential (Zubkov, 2009); an economy tending to achieve the emergency goals by the exceptional tools, etc. (Pogrebinskaya, 2020). In general, as we can analyze these approaches associated by the researchers with the mobilization economy, an essence of them is the directive model of the economy with market elements.

The second approach provides the governmental concentration of all kinds of resources in order to repel internal and external threats (Matveeva, 2018; Senyavsky, 2010). Generally, V.V. Sedov (2003) presented this approach. According to this paper, the mobilization economy is as an economy which both concentrates and uses the resources to counter threatens to the country as an integral system. Note the definition of the mobilization economy as a socio-economic system presents the similar point of view. In this case, the resources concentrated in state institutions of power are used to counter threats to the life of the state and the ethnic group as well as an integral system (Bekrenev & Krylova, 2022).

Therefore, the most common interpretations of the term «mobilization economy» are:

1. an economy concentrated and used its own resources to effectively counter an external threat;
2. an economy totally used the production resources of the state;
3. anti-crisis economy associated with the occurrence of extraordinary circumstances.

Summarizing the approaches above, we can agree with the mobilization economy definition as follows: it is a category characterizing its ability to produce the maximum amount of products, works, and services by certain industries to counter existing or potential threats to the state itself by using all available resources concentrated in state institutions (Ermakov et al., 2023).

The mobilization economy is characterized primarily by quantitative and qualitative (not cost as in market conditions) indicators of the functioning of the economy as a system. The essence of the mobilization economy is its ability to produce the maximum amount of products in natural units of measurement using the necessary volume of physical resources and determined by the tasks of mobilization. Indeed, production and resources assume the presence of a quantitative relationship of their indicators, which have size, volume

2 Decree of the Government of the Russian Federation on 6, June 2020 N 1512-r. On approval of the Consolidated Strategy for the Development of the Manufacturing Industry of the Russian Federation until 2024 and for the period up to 2035.

3 Decree of the Government of the Russian Federation on 9, June 2020 N 1523-r. On approval of the Energy Strategy of the Russian Federation for the period up to 2035

4 Mobilization economy: the path to prosperity or the collapse of Russia? Round table in the editorial office of the Independent Newspaper. Available at: http:// rusotechestvo. narod.ru/finansy/f49.html (accessed: 22, May 2023).

and numerical values. Meanwhile, the indicators of income, profit, and economic efficiency are not taking into account.

Therefore, the country's economy acquires the features of «mobilization» one in the conditions of preparing the country for a protracted military conflict, or during a shortage of expendable resources for conducting hostilities, or as part of the post-war restoration of a destroyed economy.

During implementing such emergency measures, the previously existing norms and rules (based on the principles of market liberalism) are canceled. Instead, measures are able to mobilize the country's resources to the maximum for achieving the goals of the government (victory in the war, economic recovery, emergency import substitution, etc.) were urgently taken. In this regard, the definition of specific (primarily military-technical) development goals, the predominance of administrative, or even coercive management methods are at the first place. Meanwhile, the role of the state in all spheres of society is repeatedly increasing.

There are several basic principles the mobilization economy is based on (Kyung, 2012):

1. The key link principle. It provides the implementation of the resource concentration policy in cells of the economic system directly affecting the planned activities. The accumulation of resources occurs at the expense of less significant economical parts. Russia has a lot of problems now, the country's economy is under the industrial stagnation for almost 20 years. And the «key link» for excluding Russia from this protracted state is the comprehensive development of the manufacturing industry. But we should remember, nowadays the industry is part of the military-industrial complex. It also includes not only to the full utilization of existing capacities, but also the early construction of new enterprises of added value. This kind of definition and implementation is an urgent governmental task. Indeed, the mobilization of the economy will contribute to a significant acceleration of this process.

2. At any sacrifice principle. It provides the prior use of noneconomic methods of the economic impact on economic entities that influencing the speed of achieving goals. Nowadays, this speed is 19-26 %. In our opinion, it is unacceptably small. Quantitative assessment of the impact of noneconomic factors on the Russian economy dynamics, % is in Table 1).

Table 1 – Quantitative assessment of the impact of noneconomic factors on the Russian economy dynamics, %

Factors of economic dynamics	Contribution of factors to economic recovery	Contribution of factors at the stage of economic recession
Contribution of economic and noneconomic factors into growth (reduction), total, including:	100	100
1) ratio of economic factors	76	68
2) ratio of noneconomic factors, including:	19	26
– psychological	4	11
– institutional and political	3	5
– innovative and technological	3	2
– physical and geographical	6	4
– other noneconomic factors	3	4

Source: Ipatov, 2009

3. Teamwork and planning principle. It assumes the unification of all economic entities into a single team under a centralized management for joint decision-making under conditions of strict centralization and full responsibility for the decisions taken. However, the creation of the State Defense Committee, established in 30, June 1941 and successfully functioning throughout the Great Patriotic War, disbanded on 4, September 1945 can be considered as an example. Its nationwide economic plan developed by a specialized state structure similar to the Gosplan created in the USSR functioned quite successfully at the mobilization stage of its development (before the Great Patriotic War, during it and during the post-war restoration of the national

economy).

4. The principle of discretization. The state of mobilization cannot last permanently or for a long time, as this will inevitably lead to a weakening of the results achieved. Therefore, it should have a limited and clearly defined time frame.

5. The principle of conscientiousness. All economic actors (corporations, businesses, organizations, firms, etc.) and civil society should know the need for a process of mobilization and the possible sacrifices made for the common good. To date, a sufficiently large part of civil society will be dissatisfied with such a policy and will not understand why it is necessary one. Therefore, we need to aware the society about the issues of mobilizing economy and its pragmatics).

2. Conditions and urgency of the mobilization economy model implementation in the Russian Federation

In order to consider the challenges of mobilization economy in the Russian Federation, there is a need to define the conditions for the transition to a mobilization economy in modern Russia and point out the basic conditions and principles of its forming.

The researchers have no consensus on a mobilization economy, the conditions for transition to it, rtc. For instance, T.V. Martynenko (2021) refers to the characteristics of mobilization economy:

1) a high rate of savings;

2) protection of the domestic market from external factors (international competition and military threats[5]);

3) strengthening centralization of the state governing and controlling functions;

4) transition to long-term (up to 6 years) forecasting and strategic planning.

E.M. Buchwald (2022) characterizes the mobilization economy as:

1) deviation from the course aimed primarily at the socio-economic development of the country (implemented by liberal market instruments), and a decrease in the importance of the state socio-economic policy (with a reorientation to industrial policy);

2) increasing the accumulation rate (as a necessary condition for the implementation of an active industrial policy and large-scale investments);

3) reorientation of the state socio-economic policy towards medium- and short-term goals (with the definition of society needs today and in the nearest future);

4) strengthening the state regulation role (and hence central planning and control);

5) implementation of import substitution policy (through the development of domestic production. It is the most difficult task, in terms of Russia's significant involvement in dependence on import supplies of high-tech equipment, machines, machine tools, and components, as well as the presence of significant industrial cooperation with foreign manufacturers),

6) reorientation and scaling of the main directions of foreign economic relations (with their direction to the development of relations with countries loyal to Russia);

7) the inclusion of «social compensation» and maximum people savings mechanisms (through various state programs of medical care and a system of benefits).

According to Doctor of Economics, Professor Y.M. Voronin[6], the key conditions for the implementation of the mobilization economy model are:

1) rejection of the monetarist liberal model of «growth», the concept of market fundamentalism and mechanisms launched in the 1990s, and the construction of a socialist-type society based on a state planned market mechanism;

2) cancellation of the collateral auctions results of 1995, nationalization of certain strategic enterprises and industries;

3) updating the legal framework (in particular, the Federal Law On Mobilization training and mobilization in the Russian Federation), the application of the adjusted and supplemented mobilization plan

5 All in parentheses are the author's remarks

6 Voronin Y.M. Mobilization model as the only and most important condition for victory over the collective West. // Arguments of the week from 10/23/2022 Argumenti.ru. Available at: https://argumenti.ru/opinion/2022/10/795398

of the Ministry of Defense throughout the national economy;

4) the revival of the national economic complex on the basis of the restoration of the public Russian energy unified system;

5) restoration of national strategic planning and management system of socio-economic development;

6) the introduction centralized national management.

Meanwhile, to the conditions presented above, we can add the following (Bekrenev & Krylova, 2022):

1) the country should have a resource and raw material potential sufficient to form a high-performance mobilization production system;

2) the state should have a high level of development of productive forces capable to realize an economic breakthrough;

3) the country should use the latest achievements of scientific and technological progress in key industries;

4) resource mobilization should form the internal market, since the state cannot be considered an international competitor with internal inefficiency of the economy.

Summarizing the statements above, we can conclude that Russia can not have a market economy with elements of mobilization or a mobilization economy with elements of a market one.

Also, to the characteristics of the mobilization economy presented above, it is necessary to add the conditions providing the transition to the model of the mobilization economy. These conditions include (Sedov, 2012):

1. The threats to the existence of the country and their awareness by the leaders of the state.

2. Setting goals to eliminate threats or their counter by the state leadership.

3. Development of a state plan or program to achieve the set goal.

4. Authorities organization of actions to mobilize the country's resources which are necessary for the implementation of the plan or program.

5. Creating a special inspiring of the population, ensuring a willingness to make additional efforts and certain sacrifices in order to achieve the goal. It is quite formidable for the success of the mobilization policy (the USSR experience shows such a rise requires an idea uniting the entire population of the country).

Thus, we can summarize the mobilisation model is based on the use of internal resources of the country. These resources, if the country is in danger, should be urgently used to improve its national security. Indeed, the mobilization model is a development model, rather than waiting for some spontaneous improvement of the military-political and international situation. However, the experience of the gradual escalation of the military conflict in Ukraine during the SMO, and the military rhetoric of countries hostile to Russia with their outright desire to defeat our country suggested the previous situation will not only not return but will further escalate.

The mobilization model allows the country to perform the structural reforms, the necessary industrialization and modernization of the economy, and help to protect the country from emerging existential threats. Nowadays, the attempts to overcome these challenges within the framework of the existing market economy model are ineffective and even counterproductive.

3. The historical roots of the mobilization economy

When considering the problems of Russia's transition to the mobilization economy model, our own national historical experience of its implementation should be considered. It should not be the Soviet experience only. However, it is the most indicative in this regard because elements of economic mobilization were used even before the October Revolution of 1917, during the World War I, when the country was experiencing serious military and economic difficulties.

The World War I was the impetus for the emergence of a mobilization economy occurring. It showed that Russia is able to avert external threats, but internal contradictions in the political and socio-economic spheres remained unpreventable, which eventually led to the Civil War. However, the war showed the weakness of the basic industries and underdeveloped transport infrastructure, which had a direct impact on the supply of army with food, cloths, etc.; enterprises with metals, raw materials, fuel; and the population with food and

non-food products (Mobilization economy: the concept, its boundaries and content, 2010).

In the early months of the war, a special labour regime was introduced in state military enterprises. Reserved workers could not move from one factory to another without special permission. They were deprived of the right to strike and demand higher wages. The practice of soldiers being seconded to government factories was spreading. These soldier-labourers were assigned to the factories on conditions of barracks maintenance. Failure to obey the orders of the factory administration was equated with a breach of military discipline. A total of 33,000 soldiers were seconded to state factories from military units.

In October, 1915 the special council for defense approved 'regulations on compulsory work' which stipulated that population from neighbouring areas, with the exception of clerics, civil servants, students, and teachers, could be compulsorily employed at military factories. Citizens involved in compulsory work could not be obliged to cease work without the written permission of the administration. Those guilty of failing to comply with the rules were liable to up to three months arrest or a fine of up to RUB 3,000. The public protested against this return to serfdom. However, the government ignored these protests. In 1916 the Special Conference on Defence proposed the introduction of a special procedure involving «forced labour in the form of a certain kind of conscription».

By 1916, forced forms of labor recruitment, the assignment of workers to specific enterprises, the widespread use of night and overtime work, the prohibition of strikes, etc. had spread throughout the country.

In the field of foreign trade, the Tsarist government decided to take measures anticipating the monopoly on foreign trade introduced by the Bolsheviks. In February 1916 the Special Council for Defence prohibited the entrepreneurship from placing orders abroad. Entrepreneurs could make foreign orders only through an authorized representative of the «Special Conference» which concentrated all currency for foreign purchases. This decision angered the entrepreneurs, but the government made no concessions.

In 1916 in a number of large cities for distribution of bread, meat, and sugar was introduced a card system. The norms varied from the place. On May, 24th, 1916 there were introduced rules of sugar supply: for Petrograd and Moscow – 4 pounds per month per a person; for cities with population over 150 thousand people – 2.5 lb; for other towns – 1.5 lb; for the rest of the population – 5/9 lb per month. However, before the February Revolution the card system could only be introduced in 18 cities, including Moscow.

Under the Provisional Government, the card system became ubiquitous and was extended to all provisions. Lately rationing of ration cards was diminished. In August 1917 in Petrograd and Moscow the bread ration was reduced from 3/4 to 1/2 lb per day. The urban population was forced to spend much of their time in food queues (Glazyev, 2018).

During the war, a «mobilization» economic model emerged with considerable restrictions on economic freedoms, centralized management and state regulation, administration, partial nationalization, elements of planning, food distribution, price taxation, etc. The World War I developed the direct state intervention into the economy, its subordination to military objectives, and the strict distribution of strategic goods and resources. However, all warring countries, including Russia, had the governmental control on the supply of raw materials and provisions both for production and the population, military production, transport, and labour relations, etc. As a result, the role of state institutions in dealing with economic matters increased considerably.

New forms and methods of management occurred during the World War I, new mechanisms of the relationship between government and business, were used in the post-war period already in Soviet Russia. In the USA these innovations were implemented during the Great Depression, the deepest economic and socio-political crisis. But those new economic model was formed during the World War I. The politicians, theorists and practitioners used this theory in the 1930s. This model formed the basis of the three emerging variants of mobilizing economic development: «state socialism» in the USSR, «liberal-regulated capitalism» in the USA and «totalitarian capitalism» in Nazi Germany (Mobilization economy: the concept, its boundaries and content, 2010).

To consider the possibility of implementing the mobilization economy in modern political conditions we should rely on the historical Russian experience of implementing such a model of economic development

practically throughout the XX century, especially in the pre-war, military, and post-war period[7] of the USSR.

The USSR showed the world a unique experience of the formation and use of a mobilization economy in response to the threats to the country's existence emerged. The essence of these threats was very clearly formulated by Stalin in February 1931: «We are 50 to 100 years behind the advanced countries. We must run this distance in 10 years. Either we will do it or we will be swept aside» (Stalin, 1951).

The task was achieved through mobilization efforts, which made it possible to create an essentially new economy in just two five-year periods. Table 2 gives an overview of the quantitative changes in the USSR economy.

Table 2 – Indices of economic growth in the USSR in 1928-1940

Indices, years	1928	1937	1940
Gross social product	1	3.4	4.5
National income	1	3.9	5.1
Main production assets	1	1.7	2.4
Industrial products	1	4.5	6.5
Gross agricultural output	1	1.1	1.3
Capital investments	1	5.2	6.7
Retail turnover	1	2.0	2.3

Source: The national Economy of the USSR for 70 years: Jubilee Statistical Yearbook, 1987

The number of factories and towns built before the war from the late 1920s was an evidence not only of quantitative changes, but also of the qualitative transformation of the economy through the implementation of the mobilization model of the country's development. During the years of the pre-war five-year plan, 250 new towns with modern large enterprises sprang up in the country. During the first Five Year Plan (1928-1932) 1,500 new large industrial enterprises were built; in 1933-1937 4,500 new industrial enterprises were constructed: in 1938-1940 – 3,000 (Voznesensky, 1947).

The mobilization nature of the Soviet economy made it possible to defeat the Nazi, who managed to conquer almost the whole of Europe, use its material, production and human resources for military purposes, and then quickly restore the economy and ensure military parity with the USA and the NATO bloc.

Subsequently, the mobilization economy ensured a relatively high level of production of consumer goods, especially food, as shown by 1989, which can be considered the final year of the mobilization (command and administrative) economy of the USSR when the Soviet Union coming 7th in the world in terms of food consumption. Table 3 shows food production per capita in the leading countries of the world in 1989 (Kara-Murza, 2002).

Table 3 – Food production per capita in the leading countries of the world

Name of products (kg/person-year)	The USSR	The USA	England	Germany	Japan
Seed	683	842	380	462	114
Potato	219	65	105	125	33
Meat (carcass weight basis)	69	122	68	97	31
Milk	374	268	263	400	60
Sugar sand	29	24	22	50	7
Butter	6.3	2.0	2.6	6.0	0.6
Fish (crop)	40	24	24	3.4	97
Eggs (pcs.)	292	270	214	-	-

Source: Kara-Murza, 2002

7 We mean the Great Patriotic War of 1941-1945.

In contrast, in the first 10 years of the market economy of post-Soviet Russia, there was a twofold drop in the total production of goods. High-tech, knowledge-intensive, and eco-friendly industries declined most rapidly. The production of computers, CNC machines, and many types of high-grade rolled products has almost completely stopped. There was a significant decrease in consumer goods.

The result of market transformations was the loss in the 2000 years of the XX century of almost all types of national security: economic, technological, food, information, cultural, etc.

However, the economic security of a country depends on the share of imported goods in the total volume of commodity resources. For example, for large countries, the share of imports in the consumption of any product or commodity group, especially for food, should not exceed 30%. However, in Russia in 90s this share was significantly higher. Therefore, the overall level of real independence of the country was in the range of 30-50%[8]. The decrease in the level of economic and military potential weakened the country state sovereignty.

The result of the liberal market economy model in Russia thirty-year implementation is the unfavorable structure of the economy. This kind of economic model has predominated in terms of exported fuel and raw materials, the development of the extractive industry, and the actual collapse of the industrial processing sector, as well as the dependence of the country's position on energy prices on the world markets. Nowadays, this situation is still standing, despite the deteriorating military-political situation and, as already noted above, the operation of the remaining domestic processing military-industrial complex is actually at full capacity without the apparent availability of reserves for increasing processing capacity.

Thus, the state of the economy and the existential nature of threats to the country's future make it necessary to refer to the experience of mobilization economy formation in the 1930s. The mobilization is a necessary factor in transition of the Russian economy from a resource-based to an innovative development. It has the prospects of the earliest possible construction and commissioning of new additional facilities to achieve the SMO goals and protect the country from destruction by the West, to ensure its sovereignty, its own path of development and subsequently to raise the country to the rank of world technological leaders. Mobilization is necessary due to consolidating Russia's leading position in the global technological race. It is inconceivable without strengthening the country's defence potential to the extent sufficient to ensure national security and sovereignty.

4. The main steps of Russia towards the introduction of the mobilization economy

Indeed, it is possible to change the situation and monetize Russian natural capital with the maximum benefit for Russian citizens only if the postulates of the mobilization economy are introduced, in particular, strengthening state regulation. The government should set clear tasks for business, concerning, for example, the volume of extraction and the share of minerals involved into deep processing followed by the production of high-margin products (Abramovskikh & Babenko, 2019).

The state, of course, should develop tools contributing the establishment of conditions for accelerated construction of specialized industries, motivating businesses to develop petrochemistry, as well as improving the efficiency of resource consumption, since at the moment this indicator is at an extremely low level. We urgently need to increase the potential for the use of mineral resources, reduce losses during the transportation of hydrocarbons, engage in the introduction of modern technologies optimizing their use, and energy conservation. The new economy should be based on an energy-saving strategy, which will increase GDP at least 2 times over the next 2-3 years (Vojvodina, 2010).

However, there is no need to abandon the production of first and even second necessity. The main issue is the redistribution of resources and forces, directing them to more in-demand and necessary processes for society. Therefore, the economy will change gradually: for small and medium-sized businesses, for employees of factories, for any person living in the territory of the Russian Federation (so-called «soft» form of economic change).

This «soft» form of economic change, switching to the mobilization model, will have more radical

8 Russia in a globalizing world. New requirements for the development strategy. Federation Council of the Federal Assembly of the Russian Federation, 2001

management measures, since the success depends on this segment. The strengthening of the economical planned beginning, not accompanied by increased responsibility for the implementation of planned regulations, is not able to lead to the mobilization of resources. It only leads to the inefficient spending, as happened, for example, in the case of the Strategy of Innovative Development of the Russian Federation, which was supposed to lead to «the transfer of the Russian economy to an innovative development path by 2020». But this goal has not been achieved. This strategy itself is forgotten. Strategy 2020 has failed, its developers have demonstrated their inconsistency, but they are not suspended from business. They continue to actively offer their services to the society and the state apparatus representing it to develop new strategic and planning documents (Kyung, 2010).

The transition of the economy into mobilization form allows us to use Russian unique raw material potential in the production of goods offered to consumers. It will finally allow us to professionally engage into the reproduction of the mineral resource base, preserve the statehood and civilizational identity, lay the foundation for sustainable development of several subsequent generations (Martynenko, 2021).

In the conditions of modern global military-political and economic challenges, the country faces the most important challenges of strengthening national security: in the ideological, foreign policy, defense, the economic spheres, etc. Meanwhile, it is necessary to find special ways to increase the national security of the unified national economic complex. These ways have been developed by world practice and domestic economic history. Therefore, it is the mobilization model of economic development.

Qualitative components of the mobilization economy, in our opinion, may include the following:

1) increasing the role of the state in economic policy with optimal preservation of market mechanisms in the mass consumer sector;

2) establishment of a national financial system independent from the dollar, taking into account the interdiction of capital outflows from the country;

3) the revival of domestic science and formation of a new type of domestic innovative economy;

4) development of domestic large and medium-sized production on a new scientific, technical, and technological basis with the concentration of material and financial resources on priority sectors of the domestic economy and an increase in the share of state-owned manufacturing enterprises, especially in the field of production of engineering and domestic machine tool construction;

5) restoration of the planning system for short-term (five-year), medium- and long-term forecasting with the help of modern automated control systems based on domestic digital technologies;

6) formation of the development budget, a significant increase in the rate of accumulation, the volume of investments in the increase of fixed capital;

7) ensuring maximum protection from external factors of economic pressure through real deofshorization of the economy;

8) strengthening the diversification of export markets by promoting Russian goods and services to the markets of China, Latin America, Africa, and the Middle East;

9) restoration of the state reproduction and distribution system of the personnel reserve;

10) establishment of the state control effective system at all levels of executives and the economic sphere as the most important condition for strengthening executive discipline at all levels of government and the national economic complex.

Conclusions

The beginning of a special military operation in Ukraine provoked the intensive departure from the model of a market liberal economy and a gradual transition to the mobilization economy. Indeed, in Russia the era of liberal market (anti-etatist) capitalism with its principle of complete freedom of entrepreneurship and non-interference of the state in economic activity is coming to the end. It is possible to predict the change of the national economic paradigm according to the scheme: market economy – mobilization economy – directive (socialist) economy (Ermakov et al., 2023).

The mobilization economy of a country is a category that characterizes its ability to produce the

maximum amount of products, works, and services in natural units of measurement in certain industries to counter existing or potential threats to the existence of the state itself by using all available resources concentrated in state institutions of power. The criterion of the mobilization economy is to maximize the volume of production, work performed and services rendered in natural units of measurement. The essence of such an economy is not in the concentration of resources, but in their use for the production of products, works, and services in natural units of measurement in maximum volumes.

In the modern conditions of the country's development, there are already signs of the introduction of elements of the mobilization model of development:

- concentration and allocation of resources in strategic directions for the country;
- localization of production of the most important goods for the economy, the ability to manage the budget more flexibly during a crisis or emergency situations;
- introduction of restrictive measures and more active application of the regulatory function of the state (this is evidenced by the introduced changes in labor, criminal and administrative legislation),
- active transition to an advance system of financing by the Government of enterprises of the agricultural sector and the military-industrial complex;
- public understanding of power, making political and strategic decisions, insufficiency of existing production capacities for waging a full-scale war and the vital necessity of their (capacities) an early large-scale increase. It can not be implement in terms of the using the market mechanism as the basis of the socio-economic formation existing in Russia).

The key conditions for the transition to a mobilization economy in Russia are:

- rejection of the monetarist liberal model of economic development;
- cancellation of the collateral auctions of 1995 results and nationalization of strategic enterprises and industries;
- updating the legal framework to ensure the fastest possible transition of the country to large-scale state regulation of macroeconomic economic activity;
- the revival of the national economic complex based on the restoration of the of the Russian energy unified system;
- restoration of the national strategic planning and management system of socio-economic development;
- the introduction of the country centralized management with the officials responsibility degree determination for the management decisions made and implemented;
- nationalization of the Bank of Russia.

Thus, the country's short-term perspective is as follows: the longer the SMO lasts, the faster the awareness of the need to transition to a mobilization economy in Russia comes and happens.

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CONFLICT OF INTEREST

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Analysis of the human capital contribution indicators to the regional economy efficiency (on the example of the Central Federal District regions)

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Abstract. The paper considers the contribution to the development of human capital through the indicators of the Sustainable Development Goals, indicators of the national projects being implemented in Russia, macroeconomic indicators of economic efficiency of Rosstat. The contribution of human capital to the economy, based on the Sustainable Development Goals, can be considered through indicators of labor productivity, physical and value volume of gross domestic product per capita, the share of the added value of the "Manufacturing" industry in the gross domestic product of Russia, the share of high-tech and knowledge-intensive industries in the gross domestic product. The purpose of the article is to reflect the contribution to the development of human capital in the indicators of the implemented national projects, in macroeconomic indicators of economic efficiency used by Rosstat, in the indicators of the Sustainable Development Goals. To analyze the factors of labor productivity at the mesolevel, the indicators of human capital contribution to the efficiency of economic development of regions. The article characterizes the National Project "Labor productivity and employment support" in the Ivanovo region. The results of regional studies of labor productivity are summarized. On the example of the regions of the Central Federal District the dynamics of gross regional product per capita, the index of the physical volume of gross regional product, the level of labor productivity, the number of issued patents, developed and issued advanced production technologies, the volume of innovative goods, works and services are analyzed.

Keywords: human capital, innovation economy, creativity of regions, digitalization of regions, education, science, scientific potential of the region, national projects, sustainable development goals, labor productivity, gross regional product, science, innovation, patents, inventions, regions of the Central Federal District, Ivanovo region.

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Introduction

In the second half of the 20th – early 21th centuries new theories and concepts of "industrial society" (J. Galbraith), post-industrial society or the theory of three stages (D. Bell, E. Toffler), information society (E. Toffler), knowledge economy as the highest stage of development of post-industrial and innovation economy, nooeconomics (S. Bodrunov, A. Tebekin), etc. became widespread. It was due to the large-scale transformations in the economy associated with scientific and technological progress. There are a lot of studies concerning with circular economy, service economy, shoring economy, innovation economy, creative economy, creative class and precariat one (Berendeeva, 2019).

The domestic publications describe the concept of quality economy as a comprehensive system of methods and tools to ensure the achievement of real economic results, improvement of quality indicators in all spheres of activity and life of people (development of quality assessment methods: life, habitat, products, processes, enterprise; creation of a multilevel quality management system; creation of a multilevel training

system for economics and quality management, etc.) (Okrepilov, 2022)

Nowadays, the concepts of human development are extremely relevant: the theory of human capital is an example. There is a development of Adam Smith's model of the economic man. On its basis appeared the model of the ethical economic man, the sociological man (Berendeeva, 2019), the model of the harmonious man (Trifonov, 2022); questions of human capital formation in the innovation economy (Batrakova, 2021).

Recently, P. Romer's theory of endogenous economic growth gained worldwide recognition. According to this theory, the long-term rate of economic growth depends on political measures. According to P. Romer's theory (1994), subsidies play the important role for research and development, for education, etc. These lead to the economic growth through the implementation of innovations. Along with technological progress, important factors of economic growth in the long term are:

- quality of human capital, which depends on investments in human development (education, health care, etc.);
- creation of the necessary conditions and prerequisites for the protection of intellectual property rights under conditions of imperfect competition;
- state supporting the development of science and technology;
- role of the government in creating a favorable investment climate and borrowing new technologies.

As A. Pilyasov and O. Kolesnikova (2008) note, "significant reserves for awakening the creative activity and innovativeness of the local community are in the regional and municipal tools to support small and medium-sized businesses, form intellectual territories, improve human capital, promote cultural and spiritual diversity and stimulate the creative activity of the local community". Therefore, it is important to have effective institutions and a strong regional authority.

The issue of quantitative and qualitative assessments of the changes taking place is also relevant. Non-financial assets, intellectual property (marketing assets, trademarks, brands, logos, etc.) began to be evaluated when calculating national wealth.

We calculate the creativity index of the regions. In many studies it is based on the methodology of R. Florida. He considers the summary index of creativity calculated on the basis of three indices: talent, technology and tolerance . A. Pilyasov and O. Kolesnikova modernize the method of R. Florida's methodology in regard to the specifics of our country. The authors demonstrated the top seven regions by the Talent summary index which have good universities and academic schools. They identified 12 leading regions; for example, the leadership of the Nizhny Novgorod and Ulyanovsk regions is associated with a high level of budget spending on science (respectively – 4.91% and 3.11% of GRP) – this is more than in Moscow (2.47% of GRP, the average indicator for Russia is 1.35%). The leadership of Perm Krai and Tomsk region is associated with a large number of issued patents per 1 million residents, the leadership of Rostov, Penza and Vladimir regions – with significant investment in science than the national average (Pilyasov & Kolesnikova, 2008).

The study by I. Groshev and A. Krasnoslobodtsev (2020) provides a regional analysis of the creative space index, which includes three components ("talent", "tolerance", "technology"), and the index of regional digitalization, which contains three indices (digital literacy, ICT development and digital life). The authors proved a strong correlation between the level of creativity in Russian regions and the level of regional digitalization.

The study by V. Novikov (2020) analyzes the conditions and results of innovation activity in the regions of Russia on the example of Moscow, St. Petersburg, the Republic of Tatarstan, Ivanovo, Nizhny Novgorod and Tomsk regions. B. Korobova and Y. Zhigalova (2017) estimate the innovation potential of the Ivanovo region.

The study by N. Shatalova (2022) shows a direct correlation between the level of competitiveness of the Russian economy and 4 indicators characterizing innovation activity in Russia (the level of innovation activity of organizations, the share of organizations that provide technological innovation, the share of innovative goods, works and services in the total volume of shipped goods, the volume of innovative goods, works and services in the entities of the Russian Federation).

The National Research University Higher School of Economics calculates the rating of innovative

development of the entities of the Russian Federation, and provides the indicators of digitization maturity of the regions (Irodova & Sokolov, 2022). Since 2021, the Methodology for Evaluating the Efficiency of Activities of Senior Officials (Heads of Senior Executive Authorities) of Constituent Entities of the Russian Federation and Activities of Executive Authorities of Constituent Entities of the Russian Federation includes the indicator of "digital maturity" of public authorities of constituent entities of the Russian Federation, local authorities and organizations specialized in healthcare, education, municipal services and construction, public transport, which implies use of domestic information and communication technologies in their activities.

Assessments of the efficiency and productivity of economic transformation can often include economic and social indicators. The results of social reforms are usually considered through indicators of the standard of living and quality of life, the welfare of the population. This paper emphasizes the economic goals of the reforms and their implementation.

The increasing importance of the human factor, combined with the development of machinery and technology, has allowed mankind to raise productivity to a new level. Modern research considers the development of human capital as an important factor in increasing labor productivity. Labor productivity in Russia is about 2 times lower than in developed countries (Vertakova, Maltseva & Shulgina, 2019). Gross domestic product (GDP) per employee (at the current exchange rate and to purchasing power parity) and the annual growth rate of labor productivity can be calculated by country. The research on the non-primary industries of the Russian economy has shown that there are significant differences in the level of labor productivity not only between industries, but also between companies of the same industry, with increasing stratification of companies by the level of labor productivity (Simachev, Kuzyk & Fedyunina, 2020).

Russia is implementing the national project "Labor Productivity and Employment Support," which includes the following indicators as targets:

1. Growth of labor productivity at medium and large enterprises of the basic non-primary industries.

2. The number of entities of the Russian Federation involved into the implementation of the national project.

3. The number of medium and large enterprises of primary non-primary industries involved into the implementation of the national project:

3.1 The share of enterprises out of the total number of enterprises involved in the national project, where the increase in labor productivity corresponds to the targets;

3.2. The number of medium and large enterprises of basic non-resource industries that used the measures of support under the national project.

At the beginning of 2023 there were established The Federal Center of Competence and Regional Centers of Competence (RCC) in 60 regions. Their purpose is to help to the companies to implement lean production, improve management, logistics and product sales. There is also a project "Productivity Leaders" to improve the skills of top management of companies. According to the Ministry of Economic Development of Russia, in 2019-2021 more than 2,300 enterprises participating in the National Project have increased labor productivity by 24% – 5% higher than those that were not involved in the National Project. At the same time there was an increase in value added by 383 billion rubles, the output – by 46%, achieved a reduction in production time by 35%, stocks of work in progress – by 36%, Now in the national project is already involved more than 4000 enterprises .

The purpose of the study was to measure the contribution into the development of human capital through the indicators of the national projects being implemented, the macroeconomic indicators of economic efficiency used by Rosstat, and the indicators of the Sustainable Development Goals. Also we can analyze the factors of labor productivity at the mesolevel, indicators of the contribution of human capital in increasing the efficiency of regional economic development.

Metodology

The objects of the study are the regions of the Central Federal District (CFD). The subject of the study is the national project "Labor productivity and employment support", the statistical base of Rosstat, related to

the contribution of human capital in the economy of Russia and the regions of the Russian Federation.

Results

An important issue is to study the impact of the quality of human capital on the labor productivity.

The studying of the labor productivity factors shows that they can be conditionally divided into two groups: "traditional" and "new" ones. "Traditional" factors are the presence of obsolete, worn-out production facilities and infrastructure, backward technologies, including information technology, the shortage of qualified personnel, etc. "New" factors emerged as a result of reforms conducted in Russia since the 1990s. According to Z. Mkrtichan (2020), "additional factors and causes influencing labor productivity in the economy have emerged in the new Russia, aggravating the influence of 'traditional' factors: corruption, non-transparent and excessive regulation of business and production processes by the state, obsolete labor legislation, etc." There are macro- and meso-economic, external and internal, corporate and personal factors. But the intraproductive factors of labor productivity growth (at microlevel) are formidable, because the production activity is carried at microlevel.

We analyzed regional studies of regional indicators and the factors of labor productivity.

E.Yu. Merkulova (2019) classifies the Russian regions according to the level of labor productivity for 2017 (thousand rubles per employee per year), with the following levels identified:

– 343-652 (low level) – 38 entities of the Russian Federation are placed here, including the Central Federal District regions: Bryansk, Vladimir, Ivanovo, Kostroma, Orel, Ryazan, Smolensk, Tambov, and Tver;

– 652-1137 (medium level) – 8 entities of the Russian Federation, including regions of the Central Federal District: Belgorod, Voronezh, Kaluga, Kursk, Lipetsk, Moscow, Tula, and Yaroslavl;

– 1710-2155 – 4 subjects of the Russian Federation, including Moscow as an entity of the Central Federal District;

– 2712-3189 – 2 subjects of the Russian Federation, not in the Central Federal District.

G. Galieva (2019), on the example of the Republic of Bashkortostan, identified the following negative causes inhibiting the growth of labor productivity: the growth of migration of working-age people, as a rule, workers with high qualifications; employers' use of low-paid migrants' labor to reduce business costs; aging of labor resources in many regional labor markets as a result of arrival of working-age population on a smaller scale compared to their departure.

On the example of Krasnoyarsk Krai, S. Samusenko and T. Zimnyakova (2021) showed the predominant contribution to regional productivity growth of export-oriented and mining sectors, the physical rather than human capital. The example of the Kaluga region reveals the influence of the demographic structure and employment of the municipalities on labor productivity. Thus, due to the concentration of population and economic activity in certain municipalities of the region there are imbalances in spatial development. In this regard, there is an issue of applying an active policy of spatial development of the region (Tyutin, 2020).

The study of O. Nagaeva and G. Popadko (2019) showed that a significant influence on the regional level of labor productivity has a sectoral structure of the economy; resource regions are characterized by a higher level of labor productivity than non-resource ones. The authors revealed that within the group of resource regions there is a high differentiation of labor productivity values; the absolute leaders by this indicator are mono-industrial regions, with the dominant oil and gas complex in the economy, and lagging regions with the priority development of the construction and agricultural sectors.

By the 2019 study, 83 entities of the Russian Federation utilizing the modeling method showed that computing of enterprises, an increase in the number of computers connected to Internet networks, and wage levels are the most significant factors influencing the labor productivity (Lubnin & Yuferova, 2022).

The study of existing performance management practices and policies allowed us to divide them into two groups: 1) use of reserves, optimization of existing business processes, production, logistics, etc.; 2) additional investments in the implementation of modern technologies. The latter will be effective only if all the processes in the enterprise are already fixed, and the organizational culture corresponds to the goals and objectives of the company (Vertakova, Maltseva & Shulgina, 2019).

Rosstat highlights the following macroeconomic performance indicators of the economy:

- Index of labor productivity
- Share of high-tech and knowledge-intensive industries in GDP, and in GRP
- Share of investment in fixed capital in GDP, and in GRP
- Indices of changes in capital-labor ratio and yield of capital investment
- Coefficient of fixed assets renewal (in comparable prices)
- End-year degree of depreciation of fixed assets
- High-performance jobs growth
- Number of high-performance jobs growth by type of economic activity by Russian regions
- Level of innovation activity of organizations
- Share of domestic spending on research and development in GDP and GRP
- The coefficient of the inventor activity (the number of domestic patent applications for inventions submitted in Russia, per 10 thousand people of the population) .

In the statistical collection "Russian Statistics"– 2022 in section 5 "Labor" the indicator "the rate of growth (decline) of labor productivity by types of economic activity" is highlighted.

In 2019-2021, the highest rates of growth in labor productivity were observed in the following activities: "Water supply, water removal, organization of waste collection and disposal, and activities to eliminate pollution" (106.6%), "Information and communication" (103.3%), "Wholesale and retail trade, repair of motor vehicles and motorcycles" (103.2%), "Processing industries" (102.8%). The rates of decrease in labor productivity were noted for such kinds of activity as "Transportation and storage" (98.2%), "Real estate activities" (98.6%), "Mining" (99.1%), "Construction" (99.2%) (see Table 1).

Table 1 – Rate of growth (decline) of labor productivity for some types of economic activity in the Russian Federation

Period	2019	2020	2021	Average growth rate for 2019-2021*
Total	**102.4**	**99.6**	**102.8**	**101.6**
Mining	101.3	95.4	100.7	99.1
Processing industries	103.2	104.4	100.7	102.8
Electricity, gas and steam supply, air conditioning	100.1	100.2	105.4	101.9
Water supply, wastewater treatment, organization of waste collection and recycling, activities for the elimination of pollution	106.0	104.6	109.2	106.6
Agriculture, forestry, hunting, fishing and fish farming	106.7	99.9	100.3	102.3
Construction	96.8	101.0	99.8	99.2
Wholesale and retail trade, repair of motor vehicles and motorcycles	101.7	102.3	105.7	103.2
Transport and storage	101.1	90.7	102.7	98.2
Information and communication	105.8	101.4	102.6	103.3
Real estate activities	102.4	96.0	97.5	98.6

**estimate index*
Source: Russian Statistical Annual, 2022

Russia implements the 2030 Sustainable Development Goals (17 goals and 169 objectives). The indices were approved by the UN General Assembly in July 2017 and were updated in 2020-2022. In our opinion, the most significant indices reflecting the contribution of human capital in improving the efficiency of economic

development are the physical volume of GDP per capita, labor productivity, the share of the added value of the "Manufacturing" industry in GDP of Russia, the share of high-tech and knowledge-intensive industries in GDP. For 2017-2021, indices of the physical volume of GDP production per capita and labor productivity in the Russian Federation exceeded 100%. The exception was 2020 – the year of the Covid-19 pandemic. The share of the added value of the "Manufacturing" industry in GDP of the Russian Federation during these years was growing and in 2020 reached 15%. The share of high-tech and knowledge-intensive industries in GDP has grown from 21.8% (2017) to 23.0% (2021) (see Table 2).

Table 2 – Indices of the Sustainable Development Goals, representing the contribution of human capital to the improvement of the economy's efficiency

Period	2017	2018	2019	2020	2021
8.1.1. Index of the physical volume of GDP production per capita, %	101.7	102.8	102.2	97.5	105.2
8.2.1. Index of labor productivity,%	102.1	103.1	102.4	99.6	102.8
9.2.1. Share of the added value of the " Processing industry" in GDP of the Russian Federation, %*	13.7	14.4	14.5	15.0	
per capita, RUB	77 011	90 682	96 858	98 424	
9.b.1. The share of high-tech and knowledge-intensive industries in GDP, %	21.8	21.3	22.2	24.5	23.0
Agriculture, forestry, hunting, fishing and fish farming	106.7	99.9	100.3	102.3	
Construction	96.8	101.0	99.8	99.2	
Wholesale and retail trade, repair of motor vehicles and motorcycles	101.7	102.3	105.7	103.2	

**data presented only up to 2020.*
Source: Russian Statistical Annual, 2022

According to A. Akayev and V. Sadovnichy (2021), since technological progress depends on the level of knowledge, in the information-digital era it should be determined by the dynamics of technological information production in the economy; "the main driving force of the digital economy is the symbiosis "human+intellectual machines", which is effectively operated under human guidance." Meanwhile, information and digital technologies influence traditional sectors of the economy. There is an evolution in the labor market caused by the widespread use of information and communication technology over the past 30 years. There is a technological bias in demand for high-qualified labor, which increases the polarization of labor in the high- and low-skilled segments, reducing medium-skilled jobs and increasing income inequality in society.

Consider the contribution of human capital into the region's economy on the example of the CFD entities: 8 of these regions surround the Moscow agglomeration (Moscow and the Moscow region). But many other regions are located at a distance of 200-300 km to the border of the Moscow region, and all of them form the Moscow macroregion as an economic system. The Moscow agglomeration acts as a key point of national economic growth, possessing enormous resources (financial, labor, material, technological, etc.). The Moscow region has a strategic objective: to maintain and strengthen its leadership position in the competition for human capital and investment. The regions neighboring the Moscow agglomeration improve their competitive advantages through the development of industrial, transport, transit, logistics, infrastructure, and other potentials.

The indices of the human factor contribution to the regional economy are represented in the Rosstat statistical collection "Regions of Russia". They are noted in the following sections: 1. "Main characteristics of the subjects of the Russian Federation", 9. "Gross Regional Product" and 19. "Science and innovation".

The index of GDP (gross value added) takes an important place among the indices of the Sustainable Development Goals. The research of A. Chub (2022) showed that economic development (through the GDP index) correlates with investment into the intellectual and technological capital. A research by S. Shkiotov

(2022) on the example of the economies of the Eurasian Economic Union supported the influence of GDP per capita and the HDI on the level of economic freedom.

Our research reveals that in terms of GRP per capita Moscow is the leader among the CFD regions (more than 1.5 million rubles). In 2020 in 4 regions this index exceeded 500 thousand rubles (Moscow, Belgorod, Kaluga, Lipetsk). In 6 regions this index is in the range of 400-500 thousand rubles (Yaroslavl, Kursk, Tula, Voronezh, Voronezh, Ryazan, Vladimir). And in 6 regions – in the range of 300-400 thousand rubles (Tver, Orel, Smolensk, Tambov, Bryansk, Kostroma). Only the Ivanovo region has less than 300 thousand rubles.

The index of the physical volume of GRP was most favorable (over 100%) in all regions only in 2018. In 2019, there was a decline of this index only in three regions (Lipetsk, Tambov, and Tver). In 2020, there was a decline in 10 regions, which is associated primarily with the Covid-19 pandemic. Only eight CFD regions (Belgorod, Ivanovo, Kursk, Lipetsk, Orel, Ryazan, Tambov, and Tula regions) showed a growth of more than 100% (see Table 3).

Table 3 – Dynamics of GRP per capita and the index of physical volume of GRP in 2018-2020

Period	Gross regional product per capita, RUB			Index of the physical volume of GRP production in constant prices, as a percentage over the previous year		
	2017	2018	2019	2018	2019	2020
The Russian Federation	614,333.2	647,708.1	640,519.0	102.8	101.6	97.8
Central Federal District	792,780.9	840,986.7	854,978.5	102.8	101.8	99.2
Belgorod region	588,641.5	617,024.6	646,569.0	102.4	102.0	100.1
Bryansk region	304,547.1	333,612.6	347,204.5	103.0	102.3	99.6
Vladimir region	349,856.4	393,135.2	410,443.6	100.5	106.4	99.8
Voronezh region	408,140.7	430,689.9	459,629.5	102.7	101.3	97.4
Ivanovo region	230,325.5	254,801.2	273,821.5	101.5	102.5	101.3
Kaluga region	502,224.2	546,488.9	558,174.6	102.7	102.3	98.7
Kostroma region	299,569.1	320,813.9	323,951.6	100.3	101.5	96.3
Kursk region	405,890.2	448,533.4	487,030.7	102.9	102.7	102.1
Lipetsk region	526,882.4	499,274.3	546,151.3	102.1	98.2	102.8
Moscow region	615,059.9	679,655.1	683,845.1	102.0	106.2	98.9
Orel region	332,418.3	362,066.3	390,170.2	101.1	102.8	100.0
Ryazan region	372,321.8	392,641.3	412,845.1	100.3	101.3	101.1
Smolensk region	354,239.9	372,073.3	386,274.8	102.0	100.0	99.0
Tambov region	343,693.1	349,773.1	378,455.8	103.3	97.7	100.2
Tver region	368,955.6	386,059.1	391,722.2	103.5	98.4	96.6
Tula region	448,896.8	459,650.6	486,544.2	103.2	100.1	103.1
Yaroslavl region	462,207.4	484,799.3	495,102.2	103.2	100.1	99.7
Moscow	1,494,938,0	1,565,396,3	1,567,644,8	103.2	101.1	99.0

Source: Regions of Russia. Regions of Russia. Socio-economic indicators, 2022

The index "labor productivity" is one of the main socio-economic indicators.

The following regional projects are implemented in Ivanovo region as a part of the National Project "Labor Productivity and Employment Support" (implementation period 01.10.2018 – 31.12.2024):

- "System measures to increase labor productivity".
- "Targeted support for enterprise productivity improvement" .

The regional project "System Measures to Increase Labor Productivity" provides training under

the programs "Productivity Leaders" (for management) and "Export Growth Accelerator" (for business representatives on drafting an export project). Also, the Industry Development Fund issued concessional loans at a rate of 1% per annum.

The regional project "Targeted support for increasing labor productivity at enterprises" provides methodological and organizational support for increasing labor productivity at enterprises. It establishes the specialized competence centers at the federal and regional level to implement best practices (standard solutions) and improve the labor productivity. In 2019 on the basis of an autonomous non-profit organization "Center for Entrepreneurship Development and Export Support of Ivanovo region" established the Regional Center of Competences in the field of labor productivity.

Our analysis showed that among the CFD regions the highest labor productivity indicator was in 2020 in the Ivanovo, Kursk, and Ryazan regions – 105.7%; 106.2%; 105.9%, respectively; less than 100% it was in the Voronezh, Kostroma, Moscow, and Tver regions – 98.2%; 99.5%; 99.3%; 98.5%, respectively (see Table 4).

Presidential Decree № 231 of April 25, 2022-2031 declared the years 2022-2031 as the Decade of Science and Technology. Consider the indices characterizing the scientific potential of the region.

Scientific studies prove the connection between the socio-economic development of the regions and the level of their scientific potential. They estimate the actual and probabilistic scientific potential of the Russian regions (Shipitsyna & Zhuykova, 2022).

The human contribution to the regional economy is also presented in Section 19. "Science and Innovation".

To assess the scientific potential of the region researchers propose a comprehensive approach. Its components are as follows:

1. Material and technical equipment (resources and methods of inventions development and implementation of projects, due to which scientific activity occurs in the region).

2. The level of education of academic staff, those, who can generate, implement and broadcast the scientific ideas.

3. The volume and structure of scientific research (the set of all available scientific background previously formed in the region, as well as the ability to create their own information and innovation product).

4. The volume of funding (from the federal and regional budgets, extra-budgetary funds, foreign and private investors) as a basis for the formation of scientific activity in the region.

5. Organizational structure of the scientific sphere as a set of all organizations in the region, participating in scientific activity (budgetary and commercial organizations, foundations, competitions, venture business, educational institutions of higher and secondary vocational education) (Shipitsyna & Zhuykova, 2022).

The scientific potential of the regions of Russia is increasing.

– The most of the invention and utility model patents and advanced production technologies are traditionally issued in large Russian regions with a developed scientific and educational infrastructure – Moscow (more than 12 million people) and the Moscow region (more than 7 million people). Voronezh region leads by the number of issued patents for inventions. Bryansk and Voronezh regions are leaders in patents for utility models.

– In terms of advanced production technologies used, Vladimir region leads after the capital region, followed by Tula, Kaluga, Yaroslavl, Tver, Lipetsk, and Voronezh regions. Outsiders are the Ivanovo and Orel regions. Relatively low figures are in the Bryansk, Kostroma, Kursk, and Ryazan regions (see Table 4).

Conclusions

We can consider the contribution of human capital to the economy, based on the Sustainable Development Goals. It can be also correlate with the indices of labor productivity, the physical and value volume of GDP per capita, the share of added value of the "Manufacturing" industry, and the share of products of high-tech and knowledge-intensive industries in GDP of Russia. In 2020, Moscow was a leader by the index of "GRP per capita" among the regions of the CFD. Only in four regions this index exceeded 500 thousand rubles (Moscow, Belgorod, Kaluga, Lipetsk regions). According to the analysis of labor productivity among the CFD regions, in 2020 this indicator was highest in the Ivanovo, Kursk, and Ryazan regions (over 105 %); less than 100 % it

was in the Voronezh, Kostroma, Moscow, and Tver regions.

Table 4 – Indices of human capital contribution to science and innovation on the example of the regions of the Central Federal District

Period	Labor productivity in 2020 as a percentage of the previous year	Patents issued, 2021		Developed advanced production technologies, 2021	Advanced production technologies in use, 2021	Volume of innovative goods, works and services	
		inventions	utility models			million, RUB	As a percentage of the total volume of shipped goods, work and services
Belgorod region	101.1	**147**	82	34	**3 349**	**190,335.9**	**11.6**
Bryansk region	104.2	29	97	9	1 779	35,265.2	7.9
Vladimir region	104.8	112	28	10	6 604	27,132.8	3.8
Voronezh region	98.2	336	90	24	3 072	38,083.6	4.0
Ivanovo region	105.7	52	20	10	900	12,964	5.7
Kaluga region	100.3	140	33	... 1)	3 514	35,790.5	3.3
Kostroma region	99.5	47	10	... 1)	1 760	1 836.8	0.8
Kursk region	106.2	114	31	–	1 794	17,028.5	2.6
Lipetsk region	103.5	38	23	... 1)	3 105	46,904.1	3.6
Moscow region	99.3	984	405	201	16,190	502,758.0	7.6
Orel region	101.7	47	11	... 1)	1 378	5 315.3	2.1
Ryazan region	105.9	120	65	13	1 881	30,078.4	5.5
Smolensk region	101.6	33	21	... 1)	2 256	8 819.3	2.2
Tambov region	100.9	78	22	-	2 010	20,395.6	6.0
Tver region	98.5	79	48	... 1)	3 158	48,113.1	9.4
Tula region	103.8	98	56	... 1)	4 440	134,432.4	10.3
Yaroslavl region	103.4	89	67	4	3 511	30,375.2	5.0
Moscow	102.5	4 280	1 614	421	13, 077	795,297.0	3.2

1) Data are not published in order to ensure the confidentiality of primary statistical data received from organizations in accordance with Federal Law № 282-FZ of November 29, 2007 "On official statistics and the state statistical system in the Russian Federation" (paragraph 5 of Art. 4, Part 1 of Art. 9).
Source: Regions of Russia. Regions of Russia. Socio-economic indicators, 2022

The scientific potential of the regions of Russia is increasing. The most of the invention and utility model patents and advanced production technologies are traditionally issued in large Russian regions with a developed scientific and educational infrastructure – Moscow and the Moscow region. Voronezh region leads by the number of issued patents for inventions. Bryansk and Voronezh regions are leaders in patents for utility models. In terms of advanced production technologies used, Vladimir region leads after the capital region, followed by Tula, Kaluga, Yaroslavl, Tver, Lipetsk, and Voronezh regions. Outsiders are the Ivanovo and Orel regions. Relatively low figures are in the Bryansk, Kostroma, Kursk, and Ryazan regions.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHORS' CONTRIBUTION

Alla B. Berendeeva – conceptualization, project administration, funding acquisition, writing – original draft.

Olga O. Korobova – data curation, formal analysis, validation, writing – review & editing.

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Commercial organizations projects as an economic mechanism of their «survival» in challenging market conditions

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Abstract. Nowadays, domestic researchers use the concepts of «project», «project management», and «project activity» without the strong scientific rationale. The commercial organizations activity provides the importance of studying the scientific essence and content of projects and project management in modern market conditions. Indeed, there are requirements of their competitiveness necessary level. At the same time, the concept of a project requires to consider its scientific essence. The various papers and Internet contain a lot of controversial definitions of the project, project management, and project activity concepts. As a result, there is an issue of scientific rationale of the project, project activities and project management in terms of the activities of commercial organizations. Based on the analysis of the investigated problem to identify the essence of the concepts of projects in the activities of commercial organizations and project management, the following conclusions are made: currently, researchers actively use the concept of the project in relation to the activities of commercial organizations in market conditions, while a clear scientific understanding of the essence of the project they are not given; an important characteristic of the project as a product will be a certain uniqueness for the consumer; work on the implementation of the project in a commercial organization becomes a kind of professional activity and can be designated as a project activity, that is, work on the project; limited time to implement the project - this is not a characteristic of the project, but a prerequisite for the implementation of the project in a commercial organization, as a «delay» in improving its products or creating new products can cause the loss of the market and, consequently, the existing level of competitiveness of the commercial organization; limited resources to implement the project - this is also not a characteristic of the project, but the second prerequisite for the implementation of the project in a commercial organization, as to improve its products or create new products can cause a loss of market and, consequently, the existing level of competitiveness of the commercial organization; the product of the project activities can not be managed, as from the position of the theory of management of organizations the object of management are the employees of the organization, as a consequence of this you can not manage the product of the project activities, not the activity itself, but you can manage the employees involved in the project activities.

Keywords: commercial organization, competitiveness, project, project activity, result of project activity, project boundaries, new product, project uniqueness, limited time, limited resources, project management.

JEL codes: D 21, L 02, M21

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Introduction

Currently, the concept of project and project activity has become constantly used by domestic researchers in terms of any activity of commercial organizations. For example, the new project of Rosseti Group is a stylized power line support a bear with an axe (symbol of the city) in Yaroslavl, Russia. Indeed, the lighting of this power line support initially prevented residents of nearby houses from resting at night. As a result, Rosseti subsequently announced this support illumination taking into account the complaints of the population. At the same time, it was emphasized that the company managed the project.

Various papers on project management and project activities give contradictional interpretations of «project» and «project management» essence. It creates problems of their scientific rationale. For instance, researchers A.I. Balashov, E.M. Rogova, M.V. Tikhonova, E.A. Tkachenko note that «although the concepts of «project» and «project management» have entered our lives long ago, there is no generally accepted interpretation of this term. A project in Russian management is understood as a complex and set of tasks and actions that have the following distinctive features: clear final goals, the relationship of tasks and resources, certain deadlines for the start and end of the project, a certain degree of novelty of goals and conditions

of implementation, the inevitability of various conflict situations concerning the project» (Balashov, 2017). Consequently, it can be assumed that researchers do not have a scientific explanation for these terms but use them as they are comfortable in each specific case when it comes to any innovations of commercial organizations activity. But it can characterize any activity of the organization.

In Soviet times, a project was usually understood as a set of documents being developed to create a new product. For example, an architect was developing a project for a new building or an entire block, or the designers were developing a project for a new space station, etc. Accordingly, these projects were a set of documents allowing the builders to construct a complex of buildings such as they were conceived by an architect or employees of an organization received an order for the construction. This idea of the project still persists.

Additionally, the project is an order that has not yet been approved by the head of the organization and could be changed. For instance, the H&R Manager prepared a draft order on encouraging employees of the organization in connection with its anniversary or on events following the results of employee certification and submitted it to the CEO. Otherwise, there could be a draft law or bill has been submitted to the State Duma of the Russian Federation, etc. Until the relevant decision is made by the deputies, the law or bill will remain drafts.

Also, a project is understood as some kind of practical result in the form of a new product of the organization's activities, perceived as unique. Therefore, a project can be called some new building that was built as an unique architectural monument. For example, in 2020 in the Odintsovo City District, the Moscow Region, Russia there was implemented a project adedicated to the 75th anniversary of the victory in the Great Patriotic War. On the territory of the Patriot Park there was built the Main Temple of the Armed Forces of the Russian Federation was built. It is the third largest in the country after the Cathedral of Christ the Savior and St. Isaac's Cathedral. The entire architecture of the building is permeated with symbols of the Victory of our country in the Great Patriotic War of 1941-1945. For example, the diameter of the base of the central dome is 19.45 meters, which symbolizes the year of the end of the war. The height of the belfry of the temple is 75 meters in honor of the 75th anniversary of the Victory in the Great Patriotic War, when the temple was built. The area of the stained glass windows on the vaults of the upper temple is 1418 m^2, which means 1418 days and nights of the war, etc[1].

Indeed, this kind of the project interpretation is not of interest for domestic researchers studying the problems of organizations' activities in market conditions, since such project cannot be further managed. Accordingly, it is impossible to develop a «modern theory of project management». It is impossible to manage a set of documents for the construction of a building, the order of the head, or a built temple, etc.

Main Part

Nowadays, domestic researchers consider the project concept in terms of the activities of commercial organizations.

The number of the most common modern definitions of the term «project», each of which probably has the right to exist depending on the specific task facing researchers of the problem of projects and their management, but does not give a scientific understanding of the essence of the concept of a project, since it is not based on scientific theories of organizations and activities. Most often, domestic researchers use project definitions taken from foreign sources as the basis for their research.

For example, the Miriam Webster Dictionary defines the project as «anything that is being conceived or planned, for example, a large enterprise»[2].

The Guide to the Basics of Project Management of the American Institute of Project Management contains the following definition of a project: «A project is a time–limited enterprise (event) aimed at creating a unique product or a unique service».

The World Bank management defines the concept of a project as follows: «A project is a set of interrelated activities designed to achieve set tasks with clearly defined goals within a given period of time and with a

1 The main temple of the Armed Forces of the Russian Federation. https://ghvs.ru/ (accessed 10.02.2023)
2 https://www.merriam-webster.com/dictionary/project (accessed 10.02.2023)

fixed budget».

The Purchasing Managers Index (PMI, USA) considers it as «a temporary enterprise aimed at creating a unique product, service or result»[3].

The Association of Project Managers (APM, UK) considers it «as a unique, temporary enterprise to achieve planned goals» (Kiselyov, 2023).

At the same time, there are many other concepts of the project in various scientific and educational papers of domestic researchers.

For example, P. Dikiy, in his book «Project Management» defines a project as a tool for organizing operations (actions) that cannot be carried out within the normal activities of the organization (Dikiy, 2019).

In addition, the project could be defined as follows:

A project is a task with certain initial data and required results (goals) that determine the way to solve it.

A project is a system of goals formulated within its framework. However, the physical objects created or modernized for their implementation, technological techniques, technical and organizational documentation, material, labor and other resources, as well as management decisions and measures for their implementation.

The project is a product appropriate to the conditions and needs of the customer.

A project is a purposeful, time-oriented sequence of, as a rule, one-time, complex and irregularly repeated actions (activities or works) to create a unique product with the following specific features:

- momentaneousness and integration of the project structure;
- complexity of the project structure;
- specificity of content and financial results.

A project is a one-time set of actions and tasks that has the following distinctive features:

- clear goals to be achieved, while meeting a number of technical, economic and other requirements;
- internal and external relationships of tasks, works, operations, and resources that require clear coordination in the process of project implementation;
- certain deadlines for the start and end of the project;
- limited resources;
- a certain degree of uniqueness of the project goal, conditions of implementation;
- the inevitability of various conflicts.

The project includes the idea (problem), the means of its implementation (solutions to the problem), and the results obtained in the process of its implementation.

A project is something changing our world: the construction of a building, research and development programs, the reconstruction of an enterprise, the creation of a new organization, the development of new technology and equipment, the construction of a ship, the creation of a movie, the development of a region, etc.

These various definitions do not allow us to clearly distinguish the scientific essential basis of the project. Since thinking about the meaning of the presented formulations of the project concept and comparing them with each other, make clear their scientific «incorrectness», «blurriness», contradictory nature, and a very «broad» interpretation of the terms.

Assume a number of «project» definitions can be found in scientific and educational literature.

Firstly, it is rather difficult to understand a project as «what is conceived or planned». It is more appropriate to the notion of an idea, which, for example, could be expressed in the project documentation. At the same time, a draft sketch with a proposed version of a monument could be submitted for a competition. Or, for example, an engineer has an idea for a rationalization of complex work, which he has presented to the head of the organization. The head of the organisation agreed to include the engineer's suggestions in next year's workplan. In this case the issue is not a project, but the engineer's idea and the possibility to implement it in a certain perspective.

Secondly, by defining a project as 'a set of interrelated activities', one might think of it as a workplan. For example, financial planning should be comprehensive to provide financial resources to different areas

3 https://www.pmi.spglobal.com/public?language=ru (accessed 10.02.2023)

of the organization: innovation, i.e. development and implementation of new technologies affecting the competitiveness of products, creation of new products, production; supply-sale activities; production activities; organizational activities, etc. All activities in the workplan of financial-economic service of the organization in these directions should be interconnected. Because without the implementation of necessary activities of supply activity it is difficult and even impossible to perform the necessary activities of production activity. But all of this has been identified in the theory of management of organisations as the principles of their effective activity.

Thirdly, considering a project as an activity involving the creation of a unique product, service or result, the researchers do not indicate the uniqueness of the product. For example, Toyota is constantly improving its cars by making various changes in their design so they always better compared to competitors' cars and are of interest to consumers. Therefore, all innovations introduced to improve a car should be considered as projects, and all cars produced by Toyota should also be considered as projects, too, etc.

Fourthly, presenting the project as «a large enterprise (event) limited in time», the researchers do not explain the meaning of time limitation. It is impossible to perform any work in less time compared to the norms and standards, as it will result in production technology failure and, consequently, quality reduction in the work to create a given product. For example, increasing the speed of an assembly line in a car factory in excess of the calculated standard in order to reduce the time it takes to produce cars may result in workers simply not being physically able to perform all the work operations properly. Unfortunately, one of the researchers gives the following example of a project: while you go to the country house to dig potatoes, it is just a work (activity), and if you go to the country house to dig potatoes and put them away in the cellar before 6pm, it is a project. Then, according to such logic, it follows that all the work of such a person at the dacha, who has scheduled it in time, should be called a project. And the scientific essence of the project is absent. As A.N. Leontiev notes, «it is not written on the «forehead» of the activity, the subject of which science it is» (Leontiev, 1996). Generally, it is defined as an individual form of existence of social relations and characterises the way of inclusion of a person into the existing structure of the social division of labour.

Fifthly, the researchers did not say anything new that a project should be seen as «a set of interrelated activities designed to achieve, within a given period of time and with a given budget, the objectives set with clearly defined goals», as this applies to any work in organisations. They did not show the features of such work so that it could be seen exactly as a project. For example, a consumer has ordered furniture from a factory and set a budget for its production. No doubt the furniture factory workers will make the product in terms of the amount of money the consumer is willing to pay. Otherwise he will refuse the more expensive product and the organisation will lose money. In this case, the purpose of all actors involved in this activity is clear: the consumer wants to get the furniture he wants for the amount of money he is offered, and furniture manufacturers – to fulfil the order within the allocated budget and make a profit from the work done. Indeed, any activity (work) of a team will always be a «set of interrelated activities» in accordance with the principle of labour division, where each member of the professional team performs his work in the interest of a common mission. Thus, for example, when making furniture, some workers bring the necessary materials and components from one shop to another for work, other workers make blanks to assemble furniture as they receive the necessary materials, etc. Every worker has to perform his work operations in a manner calculated to enable the other workers to perform their own work operations in time to complete the order at the set time. Then it turns out that any order to manufacture any product (goods), i.e. the productive activity to implement the order for the organisation should be regarded as a project. But then the concept of uniqueness disappears, as the professional activity of workers in the manufacture of furniture for them is just a regular work. Consequently, this concept of project also has no scientific rationale operations in such a way that other workers can perform their work operations in a timely manner in order to fulfill the order at the set time. But then it turns out that any order for the manufacture of any product (product), that is, the production activity for the implementation of the order for the organization should be considered as a project. But then the concept of uniqueness disappears, since the very professional activity of workers in the manufacture of furniture for them is a normal job. Consequently, this concept of the project also has no scientific justification.

Sixth, the researchers' assertion the project is «a purposeful, time-oriented sequence of usually single, complex and irregularly repeated actions (activities or works)» has no meaning or significance. It is difficult to give an example of 'single' but also 'irregularly recurring' but nevertheless 'integrated' activities or works. Any work in an organisation must always be performed by professionals. So, for example, a turner makes a part designed by an engineer according to a drawing. He only has to make one part. Can this be regarded as a one-time, non-repetitive activity or not? Indeed, the turner is doing his job as a professional and can turn any part from a drawing given to him. Or, for example, a tailor has made a bespoke suit for a customer in accordance with the customer's preferences. But her work can hardly be considered as a project, as it is her professional activity. Certainly if, in the case of an emergency, you put a non-professional, i.e. someone who has never done this kind of work, it will be a one-off, complex and irregularly repetitive task. For example, an employee of an organisation who was sick on an assembly line has to be replaced for a short time by another employee whose main activity is not related to work on the assembly line. But whether his work would be of good quality is still a question. And such work cannot be called a project, although for the employee in this case it would be unique because he or she has never done such work before.

In this context, it is problematic to understand «any activity that changes our world» as a project, since any human activity, including professional activity, is already transformative by definition. In this case, it turns out a project would have to be called any activity of an organisation, which, incidentally, is often done by researchers today.

Seventh, the researchers' interpretation of the project essence as «a temporary enterprise aimed at creating a unique product, service or result» creates the idea that it would be some kind of work for the organisation unrelated to its professional activities. For example, one might get workers in a garment factory to tidy up the workshops, i.e. to do temporary, unrelated to their professional duties in order to improve the workplace. In Soviet times, this was called «subbotnik». But where is the uniqueness of the product, service, or result?

Eighth, it is incorrect to refer to a project as «a method developed in advance to achieve an objective». But method, as a scientific term, refers to a certain sequence and order of work. For example, the method of flow production in organizations is an advanced method of organizing production based on the rhythmical repetition of basic and auxiliary operations coordinated in time and performed at specialized workplaces located in the sequence of operations of the technological process. Consequently, in terms of scientific approach, the method cannot be considered a project.

Ninth, considering a project as a tool of organising activities or operations not possible as part of the ordinary organisation activities. It is difficult to understand what kinds of organisations' activities are involved and for which some specific means of organising operations have to be created. At the same time, considering the project as a tool for organising operations and activities which cannot be performed as part of the organisation's regular activities, it is difficult to provide an example of such a project understanding.

Therefore, domestic researchers try to find a compromise in substantiating their position with regard to the essence of projects in commercial organizations' activities. For example, I. Farhutdinov, despite the 'blurring' of various definitions of the project concept given by researchers, notes that «all these definitions (project – author) contain something common, i.e., necessary signs, characteristics of a project, allowing it to stand out from the diversity of phenomena as a certain type of such phenomena»[4].

By the researcher's opinion, the main features of the project include the time-limitation (projects have a clearly marked beginning and end), and the project product uniqueness (uniqueness of the project goal).

Unfortunately, an examination of the «clearly defined beginning and end of a project» issue can not be indicated as a project characteristic, as they can only be intrinsic to individual projects. Undoubtedly, a project such as the television show «Polye Chudes» or «Tanci na l'du» had limited time parameters: the beginning and the end of the project. At the same time, the project «Polye Chudes» has a time limit of 1 hour, i.e. it is the duration by time of the very first prepared programme presented to consumers, i.e. the audience.

4 Farkhutdinov, I. Project management at the enterprise. https://upr.ru/article/proektnoe-upravlenie-na-predpriyatii / (accessed 10.03.2023)

Project «Tanci na l'du» posess the few months (season) time limit. Indeed, if these TV programs are accepted or not accepted for rotation, they lose their project status. However, these TV shows have been prepared for a long time in order to be accepted by viewers. But the work of the television staff and the people involved in the implementation of the project to prepare these TV programmes for being shown to the viewers cannot be considered a project and takes considerably more time than the showing of the TV programmes itself.

But a project in the form of a unique building or monument will not have time limits, a clear start and end time. For example, residents of Novovoronezh were shocked by the monument «Alyonka», which was erected on the 250th anniversary of Novaya Alyonovka village and opened on December 18, 2020[5]. Local residents asked the authorities to remove this monument, calling it «devilry». Meanwile, on July 1, 2022, was erected another monument to Alyonka. It was accepted by the residents of the village and turned from a project into a cultural object. At the same time, both of these monuments can be considered projects, since they were unique. But they were projects from the moment of their construction to acceptance or rejection by the residents of the village. Then they turned into a cultural objects of the village. But the work on their creating, which has a temporary beginning and end should be considered as a project activity.

The uniqueness of the project goal can be perceived by some people as unique, while for others it will be common one. For example, the new Kamaz sports car designed for truck rally, is a unique product for the automobile plant. It differs from the usual Kamaz cars production and is customizing product. But for athletes such a car is not unique, since it was created in accordance with the norms and standards imposed on sports trucks and is similar in characteristics to sports trucks of other automobile manufacturers.

Additionally, there is an issue of the uniqueness of the project goal.

Therefore, the characteristics of the project defined by researchers (clear and specific goals, limited resources, and limited project time) need to be clarified.

Firstly, should be noted, that from Latin the word «project» is translated literally is «thrown forward». We can conclude, it as a result (product) of project activity.

At the same time, there is a need to define what should be understood as the goal of the project, and what goal should be perceived as clear and specific in terms of science.

According to the dictionary of S.I. Ozhegov, «the goal is something what the people strive for, what they want to achieve, to realize» (Ozhegov, 2012).

Therefore, in terms of science, the goal is not what we do, but what we do it for, what we strive for; the goal is some kind of guideline determining the forward movement. In order to determine this movement, we need to see its desired direction. So, for example, a ship in a storm needs to approach to the invisible shore. And so the lighthouse, as a landmark, gives the ship opportunity to determine the right direction of movement to the shore, where it will be possible to hide from the weather. But define this goal as incorrect one is wrong, since the goal encourages people, organizations to take certain actions. If there is no goal, then there are no actions. By V.G. Belinsky, «without a goal there is no activity, without interests there is no goal, and without activity there is no life.»

But in case of commercial organizations projects, a number of researchers note «a well-formulated project goal should be specific (perceived by all participants); measurable (it is necessary to formulate the identified problem in terms of the specific indicators), achievable under given time and resource constraints». As an example of «good» project goal for the commercial organization engaged in advertising: it is necessary to increase site traffic to 1,000 visitors per day for 2 months with the help of daily publication of new materials and advertising of the resource in social networks. In this case the goal is an increase in site traffic to 1000 visitors per day for 2 months with the help of daily publication of new materials and advertising of the resource in social networks. The task will be the profit of the organization: the more visitors, the more profit. The size of the specifically designated profit is determined by the need of the organization to maintain the level of competitiveness and obtain the desired result of its professional activity.

Indeed, in Ozhegov's dictionary, a task is understood as something that is assigned for execution, an

5 Residents of Novovoronezh were shocked by the monument to Alyonka. https://news.mail.ru/society/44638938 / (accessed 16.02.2023)

assignment. In Ushakov's dictionary, a task is a specific assignment. As a result, the task, unlike the goal, must always be specific and measurable. For example, a commercial organization in order to make all payments to employees, utility payments, purchases of raw materials and equipment, tax payments and upgrade (modernize) production facilities at the end of the year, in order to keep up with competitors, it is necessary to receive 100 million rubles of profit. As a result, all the tasks planned must be formulated in accordance with the required profit of the commercial organization. Otherwise, the organization may lose the market share, it also may not achieve the necessary level of competitiveness, or even may bankrupt. Consequently, the purpose of the commercial activity is the basis for determining the tasks of the organization (Kiselyov, 2020). It can be achieved by planning the activities of the organization, taking into account the actions of competitors.

In this case, the project is designed to respond to the committed or planned actions of competitors related to the violation of market equilibrium in accordance with the target orientation of the organization's activities.

In accordance with the situational approach, the project goals related to particular problems can be decomposed. For example, when implementing a project technique to create a project of the Russian airliner MS-21, it became necessary to create a new wing of the aircraft from domestic composite materials (Popov, 2021). In terms of the situational approach of the theory of organizational management, the private goal appears – to create a new wing to ensure the overall implementation of the project of a new aircraft. And researchers often define such goals as «clear goals». But the concept of a goal as a «clear goal» does not seems correct from the standpoint of science. The goal is whether it exists or not. If there is no goal, there are no actions, and, accordingly, there will be no project as a result of actions. Thus, in this example, the ultimate goal of the MS-21 aircraft project is to create a new domestic passenger airliner that allows domestic airlines save their marketshare and the level of competitiveness.

In addition, researchers often consider limited resources and limited timet as the important characteristics of the project. However, it is incorrect. It is more accurate and correct to define them the conditions for the project implementation or project activities. Indeed, for example, when implementing a project related to the creation of a unique product for a given period of time (a product that differs in relation to the regular manufactured products of the organization) it is always necessary to take into account the target orientation of the project – timely preservation of the desired level of organization competitiveness through the implementation of the project. But in demands rapid decision making, especially if competitors have already started to issue their new products to the market. It indicates the project limited time. But it does not mean that it is necessary to reduce the time of work, determined by the actions of competitors.

For example, when implementing an architectural object as a project, a builder has a norm of laying 50 bricks per hour. Consequently, one builder can lay 400 bricks in an 8-hour working day. The team of 10 builders can lay 4000 bricks. The foreman needs to halve the time for the construction of the object walls. Meanwhile, he cannot force builders to lay twice as many bricks for each hour of work to complete a new task. Because, firstly, builders will not physically withstand such a speed of laying bricks. Secondly, it may lead to a violation of the technology of laying bricks. Therefore, there will be a quality reduction. The foreman should double the number of builders in order to complete this work. At the same time, he will need to make a decision on how to double the volume of concrete, since its consumption will double, etc. At the same time, the project budget should also have to be increased, as the number of employees involved in the implementation of the project by the right time will increase, etc. As a result, limited time cannot characterise the project.

The limited resources are not characterizing the project, too. Indeed, for creating the product, we need a certain resources. If there are not enough resources, the product (result) of the project activity will not be created. Also the quality of the product will decrease due to implementation of cheaper raw materials, equipment, etc. For instance, the consumer allocated a certain sum of money to repair an architectural monument to the project developer. This sum of money will be spent on the repair itself. But, this repair will be incomplete and substandard, since cheaper materials for repair can be purchased. As a result, limited

resources are not characterised the project, too. There are certain standards, State Standards, technical conditions, etc. According to these standards, the necessary amount of materials and resources should be used for the sucsessful project implementation. Otherwise, there will be a constant need for additional resources to the originally allocated ones.

At the same time, it is necessary to distinguish the cost of the project, the cost of a product created by a commercial organization for consumers, and the cost of carrying out project activities. For example, according to the estimates of the MA-21 aircraft project participants, in the mid-2000s, about RUB 14.825 bn were required for the design, development, and certification of the MA-21. The government provided RUB 6.67 bn within the framework of the civil aviation development target programme. But RUB 8,155 bn the project participants had to find themselves. As it was planned, the federal budget would finance 40% of the work, borrowed funds would amount to 25%, and the programme participants had to cover about 35% of the costs. At the same time, the cost of the MA-21 aircraft is planned to be RUB 3,144 bn[6].

Indeed, the need to implement projects, for example, launching a new product on the market by a commercial organization, will depend on the actions of competitors and may even arise unexpectedly. As a result, the development of the commercial organization project will need to allocate the necessary resources. But it should not disrupt the regular operation of the organization (Kiselyov, 2021). Therefore, a commercial organization should have to find the resources necessary for the project implementation. Meanwhile, it could lead to the detriment of some already planned activities implementation.

As a result, limited resources cannot be considered a characteristic of the project. It is more correct to define the availability of resources as the conditions for the successful project implementation. Or define them as the project activity. However, we should take into account the capabilities of the project customer or its participants.

Nevertheless, the project features, which are highlighted by many researchers, are not related to the project itself. They mostly relate to the process of project implementation (obtaining some result). For instance, domestic researchers use a concept of «project triangle» as a characteristic of the project. By this concept, the three sides of this triangle denote the time, the content of the project and the cost. In their opinion, the project time is always limited. The content of the project denotes the project work to be done itself. And the cost includes the cost of all project resources, including human resources, etc. The essence of the project triangle, according to the researchers, is the interconnection between all three elements (sides of the triangle). The adjustment of one of the elements (sides) of the triangle automatically affects the other two elements (sides). But it mainly refers to the conditions of professional activity on the implementation of the project, or to the project activity.

Thus, the commercial organization project should be considered as the result of project activity, presented as the result of its activities in the form of a unique product. Indeed, it makes the products of a commercial organization attractive to consumers and different from similar products of competitors. Therefore, the project can be defined as a mechanism for achieving the organization's goal and provision of the necessary competitiveness.

The project management concept is also challenging issue. For example, according to the textbook «Project Management» by P. Dikiy, «project management includes control of all its aspects, makes it possible ... to coordinate various parts of the project, optimize the order of work», etc. (Dikiy, 2019). Thus, his concept of project management should be understood as the management of employees involved in the implementation (creation) of the project.

The president of the British Project Management Association, M. Barnes, believes that «project management is the science of determining the purpose of an activity and organizing the work of groups so that these goals are achieved at the end of the activity». Consequently, under the concept of projects, they begin to interpret the managing of the work involved into the project activities employees.

In general, domestic researchers give rather complex and voluminous definitions of project management, which are often not related to the basic concept of domestic management theory – the concept of «management».

6 How much does it cost to create an MS-21. https://aviation21.ru/skolko-stoit-sozdanie-ms-21/ (accessed 16.02.2023)

therefore, today we have a lot of different concepts of project management. Makarov A.M. gives the following definition: «Project management is a methodology of organization, planning, management, coordination of human and material resources throughout the project life cycle, aimed at achieving its goals by applying a system of modern methods, techniques, and management technologies to achieve the results defined in the project in terms of the composition and scope of work, cost, time, and quality»[7]. This definition seems to be correct but in terms of management science, it is only a set of incompatible phrases and terms. According to the concept above, project management is interpreted as a methodology. However, in terms of science, methodology is a set of research techniques used in any science, or the method of cognition. Also, the methodology is a system of methods, etc. (Genisaretsky, 1975). Consequently, it is difficult to understand the content and practical significance of this definition for the project management itself.

In this case, it is necessary to base on the concept of management in the theory of management organization. For example, according to B.G. Litvak (2004), management is «the process of formation and implementation of managerial influence». But it is possible only in relation to the employees of organizations. Speaking about management (managerial activity), a specialist in the field of management A.V. Karpov (2007) notes that management is «the activity of co-organizing the activities of other people». Consequently, the object of management (managerial activity) in organizations or management are employees. Indeed, it is the key to understanding the management concept essence. Therefore, considering the project as a result of project activity, it is not correct to define the project management in terms of the management theory. It is impossible to manage the projecs as projects cannot be objects of management. And project management, in this case, for domestic researchers implies the «co-organization» of the organization's employees' activities involved into the implementation (creation) of the project or in project activities.

Consequently, researchers replace the concept of management with the concept of «project management». For example, I. Farkhutdinov, Financial Director of the Radius Group in his article «Project management at the enterprise» (2019) wrote: «project management begins with understanding the term «project». Various schools define a project as a set of actions having a temporary nature and a common goal to create a unique product, service or any other unique results. In practice, any activity can be called a project as the company's management decides to control separately from operational tasks. And this is the essence of understanding project management of an enterprise. If it is advisable to manage any initiative separately from regular operational tasks, then this initiative should be formalized as a project»[8]. The researcher intuitively denies understanding the project as a set of actions having a temporary nature and a common goal to create a unique product, service or any other unique results. Nevertheless, he adheres to the misconception that the project needs to be considered a project activity. As a result, he named a project any professional activity that the management of the organization decides to control, and any initiative «designed as a project».

But it is not correct to define the management of activities in terms of science. Since activity is the work of people, employees and collectives of organizations. And it is possible and necessary to manage the people performing this work.

But generally, the concepts of project management given by researchers have no scientific justification.

For example, Internet contains this one: «Project management is an integral element of the modern management system in Russia. Many domestic and foreign companies use project management to improve the quality of their products and services, reduce costs, and increase profits» [20]. This particular definition is more a slogan than a scientific definition of this concept essence.

The other source gives the following one: «project management implies a methodology for managing important and large-scale tasks for achieving a specific goal, set deadlines, and limited resource provision. This approach makes it possible to combine constant (linear) processes taking place in the company and targeted (one-time) initiatives into a single whole»[9]. But in terms of science, the methodology applied to the

7 Makarov A.M. Project management. http://elibrary.udsu.ru/xmlui/bitstream/handle/123456789/10232/2012832.pdf?sequence=1 (accessed 10.03.2023)

8 Farkhutdinov, I. Project management at the enterprise. https://upr.ru/article/proektnoe-upravlenie-na-predpriyatii / (accessed 10.03.2023)

9 What is project management? https://finswin.com/projects/metody/proektnoe-upravlenie.html (accessed 16.02.2023)

activity is considered as a set of methods and techniques for carrying out any work.

However, the researchers distinguish the project management from managing of the projects by the number of different «controls».

According to F. Afanasyev, project management includes the management of the following nine items:

- managing the content and scope of the project;
- project timeline management;
- project budget management;
- project personnel (team) management;
- managing the stakeholders (stakeholders, participants) expectations;
- project communications management;
- project risk management;
- project quality management;
- project procurement management (Afanasyev, 2017).

By P. Dikiy, the project management includes «managing constraints», which are «the task of a project manager» (Dikiy, 2019).

Thus, the interpretation of project management by different researchers allows us to suggest that, having no other way to determine the scientific essence of project management, they, as a rule, include a complex of «different controls» in it. Unfortunately, there is a substitution of concepts by researchers. Indeed, in terms the theory of management, not the processes.

Probably, domestic researchers tried to indicate the scientific understanding of the project management essence. But this approach does not correlate with the scientific concepts of project management and project activity management. This is not required to the basic provisions of the theory of management.

However, the managerial activity, as a kind of professional activity, represents a share of any professional activity. Otherwise no activity without «co-organization» of the included employees' activities will be effective one. Since co-organization will require both managerial decision-making and work planning, employee motivation, and the implementation (fulfillment) of tasks time monitoring assigned to employees (Kiselyov, 2021). It also applies to project activities. Since, without its organization, the work of employees of commercial organizations involved in project activities will not be effective one.

Considering the concepts of projects and their management in terms of the theory of organization management, we can note the projects become «constant companions» of organizations' activities with the development of technology, acceleration of scientific and technological progress, and reduction of the life cycle of products. All these affect behavior and action of commercial organizations and lead to their changing. In other words, competition does not exist by itself. It is the result of the activities of commercial organizations, when the effectiveness of one organization turns into the defeat of a competing one. At the same time, the competition between commercial organizations leads to the product improvement. It allows them to maintain the interest of consumers. For example, by E.P. Vorotnikova and V.V. Kulikova, «currently, the market economy and the competition generated by it make it necessary for manufacturers to pay considerable interest to the quality of the manufactured goods. It is very important. The consumer pays attention to the product when making his choice. Today, a product with unique properties, with a certain quality and brand, is in the greater consumer demand» (Vorotnikova & Kulikova, 2016). As a result, the new product of the organization itself, new technologies and modernization of production associated with improving the consumer characteristics of the products produced by the organization will act as projects. Since they require the involvement of specialists and the modern innovations for their timely implementation. It allows the orgatizations to produce the unique product for consumers compared to a similar product of competitors.

Thus, the implementation of projects will form the basis for ensuring the necessary level of competitiveness of commercial organizations. Therefore, projects should be considered as a mechanism allowing the commercial organizations to ensure the required level of competitiveness.

But to ensure the success of these projects, it is necessary to provide the professional management of the

project team, project activities, taking into account the basic principles of management and the peculiarities of market competition.

According to Yu.V. Taranukha (2017), «the concept of «competition» is used in scientific literature and in practice so often that it has become a kind of universal category and seems to be something taken for granted. Despite the large number of foreign and domestic studies on competition, they rarely consider its content. It is difficult to find works devoted to the mechanism of competition development itself».

The scientific analysis of the essence of projects in the commercial organizations activities allows us to consider the projects as mechanisms for timely provision of the necessary level of commercial organizations competitiveness.

By Yu.B. Rubin and O.N. Potapova (2016), acting in a competitive environment, commercial organizations «should ensure the safety and sustainable development of their business, create space for the successful realization of their legitimate interests. ... They are forced not only to help themselves, but also create problems for their competitors in the realization of similar interests in the development of their own business». Consequently, in researcher's opinion, commercial organizations should perform certain «competitive actions» could not allow competitors to achieve sucsess, since «competitors' achievements become their own defeats» (Rubin & Potapova, 2016). Otherwise, commercial organizations need to strive to always be «one step ahead of them», performing and implementing the necessary projects ahead of competitors.

It makes the researchers started defining the project management this way. According to their studies, it is possible to achieve the production goals, release the products superioring in their consumer characteristics to competitors' products in a quite short time. In other words, to implement projects characterizing a certain degree of novelty and uniqueness for the consumer. To achieve these goals, commercial organizations will have to form project teams, in which they have to include only the high qualified and skilled specialists (Pavlyuk, 2019). Otherwise, the successful implementation of their projects will turn into defeating in the competition for a commercial organization.

As a result, in terms of the theory of organization management, it would be more correct to define the project management or project management in the activities of commercial organizations. Nevertheless, the project team management should ensure the effectiveness of project activities, have a clear target focus on timely provision of the organization with the necessary level of competitiveness through the implementation of the necessary projects, considered as a set of «competitive actions».

Conclusions

Thus, based on the analysis of the problem under study, the following conclusions are as follows:

1. Currently, researchers are actively using the concept of a project in relation to the activities of commercial organizations in market conditions. At the same time, they do not give a clear scientific understanding of the project essence. At the same time, in terms of the theory of management and the theory of project activity, a project can be understood as something that allows commercial organizations to achieve their main goal – to provide the necessary level of competitiveness in the challenging market conditions.

The analysis showed the projects in the activities of commercial organizations cannot be considered as some kind of temporary measures or some kind of special activity. Projects can be considered as something that canl help organizations to react to changing market competition conditions and ensure the preservation of the necessary level of competitiveness. It also can be named as an «economic mechanism» for the «survival» of commercial organizations in market conditions. As a result, the products or services of a commercial organization should always be attractive to the consumer, having the unique properties and characteristics. Otherwise, the project should be considered the product prepared for the consumer, which will be interesting to him. These projects can be classified as external projects. At the same time, the project also may be a new technology or modernization of the equipment of a commercial organization. It will allow the organization to improve its product. thise kind of projects may be considered as internal projects of the organization. Thus, an important characteristic of the project as a product is its certain uniqueness for the consumer.

2. Therefore, commercial organizations have a need to improve technology, modernize equipment, and

improve the products. In order to implement a project, they should create an interesting or unique project for the consumer, attract the qualified specialists, etc. Nowadays, with the accelerating rate of life cycle products reduction, the project implementation requirement is becoming constant, since organizations are constantly forced to improve their products, implementing more and more new projects. As a result, the project implementation becomes a kind of professional activity and can be designated as a project activity of the commercial organization.

3. At the same time, the implementation of projects in commercial organizations often response to the actions of competitors. Therefore, competitiveness requires the implementation of the project in a limited time so that consumers do not have time to lose interest in the products of a commercial organization. However, the limited time for the implementation of the project is not a characteristic of the project, but a prerequisite for the implementation of the project in a commercial organization. Indeed, any delay in improving its products or creating new products can cause the loss of the market share and, accordingly, the existing level of competitiveness of a commercial organization.

4. There is no doubt that the implementation of a project in the activities of a commercial organization will always require certain funds, often significant for a particular organization, which need to be found without simultaneously reducing the efficiency of the main production activity, which is often considered by researchers as limited resources and is considered as another characteristic of projects.

However, limited resources for the project implementation are also not a project characteristic but the prerequisite for the implementation of the project in a commercial organization. Since the attempts to improve its products or create new ones can cause the loss of the marketshare and, accordingly, the existing level of competitiveness of a commercial organization.

5. The limited time for the implementation of projects, determined by the actions of competitors, and the need to find resources for the project implementation, made researchers to study the project management itself. But the product of project activity cannot be managed, since in terms of the theory of management the object of management is the employees of the organization. As a result, it is possible to manage not the product of the project activity but the employees involved in the project activity. Thus, it is necessary to consider the issue of managing the project team in order to ensure the effectiveness of the project activity for the implementation of the project in the required time with a specific amount of resources allocated for this.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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