



SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

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这些会议文结合了会议的材料 – 研究论文和科学工作者的论文报告。它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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宏觀與中觀經濟層面的私人醫療服務市場：現況與前景
**THE MARKET OF PRIVATE MEDICAL SERVICES AT THE
MACRO AND MESOECONOMIC LEVEL: STATE AND
PROSPECTS**

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註解。 本文致力於私人醫療服務市場的理論面、確定區域商業醫療市場的方法及其發展前景的研究和概括。 對私人醫療服務市場的基本理論基礎進行了分析和建構。 本研究的概念工具是根據作者對「私立醫療服務」、「私立醫療服務區域市場」類別的解釋來定義的。 強調了俄羅斯私人醫療服務市場的發展方向，反映了該國社會經濟轉型的具體情況。

關鍵字：私人醫療服務市場、發展前景、區域經濟、公共政策。

Annotation. *The article is devoted to the theoretical aspects of the private medical services market, the study and generalization of approaches to determining the regional commercial medicine market and the prospects for its development. The fundamental theoretical foundations of the market for private medical services are analyzed and structured. The conceptual apparatus of the study is defined in terms of the author's interpretation of the categories "private medical service", "regional market of private medical services". The directions for the development of the private medical services market in Russia, reflecting the specifics of socio-economic transformations in the country, are highlighted.*

Keywords: *private medical services market, development prospects, regional economics, public policy.*

Commercial medicine is an integral part of the country's healthcare, which is capable of effectively fulfilling the tasks of protecting the health of citizens and is a tool for the protection and reproduction of labor potential. The dynamic devel-

opment of market relations in Russia has radically influenced the economic conditions for the formation and functioning of the market for private medical services.

The private sector of medical services in Russia has begun to actively develop in recent decades, while the formation and development of the commercial medicine market is determined by the specifics of such significant concepts as medical service, medical care, health care, paid medical service, private medical service; therefore, for the purposes of this study, it is necessary to consider features and differences of the term “medical service”.

In Russia, the term “medical service” appeared in the process of transformation of the socioeconomic system simultaneously with the introduction of such a form as compulsory health insurance (which in its current form has nothing to do with market relations and insurance principles). It is essentially a source of healthcare financing that emerged in connection with the country’s sharp budget cuts in the 1990s.

In the economic and specialized literature, there is an ambiguity in the interpretation of this concept. On the one hand, the following interpretation is proposed: medical services are paid activities (or a set of paid activities) not related to the performance of work and carried out within the framework of medical activities by medical professionals, aimed at the prevention of diseases, their diagnosis and treatment to meet the needs of citizens in maintaining and restoring health [1]. In this case, the author emphasizes payment as the basic principle of providing medical services.

You can find other points of view, where the concept of “medical service” is revealed as a set of professional compensated, expediently necessary actions of the performer, in some cases counter-actions from the patient (customer, consumer), aimed at meeting the needs of the latter in the form of a certain state of health [2]. Other sources indicate that this is “a set of lawful actions carried out by medical workers in state (municipal) healthcare institutions or private medical organizations, aimed at improving the patient’s health and recovery and of a reimbursable nature” [3].

Thus, we can highlight a number of distinctive features of medical services:

- a set of actions carried out by medical workers on a professional basis;
- focus on improving the patient’s health status;
- remunerative nature.

The generally accepted conceptual apparatus regarding the formation of the definition of “private medical service” is practically not formed at the moment, however, clarification of this concept is essential for the subsequent study of the market of private medical services, the rationale for its classification and determination of its volume, potential and development trends in the macro, and meso economic levels.

Paid medical services are in addition to the legally guaranteed volume of free medical care to citizens within the framework of the program of relevant state guarantees approved within the framework of territorial programs in the constituent entities of the Russian Federation. Consequently, when providing paid medical services, the regulatory documents for the provision of medical care of the Ministry of Health of Russia and other relevant departments must be observed, while at the request of the consumer (customer), these services can be provided in full standard of medical care or in the form of individual consultations or medical interventions, including in a volume exceeding the volume of the performed standard of medical care [4,5,6].

As part of the study of the theoretical apparatus, the authors correlated the concepts of “health care”, “medical care”, “medical service”, “paid medical service” and “private medical service” (Figure 1).

Health protection	System of measures, prevention, medical care
Health care	Legally enshrined complex concept
Medical service	A legally enshrined concept turns out to be professionals, on the basis of title documents
Paid medical service	A legally enshrined concept, the key difference is payment, which can be provided by public and private medical services institutions
Private medical service	The concept is not legally fixed; it is proposed by the authors as a tool for aggregating subjects of the paid medical services market - private medical services, institutions into a separate specific market - the market for private medical services

Figure 1. System of conceptual apparatus of medical services.

Source - compiled by the authors

As can be seen from Figure 1, the conceptual apparatus of medical services is based on basic legal concepts enshrined in regulatory legal documents; while a gradual specification of concepts occurs, indicating key distinctive features (professional nature, principle of payment, and indication of specific market entities - private medical institutions).

Based on the conducted research, a definition of private medical service is proposed, based on the matrix principle of the impact of classification characteristics and including economic, financial and legal components:

- private medical service - a medical service or a set of medical services provided by private medical organizations on the basis of a list of works (services) that constitute medical activities and specified in the license to carry out medical activities, and financed within the framework of the implementation of state guarantee programs for the free provision of medical care to citizens or at the expense of citizens and other legal entities and individuals.

The conceptual apparatus refined by the authors makes it possible to aggregate certain subjects of the market for paid medical services - private medical institutions - into a separate specific market - the market for private medical services.

The commercial medicine market, despite its relative youth, is subject to market laws in its development and is also influenced by economic policy, which imposes certain features on its development. The market functioning of medical services is characterized by the following factors:

- ambiguity in the perception of consumer properties of medical services, creating objective difficulties in choosing services;
- the specifics of the formation of demand for health care services, which is determined by the social significance and low elasticity of demand for these services;
- in healthcare it is impossible to clearly determine the relationship between a doctor's costs and the results of his actions (health status);
- medical services are characterized by a large degree of clinical uncertainty, which is why a medical service should be called medical care, not a service, and should not be subject to the consumer protection law, but in our country, medical care is renamed a medical service and is subject to the law on consumer protection. Protection of consumer rights, which is fundamentally wrong;
- medical institutions operate in conditions of the need to combine economic efficiency and social justice, etc.

The creation and further development of the commercial medicine market necessitates studying its essence, types, development trends, and management methods.

The study and generalization of approaches to the definitions of the market for medical services, the market for paid medical services, and private medical services made it possible to propose an expanded concept of the regional market for private medical services, which focuses on the features of the market for private medical services, namely, the interaction of subjects of this market under the influence of demand factors and proposals within the region in which they are located.

The regional market for private medical services is a system that includes interconnected relations between subjects of the private medical services market in terms of the provision of these services and operates within one region in accordance with its socio-economic, geographical and institutional characteristics.

The main subjects of the regional market for private medical services, along with sellers of medical services (medical institution, medical worker) and buyers (which can be both individuals and legal entities: patient, employer, state), are these institutions: medical insurance organizations, the state as a regulator, licensing authorities, the compulsory health insurance fund and its territorial divisions, suppliers of medicines and medical equipment, investors, advertising agencies, representatives of the judicial system and others.

It is of some interest to study the regional market for private medical services using a specific example - the Kostroma region.

Paid medical services in the Kostroma region are provided by public and private medical organizations. The public sector of providing medical care to residents of the Kostroma region is represented by a network of medical institutions, including 48 medical organizations, including 27 hospitals, 5 dispensaries, 7 independent medical organizations, 4 special-type institutions, as well as other institutions.

The geographical features of the Kostroma region, namely its extension to the northeast and a significant distance to the regional center, necessitate the operation of 15 hospitals in rural areas. Primary health care to the population is provided by 36 medical organizations, primary specialized health care to the population is provided by 41 medical organizations. 95% of them provide paid medical services to one degree or another.

As for the private sector of providing medical care to residents of the Kostroma region, it is represented by 464 medical centers and private clinics of various profiles, which is the lowest figure among the regions of the Central Federal District. The largest multidisciplinary centers are: Medical Center "Myrt", Medical Center "World of Health", ASC, MEDEX, Mother and Child.

A significant part of the private sector of medical services often specializes in narrow, most marginal or least expensive areas, such as dentistry, outpatient services, tests and analyses, cosmetology, and eye surgery.

The volume of paid medical services to the population of the Kostroma region in 2022 amounted to 2.55 billion rubles or 0.6% of the total volume of paid medical services in the Central Federal District, which is the lowest figure among the constituent entities of this district. However, private clinics in the Kostroma region have the greatest involvement in the compulsory health insurance system, since the share of private clinics that received volumes under compulsory health insurance was 88%, which is the fourth indicator in the Central Federal District, which indicates a relatively low effective demand in our region.

The regional market for paid medical services and the private healthcare sector as a whole reflects all the problems of a transitional market economy and is characterized by the uneven development of its individual segments, the imperfection of the legislative framework and the low activity of citizens and legal entities in terms of maintaining health. At the same time, this market represents a promising area for investing financial and intellectual capital.

Under the influence of the pandemic, the areas of revenue growth drivers in private medical clinics have temporarily changed. Firstly, the number of elective operations has decreased, and not only because of the temporary ban on their performance: patients are afraid of becoming infected with coronavirus in the hospital and usually decide to postpone elective operations, while the load on outpatient departments has increased. Secondly, the demand for laboratory diagnostics, computed tomography, lung x-rays, calling a doctor at home, and online consultations has sharply increased, which have become the main growth factors.

The geopolitical situation has intensified the struggle for medical personnel between public and private clinics, and multidirectional trends have been identified. On the one hand, medical workers of state medical institutions working with Covid patients receive increased salaries from the state. In addition, the staff of public clinics has greater security as a result of booking. As a result, it has become more difficult for private clinics to attract and retain doctors and nursing staff. The opposite trend is that qualified specialists working in the public sector cannot withstand intensive work for many months and are leaving for the private medical sector with a less stressful work schedule.

The public sector has historically dominated the inpatient medical care segment due to the larger bed capacity, the established reputation of doctors, and the price factor. However, in certain areas of high-tech medical care, such as cardiology, cardiac surgery, neurosurgery, oncology, reproductive medicine, traumatology and orthopedics and others, private medical centers have consistently attracted patients of middle and high income levels, inviting eminent specialists.

Due to the tendency of the population to save money on the one hand, and the implementation of the national project “Healthcare”, on the other hand (which allowed public hospitals to improve service and create more comfortable conditions for patients), there has been an outflow of patients to the public sector to receive high-tech medical services assistance, including on a paid basis.

An analysis of the state, problems and development trends of the regional commercial medicine market allowed us to formulate several general provisions.

- the conceptual apparatus of the study has been clarified in terms of the author’s interpretation of the categories “private medical service”, “regional market of private medical services” in terms of updating its local nature, characterized by features reflecting the specifics of the region as a relatively isolated socio-economic system;

- the regional market for paid medical services and the private healthcare sector was studied using a specific example - the Kostroma region, its structure, composition and position in the commercial medicine market of the regions of the Central Federal District were determined;
- the specialization of commercial medical institutions in narrow, most marginal or least costly areas, such as dentistry, outpatient services, tests and analyses, cosmetology, eye surgery, has been identified.
- it has been established that the geopolitical situation, as well as state policy in the field of healthcare, primarily the implementation of national projects, have a significant multidirectional impact on the situation in the market of paid medical services for public and private organizations.

References

1. Drozdova A.V. *The concept of medical services as a civil category // Siberian Legal Bulletin. - 2004. - No. 3.*
2. Danilochkina Yu.V. *Concept and legal nature of medical services // Medical law. 2008. No.P. 17.*
3. Ramenskaya A.A. *Medical service: concept and content / A.A. Ramenskaya // Tatishchev readings: current problems of science and practice: materials of the XII International scientific. practical Conf.: in 2 parts, Part 2. - Tolyatti: Volzhsky University named after. V. N. Tatishcheva. — 2015. — pp. 248-251.*
4. *Federal Law of November 21, 2011 No. 323-FZ "On the fundamentals of protecting the health of citizens in the Russian Federation."*
5. Komarov Yu.M. *On the rational system of organizing health care and providing medical care // ORGZDRAV: news, opinions, training. VSHOUZ Bulletin. 2018. No. 1. pp. 39-46.*
6. *Constitution of the Russian Federation: [adopted by popular vote on December 12, 1993 with amendments approved during the all-Russian vote on July 1, 2020] // Official Internet portal of legal information. - URL: <http://www.pravo.gov.ru>*
7. *Unified database of the private health care system Statprivat - Moscow. - URL: <https://statprivat.ru/>(access date: November 30, 2023) - Text: electronic.*
8. *Federal State Statistics Service: official website. - Moscow. - URL: <https://rosstat.gov.ru/> (access date: 12/04/2023). - Text: electronic.*

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制度變革中異常行為的訊號功能
**THE SIGNALING FUNCTION OF DEVIANT BEHAVIOR IN
INSTITUTIONAL TRANSFORMATIONS**

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抽象的。越軌行為通常與負面性連結在一起，因為偏離特定社會所接受的行為規範會導致制度體系的破壞。但在某些情況下，異常行為發揮了積極作用，表明經濟主體不願遵循既定的行為規範，因此需要進行相關的製度改革。

研究的目的是找出對異常行為採取正面態度的原因。研究對象是經濟主體的越軌行為。研究的主題是異常行為在製度轉型中的訊號作用。

本文對異常行為進行了解釋，將其視為製度改革必要性的訊號功能來源。

關鍵字：越軌行為、其負面與正面作用、訊號功能、製度轉型。

JEL分類：B52、D03、L00、O1、P00。

Abstract. *Deviant behavior is usually associated with negativity, since deviation from the norms of behavior accepted in a given society leads to the destruction of the institutional system. But there are cases when deviant behavior plays a positive role, indicating the reluctance of economic agents to follow established norms of behavior and, hence, speaking about the need for relevant institutional reforms.*

The purpose of the study is to find out the reasons for a positive attitude towards deviant behavior. The object of the study is deviant behavior of economic agents. The subject of the study is the signaling role of deviant behavior in institutional transformations.

The paper presents an interpretation of deviant behavior as a source of signaling function about the need for institutional reforms.

Keywords: *deviant behavior, its negative and positive roles, signaling function, institutional transformations.*

JEL classification: *B52, D03, L00, O1, P00.*

The traditional attitude towards deviant behavior of economic agents is wary, if not negative, because it can lead to destruction of the institutional system. This attitude is explained by the following characteristics inherent in such behavior:

firstly, it does not correspond to “generally accepted or officially established social norms”, and the actions of economic agents do not fit into existing laws, rules, traditions and social attitudes;

secondly, although both the behavior and the agents themselves cause rejection on the part of other people, the assessment of the negative can be ambiguous: on the one hand, sanctions in relation to violators of habitual behavior can perform the “function of preventing undesirable behavior”, and on the other – “can lead to to such a negative phenomenon as personal stigmatization”, taking into account the fact that “a bad reputation increases dangerous isolation, prevents positive changes and causes relapses of deviant behavior”;

thirdly, it “causes real damage to the individual himself or to the people around him,” which can be expressed in the destabilization of the existing order, causing moral and material damage, physical violence,” etc. In this context, deviant “behavior is destructive: depending on the form, destructive or self-destructive”;

fourthly, it can be characterized “as persistently repeated (multiple or long-term)”, which in the long term does not contribute to institutional reinforcement (Zmanovskaya, 2003, pp. 12-13; Yeznkyan, Imanov, 2023, p. 130).

This paper focuses on the ambiguous nature of deviant behavior and the possibility of presenting it as a signaling function indicating the need for institutional reforms. If this function reaches decision makers, then it will be possible, firstly, to “prove that deviations are normal and useful for society, since they stimulate progressive changes in it” (Zmanovskaya, 2003, p. 15), and, secondly, transform it from a negative indicator (inhibition) into a positive factor (development). And if negativity is associated with outdated institutions, then the new institutions that replace them are associated with positivity, since in the long term they can lead to positive changes in the institutional system. The essence of deviant behavior can, following V.E. Dementiev, be expressed in the words spoken at the seminar “The Unknown Economy” at the Central Economics and Mathematics Institute of the Russian Academy of Sciences on October 11, 2022: “Deviant behavior is the engine of institutional dynamics”.

As an example of deviant behavior, let us cite opportunistic behavior which means the pursuit of personal interest with guile. Moreover, the more cunning the opportunist is, the greater his gain.

According to O. Williamson, guile includes “calculated efforts to lead astray, deceive, conceal information and other actions that interfere with the realization of the interests of the organization”. And one more thing: opportunistic behavior must be distinguished “from simple selfishness, when individuals play a game with fixed rules to which they unconditionally obey” (Williamson, 1996, p. 689).

Also note that opportunistic behavior is quite broad. Take, for example, the emergence of managerial corporations, which arose as a result of the separation of control from ownership in the 1930s. last century (Berle, Means, 1932), the meaning of which boils down to establishing the dominance of the interests of managers over the interests of stockholders. Subsequently, theories and models of the managerial corporation began to emerge (Baumol, 1967; Marris, 1964; Williamson, 1964; etc.).

To date, many models have been developed to explain the behavior of a management corporation, especially models focused on maximizing managerial utility. Thus, the work (Marris, 1964) presents a management objective function with two “instrumental variables”: the “growth rate” of real assets and the “valuation norm”, which serves as a tool for achieving a reliable level of security from possible capture. Marris discovered the point at which the marginal rate of substitution between growth and security equals the marginal cost of valuing additional growth. This indicates that, in contrast to traditional assumptions of financial and economic theories, a managerial corporation will, instead of maximizing share value, increase growth through valuation until it reaches the optimal level of managerial utility (Yerznkyan, Imanov, 2023, pp. 133-134).

Many corporations that emerged as a result of large-scale privatization in Russia can also be classified as managerial ones, but with certain reservations. They are distinguished from Western managerial corporations by features inherited from the shock therapy of the 90s. These include: i) the almost complete lack of control over management by shareholders and the state (Goldman, 1994); (ii) the close relationship between managers and their former patrons-officials (the reason is that “the career of managers, the life and death of the company, taxes, subsidies and credit, prices and wages, all financial “regulators” affecting the prosperity of the company, depend more on their superiors than on the results of market activities” (Kornai, 1986); (iii) a high degree of corruption and participation in the pursuit of rent, along with government officials, also by the political elite and organized crime (Rybakov, 1997; Simonia, 1997; Cheshkov, 1997).

Speaking about opportunism, it is also worth mentioning the peculiarities of the manifestation of deviant behavior in the Russian higher education system. Thus, in the work (Ustyuzhanina, Molokova, 2020) the focus is on the issues of its manifestation in the behavior of stakeholders with an emphasis on opportunistic behavior as the most common type of deviation. At the same time, what is

especially significant, stakeholders are understood not generally as participants in higher education or people involved in it, but as those who have the ability and/or opportunity to influence the higher education system, and most importantly, to receive a quite visible effect from this (contractual or external).

Let us complete our consideration of examples of deviant behavior with the conscious transformation of [formal] principals into [informal] agents. In Russian conditions, the logical explanation for this transformation is that after the destruction of the administrative-command system of centralized governance, enterprise managers were left to their own devices and in their actions as representatives of legal entities selfish – rent-seeking – motives characteristic of individuals prevailed. This kind of economy was characterized by George B. Kleiner with the concept “economics of individuals” (Kleiner, 1996), which “serves to describe the phenomenon of separation of personal interests from the interests of companies, personal wealth from the property of enterprises” (Yerznkyan, Argunova, Mishurov, 2011, p.22).

To explain the specifics of such an economy, Academician Dmitry S. Lvov recalls that in the world economic literature it is customary to distinguish between two alternative approaches to the relationship between an employee and an enterprise: the “philosophy of contract” and the “philosophy of fate.”

According to the *first* approach (philosophy of contract), common in orthodox economic theory, the only thing that binds the worker and the firm is the contract. As an example, we can refer to American corporations with their clear instructions for staff and limited relationships with the team and management.

According to the *second* approach (“philosophy of destiny”), the employee and the company are connected not so much by a contract, but by a common destiny. The future of the company depends on the actions of the employee, and the future of the employee depends on the prosperity of the company. The contract itself plays a subordinate role, establishing only the fact of employment. A striking example of the second approach is demonstrated by Japanese enterprises, where the uncertainty of instructions to staff is more than compensated for by horizontal mutual understanding, moral responsibility, and a sense of team. Apparently, it is for this reason that Japanese industrial companies prefer to “hire university graduates with a general, comprehensive rather than specialized education. Of course, it is important for the company what the employee can do, but perhaps even more important is his ability to further learn, the ability to adapt to the needs of the company (Sokolov, 1982, p. 63).

Academician Nikita N. Moiseev essentially agrees with this, saying that Japanese “firms select new employees not so much by qualifications and talent, but by their ability to follow the general “philosophy” of the company, be a member of the team and perform the assigned work efficiently. The ability to “keep your head down” is valued in society as highly as in ancient times” (Moiseev, 1998, p. 179).

Unfortunately, in Russia a different situation has developed in which belonging to a team is not considered as “fate”, and the contract as such is not interpreted by the counterparties (the employer-principal and the employee-agent) as a mandatory guide to action. To characterize the relationship between an employee and an enterprise in Russian conditions, which have developed at least as a result of the neoliberal reforms of the nineties, the most appropriate is a kind of “guest philosophy.” Of course, such situation now differs from the situation in the 90s, but many characteristic features still remain.

As already stated, deviant behavior signals that institutional change is needed. Generally speaking, there are not many indicators of such changes – political (political order, annual freedom report) and economic (index of economic freedom, risks, governance indicators, ease of doing business). It is noteworthy that the available indicators tend to reflect a liberal or at least neutral point of view. These are, for example, the index of economic freedoms and the rating of economic freedoms, which are structured in such a way that the best conditions for economic activity are recognized without government intervention in it and with effective protection of property rights, thereby any government intervention is a priori obtained with a “minus” sign, and therefore it is obviously assessed as incorrect and subject to eradication.

Deviant behavior in itself can serve as an indicator of the withering away of old institutions and, as a consequence, the need to replace them with new institutions, if, of course, the economic system is faced with the task of deploying the driving forces of this process in the direction of increasing the efficiency of the institutional system capable of ensuring economic development. This can be done in various ways, for example, by: (i) increasing the consistency of the interests of society and the individual at all steps of the social ladder; (ii) achieving high rates of economic growth and living standards for all segments of the population; (iii) weakening social conflicts; (iv) expansion of political and economic freedoms; (v) reducing transaction costs (Ovsienko, 2006, p. 50).

From this we can draw the following conclusion: sustainability should not be confused with efficiency, when achieving one does not entail ensuring the other, otherwise destructive consequences cannot be avoided, as happened in Russia. In the process of implementing the Russian model of reforms, according to Academician D.S. Lvov, two fundamental mistakes were made, among others:

- simultaneously with the privatization of the reproductive assets of enterprises, their new owners were given the opportunity to privatize and appropriate rental income;

- a new “class” of managers-directors and managers of corporatized enterprises was essentially removed from public control and legal responsibility for the efficient use of assets belonging to these enterprises. This was largely facilitated

by the fact that one of the strategic owners of corporate enterprises – the state – withdrew from managing the property it owned (Lvov, 2006, pp. 7-8).

Speaking about institutional changes, we note that one of their varieties is institutional innovation, both formal and informal. In a situation where institutional innovations manifest themselves and show their competitiveness, they will be able to gain a foothold in the institutional structure. Otherwise, if they turn out to be irrelevant or inadequate, they will hardly be expected to be consolidated.

It is also interesting to understand the issue of the interconnectedness of institutions and their carriers. For example, Geoffrey Hodgson (2003) argues that institutions can not only influence individuals, but in a certain sense shape them, helping to change their individual preferences. In order to fully experience the ways of influencing people, it is necessary to take into account culture, circumstances, situations and other phenomena that in one way or another relate to the influence of institutions on the behavior of their carriers. In general, it can be argued that as institutions are, so are their bearers. The reverse influence is not so obvious: it is hardly possible for individuals to directly influence institutions if they do not belong to the elite endowed with power, unless people generally cease to fulfill their role as institutional bearers.

From the point of view of deviant behavior, social institutions that regulate people's behavior do so "to the extent that the latter are inclined to comply with the norms they set." Moreover, this tendency itself "is supported by positive and negative connections between a person and society, the effectiveness of which is determined by the correspondence of the moral values of the individual and the dominant ideology. The higher this correspondence, the more effectively the institutions that determine production relations work. And, conversely, with an increase in the proportion of people who reject the dominant ideology, the ability of institutions to support production relations narrows" (Glazyev, 2018, p. 557).

In a situation where institutions are left without their bearers, they turn into virtual institutions, which indicates institutional disruption (Yerznkyan, 2017) and an extreme degree of deviation. All this speaks to the extreme degree of destruction of the institutional system, even to the point of undermining it.

As an example, let us cite the loss of institutions of their carriers as a result of uncritical borrowing (import, transplantation) of institutions for their implantation in the institutional fabric of the recipient country. Post-Soviet Russia is an example of uncritical borrowing, while modern China is a critical one. Why borrowing fails is explained by the rejection of formal institutional innovations by the bearers of the informal institutional system. Douglas North speaks directly about this: "what is most striking (although seldom observed, particularly by advocates of revolution) is the persistence of so many aspects of a society in spite of a total change in the rules" (North, 1990, p. 36), and such an attitude towards the institu-

tional elements inherited by society should be considered a given, which cannot be ignored.

In itself, the desire of people acting as bearers of institutions to preserve their cultural and historical traditions is a serious factor in maintaining the continuity of the institutional system, which should not, however, be absolutized, since in this case there would be no institutional renewal.

And if in the process of the evolutionary development of institutions, their state can serve as an indicator of obsolescence, and therefore a signal for their renewal, then during revolutionary changes, when in society there is a transplantation of new institutions imposed by the authorities, the fact of their rejection by people who do not want – for one or another reasons – to become carriers of institutions alien to themselves, can serve as a signal of choosing an erroneous trajectory of institutional development that ignores the specifics of the country.

In conclusion, we note that after deviant behavior has fulfilled its signaling function, it is time to build an institutional system relevant for economic development. This alignment can be achieved with the help of two types of institutions – regulatory (regulative) and constitutive (constitutive).

Such a system can be built through “updating old and creating new institutions capable of regulating and/or constituting the economy. The impact of regulatory institutions on economic agents limits their behavioral abilities; the impact of constitutive institutions is directly opposite to the first: it leads to the formation of new opportunities for economic agents. In order for the economy to develop, and not just grow (without qualitative changes in its structure), it is necessary to give impetus to innovation processes, for which it is necessary to ensure the proactive creation of an institutional system adequate to development” (Yerznkyan, Imanov, 2022, p. 39).

References

1. Baumol W.J. *Business Behavior, Value and Growth*. – New York: Harcourt, Brace and World, 1967.
2. Berle A.A., Means G.C. *The Modern Corporation and Private Property*. – New York: Macmillan, 1932.
3. Cheshkov M. *On the Usefulness and Limitations of Old Concepts in a New Situation // World Economy and International Relations*. 1997. No. 7. – P. 9-11 (in Russian).
4. Glazyev S.Yu. *Leap into the Future. Russia in New Technological and World Economic Structures*. – Moscow: Book World, 2018 (in Russian).
5. Goldman M.I. *Lost Opportunity: Why Economic Reforms in Russia Have Not Worked*. – New York-London: W.W. Norton & Co., 1994.

6. Hodgson G.M. *The Hidden Persuaders: Institutions and Individuals in Economic Theory* // *Cambridge Journal of Economics*. 2003. No. 27. – P. 159-175.
7. Kleiner G.B. *Modern Russian Economy as an “Economy of individuals”* // *Questions of Economics (Voprosy Ekonomiki)*. 1996. No. 4. – P. 81-95 (in Russian).
8. Kornai J. *The Hungarian Reform Process: Visions, Hopes, and Reality* // *Journal of Economic Literature*. 1986. No. 24.
9. Lvov D.S. *Social-Economic Space: System Problems and Ways of Russia’s Institutional Renovation* // *Theory and Practice of Institutional Reforms in Russia / Collection of scientific papers / ed. by B.H. Yerznkyan. Vol. 7. – M: CEMI RAS, 2006. – P. 6-16 (in Russian)*.
10. Marris R. *The Economic Theory of Managerial Capitalism*. – New York: Free Press, 1964.
11. Moiseev N.N. *The Fate of Civilization. Path of Reason*. – Moscow: Publishing house MNEPU, 1998 (in Russian).
12. North D.C. *Institutions, Institutional Change and Economic Performance*. – Cambridge: Cambridge University Press, 1990.
13. Ovsienko Yu.V. *Russian Institutional Changes, their Features and Impact on Socio-Economic Dynamics* // *Theory and Practice of Institutional Reforms in Russia / Collection of Scientific Works / ed. by B.H. Yerznkyan. Vol. 7. – Moscow: CEMI RAS, 2006. – P. 50-62 (in Russian)*.
14. Rybakov V. *“The Bureaucratic Bourgeoisie” and the Problems of the Formation of Capitalism in Russia* // *World Economy and International Relations*. 1997. No. 7. – P. 14-18 (in Russian).
15. Simonia N. *On Bureaucratic Capitalism in Russia* // *World Economy and International Relations*. 1997. No. 7. – P. 5-9 (in Russian).
16. Sokolov A.I. *Japan. Economics and education*. – Moscow: Nauka, 1982 (in Russian).
17. Ustyuzhanina E.V., Molokova E.L. *Deviant Behavior of Stakeholders in Russian Higher Education* // *Manager (Upravlenets)*. 2020. Vol. 11. No. 1. P. 70-83. DOI: 10.29141/2218-5003-2020-11-1-7 (in Russian).
18. Williamson O.E. *The Economics of Discretionary Behavior: Managerial Objectives in a Theory of the Firm*. – Englewood Cliffs, N.J.: Prentice Hall, 1964.
19. Williamson O.E. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. – Saint-Petersburg: Lenizdat; CEV Press, 1996 (in Russian).
20. Yerznkyan B.H. *Institutional Reinforcement: Three Types of Relationships* // *Journal of Institutional Studies*. 2017. Vol. 9. No. 1. – P. 27-38 (in Russian).

21. Yerznkyan B.H., Imanov R.A. *Deviant Behavior as a Factor of Economic Development // Theory and Practice of Institutional Reforms in Russia / Collection of Scientific Works / ed. by B.H. Yerznkyan. Issue 55. – Moscow: CEMI RAS, 2023. – P. 113-128 (in Russian). DOI: 10.33276/978-5-8211-0813-5-113-128.*

22. Yerznkyan B.H., Argunova V.N., Mishurov S.S. *Methodological Issues of Analysis and Design of the Institutional Environment for Innovative Development of the Region. – 1.2 of the Collective Monograph: Innovative Development of the Region: Potential, Institutions, Mechanisms / Ed. by ed. G.B. Kleiner, S.S. Mishurov. – Ivanovo: Ivan. State University, 2011. – P. 15-30 (in Russian).*

23. Zmanovskaya E.V. *Deviantology: (Psychology of Deviant Behavior): Proc. aid for students higher textbook establishments. – Moscow: Publishing Center “Academy”, 2003 (in Russian).*

加強新技術秩序的組織和製度條件

ORGANIZATIONAL AND INSTITUTIONAL CONDITIONS FOR REINFORCING THE NEW TECHNOLOGICAL ORDER

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抽象的。 本文探討了新技術秩序的製度支撐問題，為此需要研究組織和製度變遷以及技術變革相互影響的本質。 本文的目的是找出伴隨這些變化的新商業組織形式的發展問題和前景。 研究對象是經濟活動的新組織形式和製度化。 研究的主題是確定循環經濟作為代表新技術結構的形式之一的特徵。 這項工作特別強調研究珍珠公司的製度體系的特徵，作為新技術結構的最充分的組織代表。

關鍵字：組織與制度變遷、技術結構、循環經濟、加強、珍珠公司。

JEL分類：B25、B41、Z10。

Abstract. *The paper examines issues related to the institutional support of a new technological order, for which it is necessary to study the nature of the mutual influence of organizational and institutional changes, as well as technological transformations. The purpose of the article is to identify, along with these changes, also the problems and prospects for the development of new forms of business organization. The object of research is new forms of organization and institutionalization of economic activity. The subject of the study is to identify the features of the circular economy as one of the forms of representing a new technological structure. Particular emphasis in the work is placed on the study of the features of the institutional system of pearl companies as the most adequate organizational representatives of the new technological structure.*

Keywords: *organizational and institutional changes, technological structure, circular economy, reinforcement, pearl companies.*

JEL classification: *B25, B41, Z10.*

Before we begin the main presentation of the article, we note that the need to identify the mutual influence of organizational and institutional changes, on the one hand, and technological transformations, on the other, is determined by the fact that these changes can contribute to both an increase in economic efficiency and its decrease, depending on the ability institutions act systematically and strengthen or weaken the entire institutional system. The work shows that with appropriate management of these changes, it is possible to achieve a systemic solution that links organizations, institutions and technologies with each other so that a synergistic effect can be achieved.

The specificity of the influence of organizations and their employees as institutional carriers on institutions is explained by the inherent ability of the carriers to exert influence through their actions, but in the same way, institutions are able to influence their carriers, predetermining their behavior. A significant role in this is played by taking into account national specifics, which permeate both institutions and the carriers themselves. The reason, but not the justification, for the neglect of national specificity by the holders of institutions belonging to the supporters of the first canon is the lack of context so characteristic of standard economics, which “trains people to look at the world through the prism of methodological and mathematical lenses, while losing sight of the factors of real life” (Reinert, 2011, p. 34).

The work also substantiates that for modeling production systems it is advisable to use *emic* and *etic* approaches, in other words, approaches from the inside and outside. In more detail, the first of them develops an internal, insider approach to the study of systems, the second – an external, outsider approach. The names of these approaches initially arose in linguistics, later in terms of content they moved into cultural studies, sociology, psychology and other scientific fields; currently, the concepts of *etic* and *emic* have also found application (and not only in name) in economic science (Oleinik, 2011). The very introduction into scientific circulation and formalization of the concepts “*etic*” and “*emic*” – initially in linguistics (linguistics) – belongs to the American linguist Kenneth L. Pike, who defined these concepts as “two main points of view from which a human observer can describe behavior human beings, each of which is valuable for certain specific purposes” (Pike 1954, p.8).

And although many researchers prefer one approach to another, considering them mutually exclusive, we are of the view that they are not mutually exclusive, but, on the contrary, are complementary, complementing each other, and that raising any of them to an absolute degree is counterproductive, since depending on the specific situation, both approaches may be in demand, as in the situation of, say, choosing an enterprise strategy, determined by factors that are partly external, but which become their internal matter over time.

It is of interest to use *etic* and *emic* approaches to human/social capital, while the concept of human capital correlates with the individual, and social capital with society.

Taking into account the fact that the choice of an etic-approach involves “the use of universal categories and principles devoid of any national specificity,” and the choice of an emic-approach involves reliance on “categories and concepts used by the people studied in everyday life” (Oleinik, 2011, p. 94-95), and also bearing in mind Karl Popper’s conceptual idea of the existence of three worlds (Popper, 2008, p. 22), it is of interest to unite the first two worlds – the sensory and the intelligible – with the third world – the mental one, which plays the role of a mediator between world 1 (sensible) and world 2 (intelligible).

An impressive example of the application of the emic approach was proposed by Academician Dmitry S. Lvov, a model that can “become a prototype of the revival of Russia, allowing it to take its rightful place in the global economy of the 21st century” (Lvov, 2000, p. 8). D.S. Lvov’s confidence in success was based not only on purely theoretical considerations, but also on actual knowledge of the situation: “...despite the enormous destruction of the economy during the years of reform, Russia still remains a rich country. Its natural resource potential is approximately 2 times greater than the United States, 5-6 times than Germany, and 18-20 times than Japan. And today Russia’s net economic profit is 60-80 billion dollars. This is 3-4 times more than the total volume of budget funds for the current year” (ibid., p. 43).

We especially note that for the new technological structure, the closed-cycle economy, or circular economy (CE), is of significant relevance. Over the past few years, the concept of a CE has gained great popularity both at the government level, among businesses, and in academia. Against this backdrop, there is a growing number of ways in which CE is defined (which does not contribute to clarity about what is meant by CE). As a consequence, the CE remains open to interpretation (Kalmykova et al., 2018).

Thus, the study by Ann Velenturf and Philip Purnell is devoted to the analysis of 114 definitions of CE (Velenturf, Purnell, 2021), among which the authors identified the definition given by the Ellen MacArthur Foundation (Ellen MacArthur Foundation, 2012) as the most common “[CE] industrial system, which is restorative or regenerative in intent and design. It replaces the end-of-life concept with remanufacturing, moves towards renewable energy, eliminates the use of toxic chemicals that impair reuse, and aims to eliminate waste through the design of materials, products, systems and, within that, business models”.

Recently, in academic circles, the definition of CE has focused on social justice, incl. regarding the distribution of resources between generations. In particular, Parrique et al. (2019) note: “The conservation of non-renewable resources is a matter of intra- and intergenerational equity. Every non-renewable resource used in one place is a resource that will not be available elsewhere, and every non-renewable resource used today is a resource that will not be available tomorrow.”

In our previous studies, we focused on the following aspects of CE (Yerzkyan, Fontana, 2021): achieving environmental balance and solving social problems with sustainable economic growth; changing consumption patterns, incl. through efficient use of resources, extending the life of goods, recycling, upgrading, reuse and sharing; maximizing the efficiency of the life cycle of resources, goods and services, incl. by minimizing the use of primary resources and reducing waste

In this study we consider the reasons for the need for a transition to CE, while attention is focused on the fact that the lack of a common understanding and definition of such an economy leads to significant differences and the development of numerous indicators to measure progress in achieving circular goals, which makes it difficult to share experience and conduct cross-country comparisons to identify best practices and expanding experience regarding the implementation of circular solutions. Based on the results of the study, circular images of the future were formulated, which are reduced not to a final state, but to some process of continuous improvement, interpreted from the position of the evolutionary perspective of a circular economy.

Russian scientists interpret CE as “an economy that minimizes waste and losses” by creating “closed technological cycles with full use of incoming raw materials, not generating waste beyond their scope”, “use of renewable energy, extension of the cycle of resource use, full circulation of materials” (Bobylyev S.N., Solovyova, 2020; Circular Economy: trends and prospects, 2023).

Among the reasons causing the need for a transition from a linear to a circular economy are S.N. Bobylev and S.V. Solovyova. note, quite convincingly, the following ones: (i) resource limitations against the backdrop of continuing growth in demand for primary resources; (ii) growing environmental problems, incl. due to unauthorized discharge of untreated wastewater and the growth of landfill areas (which leads to contamination of soil and water resources, and also harms public health and the biosphere); (iii) socio-economic development: urban agglomerations can introduce business models that are favorable to circular practices, which have not only an economic effect, but also help in solving urban environmental problems; (iv) technological development and implementation of Industry 4.0 technologies, which stimulate innovation in CE business models and contribute to the transition to CE.

It is also argued that the diversity of existing circular economy indicators – meaningful benchmarks that express the desired outcome in synthetic (often numerical) form – leading to their overabundance, do not fully reflect the goals of the circular economy and are often contradictory in both form and content. The logical explanation for the diversity of circularity indicators and methods for measuring circularity is that the concept itself is still in a state of development.

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materials, not generating waste beyond their scope”, “use of renewable energy, extension of the cycle of resource use, full circulation of materials” (Bobylyev, Solovyova, 2020; Circular Economy, 2023).

Using water resources as an example, the main characteristics of the desired circular future are identified, which include: creating conditions for the conservation and maintenance of biodiversity; use of green energy; sustainable use of water resources; increased creation of social value; structural support for the well-being and health of the population; support for the implementation of innovative technologies at all stages of the product life cycle.

Before moving on to the topic of the circular economy, let us recall Joseph Stiglitz’s statement about the Koreans: “If Korea’s problems were as deep-rooted as the IMF charges suggested, they could never have been solved in such a short time. The Koreans turned out to be prudent enough to decide for themselves when it is necessary and when it is not necessary to do what the IMF advises them” (Stiglitz, 2005, p. 269).

The Chinese did the same in their time, following the principles laid down in the strategy of their actions by Deng Xiaoping: “when implementing modernization, it is necessary to proceed from the reality of China. Both in the process of revolution and in the process of construction, it is necessary to seriously study and borrow the experience of other countries. However, blindly copying other people’s experience and other people’s models has never led to success. We have many instructive lessons in this regard. China’s affairs must be conducted in accordance with its real situation, moreover, by the forces of the Chinese people themselves... If we talk about our achievements, about our experience, then it boils down to the fact that in recent years we have restored the principle of a realistic approach to business... Mechanically borrowing others’ model, we have delayed the development of productive forces, caused ossification of thought, and prevented the people and lower levels from being active” (Deng Xiaoping, 1988).

Based on the study of the experience of introducing the circular economy model into practice, it was found that the reason for the slowdown in the transition from a linear to a circular economy model. Basically it comes down to the existence of numerous barriers. To overcome them, it is advisable to classify barriers into external (insufficient financial support, legislative barriers, institutional barriers, infrastructural, technological, social, consumer, environmental, cultural, related to supply chains) and internal (policies implemented at the enterprise, rejection of the circular economy from outside internal stakeholders, low levels of cooperation and other organizational barriers, shortages of relevant skills and training, product design, limitations in access to financial and other resources). It is also advisable to highlight two main directions for the implementation of the circular economy: with an emphasis on specific sectors of the economy and/or products (applied in

the EU); with an emphasis on scale - systemic implementation across the economy at all levels (micro-, meso-, macro-level) (accepted in China).

To conclude the topic of human/social capital, let us recall that it seems especially important for the correct construction of a moral economy, the axioms of which are presented in a condensed form below as presented by Dmitry S. Lvov:

1) any government does not have and will never have the secret of building a just society if it does not lay the foundation for spiritual and moral revival;

2) the goal should be the economy, the main driving force of which will be the desire not for wealth, but for a high quality of life;

3) collectivist principles are the genetic code of Russian society, deviation from these principles will inevitably lead to a violation of the spiritual foundation of society;

4) a system of national property, the most important components of which are the natural environment, territory, water and air basins and, in general, all natural resources that are the public domain;

5) unlike many other countries, Russia has a fundamental source of budget revenue, and this is rent from natural resources, which, in accordance with moral, ethical, universal and ethical principles, should belong to everyone;

6) it is necessary to reconcile the principle of private property with an indispensable attribute of a market economy - freedom and equality in the process of exchange of goods for everyone;

7) the material realization of the supreme ownership rights of society over territorial and natural resources should be the circulation of rents from all used resources into public revenues accumulated in the system of public (state) finance.

As for the CE, we note that in 2022, the Federal project “Circular Economy” was adopted at the legislative level in the Russian Federation, the implementation of which is planned until 2030. The first stage of the federal project (2022–2024) provides for the creation of conditions for the transition of the economy Russia to CE (in particular, we are talking about minimizing waste in economic sectors and involving waste in economic circulation with maximum resource efficiency); the second stage of the FP (2025–2030) provides for the expansion and modernization of infrastructure to increase the share of recycled waste for its subsequent inclusion in economic circulation (https://musor.moscow/blog/jekonomika-zamknuto-go-cikla/?ysclid=lgfd3qm8ax_51659_4252).

To conclude what has been said, we have examined the features of the institutional system of pearl companies – organizations that most fully meet the specifics of the new technological structure. Institutions are interpreted in the spirit of Douglas North, who understands them as the “rules of the game”, in contrast to organizations – “players”, otherwise – economic agents. In turn, each organization may have its own players, as well as its own institutions - intra-organizational rules of the game. Pearl companies

are the most modern companies, organized in a unique way with their own institutional specificity, which allows them to ensure the long-term efficiency of the employees of the enterprise, its structural divisions and the company as a whole. The formation of pearl companies is considered in the context of spiral dynamics, giving a classification of various types of organizations that were in the economic systems of various countries and ending with turquoise organizations.

Pearl companies are the most modern companies, organized in a unique way with their own institutional specificity, which allows them to ensure the long-term efficiency of the employees of the enterprise, its structural divisions and the company as a whole. The formation of pearl companies is considered in the context of spiral dynamics, giving a classification of various types of organizations that were in the economic systems of various countries and ending with turquoise organizations (Kuropatkina, 2022; 2023). So in this theory, in 1996 by Graves et al., it is accepted: to classify the stages of development in accordance with the color scheme. The initial impetus for the development of spiral dynamics was the attempt, beginning in 1952 by Clair Graves, to explain differences in the emergent cyclic levels of existence and motivation of people and their reactions (Graves, 1959).

References

1. *Bobylev S.N., Solovyova S.V. Circular economy and its indicators for Russia // The world of the new economy. 2020. No. 14(2). – P. 63-72. DOI: 10.26794/2220-6469-2020-14-2-63-7 (in Russian).*
2. *Closed-loop economy: trends and prospects: monograph / E.Yu. Dorokhina, D.E. Kucher, S.G. Kharchenko; edited by E.Yu. Dorokhina. – Moscow: MAX Press, 2023. <https://doi.org/10.29003/m3129.978-5-317-06912-4>.*
3. *Deng Xiaoping. Basic issues of modern China. – Moscow: Politizdat, 1988 (in Russian).*
4. *Ellen MacArthur Foundation. The Global Commitment 2021. Available at: <https://ellenmacarthurfoundation.org/global-commitment-2021/overview> (accessed on 05 June 2023).*
5. *Fontana K.A., Yerzknayan B.H. Circular economy – circular images of the future // Economic science of modern Russia. 2023. No. 3 (102). – P.33-47 (in Russian).*
6. *Graves C. W. An Emergent theory of ethical behavior based upon an epigenetic model. – New York: Schenectady, 1959.*
7. *Kalmykova Y., Sadagopan M., Rosado L. Circular economy – from review of theories and practices to development of implementation tools // Resources, Conservation and Recycling. 2018. Vol. 135. – Pp. 190-201. DOI: <https://doi.org/10.1016/j.resconrec.2017.10.034>.*

8. Kuropatkina L.V. *Formation and development of the corps of pearl organizations in Russia // System modeling of socio-economic processes: proceedings of the 45th Anniversary International Scientific School-Seminar, ed. Doctor of Economics I. N. Shchepina. – Voronezh: Origins, 2022. – P. 204–209 (in Russian).*

9. Kuropatkina L.V. *New forms of production organization: mother-of-pearl companies // Russian Journal of Economics and Law. – 2023. – T.17. – No. 1. – P. 23-34. DOI: 10.21202/2782-2923.2023.1.23-34 (in Russian).*

10. Lvov D.S. *Free economy of Russia: a look into the 21st century. – Moscow: Ekonomika, 2000 (in Russian).*

11. Oleinik A.N. *Power and the market: the system of socio-economic domination in Russia in the 2000s. – Moscow: Russian Political Encyclopedia (ROSSPEN), 2011 (in Russian).*

12. Parrique T., Barth J., Briens F., Kerschner C., Kraus-Polk A., Kuokkanen A., Spangenberg J. H. *Decoupling debunked. Evidence and arguments against green growth as a sole strategy for sustainability. A study edited by the European Environment Bureau EEB. 2019. Available at: https://gaiageld.com/wpcontent/uploads/2021/04/decoupling_debunked_evidence_and_argumen.pdf.*

13. Popper K. *Knowledge and the psychophysical problem: In defense of interaction. – Moscow: Publishing house LKI. 2008 (in Russian).*

14. Reinert E. *How rich countries got rich... and why poor countries stay poor. – Moscow: Publishing house of State University –Higher School of Economics, 2011 (in Russian).*

15. Stiglitz J. E. *The Roaring Nineties. Seeds of collapse. – Moscow: Modern economics and law, 2005 (in Russian).*

16. Velenturf A., Purnell P. *Principles for a sustainable circular economy // Sustainable production and consumption. 2021. Vol.27. – P. 1437-1457. DOI: <https://doi.org/10.1016/j.spc.2021.02.018>.*

17. Yerznkyan B.H. *Institutional reinforcement: Three types of relationships // Journal of institutional studies. 2017. Vol. 9. No. 1. – P. 27-38 (in Russian).*

18. Yerznkyan B.H., Fontana K.A. *Circular economy and sustainable development of cities // Regional problems of economic transformation. 2021. No. 7(129). – P. 7-22. DOI: 10.26726/1812-7096-2021-7-7-22 (in Russian).*

19. Yeznkyan B.H., Fontana K.A. *From technological factors of innovative development to social and structural factors. – Ch. 3.1. In the monograph: Social and structural factors of modern innovative development: Monograph / coll. of authors; edited by U.V. Ustyuzhanina, A.G. Petrov. – Moscow: RUSAINS, 2023. – P. 127-134 (in Russian).*

20. Yerznkyan B.H., Fontana K.A. *Study of barriers to the circular economy (small and medium-sized enterprises) // Problems of market economy. 2023. No. 2. – P. 6-24 (in Russian).*

如何量化和激發學生的創意和專業活動（以應用電腦科學相關專業為例）

HOW TO QUANTIFY AND STIMULATE THE CREATIVE AND PROFESSIONAL ACTIVITY OF STUDENTS (USING THE EXAMPLE OF SPECIALTIES RELATED TO APPLIED COMPUTER SCIENCE)

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抽象的。提出了一種在大學整個學習期間比較定量評估和激發學生創造性和專業（教育）活動的通用方法。此方法可以*快速識別有才華的學生並*為學生在競爭激烈的市場環境中工作做好準備；*提供有關每個學生在整個學習期間取得的成績的公開資訊。結果表明，該方法可用於比較不同大學同一專業學生的創造性和教育活動的定量評估結果。

關鍵字：訓練、學生、人才辨識、創意活動、刺激、定量評估。

Abstract. *A universal method of comparative quantitative assessment and stimulation of creative and professional (educational) activity of students throughout the entire period of study at a university is proposed. The method allows *to quickly identify talented students and *to prepare the student for work in a competitive market environment; *provide publicly available information about the achievements of each student throughout the entire period of study. It is shown that the method can be used to compare the results of a quantitative assessment of the creative and educational activity of students of the same specialties in different universities.*

Keywords: *training, students, talent identification, creative activity, stimulation, quantitative assessment.*

Introduction. Prompt identification and targeted employment of talented individuals is an urgent task for every state, every corporation seeking to strengthen its market position. Indeed, for some countries and companies, almost the entire world is an area of search and subsequent “acquisition”, or rather, the purchase of talented students, potential citizens of their country and/or future employees of a successfully “searched” company. Moreover, such a search requires a significant investment of time, labor and financial resources. At the same time, the methods

used today for assessing the effectiveness of students' educational and scientific activities have, in our opinion, a number of shortcomings.

First, educational institutions do not prepare students for upcoming jobs in a *competitive market* environment. Even the assessment of a student's status based on average score, used in the USSR, gave some *advantages* to graduates with the maximum average score when choosing a place of placement. And students do not know what the average value or nature of the distribution of their own and, especially, other people's performance scores in a modern educational institution is.

Secondly, it is impossible for a potential employer to *quickly* determine which *group* of academic disciplines was most attractive to a student-future employee of the enterprise. After all, it is important for the employer to know this in order to determine in what specialization he will bring the maximum benefit to the company: task setter, systems analyst, programmer, ...

Thirdly, it is also clear that most talented individuals need to be constantly stimulated somehow.

[Note 1. It is known that each of us, to one degree or another, has a feeling of narcissism (it is possible that you have only "traces" and not "heightened pride"). Then imagine how a student feels who for many years (4 or 6-7 years) has been depriving himself of the usual joys of a sports fan (theater, amateur chess player, ...), but 2 years ago received a Rospatent Certificate of registration of his computer program, which is of great practical importance, and a year ago took 1st place at a hackathon organized by a very large company. True, he was congratulated, but his success was soon forgotten. Almost everything. But he continues to study diligently and, unfortunately, not always successfully, and for some reason the level of satisfaction with his studies decreases and weakens. And it's impossible to come up with something new and useful. But we understand that, unfortunately, there are not very many such *extraordinary, creatively thinking* students.]

The article proposes a methodology that is devoid of the listed disadvantages and allows at the same time to reduce the resource intensity of the process of searching for talented individuals in the country's universities, stimulating the creative and professional (educational) activity of students.

1.On the need for an objective and permanent assessment of the dynamics of a student's status, based on his creative success and the results of test and examination sessions.

It seems to us that in order to speed up and reduce the resource intensity of the *process of searching* for talented individuals among many university students, **firstly**, the *entire period of student training* should take place in a *quasi-competitive* environment. **Secondly**, it is necessary that when quantitatively assessing the scientific and educational results of a student's activities, objective indicators are used, the reliability of the values of which anyone can easily check. **Thirdly**,

so that information about any student's achievements useful for an educational institution, a municipality or the country, information about each of his creative and professional successes, *promptly*, quantitatively, *throughout the entire period of study*, is reflected on his status ("Status" (from the Latin "status") - position, condition). *Social status is the position (position) of an individual or group in a social system, determined by a number of economic, professional, ethical and other characteristics specific to a given system...*" – (Universal Encyclopedic Dictionary. – M.: Bolshaya Rossiyskaya encyclopedia, 2000. – 1551 p.)) and were in the public domain.

2. How to quantify a student's creative activity and its dynamics.

Obviously, in order to quantitatively assess a student's creative activity, it is necessary, firstly, to first determine which indicators can reflect the results of the student's creative activity with maximum reliability. And secondly, determine a list of actions that will achieve the desired result.

2.1. Composition of student creative activity indicators

To quantify the creative activity of students, you can use a number of well-known indicators: 1) Participation (with victory) in hackathons ("*hackathon*" is a forum for developers, during which specialists from different areas of software development (programmers, designers, managers)) together solve a problem for a while..., more often the task of a hackathon is to create full-fledged software" -...wikipedia.org; see also: skillbox.ru). Information about each victory contains information: *name of the hackathon, *organizer, *date; *the place occupied by the team (only one of the first three is taken into account: 1st, 2nd or 3rd) and the award for one team member, and not received by the entire team (amount of funds in thousand rubles).

The table for *calculating and updating (recalculating) each semester* of a student's *status* will contain *total information about all hackathons (their number) in which this student took one of the first three places (*one column*) and *the total amount of money received by this student - awards, bonuses, in thousand rubles (*second column*).

2) Rospatent certificates for registration of a computer program: *name of the software product (SP), *Certificate number and date of registration. *number of co-authors. The table for calculating student status contains only *one column*: The total number of certificates received by the student.

3) Rospatent Certificates for database registration (DB): *DB name, *Certificate number and registration date. *number of co-authors. The table for calculating student status contains only *one column*: The total number of certificates received by the student.

4) Implementation of *software products or databases developed with the participation* of the student: *name of the software or database, *object of implemen-

tation, *date of signing the implementation act. The table for calculating student status will contain 2 columns: the first column contains information about how many SP or DB have been implemented **at your university*, and the second column - how many SP or DB have been implemented **in other universities and enterprises*.

5) Publications. The initial table and the Table for calculating the status of a student according to the “Publications” indicator contain 4 columns reflecting the assessment of the significance and status of a published scientific work used today by the electronic library (**published in publications from the Higher Attestation Commission list, *in publications included in the RSCI, or *in the electronic library, * in other publications*).

6) Successful participation of the student in competitions (such as “Clever Man”, ...). For each competition the following is indicated: **name of the competition, *date, *organizer*. The table for calculating student status contains 2 columns: the first indicates the number of competitions won by the student, and the second column indicates the award received (the total amount of money received by the student, in thousand rubles)

[Note 2. When assessing the significance (information “weight”) of a student’s creative potential in the columns with the “reward” indicator, the condition is met: if the total value of the award (in any lines of the awards column) is more than 2 times less than what someone received maximum, then in such lines of the “reward” column “0” is placed. Fulfilling this condition makes it possible to eliminate the impact on the results of calculating creative potential from the student’s participation in unimportant competitions, hackathons, ...]

7) Participation of the student (as one of the performers) in the implementation of projects supported (financially) by **a university or municipality, *subject of the Russian Federation, *Russian Science Foundation*. For each project, **name, *period(s) of implementation and *organization interested in its development (enterprise or executive body) must be indicated*. The table for calculating student status contains 3 columns, which indicate how many projects were completed with the support of **a university or municipality, *a subject of the Russian Federation or the Ministry of the Russian Federation, *The Russian Science Foundation*.

The listed indicators are suitable, in our opinion, for quantitative assessment of the creative activity of students in a large group of specialties related to applied computer science, which overlap by more than 50% *in the composition of special disciplines*. It is possible that in the future this list of indicators will be expanded, and other indicators will be proposed that will make it possible to fairly well characterize and reliably evaluate the creative activity of students of various specialties in the country’s universities. We believe, however, that the described algorithms and calculation methods are unlikely to change.

2.2. Comparative quantitative assessment of the dynamics of a student’s creative activity throughout the entire period of study at the university.

The proposed algorithm for quantitative assessment of a student’s creative activity includes the following steps:

Step 1. Selecting a set of indicators that, in the opinion of independent experts, characterize the creative activity of students in a particular specialty.

Step 2. Quantitative assessment of the numerical values of selected indicators in each of the groups of specialties based on experimental studies or through examination.

Step 3. Converting the numerical values of each indicator into relative units by dividing by the average value (mathematical expectation) of the indicator for all students in the specialty.

Step 4. Summing up the relative values of indicators for each student for each of the selected periods of study (semesters) will allow us to obtain a quantitative assessment of the dynamics of creative activity of any student in a particular specialty (or students in a group of related specialties) for the entire period of study. Moreover, using similar operations, it is possible to quantitatively evaluate and compare the creative activity of students in each specialty from a group of related ones.

Example 1. Suppose that it is necessary to quantitatively determine the status of students in a specific specialty, based on data on the results of their creative activity. Table 1 presents data on the creative activity of students in a specific specialty, consisting (for clarity) of only five students, over a period of $(1+...+j)$ semesters using a limited set of indicators.

Table 1

Initial data for comparative quantitative assessment of students’ creative activity

Semester	Student’s name	Hackathons		Registration certificate		Implementation of SP or DB	
				SP	DB	at your university	at other sites
		Qty	Reward	Qty	Qty	Qty	Qty
1	2	3	4	5	6	7	8
1+...+j	S1	0	0	0	0	1	0
	S2	1	40	1	0	1	1
	S3	0	0	0	1	0	0
	S4	0	0	0	0	1	0
	S5	1	10	0	1	1	0
...
n	...	...	...	...	...	...	...

In accordance with [1], for a quantitative comparative assessment of the creative activity of students, it is necessary, having determined the average value of each indicator in Table 1 of the initial data, to calculate the relative values of the indicators in question among students of the chosen specialty. As a result of the calculations, we obtain Table 2.

Column 9 of Table 2 presents the results of calculations of the creative activity of students in the chosen specialty. However, in order to determine how large the difference in the *effectiveness* of creative activity of different students is, it is advisable to divide the data given in column 9 by the minimum value - 1.25. Column 10 of Table 2 provides quantitative *estimates* of the *status* of *students* using indicators that jointly *characterize the level of an individual's creative abilities*.

Table 2
Results of a comparative quantitative assessment of student status in the field of creative activity

Semester	Student's name	Hackathons		Registration certificate		Implementation of SP or DB		Student creative activity. (Calculation results)	Assessment of student status in the field of creative activity
				SP	DB	at your university	at other sites		
		Qty	Reward	Qty	Qty	Qty	Qty		
1	2	3	4	5	6	7	8	9	10
1+...+j	S1	0	0	0	0	1/0,8=1,25	0	1,25	1
	S2	1/0,4=2,5	40/10=4	1/0,2=5		1/0,8=1,25	1/0,2=5	17,75	14,2
	S3	0	0	0	1/0,4=2,5	0	0	2,5	2
	S4	0	0	0	0	1/0,8=1,25	0	1,25	1
	S5	1/0,4=2,5	10/10=1	0	1/0,4=2,5	1/0,8=1,25	0	7,25	5,8
	Σ	2	50	1	2	4	1	30	
	Average value	0,4	10	0,2	0,4	0,8	0,2	6	
...	
n	...	...	...	...	...	...	...	...

The content of tables 1 and 2 is updated throughout the entire period of the student's studies. Moreover, our proposed method of stimulating the creative activity of students provides the opportunity to see the results of the successful creative activity of any student not only for himself, but, if desired, also for his friends, relatives and quasi-competitors. And by dividing the entire period of study into certain time periods, for example, into semesters, you can observe the dynamics of the creative activity of each talented student, an extraordinary personality.

Similarly, by performing a comparative quantitative assessment of the creative activity of students of the same specialty in different educational institutions, one

can, for example, suddenly discover that the obtained assessment values have a significant scatter and explore its reasons.

Step 5. Assessing the creative potential of students in the analyzed group of specialties. Moreover, when assessing creative potential, one should take into account the student’s participation in every competition, hackathon, ..., take into account every Rospatent Certificate he received, every implementation of SP and DB developed with his participation, ...

It turns out that the columns of the table for calculating creative potential do not contain the number of student participations in competitions, not the number of Certificates, as in Table 1, but only ones and zeros in each column. In such a situation, apparently, the only possible way to quantitatively assess a student’s creative potential is to use the method of comparative assessment of the functional completeness and significance (information “weight”) of objects and their characteristics (signs, functions, ...) - the “FP” method (see. [2-4]).

Example 2. Let us consider, as in Table 1, the same composition of indicators characterizing the student’s creative activity. For a comparative assessment of the information “weight” of students’ creative potential, the “FP” method is used. The initial data for the calculations are presented in Table 3.

Table 3
Initial data for assessing the creative potential of students in the analyzed group of specialties - assessing its significance (information “weight”)

Semester	Student’s name	Hackathons		Registration certificate		Implementation of SP or DB	
				SP	DB	at your university	at other sites
		Qty	Reward	Qty	Qty	Reward	Qty
1+...+j	S1	0	0	0	0	1	0
	S2	1	1	1	0	1	1
	S3	0	0	0	1	0	0
	S4	0	0	0	0	1	0
	S5	1	0	0	1	1	0
...
<i>n</i>	...	...	...	...	...	...	...

Let us introduce the following notation:

$S=|s_i| (i \in K)$ – set of students of the analyzed specialty; $R=|r_j| (j \in M)$ - a set of indicators characterizing the creative activity of students.

Let us select students S_i and $S_j (i, j \in K)$ and denote $P_{ij}^0 (i, j \in M)$ - the number of indicators characterizing the creative activity of students that student S_i suc-

cessfully mastered, but student S_j failed to master, i.e. $P_{ij}^{10} = |S_i \setminus S_j|$ is the power of the difference between the sets S_i and S_j .

Then for Table 3 the matrix P_{ij}^{10} will take the form:

P_{ij}^{10}				
0	0	1	0	0
4	0	5	4	3
1	1	0	1	0
0	0	1	0	0
2	1	2	2	0

A matrix for calculating a student's creative potential ($P_{ij}^{10} + (P_{ij}^{10})^2$):

1	1	1	1	0
15	8	19	15	3
5	1	7	5	3
1	1	1	1	0
8	3	11	8	3

The results of calculating the creative potential of students in the analyzed group of specialties are presented in Table 4.

Table 4
Assessment of the creative potential of students of a group of specialties

Semester	Student's name	$(P_{ij}^{10} + (P_{ij}^{10})^2)$					Sum	Assessment of students' creative potential
1+...+j	S1	1	1	1	1	0	4	1
	S2	15	8	19	15	3	60	12
	S3	5	1	7	5	3	21	5,25
	S4	1	1	1	1	0	4	1
	S5	8	3	11	8	3	33	8,25

3. Student performance. Formation of the status of a student specialist in the field of specialties related to applied computer science.

By analogy with the quantitative comparative assessment of a student's creative activity, with the assessment of his status as a creative person, his status as a professional specialist in his chosen specialty can be assessed. And such an assessment can be obtained much easier than quantifying the creative activity of students.

[Note 3. True, the scoring of academic performance in curriculum subjects will most often turn out to be less reliable and accurate, since the scores a student

receives in exams and tests sometimes depend on the character and mood of the teacher or other quasi-objective reasons (see also [5- 7])]

Table 5 presents the truncated results of student performance in the chosen specialty after all test and examination sessions.

Table 5

Results of test and examination sessions for students of the analyzed specialty

Semester	Academic disciplines plan	Exam (e), pass/fail exam (p)	Ratings of specialty students				Average grade for the academic disc. plan
			Name 1	Name 2	...	Name k	
1	2	3	4	5	6	7	8
1-й	P1	Э	72	80	...	96	84
	P2	Э	68	92	...	88	78
	P3	3	78	74	...	94	82
	P4	Э	74	65	...	92	76
	Average for subjects included in the 1st exam session		73	77,8	...	92,5	80
	Relative average		0,9	0,97	...	1,16	
...
n-й	Pi	...	...	...	...	...	...
	Pi+1	...	...	...	...	...	...

	Pg	...	...	...	...	...	...
	Average in all disc. plan	...	...	...	...	...	...
	Relative average	...	...	...	...	...	...

We proposed a similar quantitative assessment of the status of not only students, but also teachers in [6], however, without an explicit division into two parts - creative and professional activity (academic performance in the specialty chosen by the student).

Moreover, if you rank students' scores by curriculum subjects, then by estimating the Kemeny distance [8, 9], it is easy to form groups (interrelation graphs) of students with similar preferences for certain academic disciplines.

And to make it easier for the employer to correctly select the right specialists, focusing on which disciplines of the curriculum the student considered most attractive for himself, data on the grades received by each student in all subjects of the curriculum can be *sorted in descending order and *divided each set of student grades by deciles.

Then the first 2 deciles will contain the subjects in which students will have the highest grades for the entire period of study.

CONCLUSIONS. In the article for the first time

1. A universal method is proposed for comparative quantitative assessment and stimulation of creative and professional (educational) activity of students throughout the entire period of study at the university. The method allows to

*promptly and with minimal costs identify and implement targeted employment of talented students;

*prepare the student to work in a market economy - to work in a competitive environment;

*help the employer make the right choice of the specialist he needs by providing a pre-formed group of academic disciplines in which the student received the highest grades during his studies;

*form groups of students with similar preferences for certain academic disciplines;

*provide publicly available information about all the successes and achievements of each student during the entire period of study, providing the opportunity to stimulate the creative and professional activity of not only the student himself, but also his friends and envious people.

2. A numerical example is given that confirms the possibility of using the method of comparative assessment of the functional completeness and significance (information “weight”) of objects and their characteristics (signs, functions, ...) for quantitative assessment of the creative potential of each student.

3. It is shown that the method is easy to implement and can be used to compare the results of a quantitative assessment of the creative and professional (educational) activity of students of the same specialties in different universities.

References

1. Khubaev G.N. *Ranking of objects according to multiple quantitative indicators: a universal algorithm // RISK: Resources, Information, Supply, Competition. – 2018. - No. 1.*

2. Khubaev G.N. *Comparison of complex software systems based on the criterion of functional completeness//Software products and systems (SOFTWARE&SYSTEMS). - 1998.- N2. – P. 6-9.*

3. Khubaev G.N., Shevchenko S.V. *Methodology for express assessment of the characteristics of consumer quality of websites (using the example of websites of management companies in the housing and communal services sector) // Quality and life. – 2016. – No. 1 (9). – P. 77-84.*

4. Khubaev G.N. *How the state can optimize the processes of import, import substitution and export of goods: methods and tools: Monograph. – St. Petersburg: SUPER Publishing House, 2022. – P. 59-67.*

5. Khubaev G.N. *How to evaluate and minimize the expenditure of time and financial resources on the processes of teaching citizens: methods and tools* // *Bulletin of SRSTU (NPI). Series: Socio-economic sciences.* – 2021. – V. 14. No. 5. – P. 156-170.

6. Khubaev G.N. *Computer networks in the system for assessing the quality of training of specialists* // *HIGHER EDUCATION IN RUSSIA.* - 1995. - N3. – P. 9-16.

7. Khubaev G.N. *Publication activity and applied usefulness of the results of the activities of a scientist, research team, institute: comparative assessment methodology* // *Materials of the International Scientific and Practical. conf. "Statistics in the modern world: methods, models, tools."* (Rostov-on-Don, November 15-16, 2013). – Rostov-on-Don, 2013. – P. 183-190.

8. Khubaev G. N. *Method of step-by-step ordering of many objects* // *Certificate of registration of a work in the Russian Society of Authors.* No. 17165 dated September 09, 2010

9. Khubaev G.N. *Universal method for optimizing the composition of object characteristics* // *Bulletin of Science and Practice.* – 2019. – T. 5. No. 5. – P. 265-275.

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俄羅斯酒店業發展方向與趨勢
**DIRECTIONS AND TRENDS IN THE DEVELOPMENT OF
THE RUSSIAN HOTEL SECTOR**

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抽象的。 本文探討了俄羅斯酒店業的發展趨勢。 由於客人興趣轉向俄羅斯國內地區旅遊目的地、歐洲外國遊客對酒店服務需求的限制以及外部需求轉向東部目的地，酒店服務需求因素凸顯。 研究了國際品牌向俄羅斯品牌轉型導致的俄羅斯酒店服務市場重組的趨勢。 概述了當地酒店營運商進一步成長和發展的趨勢。

關鍵字：旅館業、連鎖飯店、飯店服務需求結構。

Abstract. *The article examines the trends in the development of the Russian hotel sector. The factors of demand for hotel services are highlighted, due to the switching of guests' interest to domestic Russian regional tourist destinations, the restriction of demand for hotel services from foreign European tourists, and the turn of external demand to eastern destinations. The trends of restructuring of the Russian market of hotel services caused by the transition from international brands to Russian ones are investigated. The trends of further growth and development of local hotel operators are outlined.*

Keywords: *hotel sector, hotel chains, structure of demand for hotel services.*

The hospitality industry is an important economic system and one of the structural components of the tourism economy. The events of 2020-2022 led to certain consequences that can be observed in the Russian hospitality industry. In 2020, due to restrictions introduced to combat the spread of coronavirus infection, the number of hotel guests in Russia decreased by 37%: from 61.1 to 38.3 million people. [5] In 2022, 64.5 million people used hotel services in Russia, which was 67% higher than in 2020 (38.3 million people). [1] By the end of 2023, the volume of the Russian hotel market may reach 785 billion rubles, which is 10% more than last year's figures.

The current situation is not just a short-term phenomenon, but the beginning of a new vector for the development of the hotel sector. The changes that have occurred will be expressed not only in fluctuations in various indicators of the hotel market, but also in its structural and qualitative changes.

The main characteristic trends that determine the further development of the hospitality industry are the following: switching the focus of Russian tourists to domestic destinations, a turn in external demand from West to East; restructuring of the hotel market with the transition from international brands to Russian ones, further growth and development of local operators; expanding the geography of travel in Russia for the mass consumer and realizing, in particular, the potential of active recreation, stimulating demand for additional growth points and the emergence of new hotel and tourism projects. [2]

International sanctions and restrictions have led to a number of foreign hotel chains suspending their activities or leaving the Russian market. In 2022, the giants of the global hotel business left the Russian market: the American corporation Marriott International and its brands (there were 29 hotels in Russia); the British company InterContinental Hotels Group (there were 21 hotels in Russia); Finnish chain Sokos (three hotels); American Best Western (one hotel) and Hyatt (four hotels); Canadian Four Seasons (two hotels). The hotels retained their staff and domestic management, but were not supplied by corporate suppliers and were excluded from global loyalty programs, corporate privileges and personnel training systems. Guests can now book their stay on hotel websites or directly from the reservations department. The geography of guests has changed, there are fewer foreigners and more tourists from Russian regions, CIS countries and neighboring countries. In the segment of b2b clients, the consumer niche is now occupied by Russian brands that hold presentations, training seminars for sales representatives and other business events. According to hotel executives, the high standards of the brands and the list of services provided will remain unchanged.

Foreign policy and economic restrictions have led to a reorientation of tourism towards domestic destinations. The departure of foreign brands in the face of growing domestic demand is a strategic opportunity for Russian hotel chains. For example, the current situation provides additional advantages for more intensive development for Russian operators such as Azimut Hotels and Cosmos Group, which are already gaining weight in the market. In the absence of Western tourists, switching to a Russian brand is a more profitable strategy for hotel owners. Experts predict growth in the hotel services market due to the development of domestic tourism due to the reduced opportunities for Russians to vacation abroad and the expected influx of tourists from China and Iran.

The Azimut Hotels chain had more than 20 hotels in Europe and planned to continue expansion, but due to international sanctions it was forced to stop busi-

ness there. But the chain remains an international company and plans to open two new hotels under its management in Israel, and several projects are being developed in the CIS countries. In 2020, Azimut Hotels bought the RZD-Zdorovyie sanatorium chain. His company is also developing infrastructure at the Sheregesh ski resort in the Kemerovo region. In Russia, about 70 hotels and sanatoriums in 50 cities already operate under the Azimut brand. Over the past year, the number of rooms in the network increased by approximately 10%, approaching 12 thousand [3]

The vacated niche is also occupied by the Chinese Soluxe Hotel chain, which entered the Russian market in 2022. The first premium hotel of an international operator opened in Moscow as part of the Chinese business center Park Huaming. The hotel has 340 rooms, including the Huaming Presidential Suite with a total area of 373 square meters. The hotel has a gym, a club lounge on the 20th floor with views of the Botanical Garden, VDNKh and the Ostankino TV Tower, as well as a restaurant, bar and event space. This fact shows interest in the Russian market.

The diversity of interests of consumers of hotel services determines the modern segmentation of the Russian hotel market and the variety of hotels. The classification of collective accommodation facilities includes hotels, motels, health resort organizations, motels, hostels, apartments, country hotels and camp sites. Over 50% of travel is business travel, about 40% is leisure travel and 10% is travel for other purposes. This structure of consumer demand also determines the demand for hotels of appropriate quality and focus. [4]

Since business people and businessmen have a demand for expensive hotels with a high level of service, and this demand is quite stable. Among them, the largest percentage are business hotels and congress hotels that have conditions for holding business meetings and conferences. Due to the high demand for such services, hotel lobby areas are often converted into coworking spaces. For business people, priorities in choosing a hotel are distributed as follows: location of the hotel - availability of working conditions - quality of service - price.

Hotels intended for recreation, entertainment and excursions are classified as middle and economy class hotels, apartment hotels and resort hotels. The priorities in choosing a hotel for travelers for the purpose of recreation and entertainment are distributed somewhat differently: price - quality of service - availability of conditions for recreation and variety of services - location.

The development of mass tourism, primarily domestic tourism, creates a demand for accommodation facilities located closer to nature (country hotels and tourist complexes, private boarding houses, tourist villages, etc.) and cheaper, but with a fairly wide range of services.

The diversity of interests and needs of the remaining travelers (about 10%) creates a demand for other types of accommodation facilities (hotels for sports tourism, specialized hotels, including mobile ones, etc.).

Developing regional hotel chain complexes have the opportunity to most clearly satisfy the consumer needs of guests, taking into account the specifics of local demand. For example, Saratov hotels “Bohemia” is a network of hotels that are diverse in architecture, size, number of rooms, infrastructure and location. Some of them are located in historical buildings and therefore preserve the spirit of the city, while others are located in modern buildings that open up ample opportunities for guests of the regional center. So “Bohemia” on Vavilova is a classic modern hotel designed for the category of business tourists. The complex provides guests with well-functioning standard high-level service, as well as a large number of locations for a comfortable stay, meetings with business partners and friends, venues for seminars, conferences, and business events. The chain also includes the mini-hotel “Private Residence Bohemia”, which is located in an old historical building, where the apartment house of the merchant V.A. Krasulin was previously located. This place is designed to accommodate tourists who arrived in Saratov for the purposes of recreation, entertainment and excursions. This strategy for the development of a hotel chain allows you to work in different market segments and differentiate the offer of hotel services, so it is important to use tools for forecasting the emergence of new needs and market research.

Thus, it can be stated that the Russian hotel sector remains attractive for investment and is characterized by moderate growth in demand in the business tourism and active tourism sectors. The market has a differentiated offer of hotel services in accordance with the characteristics of local demand. Market restructuring and the departure of international brands as a whole did not change the stability of the industry, but made it possible to develop new forms of adaptation in the current demand conditions.

References

1. *Analysis of the hotel services market in Russia* URL: https://businesstat.ru/russia/services/hotels_and_tourism/hotels/ (access date 10.20.2023)
2. Grigoriev V., Tomilov E. *New realities of the hotel market in Russia.* <https://rentnow.ru/analytics/novye-realii-gostinichnogo-rynka-rossii-iyun-2022-g> (access date 10/23/2023)
3. *How Azimut Hotels began expansion [Electronic resource]* - URL: <https://www.rbc.ru/business/08/03/2023/6401d9549a7947d435596ae2?from=copy> (access date 11/30/2023)

4. Nazarkina, V. A. *Features of consumer demand in the hotel sector* / V. A. Nazarkina, B. I. Shteingolts // *Human Science: Humanitarian Research*. – 2014. – No. 2(16). – pp. 122-126. – EDN SHQ^URER.

5. *Federal State Statistics Service. Main performance indicators of collective accommodation facilities in the Russian Federation (2022) [Electronic resource]* - URL: <https://rosstat.gov.ru/statistics/turizm> (access date 10.20.2023).

進口替代是區域經濟發展的因素
**IMPORT SUBSTITUTION AS A FACTOR OF REGIONAL
ECONOMIC DEVELOPMENT**

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抽象的。現代地緣政治和宏觀經濟進程威脅著俄羅斯聯邦國民經濟的成長及其安全。本文給出了進口替代的概念，討論了其提高效率的工具和因素。簡要概述了有關進口替代必要性的思想發展歷史。介紹了在農業中使用進口替代工具的積極例子。以馬加丹地區為例，評估了發展進口替代的可能性及其確保該地區可持續經濟成長的前景。

關鍵字：進口替代；農業；金礦開採業；地區經濟安全。

Abstract. *Modern geopolitical and macroeconomic processes threaten the growth of the national economy of the Russian Federation and its security. The article gives the concept of import substitution, discusses its tools and factors for increasing efficiency. The history of the development of ideas about the need for import substitution is briefly outlined. A positive example of the use of import substitution tools in agriculture is presented. Using the example of the Magadan region, the possibilities for developing import substitution and its prospects for ensuring sustainable economic growth in the region are assessed.*

Keywords: *import substitution; Agriculture; gold mining industry; economic security of the region.*

Russia's place in the modern world economy is characterized by contradictory trends. Possessing powerful export potential, the largest reserves of natural resources, high production and scientific and technical capabilities, our country certainly plays an important role in the world economy, especially in the global energy market. At the same time, serious geopolitical events that occurred in 2022 affected all areas of state activity and changed the balance of power in the global economy. Transformations in the economic sector have entailed many difficulties and restrictions. International sanctions imposed against Russia create significant threats to the functioning of the national economy. Among the main challenges to the Russian economy, firstly, the withdrawal of imported companies from a wide variety of industries from the mar-

ket. Secondly, foreign countries have frozen Russian assets that are not located on the territory of the Russian Federation in order to undermine the functioning of the national banking system and collapse the ruble exchange rate. Thirdly, as a result of a reduction in the supply of imported components and components, the production of certain goods and services for industrial and consumer purposes is reduced. As a result of these processes, there is an increase in the level of inflation, a reduction in GDP, a fall in imports and a decrease in consumer activity. There is a threat of rising unemployment as a result of foreign companies leaving Russia.

But despite the global problems that the Russian economy has faced due to the introduction of sanctions, we can also talk about the beneficial impact of the difficulties that have arisen in the field of import supplies, which is manifested in the following main areas:

1. The prospect of eliminating the dependence of the domestic market on foreign goods.
2. Development of domestic production, made possible thanks to the vacated market niches.
3. Creation of additional jobs by Russian employers to replace the departed foreign ones.
4. Opportunities for growth in exports of domestic goods.

The primary task of Russia's economic policy today is to develop and implement a system of effective measures to ensure the sustainability of the national economy, including measures to neutralize external threats and actions aimed at realizing the emerging advantages. The adoption of these measures will make it possible to prevent the decline of the economy and ensure the economic security of the country in difficult external conditions.

The most important direction of economic development in the current conditions is import substitution. In the scientific literature there are different interpretations of the concept of "import substitution". Some authors focus on reducing the share of imports in the structure of the national economy, others on increasing production within the country. For the purposes of our research, we will understand import substitution as an economic process through which the import of imported goods into the country's territory is reduced or stopped by replacing foreign goods and services with domestic production. Import substitution is a complex problem that is aimed at increasing the competitiveness of domestic products by improving the competitive environment in the country and implementing structural restructuring of the economy. The difficulty lies in the need to carry it out as quickly as possible, but the government is ready to provide state support, as well as improve approaches to public administration [1, p. 493].

Let us determine the factors that contribute to increasing the effectiveness of the implementation of the import substitution policy and reducing the country's import dependence:

1. Availability of free and qualified labor.
2. Availability of capacities in the country's economy that are not involved in production.
3. Focus on exports, in order to achieve a positive balance of foreign trade.
4. Possibility of opening new enterprises in various sectors of the economy.
5. Development of innovative technologies to improve the production process and ensure its competitiveness.

In 2022, sharply increased sanctions pressure forced us to reconsider approaches to the import substitution policy and look for ways to implement it as quickly as possible. Against this background, the Russian government calls for abandoning specialization only in those areas where the country already has an advantage in the international market. It is important to carry out replacement in those industries in which their own competence can be revived, or where it is necessary to develop production from scratch. The industries most exposed to external risks in modern Russia include the IT sector, pharmaceuticals and mechanical engineering. They are most dependent on imported raw materials and components, because the share of imported components in the final products of these industries reaches 70%.

Import substitution is one of the directions of transition to a new model of economic development of the country and is an effective tool for increasing the economic security of Russia. Currently, the country is interested in developing its own industry, capable of providing consumers with competitive goods and services, for the purpose of internal and external protection. Russian import substitution policy includes both protectionist measures and measures to stimulate domestic production.

World experience shows that the main instruments of import substitution are:

1. Application of tariff restrictions and various barriers to exports.
2. Indirect participation of government agencies in industrial development, support for small and medium-sized businesses, subsidies for local producers.
3. Promotion of direct investment in international companies.
4. Development of new production technology.

In order to assess the possibility of using and potential effectiveness in the current economic situation in Russia of the above-mentioned import substitution tools, it is necessary to analyze the results of the implementation of the import substitution program in the Russian Federation using the example of industries in which the process of creating independent domestic production was implemented most actively, due to which fairly good results were achieved.

An absolutely positive example of import substitution is the agricultural industry, in which not only the accelerated replacement of imported products with domestic analogues is carried out, but also the production of goods that can compete

in the foreign market is developed. The sequence of adaptable planning decisions becomes the foundation for building a clear algorithm for reducing the dependence of the domestic agro-industrial complex on import flows [2, p. 170]. To support domestic producers in agriculture, measures such as reclamation measures, a ban on the import of a number of products, preferential loans, subsidies, etc. are widely used.

Consequently, by continuing to use all support measures, developing innovative technologies, and also establishing the efficient use of available resources, the agricultural sector will achieve good results in its further development.

It is obvious that it is impossible to achieve complete import substitution in the country, but high dependence on imports has an adverse effect on all spheres of life. Therefore, it is necessary to formulate optimal and effective principles of import substitution policy that will determine the relationship between import substitution and import dependence in the Russian Federation. The first principle is based on determining the leading role of mechanical engineering. This industry is the most important not only in industry, but also in the economy as a whole, as it determines the level of scientific and technological progress and directly affects all other industries. The second principle is based on taking into account the economic, geographical, and social characteristics of the regions of the Russian Federation. The third principle is to organize a mechanism for the exchange of information, skills and abilities not only between the constituent entities of the Russian Federation, but also between Russia and foreign countries. The fourth principle is the need to take into account all phases of the economic cycle to regulate the pace of import substitution. And the fifth principle includes identifying and investing in the most important areas of technology, economics and food security [1, p. 494-495].

An effective structural policy of the state in the field of import substitution assumes a focus on maintaining and balanced development of all spheres of the national economy and establishing optimal regional proportions of production. To talk about import substitution in general, it is necessary to assess the current state, opportunities and potential for the development of domestic production in different regions of the Russian Federation, since the construction of a competitive structure of the national economy should be based on these assessments. Let us consider the prospects for the development of import-independent production in a separate constituent entity of the Russian Federation using the example of the Magadan Oblast. To draw a conclusion about the possibilities of implementing an import substitution policy in the region, it is necessary to refer to the structure of the regional economy by type of activity. Let's evaluate the sectoral composition of the region's economy based on data on the share of turnover of the main industries in the total turnover of the Magadan region for 8 months of 2022 (Fig. 2) [4].

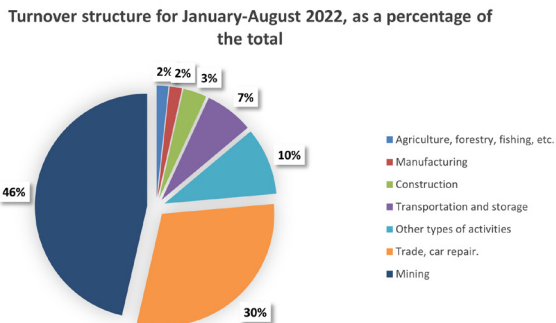


Figure 2. Turnover of organizations in the Magadan Oblast for 8 months of 2022 by type of activity

Due to unfavorable natural and climatic conditions, the agricultural sector, as well as manufacturing, will not be able to sufficiently develop import substitution in the region. Based on the current sectoral structure of the regional economy, prospects for the development of import substitution should, first of all, be sought in the field of mining, as the dominant industry in the regional economy, and in related industries. The region has a leading position in the extraction of minerals, with gold occupying a special place. Its production indicators have remained at a high level for many years. In Fig. Table 3 presents the results of the annual production of ore and placer gold in physical terms according to the Ministry of Natural Resources of the Magadan Oblast.

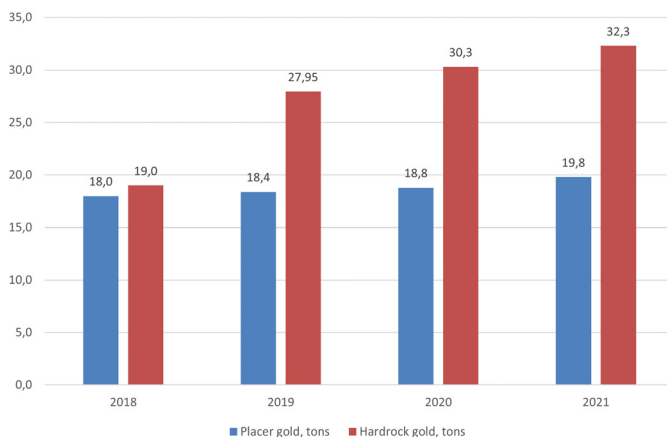


Figure 3. Mining of ore and placer gold in 2018-2021.

The gold mining industry has seen steady annual growth. In 2020, subsoil users of the Magadan region achieved gold production of 49.1 tons, which is 2.7 tons more than the production volume in 2019. In 2021, the Magadan region exceeded the gold production level of 50 tons, while in the next few years it is planned to increase the volume of ore gold production and achieve a production level of up to 53-55 tons of gold per year [5].

For the sustainable development of the region's economy, targeted work is needed to increase gold production rates both by large gold mining companies and small enterprises operating alluvial gold deposits. But an even more important task is to overcome the raw material orientation of the economy, therefore the main guideline for the development of the economic potential of the region should not be an increase in the quantitative indicators of metal production, but an increase in the degree of processing, the creation of the final product, and an increase in the technological capabilities of production.

One of the directions for developing the gold mining industry and increasing the economic security of the region could be the restoration of production complexes that previously existed in the region. An example is the Kolyma Refinery. On February 1, 2015, it ceased financial and economic activities for an indefinite period. We believe that in a region that ranks 2nd in gold mining and 1st in silver mining in the country, the presence of such an enterprise that ensures a closed production cycle is simply necessary. Restoring the plant at a new level of technological development and using high safety standards will require a lot of investment, but this need is justified in terms of creating new jobs, increasing budget revenues and developing the production potential of the region. Not being an import-substituting enterprise as such, a refinery can become the basis for the development of import substitution in the field of production technologies and the chemical industry.

An important industry related to gold mining is mechanical engineering. The development and operation of deposits requires a large amount of various equipment, including bulldozers, loaders, excavators, dump trucks, as well as engines, spare parts, and components for them. Currently, the main suppliers of equipment are imported companies from the USA, Japan, Western Europe, as well as from China, India and South American countries. A significant part of this market is currently experiencing supply difficulties due to the introduction of sanctions. Partially, the problem of providing equipment can be solved with the help of parallel import tools, as well as increasing the volume of interaction with the countries of Asia and South America. Nevertheless, steps to develop import substitution are possible in this industry. Thus, the "Reman" center was built in the Magadan region. It works on the principle of remanufacture, that is, the production of new equipment occurs on the basis of a used model or its individual parts. This makes it possible to restore products to the original level, with the possibility

of exceeding it, when using combinations of reused, remanufactured parts in a new production cycle. Another direction of development is related to increasing the use of Russian-made equipment. A promising supplier is the Russian concern “KAMAZ”, which produces diesel trucks, engines, tractors, combine harvesters and other types of equipment.

In conclusion, we note that although the need to develop import substitution has long been recognized and declared by the country’s leadership, including the economic bloc of the Government, the results achieved in this area are insufficient and fragmentary. Therefore, at present it is too early to talk about ensuring the country’s economic security in terms of reducing import dependence. As for the Magadan region, the situation here is aggravated by the remoteness and low transport accessibility of the region. These factors simultaneously complicate the possibilities of organizing production in the region and increase its dependence on imports. And if for Russia as a whole, the most vulnerable industries from the point of view of a large share of imported components are identified as priority industries for the development of import substitution, for the Magadan Oblast it is advisable to use a different approach. When planning the development of import-independent production in the region, it is proposed to build on the existing industrial structure and start with the main sector of the region’s economy - mining. The development of industries related to gold mining, the organization of production in the region and the expansion of cooperation with domestic companies will become growth factors not only for import substitution, but also for the economy of the region as a whole.

References

1. *Burbina A.A. Prospects and directions for implementing the import substitution strategy in Russia / A.A. Burbina. — Text: immediate // Young scientist. — 2019. — No. 22 (260). — P. 493-496. — URL: <https://moluch.ru/archive/260/59610/> (access date: 11/19/2023).*
2. *Shatokhin. M.V. Novoselsky. S.O., Antropova.T.G., Ponomoreva L.F. State and trends of import substitution policy in the country’s agro-industrial complex // Bulletin of the Kursk State Agricultural Academy. — 2022. — No. 3. — P.167-174*
3. *Website of the Official State Statistics Service Rosstat. — [Electronic resource]. Access mode URL: <https://rosstat.gov.ru/> (access date 11/20/2023)*
4. *Official website of the Federal State Statistics Service for the Khabarovsk Territory, Magadan Region, Jewish Autonomous Region and Chukotka Autonomous Okrug (Khabarovskstat). — [Electronic resource]. Access mode URL: <https://habstat.gks.ru/> (access date 11/26/2023)*
5. *Official website of the Ministry of Natural Resources and Ecology of the Magadan Oblast. — [Electronic resource]. Access mode URL: <https://minprirod.49gov.ru/> (access date 11/28/2023)*

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平行輸入作為克服制裁壓力的工具：風險與機會

**PARALLEL IMPORTS AS A TOOL TO OVERCOME SANCTIONS
PRESSURE: RISKS AND OPPORTUNITIES**

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抽象的。該文件探討了平行進口作為減輕俄羅斯經濟和企業制裁壓力的工具的可能性。探討了平行進口的優勢和劣勢，揭示了平行進口的風險和威脅，並對平行進口在我國的發展前景進行了展望。

關鍵字：經濟制裁、平行進口、進口替代、經濟安全。

Abstract. *The paper examines the possibilities of parallel imports as a tool for mitigating sanctions pressure on the Russian economy and business. The advantages and disadvantages of parallel imports are explored, risks and threats are revealed, as well as prospects for the development of parallel imports in the country.*

Keywords: *economic sanctions, parallel imports, import substitution, economic security.*

Economic sanctions and restrictions on world trade as a tool of political pressure were used in the Ancient World (for example, the so-called “Megarian psephism” of 432 BC). But if earlier economic wars were predominantly local in nature and were waged using a limited set of tools, then in the 21st century, an increasing number of countries are under sanctions pressure, including collective pressure, and the sanctions arsenal is replenished with new and diverse forms of restrictions. It is natural that the growing risks of introducing trade and financial sanctions lead to the desire of countries to strengthen their own economic security and, as a result, to the fragmentation and deglobalization of the world economy.

For Russia, the introduction of trade and financial restrictions means a change in the usual patterns of interaction with many countries with which previously free trade relations were maintained and export and import channels were estab-

lished. The embargo forces us to search, develop and develop ways to counter the negative impact on the economic conditions and well-being of the country. As an emergency counter-sanction measure, in March 2022, the Russian Government decided to legalize parallel imports for certain groups of goods [5]. The purpose of this step was to protect against restrictions by creating conditions for providing citizens, organizations and enterprises with goods, equipment and components of the usual quality in the required quantities. The list of the Ministry of Industry and Trade includes several dozen groups of goods, including consumer (clothing, phones, computers, electronics and many others) and industrial (transport, equipment, parts, spare parts, etc.). In August 2023, the list of goods allowed for parallel import was supplemented with products from a number of brands that have ceased sales in the Russian Federation. At the same time, the list was reduced by goods produced by companies that resumed work in Russia [6].

Research shows that there are several approaches to defining parallel imports. V.V. Pirogova connects the existence of parallel imports with the problem of exhaustion of exclusive rights and includes the import of goods legally produced, exported, and then re-imported to the country of origin.[4, p. 29].

M.G. Dolgikh and E.G. Afanasyev consider parallel import as the import into the country of a product that was legally marked with a trademark abroad, without the sanction of the copyright holder for such import (in a situation where the trademark enjoys legal protection both in the country of purchase and in the country of import of the goods) [1, P. 40].

From the point of view of G.P. Chernyshov, parallel trade is the import without the consent of the trademark owner into the territory of a country where the protection of a trademark, a product marked with this mark, put into circulation legally in the territory of another country is in effect [8, p. 20].

Thus, the essence of parallel import is the import of original products into the country without the direct consent (permission) of the manufacturer. That is, the supplier purchases products outside of a country into which imports are prohibited and brings them without the permission of the copyright holder, since after purchase the product can be sold anywhere. Before parallel imports were legalized, such sales were prohibited. Firstly, the offender paid compensation, and secondly, the imported goods were destroyed. Now suppliers have the right to import foreign products included in the list of the Ministry of Industry and Trade into Russia without the permission of the manufacturer. Figure 1 shows the groups of goods allowed for parallel imports to Russia.

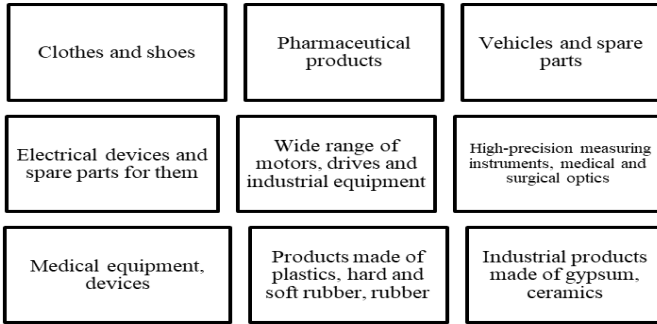


Figure 1. Groups of goods permitted for parallel import into Russia

According to the Federal Customs Service, parallel imports in 2022 grew monthly by an average of 18%. Thus, in August 2022, 383 thousand tons of various goods were imported through parallel imports; from the beginning of the application of this regime until mid-September 2022, more than 1.3 million tons. As of January 2023, the value of parallel imports since its legalization exceeded \$20 billion.

With increasing sanctions pressure, Russia has expanded active trade relations with many countries. Our country’s main trading partners are China, Turkey, Belarus, Kazakhstan, Armenia and other countries that have not joined the anti-Russian sanctions. Figure 2 presents data on the import of goods into Russia through major trading partners in the period from 2020 to 2022 [3]. Trade turnover with all the countries under consideration increased significantly: with China by 21.3 billion dollars, with Belarus by 10 billion dollars, with Turkey and Kazakhstan by 4.21 and 3.67, respectively.

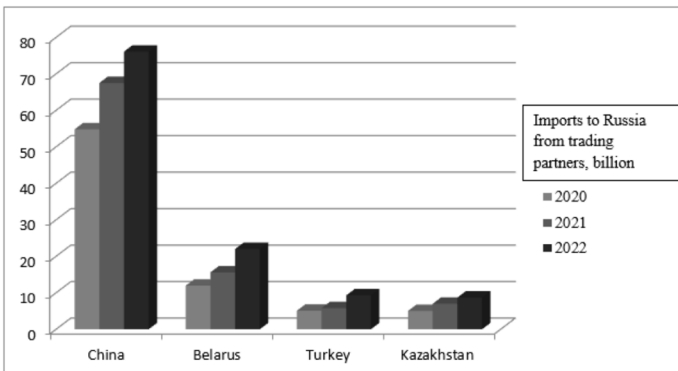


Figure 2. Imports to Russia from trading partners, billion dollars

China has long been Russia's main trading partner on the world market. The largest categories of goods imported by the Russian economy from China include cars, electronics, textiles, footwear and consumer goods. China did not support the sanctions measures applied to the Russian Federation, so the country continues to supply products, including analogues of goods produced by departed companies. At the same time, Chinese companies act with caution, fearing the introduction of secondary sanctions. An example is the automotive sector. In 2022, sales of new passenger cars in Russia decreased by an average of 58.7%. This is due to the adoption by the European Commission of a new package of sanctions, which introduced a ban on the export to Russia of any cars with an engine capacity of more than 1.9 liters, as well as electric vehicles and hybrids. China replaced departed car brands with its own, such as Chery and Haval, and the Geely brand improved its sales rate by 8.1%.

In addition to China, Russia's most important trade and economic partners are Belarus and Turkey, which supply our country with petroleum products (fuel, oil), vehicles, light industry products, electronics and food products.

The positive dynamics of the value of imported goods from closest trading partners confirms the effectiveness of the parallel import mechanism and its necessity in the context of sanctions to maintain saturation of the consumer market and meet the needs of manufacturers for raw materials, materials and components. Further expansion of parallel imports will make it possible to continue to supply the market with in-demand products, and will also make it possible to contain the rise in prices for various groups of goods.

Parallel import, which is an artificially created form of trade relations between countries and companies, built depending on the legislation of the importing country on legal or gray trade schemes, has both positive and negative aspects [2].

Positive aspects of parallel imports:

1. Cost savings. Parallel imports can provide access to goods at lower prices because they rely on the buying and selling of goods that were intended to be sold in another country. This can lead to lower product costs and increased affordability for consumers.
2. Expanding the selection of goods. Parallel imports make it possible to provide consumers with a greater choice of products and brands. Unique products or products that are not available in the local market can be imported from other countries and offered to consumers through parallel channels.
3. Reduce logistics delays. If goods or parallel imports are already in the destination country, they do not require a long time for delivery from abroad. This can reduce wait times for consumers and provide faster access to goods.

4. Stimulating competition. The availability of imported goods, which may be more affordable or of higher quality, forces local producers to improve their products and offer more competitive conditions to meet consumer needs and preferences.

Disadvantages of parallel imports:

1. Loss of control over distribution channels. Parallel imports can create problems for original manufacturers as they may lose control over the distribution channels for their goods. The emergence of independent parallel importers may lead to unwanted competition and make it difficult to establish and maintain necessary pricing and marketing strategies.
2. Certification and compliance with standards. Products originating from other countries may not meet local requirements and standards, which threatens consumer safety and requires additional testing and regulation.
3. Reduced profits for original manufacturers. Parallel imports may result in lower profits for original manufacturers. The availability of lower-priced products in the parallel market can reduce the potential profits expected by original producers in the local market, which can lead to job losses and negative business consequences.
4. Damage to the local economy: Parallel imports can cause harm to the local economy by reducing the demand for local products and services. This can have a negative impact on local producers and companies, especially if they are unable to compete with imported goods on price or quality.

Having analyzed both the advantages and disadvantages of parallel trade, we will highlight several factors that may pose a threat to the economic security of the country. First, parallel imports may infringe intellectual rights such as patents, trademarks and copyrights. Since parallel goods may be repackaged or relabeled, this creates problems for the importing country and violates the rights of the owners of the original goods, hence entailing legal risks. Secondly, parallel trade can stimulate unfair competition. Official importers and distributors who pay taxes, meet quality standards and pass all necessary checks may find themselves at a disadvantage to parallel shipments that circumvent these requirements. Also, parallel imports may pose a risk to consumer safety, as parallel products may not meet the quality and safety standards set by national authorities [8]. These risks are relevant in a situation where parallel imports exist in the country in parallel with official supplies directly from the manufacturer. Under the conditions of economic sanctions, the emphasis is shifting due to the cessation of supplies from manufacturers and official distributors. For an importing enterprise, the risks associated with lengthening logistics chains come to the fore: increased transport costs, increased delivery time, the need to find additional intermediaries, forced to maintain a larger volume of inventory in warehouses, and reduced possibilities for

using a flexible pricing policy. Due to the severance of ties with trusted counterparties and the need to find new partners, the risks of encountering unscrupulous market participants are growing.

For the country as a whole, a serious risk remains the restriction of parallel import channels on the part of the producing and selling countries, both due to political pressure on business from governments and as a result of secondary sanctions.

Thus, parallel imports can pose a threat to economic security, violate intellectual property rights, harm market stability, and potentially create risks of increasing pressure on partner countries and closing distribution channels. Russia can counter these threats with a balanced approach to state regulation of parallel imports, expanding the use of various supply and transportation channels and, if necessary, adding new items to the list of goods. These measures can help minimize negative impacts while maintaining product availability and competition in the market. Unfortunately, there are currently no recipes for completely neutralizing potential threats in relation to parallel imports. Sanctions policy requires constant adaptation of the domestic market and the mobilization of all existing economic and legal mechanisms to quickly respond to growing pressure. The solution to the issue of reducing the risks of parallel imports in the context of continued and strengthened sanctions lies in the area of import substitution. Potential prospects for parallel imports include developing the local market through a competitive environment, as well as increasing the availability of a variety of goods to consumers at more attractive prices. From a broader perspective, parallel imports can stimulate the development of trade and logistics infrastructure.

References

1. *Dolgikh, M. G. On the renewal of the exhausted right to a trademark and the legality of parallel imports / M. G. Dolgikh, E. G. Afanasyeva // Entrepreneurial Law. – 2010. – No. 1. – P. 40-44. – EDN LBDTIR. – URL: <https://elibrary.ru/item.asp?id=13121791>*
2. *Kosheleva O.E., Vorobyova M.D. Parallel imports as an anti-sanction measure // Bulletin of Innovative Technologies. – 2023. – V. 7. – No. 1(25). – pp. 39-44. – EDN JBSRZZ. – URL: <https://cyberleninka.ru/article/n/parallelnyy-import-v-kachestve-antisanktsionnoy-mery/viewer> (access date 01.11.2023)*
3. *Official website of the Federal Customs Service (FCS of Russia) Official Internet portal of legal information. URL: <https://customs.gov.ru/folder/515> (access date 10/20/2023)*
4. *Pirogova, V.V. Exhaustion of exclusive rights and parallel imports / V.V. Pirogov. – M.: Statute, 2008. – 29 p. – URL: https://science.sci.house/avtorskoe-pravo_1065/territorialnyiy-harakter-isklyuchitelnyih-prav-250540.html*

5. Decree of the Government of the Russian Federation dated March 29, 2022 No. 506 “On goods (groups of goods) in respect of which certain provisions of the Civil Code of the Russian Federation on the protection of exclusive rights to the results of intellectual activity expressed in such goods and means of individualization cannot be applied, with which such goods are labeled” // Official Internet portal of legal information. URL: base.garant.ru/403783328/ (date of access: 10/20/2023).

6. Order of the Ministry of Industry and Trade of the Russian Federation dated July 21, 2023 No. 2701 “On approval of the list of goods (groups of goods) to which the provisions of Articles 1252, 1254, paragraph 5 of Article 1286.1, Articles 1301, 1311, 1406.1, subparagraph 1 do not apply Article 1446, Articles 1472, 1515 and 1537 of the Civil Code of the Russian Federation, subject to the introduction of these goods (groups of goods) into circulation outside the territory of the Russian Federation by copyright holders (patent holders), as well as with their consent” Official Internet portal of legal information. URL: <https://base.garant.ru/407484679/?ysclid=lopepgzsqh571832134> (date of access: 10/25/2023)

7. Ulichkina L. Sh. Effectiveness of the parallel import regime under economic sanctions. *Humanitarian sciences*. 2023;13(3):152-158. doi: 10.26794/2226-7867-2023-13-3-152-158. – URL: <https://cyberleninka.ru/article/n/effektivnost-deystviya-rezhima-parallelnogo-importa-v-usloviyah-ekonomicheskikh-sanktsiy/viewer> (date of access: 01.11.2023)

8. Chernyshov G.P. The principle of exhaustion of the exclusive right to a trademark in legislation and judicial practice / G.P. Chernyshov // *Bulletin of the Supreme Arbitration Court of the Russian Federation*. – 2011. – No. 7. – P. 16–26. – URL: https://zakon.ru/LibraryHome/DownloadPub?_id=860

俄羅斯進口替代的問題與前景

PROBLEMS AND PROSPECTS OF IMPORT SUBSTITUTION IN RUSSIA

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抽象的。當今世界經濟發生的全球變化影響著每個國家。俄羅斯面臨嚴重的製裁壓力，需要國家經濟在廣泛發展進口替代機制方面迅速轉型。該書探討了現代條件下俄羅斯企業的主要問題。以農業為例，給出了進口替代的正面經驗。以最依賴進口的產業為例，介紹了進口替代的主要工具和前景：機械工程、資訊科技、製藥。

關鍵字：進口替代、經濟制裁、農業、機械工程、IT 產業、製藥。

Abstract. *the global changes taking place today in the world economy affect every country. Russia is faced with serious sanctions pressure, which requires a rapid transformation of the national economy in terms of the widespread development of the import substitution mechanism. The work examines the main problems of Russian enterprises in modern conditions. Positive experience of import substitution is given using the example of agriculture. The main tools and prospects for import substitution are presented using the example of the most import-dependent industries: mechanical engineering, information technology, pharmaceuticals.*

Keywords: *import substitution, economic sanctions, agriculture, mechanical engineering, IT sector, pharmaceuticals.*

The world is currently undergoing profound changes that are affecting every country. Sanctions imposed against Russia have forced many foreign companies to leave the market or temporarily cease their activities. The departure of companies from the Russian market means not only the loss of goods and services, but also the loss of jobs for thousands of people. Enterprises face the following problems:

1. a sharp increase in purchase prices;
2. reduction in demand;
3. problems with the supply of goods;

4. blocking the platforms on which the business operates;
5. increase in loan burden.

In order to prevent the decline of the economy in the face of reduced imports, it is necessary to replace foreign products with national ones, especially in those industries in which imports have traditionally played a large role. The process in the country's economy, through which the production of necessary goods and services is formed in the domestic market at the expense of national capacities, is called import substitution. Domestic companies, thanks to their raw material base, form the production of goods, displacing foreign manufacturers or offsetting the increasing demand for products that were previously supplied from abroad.

But import substitution, like any economic phenomenon, has advantages and disadvantages. We can include among the advantages: a reduction in import dependence, the opening of new enterprises, the development of innovative technologies, the creation of additional jobs, as well as the prospect of growth in the export of domestic goods. The disadvantages are: increased government influence on production in general, high costs of stimulating industries, rising prices for goods and decreased competitiveness.

For successful import substitution, it is necessary to stimulate manufacturers, create effective government support systems, improve product quality, and introduce innovative technologies. To achieve these goals, it is required:

1. To raise standards of resource and energy saving and environmental safety in order to increase the competitiveness of products;
2. To encourage innovation and technology development, creating a favorable environment for domestic manufacturers;
3. To use support measures, including financial ones, for enterprises operating in the most vulnerable industries that have a large share of imported components.

The Russian government proposes to abandon specialization in those areas in which Russia has an advantage in production over other countries. It is important to replace imports in those industries in which it is possible to revive their own competence, or it is necessary to develop production from scratch. The diagram shows the sectors of the Russian economy that were most vulnerable to sanctions pressure due to their high dependence on imports (Fig. 1) [1].

The IT sector, pharmaceuticals and mechanical engineering are most dependent on imports of raw materials and components, with the share of imports of individual goods reaching 90%.

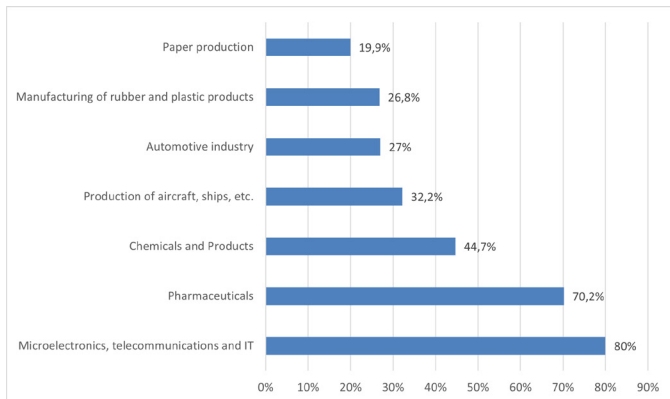


Figure 1. The most import-dependent industries in Russia

* source: own development based on data from the report of the Center for Macroeconomic Analysis and Short-Term Forecast (CMASF)

Import substitution is one of the directions of the country's transition to a new model of economic development, which can increase its economic security. Now Russia, for the purpose of internal and external protection, is interested in developing its own production facilities that will be able to offer consumers competitive goods and services. Russian import substitution policy includes both protectionist measures and measures that stimulate national production [2. P. 74]. Main instruments of import substitution:

1. Restrictions on export tariffs and the use of various barriers;
2. Indirect participation of government bodies in industrial development, support for small and medium-sized enterprises, issuance of subsidies to local manufacturers;
3. Stimulating direct investment in international enterprises;
4. Development of new technological productions.

The effectiveness of the above methods depends on the specific industry in which import substitution is carried out.

Agriculture is an industry in which the active implementation of these tools began earlier than in others, and to date significant results have been achieved. Import substitution in agriculture proceeded in two main directions: reducing imports of agricultural goods and ensuring independence from imported production technologies. From 2010 to 2021, work was carried out on certain goals, namely:

1. Increasing the use of mineral fertilizers and protective equipment of domestic production;
2. Increasing the share of using high reproduction seeds;

3. Allocation of subsidies and benefits to support agricultural production;
4. Technical modernization and use of modern technologies for growing crops.

These methods increased the volume of agricultural production and also gave impetus to the development of effective mechanisms for improving the quality of the product. An example is the development, creation and implementation of domestic achievements in the field of breeding through the subprograms of the Federal Scientific and Technical Program for the Development of Agriculture for 2017–2025. One of them is potato selection using ultrasound. Original propagation schemes for new promising domestic potato varieties have been developed using biotechnology and photonics methods.

Today, the issue of import substitution in mechanical engineering has become acute. If earlier access to spare parts, materials and technologies was not difficult, now many foreign companies and firms have established a ban on the sale of their products to Russia. The lack of imported components makes production in our country much more difficult. Basically, active government support for manufacturers is used as a tool for import substitution in mechanical engineering. But at the moment it is not enough to restore the full functioning of enterprises. To increase the efficiency of import substitution in the industry, the following measures can be additionally proposed:

1. Preferential lending to small and medium-sized enterprises through industrial development institutions, tax relief;
2. Creation of a unified information network system that will quickly respond to production problems with supplies, as well as coordinate the building of new production connections;
3. Creation of new production sites, search for optimal ways to deliver resources and raw materials.

The IT sector today is not only the foundation of the modern digital economy, but also the industry most affected by import restrictions. In this industry, to replace imported platforms, a register of domestic software has been created, to which government agencies, education, medicine, etc. are transferring. Certification of products from industries related to the provision of components of the information space is becoming important. In recent years, one of the innovative trends in the IT field is cloud data processing technology. But in conditions of economic and political pressure on the Russian Federation, it is necessary to replace it with regional data processing centers, on the basis of which it will be possible to deploy services and information systems. All these measures will help reduce dependence on the use of foreign products and increase the telecommunications structure of the technological space. Let us present the measures that make the transition to domestic software possible (Fig. 2).

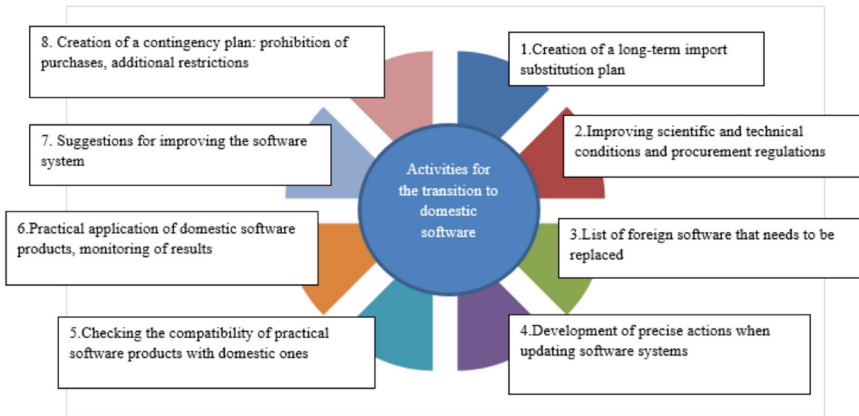


Figure 2. Scheme of transition to domestic software

Another industry that deserves special attention when prioritizing import substitution is pharmaceuticals. The development of domestic production in this area is hampered by the lack of modern medical equipment and equipment for pharmaceutical production. The government is already taking measures: the Federal Agency for Medical Biology of the Russian Federation, together with the state nuclear energy corporation Rosatom and the state corporation for promoting the development, production and export of high-tech industrial products Rostec, have created a program for import substitution of medical products. With the support of the state, a significant technological foundation was created, including new technological competencies in the field of biotechnology, including many complex biotechnological products [3. With. 205]. But at the moment, the main problem is the lack of equipment to ensure the full production cycle of drugs and raw materials: simple reagents, complex intermediates.

For 2023 and subsequent years, the country plans to:

1. Stimulating local production of medical equipment with preferential financing;
2. Increasing in public procurement for the government's own needs and the needs of laboratories to replenish national reserves;
3. Simplification and improvement of the system regulating the distribution of medical devices;
4. Ensuring an increase in the production of a full cycle of new effective drugs.

The study of the processes occurring in the main sectors of the Russian economy under sanctions pressure allows us to conclude that with the support of the state, it is possible to create an effective import substitution mechanism. It will

require comprehensive measures to develop the scientific and technical bases of industries: investing in innovative projects and developments, modernization, and restoration of domestic production.

References

1. *Official website of the Center for Macroeconomic Analysis and Short-Term Forecasting (CMASF) [Electronic resource], - Access mode URL: <http://www.forecast.ru/default.aspx> (access date 11/07/2023)*
2. *Popova I.N., Sergeeva T.L. Import substitution in modern Russia: problems and prospects // BENEFCIUM. – 2022. – No. 2 (43). – P.73-84.*
3. *Abdikeyev N.M. Implementation of plans for import substitution in high-tech sectors of domestic industry in the conditions of external sanctions // Scientific works of the VEO of Russia / 235 volume. — 2022. — p. 203-211.*

通貨膨脹—原因、後果、監管

INFLATION – CAUSES, CONSEQUENCES, REGULATION

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註解。 著作給出了通貨膨脹的概念，從供給面、需求面、外部市場和消費者預期等方面識別了促通貨膨脹的因素。 通貨膨脹的正面和負面後果被命名。 反通貨膨脹是從凱因斯主義和新古典主義方法的角度來考慮的。 對2015–2022年俄羅斯、美國和中國的通膨動態進行了分析。 結論是，儘管通膨目標制取得了顯著的正面成果，但傳統的貨幣政策方法不足以管理通膨。

關鍵字：通貨膨脹、通貨膨脹原因、通貨膨脹預期、通貨膨脹後果、反通貨膨脹監管、通貨膨脹目標制。

Annotation. *The work gives the concept of inflation, identifies pro-inflationary factors from the supply and demand side, the external market and consumer expectations. The positive and negative consequences of inflation are named. Anti-inflationary regulation is considered from the point of view of Keynesian and neoclassical approaches. An analysis of the dynamics of inflation in Russia, the USA and China for 2015-2022 was carried out. It is concluded that traditional methods of monetary policy are insufficient to manage inflation, despite the predominantly positive results of the inflation targeting regime.*

Keywords: *Inflation, causes of inflation, inflation expectations, consequences of inflation, anti-inflation regulation, inflation targeting.*

The relevance of the study of inflation processes is due to the fact that, on the one hand, in the economic literature there is no single and unambiguous definition of inflation, on the other hand, it is generally accepted that inflation is one of the most acute problems of economic development in most countries of the world and has a huge impact on the global economy. Studying the causes of such a complex socio-economic phenomenon as inflation, its impact on economic processes, makes it possible to better understand the role of the state in regulating inflation and the necessary anti-inflationary policy measures.

Inflation is a sustained increase in the general level of prices for goods and services in the economy. High inflation means a decrease in real incomes of all economic entities. This negatively affects aggregate demand, economic growth, and the standard of living of the population. Depreciation of income reduces opportunities and undermines incentives to save, and this in turn prevents the formation of a stable financial basis for investment [1].

The causes of inflation lie on several levels. On the one hand, inflation can be caused by factors on the demand side. This occurs when consumer demand is higher than the ability of manufacturers to produce goods. In this case there are pro-inflationary factors on the demand side. Cheap loans and wage growth outpacing labor productivity growth may serve as prerequisites for increased consumer demand. Then they talk about the influence of “monetary factors of inflation” - an excessive amount of money in circulation, putting pressure on prices.

Factors on the supply side cause inflation if an imbalance in the market occurs due to the fault of producers, that is, when the volume of supply is insufficient to satisfy demand. Such a situation may arise, for example, due to economic sanctions, natural disasters or a monopoly market.

Inflation can also be triggered by an increase in production and sales costs per unit of output as a result of rising prices for raw materials, materials, components, increased costs in the form of wages, taxes, interest on loans and other expenses. Rising costs could cause output to fall, adding to pro-inflationary pressures due to tight supply.

In addition to factors on the supply and demand side, pro-inflationary factors include influences from external markets, which generate the so-called “imported inflation”. The external impact on domestic prices may be associated with both an increase in prices for imported products (both final and raw materials) as a result of rising world prices, and with a depreciation of the national currency.

Another factor of inflation is inflation expectations - assumptions of people and firms about what inflation will be after a certain period of time. Inflation expectations influence the behavior of producers, forcing them to adjust prices and output, and consumers, increasing or decreasing incentives to save.

Inflation is a complex and multifaceted socio-economic phenomenon that is inherent in the economy. Its manifestations are diverse, and its consequences affect many areas of economic life.

Let us highlight the negative consequences of inflation, which include:

- Decline in motivation to work and income of the population. With high inflation, the purchasing power of money falls, which is why many people lose motivation to work and increase their earnings.
- Devaluation. Devaluation is a decrease in the exchange rate of the national currency in relation to the currencies of other countries. With high

inflation, the exchange rate of the national currency falls, as a result of which the demand for foreign currency increases, this ultimately disrupts the normal functioning of the national money market and the country's economy as a whole.

- Export of capital abroad. Many enterprises and the population of the country invest money in foreign banks, as this brings them benefits. There is also a huge crisis of public confidence in national banks.

But inflation also has positive consequences, including:

- The depreciation of the purchasing power of money is a good thing for borrowers. When borrowers take out a bank loan at a fixed interest rate, in the event of high inflation rates, they can pay the lender with cheaper money, despite rising prices.
- Moderate and predictable inflation enables national enterprises to develop and stimulates the expansion of supply (in response to rising prices) and demand (consumption grows under the influence of inflation expectations). Investments and wages are growing, business activity is increasing, export opportunities are growing, production and employment are expanding.

Based on the above, we can conclude that inflation can benefit a certain number of individuals (for example, borrowers). For everyone else, the effect of inflation will depend on its rate and on accompanying processes in the economy. Thus, the majority of the population (employees, people receiving transfer payments from the state) and firms experience the negative consequences of inflation, because income growth lags behind price growth.

The consequences of expected and unexpected inflation differ in the depth of the effect.

The consequences of expected inflation are a decrease in real incomes of the population and a decrease in the purchasing power of money.

The consequences of unexpected inflation are the transfer of wealth from one person or firm to another (from workers to firms, from lenders to borrowers, from individuals with fixed incomes to individuals with unfixed incomes, etc.). The depreciation of money forces people to give up saving, the volume of savings decreases, and the basis for investment disappears. In conditions of unpredictable inflation, uncertainty increases, which makes it difficult for economic actors to make decisions. Thus, unexpected inflation negatively affects savings, consumption, production, and investment - all key components of economic development.

To ensure sustainable economic development, it is necessary that inflation be, firstly, predictable, and secondly, low. For most countries in the world, the optimal option is when inflation is present, but at a moderate pace (up to 10% per year) [2, p. 24]. Maintaining price stability is the most important task of state economic policy.

Price stability means maintaining low growth rates in consumer prices, which economic actors neglect when making decisions. In conditions of low and predictable inflation, the population is not afraid to save in national currency for long periods, since they are confident that inflation will not depreciate their deposits. Long-term savings, in turn, are a source of financing investments. In conditions of price stability, banks are ready to provide resources to borrowers for long periods at relatively low rates. Thus, price stability creates conditions for increased investment and, ultimately, for sustainable economic development.

Anti-inflationary policy is government measures aimed at controlling the level of inflation. By implementing anti-inflationary policy, the state maintains price stability. There are two known ways to eliminate inflation: radical (achieving a low inflation rate) and adaptive (adjusting to inflation).

Economic theory examines anti-inflationary policy from the point of view of two approaches: Keynesian and neoclassical.

The Keynesian approach is to change government spending and taxes to influence effective demand. When there is excess demand, the government decides to limit its spending and also increases taxes. As a result of such actions, demand is reduced, which leads to a decrease in inflation rates. But these actions also limit output growth, leading to higher unemployment.

The neoclassical approach assumes monetary regulation, which flexibly influences the economic situation. With this approach, the country's Central Bank takes deflationary measures by limiting the amount of money in circulation.

In recent decades, inflation targeting has developed in the world, and more and more countries are moving towards it in their monetary policies. Inflation targeting is a monetary policy regime whose main goal is price stability.

Let us consider the dynamics of inflation using the example of three countries: Russia, the USA and China in 2015-2022. (Fig. 1).

The Bank of Russia has been pursuing monetary policy within the framework of the inflation targeting regime since 2015. Moving to inflation targeting, the Bank of Russia set the main goal of its monetary policy to reduce annual inflation to 4% in 2017 and maintain it at this level in the future. There were periods of disinflation, namely 2015-2016, when the Russian economy struggled with the consequences of the external problems of 2014 and gradually adapted to the new monetary policy regime. Thanks to the ongoing targeting policy, by 2017 inflation approached the Bank of Russia target. From 2017 to 2020, annual inflation remained largely flat at 4%, remaining at historically low levels. The growth began in 2021 and intensified in 2022 due to the negative impact of political processes. The Bank of Russia predicts that inflation will return to the target in 2024.

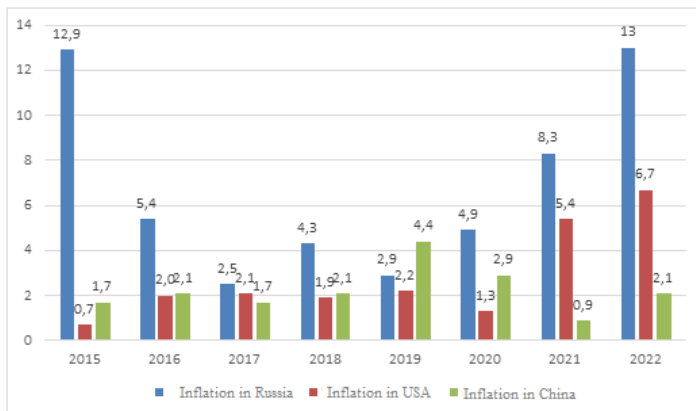


Figure 1. Inflation dynamics in the Russian Federation, the USA and China in 2015-2022.

* Source: own development based on site data <https://www.cbr.ru/>; <https://fin-plus.ru/>; <http://global-finances.ru/inflyacziya-v-ssha-po-godam/>. Data for 2022 is as of 06/01/2022

The US Federal Reserve (FRS) officially introduced an inflation target of 2% in 2012. The base rate during this period was close to zero. At the same time, economists and investors generally expected that over time, as the economic recovery became more sustainable, US rates would return to higher levels - around 4%. In the USA in 2015-2020 inflation remained low, not exceeding 2.5%. Growth began in 2021. In 2022, the economy of the USA, like that of Russia, is subject to unprecedented inflationary pressure due to political and macroeconomic factors. To minimize the negative impact of this pressure, anti-inflationary measures from the government are necessary.

The Chinese economy demonstrates the most stable inflation dynamics. The highest inflation rate was observed in 2019 (4.4%). Anti-inflationary policy in China is conducted by the central bank in conjunction with the government. The main goal of monetary policy is not to target inflation itself, but to “ensure the stability of the national currency and thereby contribute to economic growth.” If the trajectory of the economy begins to deviate from the target, the authorities of the PRC implement a softening of monetary policy, even in the presence of inflation risks.

To summarize, in the 21st century, inflation targeting is becoming an increasingly common practice and the most widely used monetary policy regime. The positive effect of using inflation targeting makes it possible to smooth out the con-

sequences of economic crises. However, the preconditions for inflation often develop outside of economic processes, as evidenced by the events of 2022. Therefore, traditional methods of monetary policy are not enough to maintain inflation close to the target level. Central banks and governments need new solutions to curb inflation and reduce its negative consequences.

References

1. *Official website of the Bank of Russia [Electronic resource], - Access mode URL: <https://www.cbr.ru/dkp/> (access date 10/29/2022)*
2. *Balashova M.A., Gulko S.N. Comparative characteristics of factors influencing inflation in Russia and China // Russian-Chinese studies. – 2022. – T.6, No. 1. – P. 22-31.*

俄羅斯聯邦國內旅遊業發展前景

**PROSPECTS FOR DOMESTIC TOURISM DEVELOPMENT IN THE
RUSSIAN FEDERATION**

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註解。 該著作涵蓋了旅遊業作為經濟活動、旅遊產品和旅遊流的概念。 旅遊業對該國國內生產總值的貢獻進行了評估。 對 2016 年至 2021 年俄羅斯聯邦入境、出境和國內遊客流的動態進行了分析。 考慮了冠狀病毒大流行的後果以及第一波和第二波制裁對旅遊業的影響。 確定了有組織的旅遊領域的需求區域。 概述了俄羅斯國內旅遊發展的優先事項和未來方向。

關鍵字: 旅遊; 旅遊產品; 旅遊流量; 有組織和無組織的旅遊流; 入境、出境和境內遊客流。

Annotation. *The work covers the concepts of tourism as an economic activity, tourist product, and tourist flow. The contribution of tourism to the country's GDP has been assessed. An analysis of the dynamics of inbound, outbound, and domestic tourist flows in the Russian Federation for 2016-2021 was conducted. The impact of the consequences of the coronavirus pandemic and the sanctions of the first and second waves on the tourism industry was considered. In-demand regions in the organized tourism segment are identified. Priorities and prospective directions for the development of domestic tourism in Russia are outlined.*

Keywords: *tourism; tourism product; tourist flow; organized and unorganized tourist flow; inbound, outbound and internal tourist flow.*

The world economy in the first twenty years of the 21st century was characterized by a high share and accelerated growth rate of the service sector. In turn, one of the largest industries in the service sector was the tourism industry. It is no coincidence that tourism attracts the attention of specialists in various fields of science and practice - economics, marketing, management, culture: tourism activities combine travel, active recreation, sightseeing, and sometimes elements of sports,

pilgrimage and much more. At the same time, unlike other industries, tourism does not lead to the depletion of natural resources, and also contributes to the preservation of national crafts and the culture of local peoples, stimulates production in other sectors of the service sector, transport and construction, and contributes to the creation of new jobs [1, p. 72].

Tourism as an economic activity is understood as a system of interaction between various industries that arises in the process of production, distribution, exchange and consumption of tourism products, goods and services.

A tourism product (product, service) is a set of tangible and intangible objects that are necessary and sufficient to meet the needs of tourists, meet the goals of tourism activities and are offered for sale to tourists.

The most important indicator of the state of the tourism industry is the tourist flow. The size and intensity of this flow show how attractive the tourism product of individual regions is, what the costs of tourists are during travel, the efficiency of the functioning of tourism enterprises and the level of tourism development in different regions of the country.

Tourist (tourist) flows are divided into two groups: organized and unorganized. The organized tourist flow is formed by those citizens who purchase tours (vouchers) from tourism enterprises. Unorganized tourist flows are created by citizens who form and implement them independently [2, p. 78].

The contribution of tourism activities to Russia's GDP in 2021 is estimated at almost 4%, and the number of workers employed in the tourism sector is 2.3 million people. These data allow us to conclude that the tourism sector plays an important role in the economy of our country, although it does not reach the level of the world economy as a whole (the share of tourism in global GDP was 9.3% in 2021).

Over the past ten years, the Russian tourism industry has periodically experienced serious shocks, which have had a significant impact on the industry's performance and structure. These include anti-Russian sanctions of the first and second waves (2014 and 2022) and the COVID-19 pandemic, which caused a decrease in global tourist flows to minimum values. Objective problems with foreign travel forced the population and government authorities to shift their focus to domestic tourism.

Despite the fact that the sanctions of 2014-2015 did not have a pronounced impact on the development of the tourism sector and did not lead to a significant decrease in outbound tourism flows, they created the prerequisites for the beginning of the implementation of the import substitution policy in the Russian tourism industry. To level out the consequences of Western restrictions and ensure consistency in the work of government bodies, scientific institutions, public organizations and business, in September 2015, a Committee for the Implemen-

tation of the Import Substitution Program was created under the Expert Council for Tourism Development under the Ministry of Culture, and in November 2015, a Coordination Council for development of domestic and inbound tourism in the Russian Federation. The result of the measures implemented by these authorities was an increase in the volume of paid tourism services provided to the population and an increase in investment in fixed capital of the tourism industry.

A new challenge for the tourism industry in Russia, as well as the whole world, is the 2020 coronavirus pandemic. It took a lot of government support to stabilize the situation. It was envisaged to reduce the amount of payments to the personal liability fund and exemption from contributions to the reserve fund for Russian tour operators. A zero VAT rate has been introduced for hotels. A tourist cashback program has been launched using the Mir card to pay for travel in Russia. In 2020, Russia adopted the national project “Tourism and Hospitality Industry,” which clearly outlines the course for the development of domestic tourism and defines measures to support this area. As a priority measure, Russian tourism launched grant support for domestic tour operators in the amount of 1.55 billion rubles, aimed at the development of camping and car camping, beach development, development of national tourist routes and construction of tourism infrastructure [3, p. 59].

In 2022, international sanctions have led to much more significant consequences for the tourism industry. Under the influence of restrictions on flights over Russian territory, introduced by the Federal Air Transport Agency in response to the actions of Western partners, the volume of incoming tourism has decreased. The cost of air tickets to many destinations has increased significantly, and routes between Russia and some countries have become longer. The southern directions of the country were left without air service, which created an increased demand for train tickets and contributed to an increase in the number of car tourists. As a result, the load on road infrastructure has increased. Serious difficulties have arisen in the payment sector: international payment systems have become unavailable, and the national payment card system “Mir” does not meet the needs of tourists to conduct transactions abroad.

With the introduction of sanctions, the need to develop tourism within the country as soon as possible has become even more obvious.

Figure 1 shows the dynamics of tourist flows in the Russian Federation in 2016-2021 [4]. The maximum value of domestic tourist flow was recorded in 2018: it amounted to 60 million people. At the same time, already in 2021, the value of domestic tourist flow approached the maximum indicators and amounted to 56 million people. The lowest domestic tourist flow (41 million people) was observed in 2020, which was a consequence of pandemic restrictions.

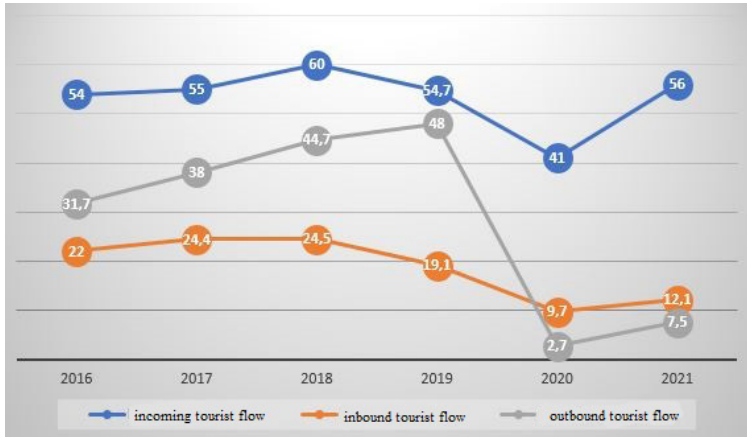


Figure 1. Dynamics of tourist flows in the Russian Federation in 2016-2021.

The incoming tourist flow is characterized by a downward trend. The highest value was also recorded in 2018 and amounted to 24.5 million people. The minimum value naturally occurred in 2020, it was equal to 9.7 million people.

The outbound tourist flow has uneven dynamics. The maximum value was observed in 2019 (48 million people), the minimum in 2020 (2.7 million people). In 2021, the outbound tourist flow increased slightly and amounted to 7.5 million people.

Thus, the most unproductive year in the tourism sector was 2020, characterized by minimal indicators for all three parameters, that is, domestic, inbound and outbound tourist flows. The reason for the decline was the coronavirus pandemic and the restrictions it caused, including the closure of borders, which reduced inbound and outbound tourism and negatively affected the domestic tourist flow. However, unlike cross-border tourism, domestic travel is showing a rapid recovery trend. And now we can confidently state a change in the structure of the Russian tourism industry towards a significant increase in the share of domestic tourism in the total volume of tourist flows.

The advantage of domestic tourism is that, unlike international tourism, it is less susceptible to external factors and is more sustainable. Domestic tourism has a positive effect on the economy of the country and its regions and contributes to the growth of new jobs [5, p. 628].

The development of domestic tourism brings benefits to the citizens of the country, allowing them to:

- get to know the culture, nature and history of your country better;
- get new jobs in travel agencies;

- do not waste time and money on obtaining visas and international passports;
- save on travel costs.

Speaking about the regional structure of domestic tourist flows in Russia, we note their uneven distribution throughout the country. The top 10 popular regions in the segment of organized tourism according to the Association of Tour Operators of Russia is as follows: Krasnodar Territory, Republic of Crimea, St. Petersburg, Vladimir Region, Stavropol Territory, Yaroslavl Region, Tyumen Region, Republic of Karelia, Republic of Tatarstan, Tver Region [6].

Among the problems hindering the development of tourism activities in the Russian Federation, we highlight the following: [5, 7]:

1. high prices for vacations, including hotel accommodation and passenger transport services, with the population's declining solvency;
2. underdeveloped tourism and transport infrastructure, low level of service;
3. seasonal shortage of rooms, air and train tickets during school and holiday holidays;
4. weak investor interest in the development of domestic tourist destinations;
5. lack of active promotion of the tourism product within the country;
6. flight restrictions in the south and central part of the Russian Federation introduced by the Federal Air Transport Agency in 2022.

Based on the analysis of the problems of the domestic tourism industry, we will outline the priorities and promising directions for the development of tourism in the regions of the country, which will help improve the economic efficiency of the Russian tourism industry:

1. Development of attractive competitive tourism products and improving the quality of tourism services that contribute to the growth of tourist flows, as well as stimulating repeated visits to the region.
2. Formation of a positive image of tourist areas in the regions.
3. Development of hotel infrastructure, improving the quality of the room stock.
4. Improving transport links, including increasing the accessibility of remote tourist sites and creating a convenient system of passenger transportation to regions attractive to tourists.
5. Providing subsidies for intraregional travel to stimulate tourism demand.
6. Use of regional traditions, folk holidays, development of event tourism.
7. Improving mechanisms for registering tourists in the regions.
8. Clear segmentation of tourists for whom the regional tourism product is intended, and its corresponding positioning.

References

1. Zyulyaev N. A., Nizova L. M., Sorokina E. N. *Domestic tourism as a type of economic activity at the mesoeconomic level // Bulletin of NGIEI. – 2018. – No. 6 (85). pp. 72-85.*
2. Oborin M. S., Saryan A. A. *Features of the dynamics of tourist flows in Russia // Service in Russia and abroad. – 2018. – No. 2 (80). pp. 75-89.*
3. Redkina E.M. *Import substitution in the Russian tourism industry: problems and prospects // Society: politics, economics, law. – 2022. – No. 10. pp. 57–60.*
4. *Official website of the Federal Tourism Agency. - [Electronic resource]. URL:https://tourism.gov.ru/(access date: 12/01/2022).*
5. Leonidova E. G. *Priorities and threats to the development of regional tourism // Regionology. – 2022. – T. 30, No. 3. P. 624–646.*
6. *ATOR named the 10 most popular regions of the Russian Federation among Russian tourists in 2021 // Interfax-tourism portal. - [Electronic resource]. URL:https://tourism.interfax.ru/ru/news/articles/84154/(access date: 12/01/2022).*
7. Bazarova E.V., Titova S.A., Kashkova S.D. *Prospects for the development of domestic tourism in Russia in modern conditions // Beneficiary. – 2022. – No. 118. P. 31-34.*

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數位盧布的經濟安全問題

PROBLEM OF ECONOMIC SECURITY OF THE DIGITAL RUBLE

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註解。 該著作探討了數位盧布的法律和經濟性質，區分了「數位盧布」、「數位貨幣」、「加密貨幣」、「國家貨幣」等概念。 數位盧布的資訊和經濟安全問題已被確定。

關鍵字：數位盧布、數位貨幣、加密貨幣、國家貨幣、數位盧布的資訊和經濟安全。

Annotation. *The work examines the legal and economic nature of the digital ruble, distinguishes between the concepts of “digital ruble”, “digital currency”, “crypto-currency”, “national currency”. The issues of digital ruble’s information and economic security are identified.*

Keywords: *Digital ruble, digital currency, crypto-currency, national currency, information and economic security of the digital ruble.*

The relevance of the study is related to the innovative nature of the digital ruble as a modern payment instrument and its high development potential. In the future, the digital ruble may outstrip cash and non-cash money in the structure of payments between economic entities. At the same time, being an innovative tool for payments and settlements, the digital ruble is exposed to risks in the field of information and economic security, which can create new threats to the development of the national economy.

Before moving on to security issues, it is necessary to determine the legal and economic nature of the digital ruble.

The legal basis for the introduction and circulation of the digital ruble is enshrined in the Federal Law of 07/24/2023 No. 339-FZ “On amendments to Articles 128 and 140 of Part One, Part Two and Articles 1128 and 1174 of Part Three of the Civil Code of the Russian Federation,” which entered into force on August 1, 2023 [9].

In the work of A.Y. Adzhieva and K.K. Tokarev gives the following definition: digital ruble is “a unique digital code (token) that is located in client digital wallets on a special digital platform” [4, p. 353]. This formulation reflects the technical aspects of the digital ruble, but does not answer questions about its relationship with such concepts as money, digital currency, crypto-currency, national currency.

To determine whether the digital ruble is a means of payment, it is possible to evaluate the performance of the digital ruble in performing the functions of money. I.V. Gryleva believes that at the initial stage of its existence, the digital ruble will not fully perform such functions of money as a means of payment (due to the lack of an offline mode for settlements using digital rubles) and a means of accumulation (due to the specifics of cryptographic standards: limitations on the validity period of electronic signature key certificates and the periodic replacement of cryptographic algorithms) [5, p. 115]. It should be noted that the Bank of Russia is working on technology for using digital rubles offline. This opportunity is declared as one of the advantages of the digital ruble over other forms of Russian national currency, especially for remote regions without the Internet. As for restrictions on the validity period of the digital ruble, according to the Bank of Russia, there will be no restrictions. The digital ruble will remain with its owner until he spends it. Thus, at least from the moment of the introduction of offline technology, the digital ruble can be considered a full-fledged monetary instrument.

The concept of digital currency is enshrined in clause 3 of Article 1 of the Federal Law of July 31, 2020 “On digital financial assets, digital currency and on amendments to certain legislative acts of the Russian Federation.” In accordance with this article of the law, digital currency is “a set of electronic data (digital code or designation) contained in an information system that is offered and (or) can be accepted as a means of payment that is not a monetary unit of the Russian Federation, a monetary unit of a foreign state and (or) an international monetary or unit of account, and (or) as an investment and in respect of which there is no person obligated to each owner of such electronic data, with the exception of the operator and (or) nodes of the information system, who are obliged only to ensure compliance with the release procedure this electronic data and the implementation of actions in relation to them to make (change) records in such an information system according to its rules.” Thus, the digital ruble cannot be classified as a digital currency (at least in the legislative interpretation) due to the fact that digital currencies cannot act as a monetary unit of the Russian Federation or another country and there is no person bearing obligations for such a currency. The digital ruble is accepted as a means of payment, which is the monetary unit of the Russian Federation (ruble), and obligations for the digital ruble are borne by its issuer - the Bank of Russia.

M.A. Abramova, N.N. Kunitsyn and E.I. Dyudikova also come to the conclusion that the digital ruble does not correspond to the category “digital currencies”

and explain this discrepancy not only by categorical differences, but also by “attempts to reject the unique advantages of innovation for users due to the possibility of their local implementation by existing traditional technological solutions, including coloring procedures and provision accessibility” [1, p. 13].

Thus, the definition enshrined in law makes it possible to clearly distinguish between the concepts of digital ruble and digital currency. According to the same definition, crypto-currencies are digital currencies. It follows from this that the digital ruble, which is not a digital currency, cannot also be classified as a crypto-currency. This distinction is important, since there is often an erroneous identification of crypto-currency and digital ruble.

The Bank of Russia gives the following definition: “a digital ruble is a digital form of the Russian national currency”, the third form of the ruble in addition to the cash and non-cash form of the national currency [7]. Thus, the digital ruble is a national currency, namely, one of its forms.

In various sources, the digital ruble is often called the digital currency of the Central Bank of the Russian Federation, which corresponds to the world practice of naming digital national monetary units digital currencies of central banks (DCCB). But such an interpretation runs counter to the concept of “digital currency” discussed above, enshrined in Russian legislation. The Bank of Russia resolves this contradiction by avoiding the use of the term DCCB and using instead the wording “digital form of the Russian national currency.”

The Civil Code of the Russian Federation classifies digital rubles as non-cash funds (Article 128 of the Civil Code), which contradicts the definition given by the Bank of Russia, which distinguishes between the non-cash and digital forms of the ruble.

To summarize the above, by digital ruble we mean a new digital form of the Russian national currency, issued by the Bank of Russia in the form of a digital code and existing in client digital wallets on the Bank of Russia platform.

Russia was one of the first to enter the active phase of the project to introduce a digital national currency. However, there are other countries that have advanced similar projects. Thus, the digital currency of the People’s Bank of China has undergone large-scale testing and the digital yuan is currently being gradually introduced into circulation [10]. The widespread use of digital forms of national currencies by different countries opens up prospects for reformatting international payments in accordance with the needs of the changing world economy.

The Central Bank of the Russian Federation intends to make the digital ruble one of the main forms of money, justifying this by the need to update the financial market in accordance with modern high requirements for speed, convenience and security of payments. “The Bank of Russia aims to ensure that the monetary circulation system meets the changing needs of citizens and businesses and contributes

to the introduction of innovations both in the financial market and in the economy as a whole” [3].

Any financial innovation before its introduction to the market must be carefully assessed from the point of view of economic and information security in order to avoid increasing risks for the national economy.

The main risk for any national currency, regardless of its form, is associated with changes in its exchange rate. The danger is posed not only by the depreciation of the national currency, but also by excessive strengthening, which negatively affects exporters. The digital ruble does not have a separate exchange rate and will be freely exchanged for cash and non-cash rubles in a one-to-one ratio, so the digital ruble is subject to the risk of exchange rate changes to the same extent as cash and non-cash rubles.

For each individual form of national currency, risks are associated with a possible decrease in its share in calculations. On the one hand, there is a risk that fear of total control of transactions with the digital ruble will undermine confidence in both the digital and non-cash ruble and will lead to a sharp increase in the share of cash turnover. On the other hand, in the case of high activity in the transfer of non-cash rubles to digital ones, there will be a risk of a reduction in lending and an increase in interest rates, because Credit transactions in digital rubles are not provided.

The digital nature of the new form of Russian currency makes it susceptible to information risks. Issues of information security of the digital ruble are considered in his work by A.N. Milyutin. According to him, from a purely technological point of view, to ensure information security, it seems advisable to develop a domestic platform for accounting for the digital ruble without the use of foreign software and computing systems.

As with cash, the owner will have direct access to digital money, in contrast to non-cash money, access to which is carried out through an intermediary - a bank [2, p. 7]. Direct access to funds, on the one hand, reduces risks, but at the same time, possible technical problems on the Central Bank platform will affect all digital rubles.

From the point of view of economic security, it is important that payments in digital rubles do not require traditional interbank infrastructure, that is, they are carried out without using the SWIFT system. This opens up prospects for the development of international payments under sanctions pressure.

The practical implementation and use of the digital ruble requires the creation of a separate institutional and regulatory environment, which requires comprehension not only from a technological, but also from a corporate, managerial and political point of view. The question of the feasibility of using state banks with legally closed reporting to directly carry out transactions in the form of a digital

ruble is being considered. Some amendments to general banking regulation, including prudential regulation, also seem inevitable [6, p. 233].

The Bank of Russia notes that the level of protection on the digital ruble platform is “unprecedentedly high.” To combat fraudsters, it is proposed to maintain additional levels of protection, such as confirmation and identification when transferring funds. However, the risks of fraud that now exist for citizens’ non-cash funds will also extend to their digital wallets. This is due to the fact that the main tool of fraudsters today has become psychological pressure on a person in order to steal his money - social engineering.

To summarize the above, we note that from the point of view of economic security, the digital ruble will not be inferior to cash and non-cash money, and in some aspects will become safer in comparison with them. Unlike cash, the digital ruble can be used for remote payment; compared to non-cash payments, it will be a more secure and safe method of payment. The main risks that may arise in connection with the introduction of the digital ruble are imbalances between the three forms of national currency in the payment system, a decrease in lending, and the vulnerability of a single platform to hacking. It should be noted that the Bank of Russia, assessing potential threats from the introduction of a digital ruble, is developing methods to neutralize them. The pilot project for the use of the digital ruble, currently being implemented in Russia, will allow us to test the impact of threats and take measures to strengthen the economic protection of the new financial instrument.

References

1. Abramova M.A., Kunitsyna N.N., Dyudikova E.I. *Prospects for the introduction of the digital ruble into the monetary circulation of Russia: attributes and principles of creating a trusted digital environment. Finance: theory and practice.* 2023;27(4):6-16. DOI: 10.26794/2587-5671-2023-27-4-6-16.URL access mode:https://www.elibrary.ru/download/elibrary_54354562_92386147.pdf (access date 11/10/2023)
2. Gabov A.V. *Digital ruble of the Central Bank as an object of civil rights // Current problems of Russian law.* 2021. T. 16. No. 4 (125). P. 64.URL access mode:https://www.elibrary.ru/download/elibrary_49391163_10686318.pdf (access date 11/11/2023)
3. *Central Bank report for 2020[Electronic resource],* - URL access mode:https://www.cbr.ru/analytics/d_ok/dig_ruble/ (date of access 05.10.2023)
4. *Natural and Humanities Research No. 44 (6), 2022.* URL access mode:https://www.elibrary.ru/download/elibrary_50283784_41993234.pdf (access date 11/11/2023)

5. *Economy and Business: Theory and Practice*, vol. 10-1 (92), 2022. URL access mode: https://www.elibrary.ru/download/elibrary_49798771_67827584.pdf (access date 11/11/2023)

6. Milyutin A.N. *On the tasks and principles of using the digital ruble* // *Russian Economic Bulletin*. 2023. Volume 6. No. 2. P. 227 – 234. URL access mode: https://www.elibrary.ru/download/elibrary_52694493_44136941.pdf (access date 11/10/2023)

7. *Official website of the Bank of Russia [Electronic resource]*, - Access mode URL: <https://www.cbr.ru/dkp/> (date of access 05.10.2023)

8. *Official website of RBC [Electronic resource]*, - Access mode URL: <https://www.rbc.ru/> (date of access 05.10.2023)

9. *Official publication of legal acts [Electronic resource]*, - URL access mode: <http://publication.pravo.gov.ru/document/0001202307240009?index=1> (date of access 05.10.2023)

10. *Russian Journal of Economics and Law*. 2022. Vol. 16, No. 1 / *Russian Journal of Economics and Law*, 2022, Vol. 16, No. 1 *Crypto-World and digital finance*. URL access mode: https://www.elibrary.ru/download/elibrary_48111339_76622140.pdf (access date 11/10/2023)

職業所得稅在馬加丹地區預算制定中的作用

THE ROLE OF THE PROFESSIONAL INCOME TAX IN THE FORMATION OF THE BUDGET OF THE MAGADAN REGION

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抽象的。目前，包括俄羅斯在內的許多國家都積極利用稅收優惠政策對個人課稅。其中之一是職業所得稅。然而，正如文章所示，這種稅收激勵工具也有其缺點。首先，傷殘領取勞動撫卹金、臨時傷殘補助金、生育補助金。其次，被解僱的員工無法利用失業保護機制。工具的正面：退出影子經濟。以馬加丹地區為例，估算了稅收對預算形成的貢獻

關鍵字：職業所得稅、自營職業、個人所得稅、預算。

Abstract. *Currently, many countries, including Russia, actively use tax incentives for the taxation of individuals. One of them is the tax on professional income. However, as shown in the article, this tax incentive tool has its drawbacks. Firstly, the disability to receive a labor pension, temporary disability benefits, maternity benefits. Secondly, it is not possible to use unemployment protection mechanisms for dismissed employees. The positive side of the tool: exit from the shadow economy. On the example of the Magadan region, the contribution of the tax in the formation of the budget is estimated*

Keywords: *professional income tax, self-employment, personal income tax, budget.*

Taxes play a vital role in all economic systems, being the main source of revenue to the state budget and a tool for redistributing national income. At the expense of tax revenues from the budget, the state performs the functions assigned to it: financing government expenditures, ensuring social and political stability, and state regulation of the economy. In their economic essence, taxes represent a direct

withdrawal of part of the gross product produced in the country and its transfer to state income for the purpose of subsequent use for the needs of society. Payment of tax is mandatory under national law and is made in the form of a mandatory contribution. The role of taxes for the state is to maintain conditions for the development of the country's economy and social sphere, increase productivity and stimulate economic growth.

All taxes are divided into direct (levied directly on the taxpayer's income) and indirect (included in the price of the product). Direct taxation in countries with developed economies is prevalent, and the share of direct taxes in total budget revenues is growing annually. It is believed that the more significant the share of direct taxes in the structure of the state budget, the more economically developed the country is.

Also, in most developed countries, taxes are divided according to budget levels, which make it possible to increase the efficiency of the budget system and contribute to the expansion of regional independence. The tax system of the Russian Federation is built on a territorial principle and consists of three levels: federal, regional and local. Taxes at each level are established by the Tax Code of the Russian Federation and regulated by authorities at the corresponding level. For example, local taxes are regulated in addition to the Tax Code by regulations of the municipality. In this case, the distribution of taxes by budget level is carried out according to the deduction standards established by budget legislation (budget classification code) based on the principle of the impossibility of increasing the budget level. That is, federal taxes can be credited to all three levels of the budget, regional taxes - to the budget of a constituent entity of the Russian Federation and the municipal budget, local taxes - only to the municipal budget. For example, in 2022, income tax, charged at a rate of 20%, is credited to the federal (3%) and regional (17%) budgets.

One of the oldest and most significant taxes in the tax systems of different countries is income tax. Income tax in different countries has its own characteristics, determined by historical, political, economic and other factors. However, it is possible to identify common features that are characteristic of most developed countries. Thus, income tax in industrialized countries, as a rule, provides a significant part of financial revenues to the budget, has a progressive tax scale, which is combined with a wide system of tax benefits and deductions.

In Russia, income tax is called personal income tax (NDFL). It is a universal tool for implementing state tax policy and is one of the main tax sources for replenishing the consolidated budget of the state. In terms of revenue, personal income tax ranks third, second only to value added and profit taxes. In the tax system of the Russian Federation, personal income tax is the main direct tax, which is withdrawn in cash for the reporting year and is taken into account on the basis of the total earnings of individuals [6].

Personal income tax is a federal tax. It operates throughout the country, is levied by the state directly from the taxpayer's income, and is used to regulate the income of lower budgets in the form of interest payments according to standards approved in the prescribed manner for the next financial year. The objects of personal income tax taxation are wages, remuneration under civil contracts, income from the sale of property owned for less than 3 years, from the rental of property, income from sources outside the Russian Federation, income in the form of various types of winnings, and other income. Income received through inheritance and income from the sale of property that has been owned for at least three years, scholarships, pensions, benefits, income subject to taxation under special tax regimes and some other types of income are not subject to personal income tax. The Government of the Russian Federation and state authorities are taking real progressive steps to reform and increase the role of personal income tax in the tax system of the Russian Federation, and are improving the methodology for calculating, withholding and collecting taxes. The most important principles for establishing and collecting personal income tax in Russia are: legality, planning, equality, non-discrimination, etc. Tax rates are the same for all taxpayers. The main tax rate that applies to most types of income is 13%; for certain types of income other rates apply (9, 30 and 35%). Over the years of the existence of personal income tax, the rates of this tax have changed frequently. But these changes were more of a corrective nature. Before the adoption of the Tax Code of the Russian Federation, in terms of personal income tax, these rates were progressive. From 2001 to 2020, there was a single tax rate for a certain type of income. From 01/01/2021, our country returned to a progressive personal income tax system: in addition to the standard rate of 13%, an increased tax rate (15%) was introduced for incomes over 5 million rubles per year. For personal income tax, additionally received by the federal budget due to this measure, targeted use is provided. It is used to treat children with severe life-threatening and chronic diseases.

The critical importance of personal income tax for the formation of a consolidated state budget is due to a number of factors.

Firstly, personal income tax is a personal tax, i.e. a tax whose object is the income actually received by the payer, and not the estimated average income that could be received in given economic conditions, it affects the interests of more than 80 million citizens.

Secondly, personal income tax makes it possible to implement to the maximum extent the main tasks (in addition to fiscal) facing the taxation of individuals - to ensure the universality and uniformity of distribution of the tax burden.

Being a federal tax, personal income tax is nevertheless not credited to the federal budget, but is distributed between the regional (85%) and local budgets (15%). The share of personal income tax in the total budget revenue of a con-

stituent entity of the Russian Federation depends on the degree socio-economic development of this region.

All citizens of the country are required to pay personal income tax - both those who are employed and those engaged in entrepreneurial or other income-generating activities. This is precisely the main problem with personal income tax collection. Despite the obligation to pay tax on any earnings, in all societies, to one degree or another, there is a shadow sector of the economy, represented by citizens who do not declare their income and, accordingly, do not pay income tax on it. A significant proportion of such citizens are the so-called “self-employed”, that is, persons who independently provide paid services to other individuals or legal entities, do not have employees and do not declare income.

In 2018, the Federal Tax Service of the Russian Federation carried out monitoring, which confirmed that the number of citizens paying taxes on their income is less than the total number of employed people, estimated by Rosstat, by more than 20%. Based on this, it was concluded that this part of citizens belongs to the shadow sector of the economy and evades taxes and other obligatory payments. To solve the problem of withdrawing citizens’ income from the shadows in Russia, it was decided to conduct an experiment to establish a special tax regime for self-employed citizens “Professional Income Tax”.

The introduction of the new tax was intended to institutionalize self-employment, a widespread form of labor activity in the country, which, due to imperfect tax legislation, almost completely ended up in the shadow sector. Having received the opportunity to legalize, the self-employed not only become equal subjects of the economy, but are also given the obligation to pay tax to the budget on the income they receive. Thus, the professional income tax (PIT), in its economic essence, is an income tax for a certain category of citizens (self-employed). The NAP is designed to increase direct revenues to the budget, as well as to bring tax coverage of citizens receiving income in various forms closer to one hundred percent.

A special tax regime was introduced by Federal Law No. 422-FZ of November 27, 2018. In 2019, the experiment was carried out in four regions of the Russian Federation. In 2021-2022, the experiment was consistently extended to all regions of Russia. Citizens of Belarus, Kazakhstan, Armenia and Kyrgyzstan also had the opportunity to register as self-employed. The validity period of the experiment according to the law is 10 years [1]. The main part of the tax on professional income is subject to transfer to the budgets of the constituent entities of the Russian Federation (63%). The remaining 37% is credited to the budget of the Federal Compulsory Health Insurance Fund.

The transition to a special tax regime is carried out voluntarily. Taxpayers who do not switch to this tax regime remain obligated to pay taxes, taking into account

other tax systems that they apply in the ordinary course. Individuals and individual entrepreneurs who have switched to a special tax regime (self-employed) can pay tax on income from self-employment at a preferential rate of 4 or 6%. This allows you to legally run a business and earn income from part-time jobs without the risk of receiving a fine for illegal business activities. Individual entrepreneurs can also switch to this tax without losing the status of an individual entrepreneur, abandoning other special tax regimes or a patent.

To become self-employed, a citizen and the activity that generates income for him must meet certain conditions:

1. Absence of employer.
2. Total annual income is not more than 2.4 million rubles.
3. Lack of hired employees.

4. Activities that are not prohibited by law for the application of this special tax regime (prohibited ones include, for example, the extraction and sale of minerals, resale of goods, sale of excisable goods and goods subject to mandatory labeling, etc.).

Compared to the income tax rate for employed workers, which in the vast majority of cases is 13% of income, the tax rates for professional income are much lower - self-employed individuals pay 4% on income received from the sale of goods or services to individuals, and 6% if their clients are legal entities. In addition, self-employed individuals are exempt from contributions to state extrabudgetary funds (Federal Mandatory Medical Insurance Fund, Pension Fund of the Russian Federation, Social Insurance Fund of the Russian Federation, and from 2023 - the Unified State Extrabudgetary Social Fund of Russia).

The low tax rate is not the main advantage of the special tax regime for self-employed individuals. A citizen applying this regime is free to choose their activity (within the law), manage their own resources and time. By registering as self-employed, they legalize their entrepreneurial activity and obtain the legal right to engage in entrepreneurial or other activities, receive income from them, and freely dispose of the profit remaining after paying taxes. The downsides of the advantages of the special tax regime are the direct consequences that arise from it. The disadvantages of self-employment for those who apply this regime to their work activity are the inability to receive a labor pension, temporary disability benefits, pregnancy and childbirth benefits. A self-employed individual cannot use mechanisms for protection against unemployment for dismissed employees.

Systematization of risks in the process of institutionalization of self-employment

The process of self-employed people coming out of the shadows and the process of institutionalizing this exit are associated with certain risks. We understand these risks as the occurrence of unfavorable and undesirable consequences for

participants in economic and legal relations regulated by tax legislation for the self-employed population. The participants in these relations are the self-employed population and the state as an institution of power, the main representative of which in these relations are the tax authorities.

Assessing the risks of the self-employed population will undoubtedly be associated with the initial decision to come out of the shadows (*Fig. 1*).

In *rice*. I we classified risks from the point of view of the dual nature of economic and legal relations (including tax relations). In this regard, tax legislation that determines high tax rates (or a high share of income withdrawal) and at the same time applies strict penalties for “illegitimate” businesses will cause the curtailment of these types of micro-businesses. Therefore, a flexible balance between these risks is necessary. What do we mean here? If the risks of loss of property are minimal (i.e. the tax regime is quite attractive for the self-employed), then responsibility for actions “in the shadows” can be increased.

The main risks of the state associated with the introduction of legislation on self-employment: -- - the risk of absenteeism “from the shadows” and the risks of opportunistic behavior of potential and actual taxpayers from the sphere of self-employment;

-social risks as a manifestation of dissatisfaction among a significant part of the population over the burden on the budget;

-the risk of curtailing the business of the self-employed (due to “prohibitively” strict legislation) and the risk of increasing the burden on the budget (due to the growth of the state’s social obligations).

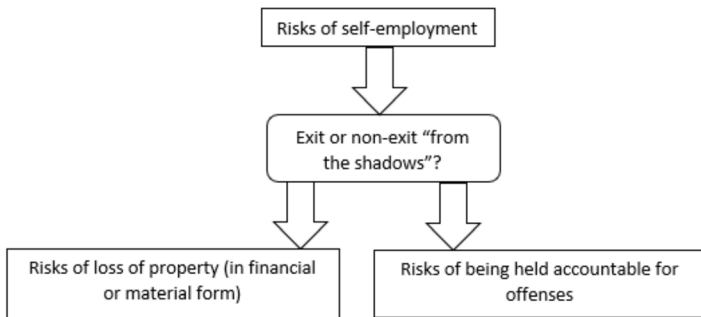


Figure 1. Risks of the self-employed and coming out of the shadows

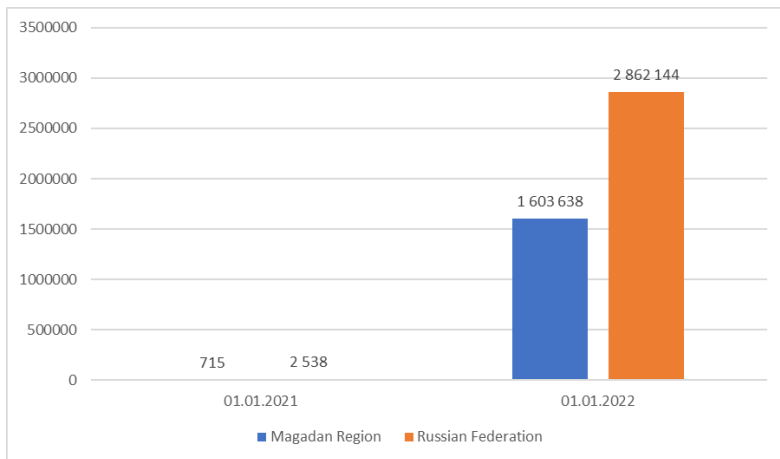
To assess the results of the experiment in Russia in general and in the Magadan region in particular, we will use data on the number of persons registered as self-employed in 2020 and 2021. INTable 1 (change into a figure) shows the dynamics of the number of people usingspecial regime in the form of a tax profes-

sional income [4]. In Russia, the increase in the number of self-employed people in 2021 amounted to 141%. In the Magadan region, the growth rate is even higher - 255%. The share of the economically active population of the region registered as self-employed was 3.0%, in the Russian Federation - 4.9%.

Table 1

Dynamics of the number of self-employed in 2020-2021 in the Russian Federation and the Magadan region

	As of 01/01/2021	As of 01/01/2022
Magadan region, person	715	2,538
Russian Federation, person	1 603 638	3 862 114



The dynamics of the number of self-employed people suggests that in terms of bringing citizens' independent income-generating activities out of the shadows, the experiment is showing success, but is still far from complete. If the estimates of the Federal Tax Service of the Russian Federation regarding citizens who do not declare income are correct, then it will be possible to speak of achieving the goal of the experiment when the share of registered self-employed approaches 20% of the economically active population.

Another important goal of introducing a special tax regime was to increase budget tax revenues. To assess the results of the experiment in this direction, we will analyze the execution of regional budgets in the Russian Federation and the Magadan region for three full years of the experiment: 2019-2021. (Tables 2 and 3) [2, 5].

Table 2
Revenues of the consolidated budgets of the constituent entities of the Russian Federation for 2019-2021.

The name of indicators	2019	2020	2021
Revenues, total, billion rubles	13,568.01	14,897.53	17,542.68
Personal income tax, billion rubles	3,955.22	4,251.92	4,791.91
Personal income tax, % of budget revenues	29.15%	28.54%	27.32%
Tax on professional income, billion rubles	1.14	3.31	21.32
Tax on professional income, % of budget income	0.01%	0.02%	0.12%

In absolute terms (in current prices), all three analyzed indicators (total budget revenues, personal income tax and personal income tax) are growing throughout the period under review. Personal income tax revenues to the consolidated budgets of the regions of the Russian Federation in the period under review were in the range of 27.32 - 29.15% of total budget revenues, which indicates the high role of the tax in the formation of the budgets of the constituent entities of the Federation (along with the income tax) and its importance to solve socio-economic problems of the regions.

Table 3
Revenues of the consolidated budget of the Magadan region for 2019-2021.

The name of indicators	2019	2020	2021
Income - total, million rubles	43,496.55	53,118.58	57,680.57
Personal income tax, million rubles	11,104.34	12,220.69	14,075.77
Personal income tax, % of budget revenues	25.53%	23.01%	24.40%
Tax on professional income, million rubles	-	0.15	7.40
Tax on professional income, % of budget income	-	0.0003%	0.01%

In the Magadan region, the share of personal income tax in the budget revenues is slightly lower (23.01-25.53%), but still high enough to consider the tax as a key source of regional budget formation.

Over the three years of the special tax regime for professional income, the consolidated budgets of the regions received a total of about 26 billion rubles. This amount is obviously not enough to speak of positive results in terms of filling the treasury. Since joining the experiment in 2020, the Magadan region has received a tax of 7.6 million rubles into its consolidated budget. Despite such low absolute values, the dynamics of personal income tax revenues and its share in budget revenues demonstrate high growth rates. For example, in 2021, personal income tax revenues to consolidated budgets of regions increased by 19 times compared to 2019, and in the Magadan region - by 49 times.

The results of the conducted research allow us to conclude that positive intermediate results have been achieved in the experiment on introducing a special tax regime for self-employed individuals. These results are reflected in a steadily increasing number of citizens registering as self-employed and in the growth of the share of personal income tax in the total amount of revenues to consolidated regional budgets. However, the insignificant absolute values of tax revenues from self-employed individuals indicate that personal income tax has not yet become a significant source of budget revenues. At the same time, the value of the special regime for the state's tax system lies in institutionalizing self-employment, maximizing tax coverage of income from economic entities, which creates a basis for the sustainability and stability of the tax system and will ultimately lead to a significant increase in state tax revenues. It should also be noted that self-employment belongs to the lower segment of small businesses, which suffered the most from pandemic restrictions in 2020-2021. This may have had a negative impact on the number of registered self-employed individuals, their income, and therefore, the taxable base.

Speaking about the role of the tax on professional income in the formation of a consolidated regional budget, we note that in just two years of the experiment in the Magadan region, the share of tax revenue on professional income increased from three ten thousandths to one hundredth of a percent of the amount of budget revenues. Given the still low absolute values, growth dynamics allow us to make optimistic forecasts regarding the increase in the share of NAPs in budget revenues. Together with other direct taxes on income (personal income tax and income tax), the NAP will form the most stable part of the regional budget revenues.

Prospects for a special tax regime "Tax on professional income" are associated with attracting an increasing number of citizens to use this form carrying out business activities. Further improvement legislative base, increased awareness of the population about the possibilities of a special tax regime will contribute to maintaining high growth rates in the number of tax subjects and tax revenues to the budget. The positive results of the experiment for the state's economy will include a reduction in its shadow sector, GDP growth, reducing unemployment.

References

1. *Federal Law No. 422-FZ of November 27, 2018 "On..."* (date of access: December 2, 2022)
2. *Consolidated budget of the Russian Federation:* <https://minfin.gov.ru/ru/performance/regions/operational/analysis> (access date 12/2/2022)

3. *Makarov E.I. Self-employment. Advantages and disadvantages identified during the experiment on introducing a tax on professional income in 2018-2020. [Electronic resource], 2021. - Access mode URL: <https://fnpr.ru/upload/iblock/90e/cw5sb4i0kymmo5ggwmpekjvslgal5zuf.pdf> (04/21/2022) (access date 12/2/2022)*
4. *Statistics of the self-employed at the beginning of 2022 by region [Electronic resource], 2022. - Access mode URL: <https://sznpd.ru/statistika-samozanyatosti-na-nachalo-2022/> (04/21/2022) (access date 12/2/2022)*
5. *Unified portal of the budget system of the Russian Federation: <http://budget.gov.ru/Budget/Revenues/Budget-execution-by-types-of-income?regionId=45000000>(access date 12/2/2022)*
6. *<https://cyberleninka.ru/article/n/analiticheskiy-obzor-praktiki-oblozheniya-dohodov-fizicheskikh-lits-v-zarubezhnyh-stranah/viewer>(access date 12/2/2022)*

提高生產利潤的方法

WAYS TO INCREASE THE PROFITABILITY OF PRODUCTION

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抽象的。本文提供了「獲利能力」概念的定義，並強調了獲利能力分析在評估生產財務狀況中的重要性。研究對象為韃靼斯坦共和國以古比雪夫命名的RBK股份公司。對公司2018-2021年的營收、淨利潤和獲利能力進行了分析。根據分析，找出問題並提出改善公司獲利能力的建議。

關鍵字：獲利能力、企業、淨利、收入、獲利能力的外部 and 內部因素。

Abstract. *The paper provides a definition of the concept of “profitability” and highlights the importance of profitability analysis in assessing the financial condition of production. The object of the research is the Joint-Stock Company RBK named after Kuibyshev in the Republic of Tatarstan. An analysis of the company’s revenue, net profit, and profitability for the years 2018-2021 was conducted. Based on the analysis, problems were identified and recommendations were made to improve the company’s profitability.*

Keywords: *Profitability, enterprise, net profit, revenue, external and internal factors of profitability.*

The main indicator of the economic efficiency of any production is the profitability indicator. The profitability of an enterprise is a prerequisite for its stable and long-term activities. According to the definition proposed Gonik G.G., Darensky R.N. Profitability should be understood as the profitability of an enterprise. It is calculated by comparing gross income or profit with costs or resources used, that is, it is an indicator that characterizes the amount of profit that each ruble of products sold brings to the organization [1, p. 128]. Profitability comprehensively reflects the use of material, labor and monetary resources. An enterprise that

makes a profit is considered profitable. In other words, profitability is the profit from every ruble invested in a business.

Using the example of the enterprise ZAO RBF named after Kuibyshev, let's look at how profitability is determined and, based on the results of the analysis of the indicator, we will give recommendations to management on increasing and maintaining profitability at a consistently high level.

The enterprise ZAO RBF named after Kuibyshev is located on the right bank of the Volga in the Republic of Tatarstan and occupies an area of 13 hectares. Since 2006, the plant has carried out repairs, modernization and service maintenance of more than 1,280 vessels for various purposes.

Vessel repairs are carried out under the supervision of inspectors of the Russian River Register and the Russian Maritime Register of Shipping. The plant has developed constructive working relationships with representatives of both classification societies, allowing them to solve technical problems that arise during repairs. The plant cooperates with organizations that have river vessels from 28 cities of Russia: Infotlot, Mosturflot, and large tanker companies V.F. Tanker, BashVolgotanker, Volgotrans and others.

The flexible pricing policy pursued by the plant and the highly qualified ship repair specialists allow us, together with ship-owners, to find the most acceptable solutions for them in terms of organizing repairs. CJSC RBF named after Kuibyshev operates on the Russian market 20 years, but the history of the enterprise is longer, it dates back to 1852. For more than 170 years, the company has been repairing and servicing vessels for various purposes.[2].

It was possible to maintain stable work for such a long time, including due to the attention of guiding the enterprise to the level of profitability. All factors that influence the profitability of an enterprise can be divided into external and internal.

External factors include:

- the amount of taxes;
- changes in demand (for example, seasonal);
- national or regional economic situation;
- political course in the country;
- sanctions of other states;
- competition;
- location of the company.

Internal factors are the characteristics of the company and the current processes occurring in it. These factors include:

- quality of services or goods;
- production volume, policy pricing;
- personnel qualifications and working conditions;
- effectiveness of marketing campaigns;

- company reputation;
- logistics organization;
- technical equipment;
- communication with partners and clients.

Flaws in the internal organization of an enterprise can become a serious reason for low business profitability even under favorable external conditions.

An objective assessment of profitability requires taking into account many indicators. We will analyze the dynamics of the main financial indicators of the activities of ZAO RBF named after. Kuibyshev for four years (2018-2021) based on data from the financial and tax reports of the enterprise and the balance sheet (Table 1).

Table 1
Financial performance indicators of CJSC RBF named after. Kuibyshev for 2018-2021.

Year	Financial indicators	Meaning	Growth/decline
2018	Revenue	RUB 197.4 million	-
	Net profit	RUB 23.8 million	-
	Assets	RUB 134.2 million	-
	Capital and reserves	RUB 110.2 million	-
	Profitability	0.12	-
2019	Revenue	RUB 141.8 million	-29%
	Net profit	RUB 3.1 million	-88%
	Assets	RUB 133.1 million	-1%
	Capital and reserves	RUB 113.2 million	3%
	Profitability	0.02	-0.1
2020	Revenue	RUB 153.9 million	9%
	Net profit	1.0 million rub.	-68%
	Assets	RUB 142.9 million	8%
	Capital and reserves	RUB 114.2 million	1%
	Profitability	0.01	-0.01
2021	Revenue	RUB 253.8 million	65%
	Net profit	RUB 29.3 million	28%
	Assets	RUB 168.6 million	18%
	Capital and reserves	RUB 143.6 million	26%
	Profitability	0.12	0.11

Analysis of the profitability of the enterprise ZAO RBF named after. Kuibyshev will be carried out based on information about revenue in the period from 2018 to 2021. (Fig. 1).

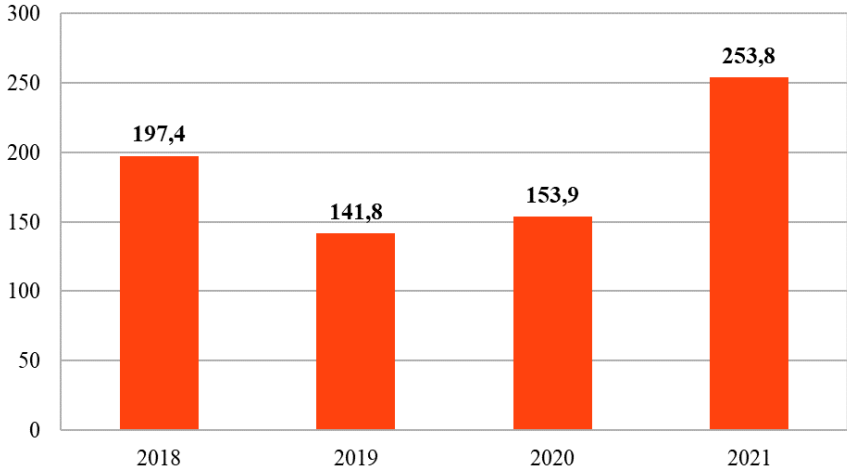


Figure 1. Revenue of CJSC RBF named after. Kuibyshev” for 2018-2021. (million rubles)

From Fig. 1 shows that by the end of the analyzed period, revenue increased by 28%. The decline in production results at the plant occurred in 2019, namely by 29% by 2018. Since 2020, there has been an increase in the indicator. Next, let's analyze the dynamics of the enterprise's net profit (Fig. 2).

For the period from 2018 to 2021, the company's net profit increased on 23%, which indicates the strengthening of the financial well-being of the enterprise.

Let's calculate profitability of production as the ratio of the enterprise's net profit to its revenue. Having analyzed profitability in the period 2018-2021, we see that, despite the significant increase in revenue and net profit for the period under review, in 2019-2020 there was a decrease in the profitability of the enterprise. The reason was a drop in sales due to ineffective promotion or decreased demand for the supplier's goods. The increase in the company's costs was associated with an increase in purchase prices, the inability to increase production capacity, and problems with supplies.

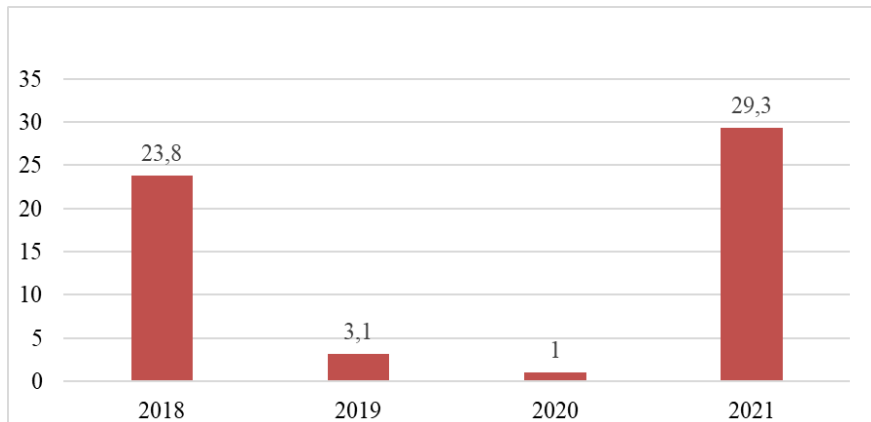


Figure 2. Net profit of CJSC RBF named after. Kuibyshev” for 2018-2021. (million rubles)

Having found out the reasons for the decrease in profitability, the management of the enterprise needs to develop an action plan to increase it. To increase the profitability of costs, production or an entire project, it is necessary to eliminate the reasons that led to a decrease in the indicator and work out the points that require active action.

Generally speaking, there are several ways to achieve higher profitability in production:

- Improving the quality of work.
- Increasing production capacity.
- Reducing costs without sacrificing quality.
- Updating the management structure.
- Improving marketing strategy.
- Employee training.
- Artificially increasing profitability taking into account competition and the general market situation.

Reasons for growth profitability of JSC RBF named after. Kuibyshev in 2021 In relation to 2019-2020 there was:

- increase in the volume of commercial and sold products, which undoubtedly has a positive effect on the activities of the enterprise.
- increase in labor productivity associated, among other things, With annual increase in employee wages.

These are ways to increase the profitability of ZAO RBF named after. Kuibyshev was allowed to achieve by 2021 level of 2018 (0.12) and maintain positive dynamics for the coming period.

Summarizing the work done, we conclude that profitability is the result of the production process, it is formed under the influence of factors related to increasing efficiency the use of fixed and working capital, reducing costs and increasing the profit of the enterprise. Profitability is an economic indicator that affects almost all areas of an enterprise's activities, namely production costs, profits, use of fixed assets and assets of the enterprise, cash flow.

Over the past four years, the enterprise CJSC RBF named after. Kuibyshev" survived both the crisis years and the years of production growth. In the crisis year of 2019, production revenue fell by 29%, but competent management decisions made it possible to restore and increase production volumes and net profit, and increase the profitability indicator to 0.12. To further maintain the stability of the enterprise's activities and increase profitability, the company's management can recommend:

1. Increase and expand production volume by searching and attracting new customers and applying a flexible pricing policy;
2. Strengthen financial control and take measures to optimize the use of working time in order to reduce costs.

References

1. *Gonik G.G., Darensky R.N. Profitability and ways to increase it // Colloquium-journal. – 2020. – No. 13 (65). – pp. 128-132.*
2. *Official website of CJSC "RBF named after Kuibyshev" [Electronic resource], - Access mode URL: <https://rbf-kuibysheva.rf/company/> (date of access: 11/09/2022).*

針對個體經營者的特殊稅收制度的發展前景

**PROSPECTS FOR THE DEVELOPMENT OF A SPECIAL TAX
REGIME FOR SELF-EMPLOYED CITIZENS**

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INTRODUCTION

Self-employment is a special tax system introduced in Russia as an experiment in 2019. Residents of all regions of Russia, as well as some foreigners - citizens of Belarus, Kazakhstan, Armenia and Kyrgyzstan, can become self-employed and pay tax on professional income in 2022.

Individual entrepreneurs can also switch to this tax without losing the status of an individual entrepreneur, abandoning other special tax regimes or a patent

The purpose of the report is to consider prospects for the development of a special tax regime for self-employed citizens.

To achieve the goal, the following tasks were set:

1. Identify why this tax regime was introduced;
2. Assess the pros and cons of the self-employed regime;
3. Analyze the main results of the experiment on introducing a tax on professional income.

People started talking about the self-employed in the fall of 2018 after the bill on professional income was introduced in the State Duma. But publications and research on this topic appeared much earlier and were associated with attempts, firstly, to describe these new phenomena of working life, and secondly, to find ways to ensure decent working conditions and protects the rights and interests of workers, even if they work outside the traditional market labor.

1. Self-employed people are the focus of the state's attention.

The modern world of work has found itself in a zone of turbulent changes for many reasons. Profound changes in science, engineering and technology have brought not only a reduction in the scale of heavy physical labor, the transfer of routine operations to the shoulders of automatic machines and robots, they have made it possible to significantly increase the growth of labor productivity and, at the same time, led to the development of non-permanent and temporary forms of employment, the expansion of employment under part-time working conditions, the emergence of agency labor, as well as the growth of self-employment.

. Non-standard forms of work are becoming increasingly widespread with the development of information technology and new communications. They have become particularly prevalent during the COVID-19 pandemic. Such rapid development has necessitated the establishment of rules and regulatory mechanisms that would provide non-discriminatory working conditions for those who, for various reasons, have not been able to integrate into the regular labor market and receive the preferences that they have formed through the joint efforts of the state, worker organizations, and employers over the past two centuries.

The state is interested in self-employment for a number of reasons:

First of all, the self-employed produce products and services and thereby contribute to the creation of the gross national product.

Secondly, self-employed people can bring income to the treasury through taxation.

Thirdly, self-employed people create jobs themselves and do not require capital investments from the state. They are not unemployed and do not claim corresponding payments.

The main problem with self-employment is that in most cases, people do not pay taxes when working for themselves. Monitoring the payment of tax on professional income has shown that around 50% of taxpayers (out of registered taxpayers of professional income tax) did not declare their income in 2018. Based on these findings, the Federal Tax Service concluded that they were working entirely in the shadow economy. Therefore, the main goal of introducing this regime was to bring people's income out of the shadows.

As of 2022, the number of registered self-employed people in Russia has reached 4 million people. During the emergency, they generated more than 610 million checks and received over 882 billion rubles of income

So you can see that You can become self-employed if several conditions are met. To do this you need:

1. to earn no more than 2.4 million rubles per year;
2. to work independently, without hired employees;
3. to engage in activities permitted for this regime (providing services; performing work; selling goods of one's own making).

2. Analysis of the main results of the experiment on the introduction of a tax regime for self-employed citizens

The features of this regime (simplified registration procedure without the need to visit the tax authority, exemption from the use of a cash register, the absence of any reporting to government agencies, comfortable tax rates) were in demand by taxpayers who had not previously paid taxes.

In addition, monitoring the payment of professional income tax also showed that about 50% of taxpayers (registered professional income tax payers) did not declare their income in 2018. Based on this, the Federal Tax Service considered that they did not pay any taxes and other obligatory payments, working entirely in the shadow sector of the economy. But one can argue with this: at least some of the designated persons only began their activities in 2019.

The first results of the experiment, according to supporters of expanding the scope of application of the special regime in the form of a tax on professional activities, allow us to assert that today this tax regime provides a solution to the main task of its introduction - creating incentives for people to come out of the shadows.

Dynamics of the total number of self-employed in the Russian Far East for the period 2020-2022

Name of the subject of the Russian Federation	Year		
	2020	2021	2022
Magadan Region	10	715	2,538
Far Eastern Federal District	202	34,969	122 520
Russian Federation	1,500,000	1 603 638	3 862 114

In the table we can see that the increase in the number of people using NAPs in 2020, 2021 and 2022 (for three constituent entities of the Russian Federation participating in the experiment since January 2020) amounted to 174%, with the greatest increase noted in the Far Eastern Federal District -60553% (from 202 people registered as NAP payers at the beginning of 2021, to 122,520 people registered as of January 1, 2022). The smallest increase is observed in the Magadan region -25280% (from 10 people to 2,538 people)

3. Advantages and disadvantages of self-employment

In accordance with Law No. 422-FZ, self-employed persons pay tax on the income of individuals from activities in which they do not have an employer and do not attract hired workers employment contracts, as well as income from the use of real estate. By compared to the tax rate applicable to employees (personal income tax), which:

is 13% of income, taxation of self-employed people appears very profitable - a self-employed person pays 4% in relation to income received from the sale of

goods or services to individuals, and 6% if their clients are legal entities. Self-employed people are exempt from paying contributions to state extra-budgetary funds.

The advantage of this form of labor relations is the freedom to plan your activities, as well as the ability to independently choose your place of work.

The disadvantages of self-employment for those who use this mode of work are the inability to receive a labor pension, temporary disability benefits, and maternity benefits.

The self-employed cannot use unemployment protection mechanisms for laid-off employees.

4. Conclusion

To summarize, the prospects for the development of a special tax regime for self-employed workers are associated with attracting an increasing number of citizens to use this form of labor and withdraw their income from the shadows. Further improvement of the regulatory framework and increasing public awareness of the possibilities of a special regime will help maintain high growth rates in the number of tax entities and the amount of tax paid to the budget. A favorable impact on the country's economy will manifest itself following a decrease in the share of the shadow economy, growth in GDP and employment.

References

1. Putintseva. O. article "Self-employment in Russia in 2022" <https://www.kp.ru/putevoditel/rabota/samozanyatost/>
2. Magazine "Contour". Kritskaya. M. "What the self-employed can expect in 2022." <https://kontur.ru/articles/4818>
3. "Komsomolskaya Pravda" article "Self-employment in Russia: pros and cons" <https://www.kp.ru/putevoditel/rabota/samozanyatost/>
4. Makarov. E.I. "Self-employment. Advantages and disadvantages identified during the experiment on introducing a tax on professional income in 2018-2020." <https://fnpr.ru/upload/iblock/90e/cw5sb4i0kymmo5ggwmpkjvslgal5zuf.pdf>
5. Korobkova N.A. text from a scientific article in the specialty "Economics and Business". "The current state and prospects for the development of taxation of self-employed people in Russia." <https://cyberleninka.ru/article/n/sovremennoe-sostoyaniye-i-perspektivy-razvitiya-nalogooblozheniya-samozanyatyh-v-rossii>
6. Federal Tax Service <https://rmsp.nalog.ru/statistics2.html>

船舶碰撞和損害賠償標準解釋的特殊性

**COLLISION OF SHIPS AND PECULIARITIES OF
INTERPRETATION OF THE STANDARDS FOR COMPENSATION
OF DAMAGES**

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抽象的。在司法實務中，因賠償損失而引發船舶碰撞的訴訟事件屢見不鮮。司法實務中的這種現象是透過影響緊急案件蔓延案件「通則」的情況來調節的。

關鍵字：船舶碰撞、監測、國際公約規定、受害方、受害方、追索權。

Abstract. *In legal practice, the incident of litigation for compensation of losses, which results in collisions of ships, is quite common. This phenomenon in judicial practice is regulated by circumstances affecting the “general provisions” of cases of the spread of emergency cases.*

Keywords: *collision of ships, monitoring, provisions of the International Convention, injured party, injured parties, recourse.*

Thus, legal scholars refer “to the articles of the SETS Chapter 7, as well as to the International Rules for Preventing Collisions of Ships (IRPCS) 1972, to the International Convention for the Consolidation of Certain Rules Regarding Collisions of Ships of 1910.” [Grechukha 2020;210].

It should be noted that the international rules on ship collisions establish unlimited possibilities within the state itself, which forms its own requirements for the formulation of a strategy for compensation for losses in the event of a ship collision, but a large-scale solution to problems, where it is necessary to note the provisions that fix maritime conventions and give the status of solving common problems internationalization are aimed at the general provisions of the international convention.

Ship collision problems are quite common and are regulated under international law in accordance with the International Rules and the Formation Convention. It should also be noted that the laws of the Russian Federation provide for provisions and articles on merchant shipping in ship collisions (in the MMC RF, SETS) taking into account the fact that a foreign ship collided with another ship on the

territory of the Russian Federation, or a ship flying the flag of the Russian Federation collided with another ship outside the territory of the Russian Federation.

Thus, the corresponding specified norms for compensation for damages in the event of a collision of ships take place and are distributed in a disciplinary context over the parties to the relationship.

In this case, the features of compensation for losses are implemented in the context of the modern concept of the proper performance of the duty of one ship to another.

The year-long study results proved that ship captains were hypnotized by monitor signs that were presented to them as reliable information, and this monitoring strategy prevented good visibility of safety detection.

The interpretation of the International Trade Relations Rules arises within the boundaries of these rules. Formulated standards for the movement of goods have a number of advantages in terms of the turnover of acceptable goods. Therefore, the economic issue in the legal case of compensation for losses is transformed in the order of the law on compliance with the rules when moving goods and luggage of passengers.

So, the International Regulations on Collisions of Ships (IRCS) 1972. are indexed by special standardization and attempts to designate such a phenomenon in shipping as a collision of ships had their grounds.

To achieve the goals of applying the Merchant Shipping Code, the laws and regulations regarding ship collisions are most often considered justified when the risk of accident of one or two ships at once increases. In case of damage to ships, the ship that violated the rules of movement on water transport compensates for losses.

So, lawyer V.N. Grechukha comments on “the provisions of Chapter 7 of the SETS, which is regulated by Article 42 of the Code” [Grechukha 2020;210.]

The regulated rules for damages in ship collisions are considered to be plaintiff-biased.

V.N. Grechukha emphasizes the following rules for ship collisions and compensation for losses: “So, in the event of a ship collision, losses caused to ships, people on them, cargo or other property are compensated in accordance with the rules established in the chapter. These rules also apply if losses are caused by one ship to another or to people, cargo or other property on board, by performing or failing to perform a maneuver” [Grechukha 2020; 210].

Lawyer Grechukha notes that the above rules are regulated by the legal norms of the Russian Federation on compensation for losses of “courts only for non-commercial service” [Grechukha 2020; 211].

It should be noted “with regard to the provisions of the International Convention for the unification of certain rules regarding collisions of ships, they apply

to collided ships flying the flag of states that are parties to the Convention” [Grechukha 2020; 211].

Thus, the existing International Regulations and Regulations on the Movement of Vessels on Water Transport are based on the experience of judicial practitioners.

In other words, Grechukha refers to Russian legislation that even if a collision between ships does not always happen, in some cases their maneuverability is determined and applied in accordance with established standards for the collection of damages from the defendant ships. At the same time, legal scholar Grechukha emphasizes that such provisions apply only to relations between the parties to the constituent entities of the Russian Federation. Other provisions designed for International relations of merchant shipping are aimed at developing infrastructure in trade turnover and the legal norm for the interference of such interactions.

In an international trade relationship, circumstances are cultivated that arise in parallel with reality and with a steady redistribution of losses where both shipowners find themselves in an unfavorable conflict.

In Chapter 16. “Compensation for damage from collisions of ships,” legal scholar V.N. Grechukha comments that “losses from ship collisions can be caused to the ships themselves, the people on them, as well as cargo or other property. Such property may be, first of all, the passenger’s luggage. Damages caused to the vessel are determined based on the nature of the damage received, the possibility of eliminating them, and the costs associated with repairing or replacing failed units and mechanisms” [Grechukha 2020; 211].

Buckwheat comments on Article 43 of Chapter 7 of the SETS, paragraph 2 of Article 43 of the SETS, paragraph 5 of Art. 43 SETS, paragraph 1, article 44 SETS, paragraph 2, article 44 SETS, paragraph 4, art. 43 SETS.

Existing articles commented by legal scholar V.N. Grechukha, are established in accordance with the present law on compensation for damages in the event of a collision of ships.

These normative provisions do not contradict judicial proceedings regarding collision of vessels. Such legal proceedings are decided in accordance with the provisions on finding an accident in a collision. Grechukha comments on Article 43 of Chapter 7 of the SETS on the resolution of disputes in favor of a ship that has suffered losses due to the fault of another ship that collided with the first. The article of the law commented on by the legal scholar Grechukha establishes the person who has suffered a collision from another vessel, and also regulates the relations representing the rules on collision of vessels and compensation for damages.

So, “if a collision occurred through the fault of one of the ships, the losses are borne by the ship through whose fault it occurred” [Grechukha 2020;211].

When a ship collision occurs with two or more ships, then each ship pays damages based on the degree of fault. Typically, such proceedings are delayed in terms

of court cases, and the identification of the person responsible for causing harm is not resolved in a timely manner, since “in practice, there are cases when it is impossible to establish the degree of guilt of each of the courts. In such situations, as stated in paragraph 2 of Article 43 of the SETS, liability for losses is distributed equally between them” [Grechukha 2020;211-212].

Grechukha argues that in ship collisions there is a presumption of innocence when no person responsible for the maneuvering of the ships is liable to the other party.

Grechukha, in accordance with legislative acts on the resolution of disputes with third parties, comments on paragraph 5 of Article 43 of the SETS. Such interest in third parties is determined by compensation for damages to the first parties by the guilty courts. In resolving disputes regarding losses in relation to third parties, shipowners jointly and severally compensate for losses to the injured party.

But Grechukha notes that there is also recourse in relation to one of the shipowners who participated in the collision of ships, and in the event of an emergency a third party was also injured. In this case, recourse in relation to one of the shipowners occurs when “a greater amount is paid than he should be paid under the current legislation” [Grechukha 2020; 212].

Regression in relation to other courts is characterized by the established rules of the Russian Federation.

Lawyers Knyazkin and Yurlov note that “regression is a so-called reverse obligation” that arises when the debtor under the main obligation to the creditor fulfills this obligation instead of a third party or through his fault. For example, a joint debtor who has fully fulfilled the obligation receives the right of recourse to the remaining debtors” [Knyazkin, Yurlov 2020; 107].

The topic of ship collisions does not interfere with economic and legal relations, but characterizes such relations. Losses incurred in a collision between vessels are provided for in accordance with the standards established by the Russian Federation, as well as with the rules of the IRPCS.

References

1. Grechukha V.N. *Inland water transport law. Textbook for master's degree.* – M.: Prometheus, 2020. – 296 p.
2. Knyazkin S.I., Yurlov I.A. *Dictionary-reference book on civil law, civil, arbitration and administrative process.* – M.: Infotropik Media, 2020. – 300 p.

哈薩克童話的形態
MORPHOLOGY OF THE KAZAKH FAIRY TALE

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抽象的。本文致力於研究哈薩克童話的形態特徵。分析了童話語言的結構和形式，突出了賦予童話故事獨特性格的關鍵形態元素。研究包括分析文化背景下的人物形態特徵、情節元素和語言轉折。研究結果可能有助於理解哈薩克魔法文學的細節，以及擴展形態學和語言學領域的知識。

關鍵字：童話、形態、功能、分析、人物、魔法元素。

Abstract. *The article is devoted to the study of the morphological features of the Kazakh fairy tale. The structure and form of the language of fairy tales is analyzed, highlighting the key morphological elements that give them a unique character. The study includes an analysis of the morphological features of the characters, plot elements and linguistic turns in the context of the cultural context. The results of the study may be useful for understanding the specifics of Kazakh magical literature, as well as for expanding knowledge in the field of morphology and linguistics.*

Keywords: *fairy tale, morphology, functions, analysis, character, elements of magic.*

Introduction

Fairy tales occupy a special place in the literary and cultural heritage of mankind. They provide us with the opportunity to escape from everyday life into an enchanted world of magic, where good triumphs over evil. So why do fairy tales not only remain popular, but also have a profound impact on human life?

First and foremost, fairy tales serve as carriers of wisdom and moral lessons. Their plots, often filled with trials and adventures, pose questions to the reader about good and evil, justice and selflessness. Fairy-tale heroes face many difficulties, their choices and actions serve as role models. When the main character defeats evil with fortitude and a pure heart, it becomes an inspiring example for us in real life.

In addition, fairy tales enrich imagination and creativity. In their worlds there are no boundaries for miracles, and any thing can become magical. This promotes creative thinking in readers, encourages them to see magic in everyday life, and gives them the opportunity to explore new ideas. Fairy tale characters become symbols of willpower, justice and magic, inspiring us to overcome our own difficulties. They show that even in the darkest moments, light can be found and that true strength often comes from good deeds and wise decisions.

As for Kazakh fairy tales, they reveal magical stories full of wisdom and magic, the key features of which are: symbolism of nature and animals, family values, moral lessons and others. These tales, passed down from generation to generation, reflect the richness and national flavor of the culture of the Kazakh people and are not only a source of entertainment, but also a mirror of national traditions and values.

The history of the study of fairy tales dates back to the 19th century and is associated with the work of various scientists, folklorists, literary scholars and psychoanalysts. For example: In 1812, the brothers Grimm, Jacob and Wilhelm, published their first collection of “Children’s and Household Tales” (“Kinder- und Hausmärchen”), which included many folk tales. They were among the first to systematize and record folklore heritage. Their work has had a significant influence on the study of fairy tales and comparative mythology.

Fairy tale morphology refers to the structural elements, compositional features, and typical features found in fairy tales. Morphology in this case means the study of the form and structure of a literary work. Professor Vladimir Propp, a Russian folklorist and structuralist, studied the morphology of fairy tales. His most famous work is “The Morphology of the Fairy Tale” (1928), in which he proposed an analysis of the structural elements of fairy tales.

This article will apply the morphological approaches of V. Propp in relation to Kazakh fairy tales and examine the morphology of the Kazakh fairy tale using the example of the fairy tale “The Wonderful Garden” (Akzholova, 2023, 117).

Literature review

Work by V.Ya. Propp’s “Morphology of a Fairy Tale” revealed to us a stable combination of sequential actions of the heroes; as the author wrote, the action of the character was important, which is determined “from the point of view of its significance for the course of the action” (Ibraeva, 2022, 414).

Propp’s methodology has become widely used in folkloric and literary studies for the analysis of not only Russian, but also other fairy tales. It provided the basis for further research into the structural analysis and interpretation of fairy tales. Propp identified 31 functional units (or “functions”) in fairy tales that occur in a specific sequence. Here are some of these features:

- the ban that the hero receives;
- violation of the ban;

- damage caused by a negative character;
- sending the hero from home on a journey;
- receiving a magical remedy;
- pursuit of the hero;
- salvation from persecution;
- the hero’s struggle with the enemy;
- hero’s victory;
- homecoming;
- reward (wedding or accession of a hero)

These functions describe the actions of the characters and the development of the plot. The overall structure of the plot is made in the form of a frame, where each function is performed by certain characters in a certain sequence. This framework was described in the following sequence: absence, prohibition, violation of the prohibition, meeting with the donor, transformation of the hero, departure, test, victory, return and reward.

In the sphere of action of characters, Propp identified several types of characters, each of which performs certain functions in the plot. These types include hero, wizard, donor, false hero, and others (Propp 2022, 114). In this work, Propp identifies abstract functions that describe the general nature of events, such as “getting” or “searching.” These functions are not tied to specific actions, but to general features of plot development, and also introduces various structural elements such as: “triple repetition element”, “change of action” and “functional roles” to detail character interactions and plot development (Propp , 2020, 25).

These elements form the basis of Propp’s method and allow fairy tales to be analyzed based on their structure and functional elements.

Analysis of a fairy tale

The fairy tale “The Wonderful Garden”, the main character of which is a young man, one of the four (youngest) students of the sage, to whom two poor people Asan and Khasen came to resolve a dispute: “How will the found treasure be disposed of?!” As a solution to this dispute, the student proposed to plant a garden of fruit trees for the local poor. As a result, his teacher-sage instructed him to complete this task.

Functions	Interpretation	An example from a fairy tale
Absence	The hero’s journey from a settlement in the steppe to the khan’s capital	“For many days he walked along the steppe until he safely reached the capital of the Khanate” (Akzholova, 2023, 120)
Ban	You only need to buy fruit tree seeds	“Buy the best seeds there and, when you return, grow the garden you spoke about” (Akzholova, 2023, 120).

Violation of the ban	Purchase from a merchant, with all the entrusted gold, the freedom of rare birds.	“Will you release them if I give you twice as much gold as the khan?” Then the young man threw off the leather bag from his shoulders and opened it in front of the caravanbashi (Akzholova, 2023, 121).
Scouting	Finding out information about who these birds are intended for	“Having pushed through the crowd, he approached the caravanbashi and, bowing respectfully, asked: “Sir, who doomed these beautiful birds to such torment and where are you going with them?” (Akzholova, 2023, 121).
Providing information about the victim	The young man receives a direct answer to his question	“Karavanbashi answers: - We are on our way to the Khan’s palace. These birds are intended for the Khan’s table” (Akzholova, 2023, 121)
Hero’s return	The hero’s return journey to his native steppe	“The young man picked up an empty leather bag from the ground and set off on the way back” (Akzholova, 2023, 121)
The pursuit	Persecution by one’s own conscience and reason	“But the closer he came to his native place, the more bitter thoughts took possession of him and the more repentance oppressed his chest. “Who gave me the right to dispose of other people’s wealth at my whim?” (Akzholova, 2023, 121-122).
The rescue	The hero, torturing himself with grief, falls asleep	“In the end, grief exhausted him so much that he fell fast asleep” (Akzholova, 2023, 122).
Exposure to the actions of the future donor	A young man sees in a dream a bird that speaks to him in a human voice.	“Oh, good young man! Forget your sadness! Free birds cannot return your gold, but they can reward you for your mercy” (Akzholova, 2023, 122).
Difficult task	Explain to the teacher and the waiting people where he spent all the gold	“What will I tell now to the teacher and those simple-minded people who are waiting for my return with seeds” - this is how the young man complained (Akzholova, 2023, 122).
The solution of the problem	Steppe sowed by birds with seeds of fruit trees	“The young man opened his eyes and froze in surprise: the entire wide steppe was covered with marvelous birds, busy with an incomprehensible task. The birds raked holes in the ground with their paws, dropped white seeds into them from their beaks and swept them again with their wings. But after that, an even greater miracle happened: green shoots suddenly appeared from every hole dug by the birds. They grew higher and higher and soon turned into mighty branchy trees, luxuriously decorated with shiny leaves. Not even a

		moment had passed before the branches of the trees were already covered with unprecedented lush flowers, filling the air with a sweet fragrance. Then the flowers flew around, and instead of them, magnificent golden apples swayed on the branches” (Akzholova, 2023, 122).
Hero’s Confession	Recognition is not of the hero himself, but of his wise solution to the dispute.	“Having listened to his story, the sage, his three disciples, Asan and Khasen, and their children immediately wished to see the garden. Soon rumors about the wonderful garden spread throughout the steppe” (Akzholova, 2023, 123).
Punishment of the enemy	The enemies are representatives of the nobility, prosperous and wealthy people.	“The first to gallop to the garden were the white bone riders on their greyhound pacers. But as soon as they reached the edge, a high fence with iron gates with seven locks rose in front of them. Then they stood on carved saddles and tried to reach the golden apples through the fence. But each of them who touched the fruit immediately lost strength and fell to the ground dead. Seeing this, the white bone riders turned their horses in fear and horror and rushed off to their villages” (Akzholova, 2023, 123).

Conclusion and conclusions

The morphological functions of V. Propp, used to analyze Russian fairy tales, to one degree or another can be used to study Kazakh fairy tales, since Russian and Kazakh fairy tales have some similarities. For example: both peoples usually include elements of magic and wizardry in their tales. Heroes can meet magical characters, use magical objects, and encounter unusual phenomena; Russian and Kazakh fairy tales often contain moral lessons. They can teach values such as: fairness, kindness, hard work and respect; Nature symbolism is common, where nature can play an important role in plot and character development; Usually, in both Russian and Kazakh fairy tales, a happy ending prevails, where the heroes achieve their goals and evil is defeated. However, despite these commonalities, each culture also adds its own unique characteristics to its tales. Kazakh fairy tales, in turn, reflect the characteristics of Kazakh culture, mythology, traditions and social situation.

For example, the fairy tale “The Wonderful Forest” primarily touches on the problems of social inequality. Constant contradictions between the rich khans, who allow themselves everything, including eating rare and unusual birds, and the honest poor people, who cannot appropriate even the wealth found on their land, burning with the desire to improve their state and help their neighbors.

The main functions in Propp's methodology for analyzing the structure of fairy tales include such basic elements as "long-suffering", "transformation of the hero", "change of the hero", "meeting of the hero with the enemy" and others. These functions are combined in a certain order, which, according to Propp, forms the structure of a fairy tale.

Analysis of the Kazakh fairy tale "The Wonderful Garden" according to Propp's principle is an interesting and productive way of understanding the structure and elements of fairy tales, allowing us to reveal the main elements of the plot and structure of this unique work. The magic and adventure presented in the tale are made clearer and more contextualized, and the moral lessons and symbolism can be explored more deeply through the lens of Propp's analysis of functions.

References

1. Akzholova G. *Kazakh folk tales* / G. Akzholova. -Astana: Folio, 2023. — P. 117.
2. Propp V.Ya. *Morphology of a fairy tale* / V. Propp. - Moscow: Eksmo, 2022. - 224 p.
3. Propp V.Ya. *Morphology of a fairy tale. Historical roots of a fairy tale* / V. Propp. - Moscow: Kolibri, 2020. - 634 p.
4. Ibraeva Zh.B. *Narratological models of eventfulness in the novel by I.P. Shchegolikhina "Old prose"* // *Bulletin*. – 2022. – No. 2. – P. 414.

烏蘇里斯克藝術家在現代俄中文化關係發展中的創作典範策略

**STRATEGIES OF USSURIYSK ARTISTS CREATIVE PARADIGMS
IN THE DEVELOPMENT OF MODERN RUSSIAN-CHINESE
CULTURAL RELATIONS**

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抽象的。該研究致力於烏蘇里斯克藝術家創作範式的特點，並確定他們對加強現代俄中文化和藝術領域關係的貢獻。本研究的目的是研究這個創意集體活動的文化方面，從而在現代條件下延續藝術傳統並結合俄羅斯聯邦和中華人民共和國的藝術經驗。確定了多項任務：

– 追溯烏蘇里斯克大師作品中固有的藝術傳統；

– 揭示烏蘇里斯克藝術家「圓」、「友誼橋」等創作聯想在與不同城市（北京、牡丹江、哈爾濱、ETC。）；

– 將展覽項目的概念確定為俄羅斯聯邦和中華人民共和國之間跨文化交流和創意交流的有前途的形式之一，為提高這些國家的藝術生活水平做出貢獻。

在完成既定任務的過程中，得出了烏蘇里斯克藝術家創作團體活動的重要作用的結論，他們為遠東美術的發展做出了寶貴的貢獻，促進了現代俄羅斯藝術的發展。中國文化關係始終處於高水準。

關鍵字：烏蘇里斯克藝術家、全俄羅斯創意公共組織「俄羅斯藝術家聯盟」的烏蘇里斯克組織、國際藝術活動、俄中文化關係。

Abstract. *The research is devoted to the peculiarities of creative paradigms of Ussuriysk artists, determining their contribution to the enhancement of modern Russian-Chinese relations in the field of culture and art. The study of the cultural aspects of the activities of this creative collective, which allowed to continue artistic traditions in the conditions of modernity and unite the artistic experience of the Russian Federation and the People’s Republic of China, is the purpose of this study, which has determined a number of tasks:*

- to trace the artistic traditions inherent in the works of Ussuriysk masters;

- to reveal the significance of creative associations of Ussuriysk artists “Circle”, “Friendship Bridge”, etc. in the context of creating new points of

cultural interaction with masters of the People's Republic of China from different cities (Beijing, Mudanjiang, Harbin, etc.);

- to determine the conceptuality of exhibition projects as one of the promising forms of intercultural communication and creative exchange between the Russian Federation and the People's Republic of China, contributing to the improvement of the level of artistic life of these countries.

In the course of solving the set tasks the conclusion is made about the important role of the activity of the creative group of Ussuriysk artists, which makes an invaluable contribution to the development of fine arts of the Far East, promoting the development of modern Russian-Chinese cultural relations at a consistently high level.

Keywords: *Ussuriysk artists, Ussuriysk organisation of the All-Russian Creative Public Organization "Union of Artists of Russia", international artistic activity, Russian-Chinese cultural relations.*

The regions of the Far East in the world culture are in the focus of researchers' close attention, and comprehension of Far Eastern art in the context of the development of intercultural relations is quite urgent for the present moment. In this regard, the issue of researching the creative paradigms of Ussuriysk artists and determining their contribution to the development of contemporary Russian-Chinese cultural relations seems relevant to study. Having become a fundamentally new phenomenon in the artistic life of Russia, they not only complimented its heritage, but also helped to expand the boundaries of its creative influence on artistic life abroad. The emergence and development of their own art school of painting allowed the artists to join the general program of artistic culture development not only in the Far Eastern region of Russia, but also to influence the modern development of art beyond its borders.

The artistic traditions of Ussuriysk, established in the late XIX - early XX centuries, were vividly developed in the second half of the last century and were largely strengthened with the advent of new times and the possibility of Ussuriysk artists to enter the international art arena, primarily with the People's Republic of China.

Graduates of the Imperial Academy of Arts in St. Petersburg: V. G. Sheshunov, P. V. Teplyakov (Nikolin) and N. M. Kabanov, who worked in Ussuriysk in the first decades of the twentieth century and laid its strong foundations, stood at the origins of the artistic life of the city. A great role in the establishment of the actively creative group of Ussuriysk artists was played by the studio of military artists, founded in 1940 by graduates of the Academy of Arts O. I. and R. I. Friedman, where qualified teaching provided its graduates the opportunity to continue their artistic education or independently find their way in art [9, p. 5].

K. P. Koval should be noted among the students, who is known as the founder of the Ussuriysk school of painting, which has been a regional artistic phenomenon with distinctive characteristics and in many ways enriched the Far Eastern painting [2, p. 5-6]. The studio is associated with the names of such Ussuriysk masters as A. V. Tkachenko and V. A. Serov, who “opened the Far East for the whole country, gave us the opportunity to embrace the philosophy of this land” [4, p. 25] and successfully develop the traditions of the Ussuriysk school of painting. To the artistic originality of the school such features should be attributed as especially accentuated decorativeness, emphasis on the aesthetic and emotional power of graphically designed colored spot, “when paintings, whether it is a landscape, still life or portrait, appear to the viewer as a kind of stained glass, which reflects deep, saturated colors” [8 p. 396].

With the formation of the Ussuriysk city organization of the All-Russian creative public organization “Union of Artists of Russia” in 1943 (hereinafter Ussuriysk organization of the All-Russian creative public organization “Union of Artists of Russia”) as a branch of the Primorye organization of the All-Russian creative public organization “Union of Artists of Russia”, a steadily enhanced artistic life of the city began. The creative enthusiasm of Ussuriysk artists has given special significance not only to the exhibition activity, which today is experiencing an extraordinary boom being attractive for international creative cooperation, but also to the education of a new modern artist, actively participating in the cultural life of the neighboring countries. And this is becoming a particularly characteristic feature for artists from Ussuriysk in the XXI century, in which we see a number of reasons. First of all, it is due to the geographical location of Ussuriysk, its transport possibilities and proximity to the border with China in conditions of its openness [7, p. 69]. But, also largely due to the rare entrepreneurial spirit and activity of the Chairman V. A. Serov and members of the Board of the Ussuriysk Organization of the All-Union Association of Artists and the Deputy Chairman for Exhibition Activities O. K. Nikitchik, who is known not only as a talented painter, but also as an active artist in the domestic and international arena of the Asia-Pacific countries. Having realized that in the current circumstances a small organization would not be able to operate fully in a closed environment, she initiated artistic associations for the possibility of trips abroad and intercultural exchange.

The idea of organizing permanent exhibitions outside her native city of Ussuriysk prompted Olga Nikitchik to establish in 2000 the creative group “Circle”, which united like-minded artists in exhibition activities and expanded opportunities for international exchange by joining the art market of the neighboring country - the People’s Republic of China, where Ussuriysk artists gained wide fame and recognition and regular customers. According to art historian A. M. Lobychev, the “Circle” of Ussuriysk artists is that rare case when a professional association

has turned into a circle of people imbued with one life impulse, the desire under any social or personal circumstances not to let a pencil or brush out of their hands, maintaining professionalism and efficiency [8, p. 392].

Olga Nikitchik has become the organizer of a long-term international art project - "Friendship Bridge", thanks to which international art activities have been regularly carried out in Ussuriysk and in the cities of the People's Republic of China, as well as in the cities of the Republic of Korea. From 2002 to 2005 under its patronage international exhibitions of artists from Russia, the Republic of Korea and China were held in Vladivostok, Pusan, Mudanjiang [3, p. 109].

The International Association of Women Artists "Flowers of the World", founded by Olga Nikitchik in 1997 and serving as its president for all these years, deserves a special mention. It promotes the active involvement of women artists in the dialogue and interaction of different cultures. Exhibitions of the Association since 1998 and up to now have been regularly held in Russia (St. Petersburg, Vladivostok, Irkutsk, Yakutsk, etc.) and People's Republic of China (Beijing, Mudanjiang, Harbin), as well as in other countries. One of the main principles of the association's creative activity is "not only organizing joint exhibitions, but also actively communicating at the time of their occurrence, sharing knowledge of the culture of another country even at the domestic level" [5, p. 32].

The active involvement of the Ussuriysk artists outside their home city includes regular solo, group and joint exhibitions with their Chinese colleagues at various exhibition venues in Russia and China. It is important to note that contacts between Ussuriysk artists and their Chinese colleagues from different cities of the People's Republic of China are characterized by great creative activity. It is noteworthy that this year marks 30 years since the signing of the agreement on the status of twin cities: Mudanjiang and Ussuriysk, when the countdown of fruitful intercultural projects with the participation of Ussuriysk group of artists started. Since 1999, when the first joint exhibition was held in the halls of the Ussuriysk House of Artists, and up to the present time annual exchange exhibitions have been organized. The gallery owner Han Jun has been playing an important role in intercultural communication, solving organizational issues and establishing a warm friendly contact with the Ussuriysk artists. In addition to the twin cities of Mudanjiang and Ussuriysk, exhibitions of Ussuriysk and Chinese artists have been held on the Russian territory in the following cities: Vladivostok (Portmei Gallery, Primorsky State Art Gallery), Nakhodka, Dalnerechensk and others. In Slavyanka settlement (Primorsky Krai), a large-scale project "Pacific Russia: Shores of Creativity" took place in 2012. In Andreevka (Primorsky Krai), the Art Coast gallery regularly hosts international exhibitions and plein airs with artists from the People's Republic of China during the summer season.

On the territory of the People's Republic of China, joint art projects involve such cities as Harbin, Suifenhe, Shenzhen, etc., where exhibitions have taken

place both in state exhibition halls and cultural centers and private galleries and museums. In 2019, a number of joint international art exhibitions of Russian and Chinese artists took place in different cities of Russia and China, dedicated to the 70th anniversary of the establishment of Russian-Chinese diplomatic relations.

The tradition of international visits by Ussuriysk artists could only be interrupted by the unfavorable epidemiological situation and the border closure associated with the circumstances. Therefore, it is especially remarkable that in early March 2023, when the borders with the People's Republic of China opened, this tradition has been resumed: a group of Ussuriysk artists received an official invitation from the administration of Dongning (People's Republic of China) to a cultural event dedicated to International Women's Day on March, 8th where a conference was held to further discuss creative plans. O. Nikitchik acted as a speaker from the group of Ussuriysk artists at the conference.

These select examples of strategies of Ussuriysk artists creative paradigms in modern Russian-Chinese cultural relations have been highlighted in order to demonstrate that creative artists are part of a much wider context. Creative strategies are implemented in an array of artistic forms and imaginative techniques, including not only co-creation. Further, the synergies of creative strategies motivated by co-creating positive change, participatory art practices are rooted in a desire to narrow the distance between artist and audience, bringing art and life of both countries closer together. The relationships between artists, audience and communities in both countries are the subject and material of their work, as the audience becomes participant, collaborator, contributor and even co-author. Through new strategies, a unified cultural space is emerging, where there is not only difference and identity, but also something that unites them.

Among recent intercultural events, we should mention an exhibition of Primorsky Krai artists, including Ussuriysk artists, as part of the cultural days in Heilongjiang Province. The venue for this cultural project was the gallery of Han Jianmin, a Chinese collector and patron of the arts. He has been collecting Russian art for many years. Han Jianmin's gallery is located on Sunny Island, or, as it is also called, the Island of Arts. It was once the summer houses of Russian emigrants. And it is very symbolic that it is this place where our masters represented contemporary Russian art. Ussuriysk artists Ivan and Olga Nikitchik, A. Tkachenko, V. Serov and others were among the Primorye masters whose paintings were displayed at the exhibition. Thanks to their various paintings a huge number of Harbin residents were able to see Russian Landscape of the Far East [1].

These, which have become traditional, group exhibitions of the organization's members, its guests and personal exhibitions, as well as international group and personal exhibitions of foreign artists prove that the Ussuriysk masters play an important role in the artistic life of the Far East region due to long-term artistic

projects that provide constant communication with colleagues from neighboring countries. Such direct connections with foreign artists, among other things, make an important contribution to the formation and development of universal values, the realization of the most diverse humanitarian tasks, appealing to a wide range of concepts and associations.

Based on the above, we can conclude that by continuing to actively develop artistic traditions in the conditions of modernity, the fruitful Union of Ussuriysk artists make an invaluable contribution to the development of the visual arts of the Far East, promoting the preservation of the region's artistic traditions, its significance at a consistently high level, the multiplication of creative initiatives and long-term projects in the field of culture and art, aimed at strengthening Russian-Chinese relations and modelling modern cultural reality.

Sources

1. *An exhibition of Primorye artists was presented in Heilongjiang Province / www.otvprim.tv (Public TV of Primorye) // Source: <https://otvprim.tv/v-provintsii-kheyluntszyan-predstavili-vistavku-primorskikh-khudozhnikov> (Date of address: 1.12.2023).*

2. *Gutareva Y. I. Kim Koval. Painting, graphics: monograph. - Vladivostok: Russky Ostrov, 2023. - 224 c.*

3. *Gutareva Y. I. Strategies of creative paradigms of the Honored Artist of the Russian Federation O. K. Nikitchik in the development of modern Russian-Korean cultural relations // Russia and Korea in the modern information space. Theses and reports of the International Scientific and Practical Conference. Editors-in-Chief K.V. Ivanov, I.V. Oleinikov. Irkutsk. Publishing house: Irkutsk State University, 2022. - C. 105-112.*

4. *Zotova O. I. Vladimir Serov: catalogue. Vladivostok, 2015. - 200 c.*

5. *Zotova O. I. Generation X. Lidia Kozmina and Oleg Podskochin // Fine Art of the Urals, Siberia and the Far East. 2019, № 1. C. 26-33.*

6. *History of the Ussuriysk city organisation of the All-Russian creative public organization "Union of Artists of Russia" // Ussuriysk city organization of the All-Russian creative public organization "Union of Artists of Russia". URL: <https://ussuri-art.ru/history.html> (date of address 12.08.2023).*

7. *Kuznetsov A. M. Phenomenon of Ussuriysk: place-village-city, people, time // Izvestiya Vostochnogo Instituta 2016/4 (32). - C. 63-72.*

8. *Lobychev A. Ussuriysk and further everywhere. Exhibition of Ussuriysk art association "Circle" // Lobychev A. Self-portrait with a nest on the head: the art of Primorye at the turn of the century. Vladivostok: Rubezh, 2013. C. 390-407.*

9. *Habarova M. V. Kim Petrovich Koval. Painting: catalogue. - M., 1987. - 27 c.*

優化吸收過程的方法作為胃腸道病理營養治療的基礎
**THE WAYS TO OPTIMIZE THE ABSORPTION PROCESSES
AS A BASIS FOR THE NUTRITIONAL TREATMENT OF
GASTROENTEROLOGICAL PATHOLOGY**

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抽象的。營養支持是胃腸病治療的重要一環。這種類型的治療與消化和運輸過程直接相關。這項工作的目的是研究在使用各種天然製劑進行腸內營養時優化小腸吸收過程的可能性。結果。結果表明，藥物的最佳縮合度為4:1。在乾殘渣裡面，你可以改變蛋白質的比例。脂質和碳水化合物。建議使用水解消化酵素。包括我們創造的phlokozim。基於乳酸桿菌的抗菌劑也是可取的。結論。1) 吸食的最佳介質是食糜。2. 混合物應含有不超過80%的水和約20%的乾殘渣。3. 絮凝物 - 創造藥物 flokozim 的基礎 4. 基於腸內優化混合物的哺乳療法

關鍵字: 營養學、吸收、最佳化、絮凝。

Abstract. *Nutritional support is an important component of treatment in gastroenterology. This type of therapy is directly related to digestive and transport processes. The aim of the work is to investigate the possibility of optimizing the absorption processes in the small intestine when using various natural formulations for enteral alimentation. Results. It is shown that the optimal degree of condensation of drugs is 4:1. Inside the dry residue, you can change the ratio of proteins, lipids and carbohydrates. It is advisable to use hydrolytic digestive enzymes, including the phlokozim created by us. Antibacterial agents based on lactobacilli are also advisable. Conclusions. 1) The optimal medium for suction is chyme. 2. The mixture should contain no more than 80% water and about 20% dry residue. 3. Floccules - the basis for the creation of the drug flokozim 4. Lactotherapy based on optimized mixtures for enteral*

Keywords: *nutritionology, absorption, optimization, floccules.*

Introduction.

It is known that regenerative rehabilitation programs should take into account ways to optimize absorption processes. In this case, the optimal products are those

similar in composition to the reference medium – chyme [1-4]. We created such mixtures in the Russian Federation. These are nutrichims (1A, 1B, nutrozyme, etc.). At the same time, at the first stages of the study, mixtures of food and pharmaceutical components were created - from electrolytes, monomeric and oligomeric compositions - and their absorption and assimilation were studied in an experiment on dogs. These compositions (salt enteral solution - SES, monomeric enteral solution -MES, polymeric enteral chyme -PEC) are shown in Fig.1.

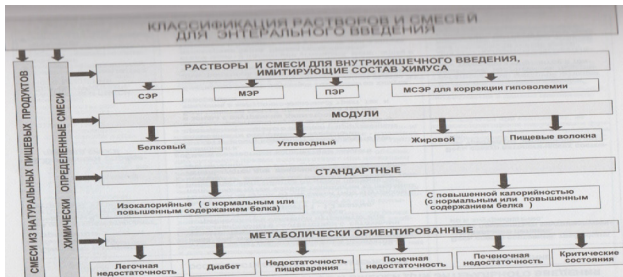


Figure 1.

Results. We have shown that the best nutritional effect is achieved by compositions made from natural food products, selected so that they are closest to chyme. These are precisely mixtures of the nutrichim type. Typically used for enteral correction, mixtures such as nutrichim are used in the form of 10-20% solutions. 1 liter of a 20% mixture of nutrichim 1A and nutrichim-2 contains 1.9 g of protein products, 75 g of fat, and 73 g/l of carbohydrates. In the Nutrichem 1B mixture, protein products are contained in an amount of 41.4 g/l, fats -51, carbohydrates 102 g/l. The total calorific content of 20% nutrichim mixtures is 1000 kcal/l. The osmotic pressure of mixtures ranges from 350-380 mOsm. The electrolyte composition in all mixtures is the same and approaches that of chyme. The composition of nutrichim mixtures can be seen from Table 1.

Состав смесей нутрихим Таблица 1

Показатель	Содержание (в %) к сухому веществу			
	в химусе	в нутрихим-2	в нутрихим-1А	в нутрихим-1Б
Общий азот	4,8	4,5	3,7	3,24
Белковый азот	2,3	2,0	3,1	2,8
Небелковый азот	2,2	2,2	0,6	0,44
Аминозот	0,7	0,71	0,48	0,54
Крахмал	13,8	13,1	16,1	20,7
Редуцирующие сахара	12,8	15	9,7	12
Декстрины	2,8	3,0	4,8	3,3
Дисахара (сахароза)	1,6	1,7	1,0	2,2
Общие углеводы	35	34,2	33	45,7
Общие липиды	36,9	36,1	35,8	26,4
Свободные жирные кислоты	15,4	16,32	6,3	5,0

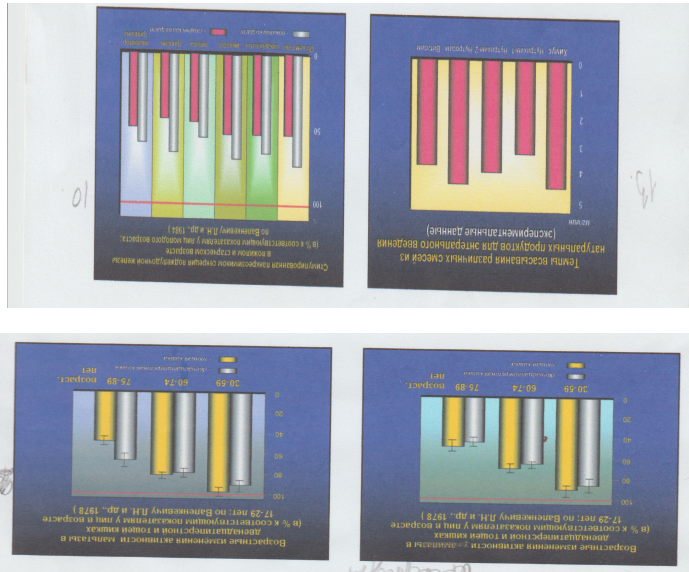


Figure 3. Rates of absorption from native and partially digested mixtures.

They are interesting in terms of assimilation and development of assimilation of compositions with the introduction into them of floccular gel structures (Fig. 4) also discovered by us in the laboratory of YuMGalperin (Research Institute of EM) floccular gel structures and the drug flocozyme created by us on the principle of their formation (Fig. 6), which is a means of rehabilitation for suppressed gastrointestinal function, which is directly related to the mechanism of electrical adaptation and correction of sorbed microbiota and its secretions on flocculi.

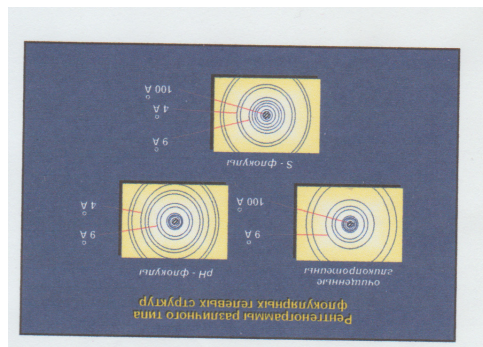


Figure 4.

The drug Flocozyme is a complex of digestive enzymes immobilized in an activating gel, obtained according to the bionic principle and imitating floccular structures formed under natural digestion conditions during the interaction of acidic gastric contents with alkaline juice of the duodenum and the upper parts of the small intestine.

Under natural conditions, floccular formations represent an endogenous dense fraction of chyme, contain proteins, lipids, carbohydrates and a significant amount of glycoproteins (GPs) involved in the formation of the gel, and have an ordered structure of the liquid crystalline type. The effectiveness of the drug has been assessed, and permission has been received for the drug from the Pharmaceutical Committee of the Russian Federation.

Conclusion. Considering the problem in a modern focus format. It should be noted that new meanings are currently being identified in it. A new strategy for combating nutritional disorders is directly related to sorbing floccular structures, the intestinal wall, where the microbiota is also located. Awareness of the importance of nutritional status allows us to more deeply understand the pathogenesis of a number of diseases and propose their personalized correction (including through genetics), apparently influencing serotonin regulation, as well as providing conditions for absorption based on optimizing absorption processes in the intestine. Ways to optimize absorption processes in the intestine, as shown, are associated with the ratio of the dry residue and the liquid part of the digestible composition, with the ratio of nutrients, and, undoubtedly, with the state of processing of the diet with enzymes (including those sorbed on floccular structures).

References

1. Galperin Yu.M. , Lazarev P.I. *Digestion and homeostasis. M., 1989.-148p.*
2. *Nutritionology in oncology of the digestive canal / ed. Kostyuchenko LN.-M., 2019*
3. *Nutritionology in gastroenterology / ed. Kostyuchenko L.N.. – M., 2011.-345 p.*
4. *Parenteral and enteral nutrition. National leadership. M., 2023- 1148 p.*

高等神經活動在學校教育數位化的功能狀況
**THE STATE OF THE FUNCTIONS OF HIGHER NERVOUS
ACTIVITY IN THE DIGITALIZATION OF SCHOOL EDUCATION**

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註解。電腦設備在現代世界的廣泛使用已成為學童發展和教育的一個組成部分。目前，在學校和教育過程中使用電子設備的問題越來越受到關注。在這個問題上尚未達成共識。一種觀點的代表認為，學童需要在教育過程的背景下研究學童在使用計算機設備的情況下高級神經活動的功能，這將表明需要限制額外的負荷，以保持注意力的集中和穩定。我們分析了該主題的現有研究，發現有關電腦對身體各種功能影響的科學著作數量極少。在討論這個主題之前，研究一下身體的表現指標以及各種電腦設備對其的影響似乎與我們極為相關。研究的目的是研究現代電腦設備對學童高級神經活動功能的影響。為了評估注意力和短期記憶，A.R. 提出了「10 個單字」技術。被使用了。盧裡亞。使用波登測試（“校正測試”）進行注意力穩定性的評估。

關鍵字：閃爍融合的臨界頻率、學校注意力、學童的視覺分析器、學校小工具、閱讀速度。

***Annotation.** The widespread use of computer devices in the modern world has become an integral part of the development and education of schoolchildren. Currently, the problem of using gadgets at school, during the educational process, is increasingly being voiced. There is no consensus on this issue. Representatives of one point of view believe that schoolchildren need to Research the functions of higher nervous activity of schoolchildren in conditions of using computer devices against the background of the educational process will show the need to limit additional load in order to maintain concentration and stability of attention. We analyzed existing research on this topic and found that the number of scientific works on the impact of computers on various functions of the body is extremely small. Before discussing this topic, it seemed extremely relevant to us to study the performance indicators of the body and the influence of various computer devices on them. The purpose of the study is to study the influence of modern computer devices on the functions of higher nervous activity of schoolchildren. To assess concentration and short-term memory, the “10 words” technique proposed by*

A.R. was used. Luria. The assessment of stability of attention was carried out using the Bourdon test - "Corrective test".

Keywords: *Critical frequency of flicker fusion, attention at school, visual analyzer of a schoolchild, gadget at school, reading speed.*

From the available literature [3, 8] it is known that an increase in visual load, caused by scientific and technological progress in society, inevitably leads to the development of visual fatigue, both in the adult population and in schoolchildren, which, in turn, reduces the possibilities of cognitive activity. At the same time, only a few [1, 5, 6] of them are devoted to the study of visual fatigue in schoolchildren of various classes.

Scientific and technological progress in society places increasing stress on the organ of vision of a modern schoolchild, which inevitably causes the development of visual fatigue and, as a consequence, a decrease in the performance of the visual analyzer. From the available literature it is known that for the diagnosis of visual fatigue, the determination of the critical flicker fusion frequency (CFFF) is widely used. Since CNSF is a quantity that characterizes the work of the visual analyzer and the central nervous system, namely the speed of impulses in the eye system - pathways - cerebral cortex, studying this indicator will help evaluate the work of the visual analyzer and the central nervous system as a whole. KFSM is the lowest frequency of light flashes at which the person being examined has a feeling of a continuous light flux. CNSF depends on many factors: the concentration of oxygen in the inhaled air, climatic conditions, and the age of the subjects. The influence of gas contamination, dustiness, illumination, as well as the psycho-physiological state of the subjects was revealed on the CSF.

There is information [5, 9] about a close relationship between CNSM and reading speed indicators. It is known that in teaching practice for students, reading speed is an indicator of reading quality. The latter can be widely used as a criterion of visual performance, which is closely related to CFSM. Therefore, by determining the CNSM, it is quite possible to predict the reading speed in each specific case.

However, research and study of the functions of higher nervous activity plays a leading role in the use of computer devices. To decide whether gadgets interfere with the educational process, it is necessary to study the concentration of attention of schoolchildren, short-term memory and the stability of their attention. A report from the Irish Institute of Economic and Social Research notes that gadgets have a particularly detrimental effect on a child's concentration and memory [12]. Scientists from Saratov State Medical University named after Razumovsky established a high frequency of use of mobile, multimedia devices and gadgets by teenagers; on average - 5 ± 2.18 hours a day every day. Excessive use of modern means of communication and game consoles by teenagers leads to a decrease in memory reserves in 55.6% of teenagers; fatigue, decreased concentration, absent-mindedness - in 65.1% of children 14-16 years old [2, 4, 7, 10, 11].

Purpose of the study. The purpose of the study is to study the influence of modern computer devices on the functions of higher nervous activity of schoolchildren.

Research objectives.

1. To study the indicator of the critical flicker fusion frequency (CFFR) of schoolchildren before visual load on the computer.
2. Investigate the dynamics of CFFM after exercise using gadgets for 10 and 40 minutes.
3. Using tests, study concentration and short-term memory, as well as stability of attention.
4. Assess the dynamics of indicators of higher nervous activity during the development of visual fatigue.

Object of study. The subjects of the study were 82 schoolchildren aged 12 to 16 years (average age ± 13.5 years). The schoolchildren applied for examination with their parents, who signed consent to the processing of personal data in the established form and consent to conduct scientific research.

Subject of study. Definition KFSM - the critical frequency of flicker fusion, was carried out on a "Sveto-test" apparatus, consisting of an electronic unit and a red light emitter. Using a regulator installed on the panel of the electronic unit, the frequency of the light emitter was smoothly changed in the range from 1 to 60 (Hz), until the flickering of the light source disappeared from the subject.

To assess concentration and short-term memory, the "10 words" technique proposed by A.R. was used. Luria. The subject is read 10 random words, selected without semantic or associative connections. After reading, they were asked to reproduce the words in any order. Concentration of attention is good if after one reading 8 or more words are reproduced, satisfactory - 7 words, weak - less than 7 words. The assessment of stability of attention was carried out using the Bourdon test - "Corrective test". **Concentration of attention** is estimated using the formula: $K = C2 / P$, where C is the number of rows of the table viewed by the subject, P is the number of errors (omissions or erroneous crossing out of extra characters). An error is considered to be the omission of those letters that should be crossed out, as well as incorrect crossing out. The higher the indicator is, the greater the concentration. But K should not be more than half of C - this is an extremely low concentration; consultation with a psychologist is necessary.

Level of development of concentration	Value, K%
Very good	81 - 100%
Good	61 - 80%
Average	41 - 60%
Bad	21 - 40%
Very bad	0 - 20%

Sustainability of attention assessed by changes in viewing speed throughout the task. Results can be calculated for every 60 seconds using the formula:

$A=S/t$, where A is the pace of execution, S is the number of letters in the viewed part of the proof table, t is the execution time.

Result	Meaning
0 - 2	Very high stability
3 - 4	High
5 - 6	Average
7 - 8	Low
9 - 10	Very low

Own research.

All subjects underwent a study of the critical flicker fusion frequency (CFFF). The results obtained made it possible to divide all schoolchildren into three groups. In group I, the average value of the frequency was 54.2 ± 0.04 Hz in 63% of students. In group II, 48.2 ± 0.03 Hz, it included 25% of those examined. And in group III, the value of CNSF was 44.5 ± 0.03 Hz in 12% of schoolchildren. The analysis showed that in all those examined, the CNFM fluctuated within normal values. All schoolchildren were asked to spend time with the gadget for 10 minutes, after which the KFSM was again determined. In group I the values were 53.2 ± 0.03 Hz, in the second group 47.2 ± 0.03 Hz, and in the third group they also almost did not deviate from the original - 44Hz. Then the same students continued studying with the gadget for another 30 minutes. The HFFM data obtained after the examination were 42.5 ± 0.05 Hz in group I, 38.2 ± 0.02 Hz in group II, and 33.2 ± 0.01 Hz in group III (Fig. 1).

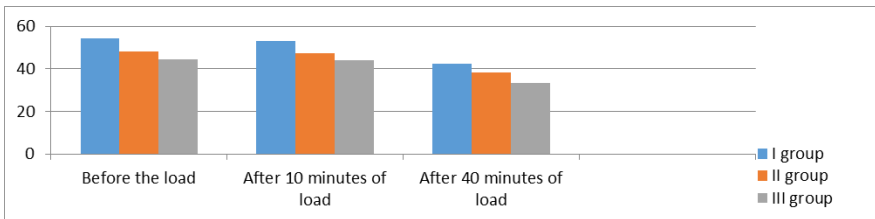


Figure 1. Dynamics of CFSM before and after load.

Analysis of the data obtained showed that in 12% of the examined patients, the initial EFFF was close to the lower limit of normal and, as a result of a 40-minute load, significantly decreased to 33.2 Hz. In group II, maximum computer load led to a deterioration in the critical flicker fusion frequency to 38.2 Hz, which is insignificant.

nificant, but still below normal values. In group I, after 40 minutes of exercise, the EFFR remained normal at 42.5 Hz, but decreased significantly compared to the initial value of 54.2 Hz, which was determined before the exercise. After 10 minutes of working with the computer, the changes in CNSM were insignificant (Table 1).

Table 1.

CNSF values in all groups examined before and after exercise.

KChSM, GC	Before load	After 10 minutes of load	After 40 minutes of load
Group I	54.2	53.2	42.5
Group II	48.2	47.2	38.2
III group	44.5	44.0	33.2

Based on the above, we can conclude that after 10 minutes of working with gadgets, a certain indicator of the performance of the visual analyzer changed slightly. Increasing the load time to 40 minutes led to a significant decrease in EFSI: in group I by 22%, in group II by 21%, in group III by 25%. The results showed that after 40 minutes, visual fatigue reduces the performance of the eye-brain analyzer by an average of 23%. In the groups with initially high and initially low EFFR, the decrease on average did not differ. From this we can conclude that 10-minute sessions with a computer slightly reduce CNFM, although a downward trend has already begun. But 40-minute sessions with a gadget lead to a decrease in performance by almost a quarter. All schoolchildren were tested for concentration and short-term memory. The “10 words” test revealed a good concentration of 8 words in 75% of those examined and a satisfactory concentration of 7 words in 25% (Fig. 2).

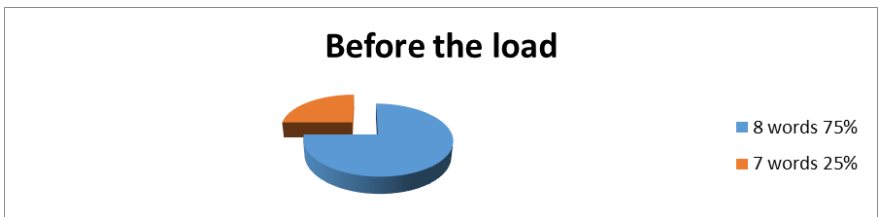


Figure 2. *Dependence of concentration on the “10 words” test on visual load with a gadget.*

After 40 minutes of working with a computer, concentration and short-term memory decreased: good - 8 words for 51%, satisfactory - 7 words for 36%, weak - 6 words for 13% of students (Fig. 3).

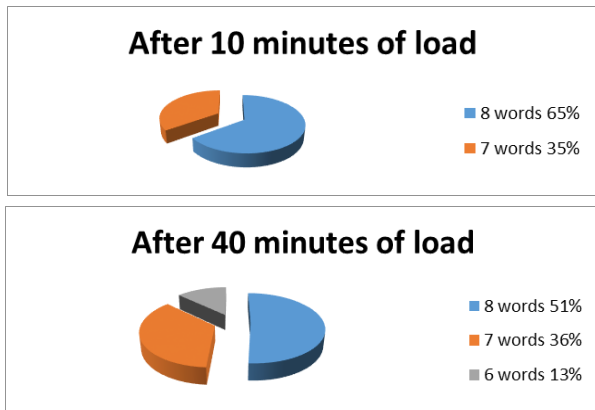


Figure 3. Dependence of concentration on the “10 words” test on visual load with a gadget

We assessed concentration of attention using the “Corrective Test”. Before working with modern computer devices, the concentration level ranged from 64 to 80%, which is rated as good. After 40 minutes of work, it dropped to 25 - 30%, which corresponds to a poor level on the rating scale; the results are presented and summarized in Table 2. Sustainability of attention also worsened after working with the gadget from a high level (3.3 points) to a medium level (4 ,8 points).

Table 2.
State of concentration and stability of attention

	WITH number of lines	P number of errors	$K=S^2/P$ Concentration of attention	S number of views new letters	t time, sec.	$A=S/t$ stand attention span
Before the load	40 40	20 25	80% 60% good	2000	600	3.3 points high
After the load	thirty thirty	thirty 35	thirty% 25% bad	2880	600	4.8 points average

Conclusions. 1. The study of CNSM during visual load revealed a decrease in this indicator when working with gadgets by 23%.

2 The concentration of attention of schoolchildren on the “10 words” test decreased, the number of students with satisfactory concentration increased by 11%, the number of students with good concentration decreased, and in 13% the concentration of attention became weak.

3. The data from the “correction test” after the load of working with modern computers revealed a decrease in the good level of attention to poor on the rating scale, and the stability of attention from a high level to a medium level.

References

1. *Batuev A.S. Physiology of higher nervous activity and sensory systems / A.S. Batuev; textbook for universities. - 3rd ed. - St. Petersburg: Peter, 2010. -317 p.*
2. *Voyskunsky A.E. The phenomenon of Internet addiction // Humanitarian research on the Internet. – 2000. – No. 6. – P. 100–131. URL: <http://nest.udm.net/unter/flowvois.htm>.*
3. *Electrophysiological studies in ophthalmology. R.A. Gundorova, M.V. Zueva, I.V. Tsapenko. //Electrophysiological studies in ophthalmology., Sat. scientific works, - Moscow: Publishing house JSC “Rusomed”, 1993 - 302.*
4. *Gunn G. E. Computer: how to maintain health: Recommendations for children and adults, St. Petersburg: Neva; M.: Olma - Press, 2003.*
5. *Egorova M. S. et al. KChSM in determining the visual performance of schoolchildren //Sb. Proceedings, Moscow, 1988.*
6. *Zhukova I. A. “Modern gadgets and their impact on children”, M.: 2012.*
7. *Luria A.R. Lectures on general psychology / A.R. Luria. - St. Petersburg - Peter, 2012. - 320 p.*
8. *Manuilova L. M., Maksimov A. S. Diagnostics of the influence of risks of the Internet space when schoolchildren of older adolescence use gadgets. - Journal “World of Science. Pedagogy and Psychology”, - section 2. - Pedagogical Sciences, 2018. - pp. 94-98, <https://mir-nauki.com>.*
9. *Sagadatova N. M. Complex diagnosis and treatment of computer visual syndrome, 2004.*
10. *Sokolova A. A. Analysis of the state of development of the problem of risks of the Internet space for the health of adolescents based on materials from foreign literature // Personal Education. – 2015. – No. 3. – P. 42–47. URL: https://elibrary.ru/download/elibrary_25004138_11587197.pdf.*
11. *Taburisa V. A. The influence of gadgets on the child’s psyche: markers of the problem, spectrum of consequences [Electronic resource] // Scientific and methodological electronic journal “Concept”. – 2016. – T. 15. – P. 1826–1830. URL: <http://e-koncept.ru/2016/96284.htm>.*
12. *Livingstone S., Smith PK (UK) Annual research review: Harms experienced by child users of online and mobile technologies: The nature, prevalence and management of sexual and aggressive risks in the digital age // Journal of Child Psychology and Psychiatry and Allied Disciplines, 2014. - Vol. 6. - pp. 635–654.*

代謝症候群女性的妊娠和分娩併發症
**COMPLICATIONS OF PREGNANCY AND LABOR IN WOMEN
WITH METABOLIC SYNDROME**

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抽象的。過去十年，全球代謝症候群發生率顯著上升，已開發國家成年人超重和肥胖盛行率已超過60%。人們認為，代謝症候群與妊娠、分娩和產後的不良後果直接或間接相關，包括子癇前症、妊娠糖尿病、靜脈血栓栓塞併發症、產後出血和臨產無力的高風險。肥胖婦女的孩子早產、巨大兒、產前胎兒死亡、分娩過程中的創傷以及代謝和神經系統疾病的風險增加。此外，孕婦的代謝症候群可能會使她們的後代容易出現長期健康問題，可能造成肥胖和胰島素抗性的世代循環。本篇綜述探討了代謝症候群對妊娠和分娩過程及可能結果的影響。

關鍵字：代謝症候群、肥胖、懷孕、子癇前症、妊娠糖尿病、剖腹產、糖尿病胎兒疾病、巨大兒。

Abstract. *Over the past decade, rates of metabolic syndrome have increased significantly worldwide, and the prevalence of overweight and obesity among adults has exceeded 60% in developed countries. It is believed that metabolic syndrome is directly and indirectly associated with adverse consequences of pregnancy, childbirth and the postpartum period, including a high risk of preeclampsia, gestational diabetes mellitus, venous thromboembolic complications, postpartum*

hemorrhage, and weakness of labor. Children of obese women are at increased risk of prematurity, macrosomia, antenatal fetal death, trauma during childbirth, and metabolic and neurological disorders. Additionally, metabolic syndrome in pregnant women may predispose their offspring to long-term health problems, potentially creating an intergenerational cycle of obesity and insulin resistance. This review examines the impact of metabolic syndrome on the course and possible outcomes of pregnancy and childbirth.

Keywords: *metabolic syndrome, obesity, pregnancy, preeclampsia, gestational diabetes mellitus, cesarean section, diabetic fetopathy, macrosomia.*

Metabolic syndrome (MS) and obesity are a major public health problem of the 21st century. Over the past decade, the prevalence of overweight (body mass index (BMI) 25–29.9 kg/m²) and obesity (BMI ≥ 30 kg/m²) has been steadily increasing in most countries [2, 45]. The World Obesity Atlas estimates that more than 2.6 billion people will be obese in 2023, representing approximately 40% of the world's population [45]. Annually, approximately 39 million pregnancies are complicated by metabolic syndrome, and in some countries, the estimated prevalence of overweight and obesity during pregnancy exceeds 60%.

Metabolic syndrome is a significant risk factor for such complications of pregnancy and childbirth as gestational diabetes mellitus (GDM), preeclampsia (PE), labor anomalies, and therefore the risk of surgical delivery increases, and the chances of successful induction of labor activity is progressively decreasing [2, 11, 20]. This review examines possible complications of pregnancy and childbirth due to metabolic syndrome.

The leading complication of pregnancy with obesity is gestational diabetes mellitus (GDM), the risk of which is more than 2 times higher than in normal weight patients [47, 48]. Moreover, Yao D et al (2020) and Alwash SM et al (2021) noted that visceral and central obesity, which are a major component of metabolic syndrome, are more significant risk factors than general obesity [49, 50].

Pregnancy is an insulin-resistant condition in which changes in insulin signaling pathways suppress glucose uptake into peripheral tissues by redirecting it to the fetus [19, 51]. This is associated with a decrease in the post-receptor insulin signaling cascade, in particular, with a decrease in tyrosine phosphorylation, a substrate of insulin receptor 1, which leads to a decrease in the ability to translocate the glucose transporter GLUT 4 to the surface of the muscle cell [54]. Persistent insulin resistance in gestational diabetes may be associated with inflammatory factors caused by the action of placental hormones and other cytokines that affect the post-receptor insulin signaling cascade [18, 19, 20]. Against this metabolic background, some women develop GDM.

Insulin resistance is a promoter of vascular endothelial dysfunction and a systemic pro-inflammatory state resulting from the production of cytokines from ad-

ipose tissue [21, 25]. In addition, IR of vascular endothelial cells is the leading mechanism for reducing the formation of nitric oxide II (NO), which has powerful angioprotective and vasodilating properties, which ultimately leads to the clinical manifestations of PE and MS [13]. L.L. Wu et al. (2021) found that the incidence of PE is 10 times higher in women with metabolic syndrome compared to normal weight patients [22].

The energy needs of the maternal body during pregnancy in the context of insulin resistance are met by the accumulation of atherogenic lipid fractions [4, 13, 22]. Pregnant women with preeclampsia (PE) demonstrate a significant predominance of triglyceride (TG) levels, high-density lipoproteins (HDL), and the triglyceride (TG)/HDL ratio compared to patients with normotension, indicating the common development of atherogenic disorders in metabolic syndrome and preeclampsia [13, 14, 20, 21].

Earlier it was believed that obesity is a risk factor for late-onset pre-eclampsia, but a study by BicoCCA MJ et al. (2020) demonstrated that maternal obesity is associated with both early and late onset of pre-eclampsia [23]. Moreover, it has been shown that reducing the mother's weight before conception through lifestyle changes or bariatric surgery reduces the risk of pre-eclampsia [24].

During pregnancy, a state of physiological hypercoagulability develops due to the activation of antithrombotic mechanisms, leading to an increase in the levels of blood coagulation factors, tumor necrosis factor-alpha (TNF- α), plasminogen, and plasminogen activator inhibitor. Elevated TNF- α and plasminogen activator inhibitor are independent factors of thrombophilia and thrombosis during pregnancy and the postpartum period [16]. The pathogenesis of venous thromboembolic complications (VTEC) in pregnant women with metabolic syndrome includes enhanced coagulation, decreased fibrinolysis, venous stasis, endothelial dysfunction, and systemic inflammation [23]. High metabolic activity of adipose tissue, intensifying the release of IL-6, tumor necrosis factor-alpha, TF, and PAI-1, generates a hypofibrinolytic, prothrombotic, proinflammatory state, intensifies endothelial dysfunction, and contributes to oxidative stress. This cascade exacerbates the risk of VTEC occurrence [18, 43]. For example, a study by Butwick A.J. et al. (2019) showed that the risk of developing VTE during pregnancy and the postpartum period was significantly higher in women with obesity compared to normal-weight patients. Moreover, women with level 3 obesity had the highest chance of developing VTE before delivery compared to patients with normal BMI [13].

Obesity is one of the key risk factors for postpartum hemorrhage, which is more than twice as high in women with a BMI ≥ 30 kg/m² compared to normal-weight patients [45, 46]. This is due to the larger weight of the fetus and head circumference of children born to women with metabolic syndrome.

Women with obesity and metabolic syndrome are less likely to initiate and sustain spontaneous labor than normal-weight patients. In the study by Mustafa HJ et

al (2023), it was found that obesity in mice resulted in increased uterine contractile activity during labor, but the contractions were uncoordinated and labor duration was extended by 9 hours [47]. Additionally, the results of this study are consistent with several studies describing labor activity in humans. For instance, women with obesity had three times less efficiency of labor induction than patients with normal weight, resulting in a higher frequency of emergency cesarean section due to the lack of oxytocin-induced labor stimulation effect [5, 48, 49, 50]. Several studies have shown that the risk of emergency cesarean section increased proportionally with BMI, reaching a maximum at a value of 40 kg/m², corresponding to morbid obesity [51, 54].

In the case of metabolic syndrome, there is a failure in insulin signaling, leading to inadequate translocation of glucose transporter 4 (GLUT4), the primary transporter responsible for glucose delivery into cells [70]. The rate of insulin-stimulated glucose uptake is reduced by 54% in metabolic syndrome compared to normal pregnancy, while the amount of insulin receptors remains unchanged [70]. Furthermore, alterations in the expression and phosphorylation of underlying regulators of insulin signaling, including insulin receptor substrate (IRS)-1, phosphatidylinositol-3-kinase (PI3K), and GLUT4, have been described [68]. It is considered that saturated fatty acids, pro-inflammatory cytokines, and adiponectin increase intracellular diacylglycerol concentrations in myocytes, activating protein kinase C and inhibiting tyrosine kinase IRS-1 and PI3K [69]. This pathophysiological mechanism may underlie the development of gestational diabetes mellitus in the context of metabolic syndrome.

Pregnant women with obesity tend to have increased upper body fat deposits, and the propensity for centralized fat accumulation raises the concentration of free fatty acids and lipotoxicity, leading to inflammation, endothelial dysfunction, decreased trophoblast invasion, and, consequently, impaired placental function [24]. Excessive supply of lipids and glucose to the fetus in the setting of suboptimal placental function contributes to an excess supply of macro- and micronutrients to the fetus, increasing the risk of macrosomia, diabetic fetopathy, and childhood obesity as a result [15, 25]. Additionally, children born to mothers with metabolic syndrome are at a higher risk of neonatal complications compared to those born to mothers without metabolic disorders [2, 6, 10]. Diabetic fetopathy (DF), including morphofunctional immaturity, perinatal central nervous system (CNS) damage, and maladaptation in the early neonatal period, is a characteristic neonatal complication in mothers with metabolic syndrome [6, 7, 9]. Moreover, newborns from mothers with metabolic syndrome are more likely to develop hepatomegaly, CNS depression syndrome, and diabetic cardiomyopathy [2, 7, 8, 11].

In addition to perinatal adverse consequences, maternal obesity is also associated with long-term diseases in children. Several studies have shown that inflam-

matory states during pregnancy are associated with the development of childhood obesity, neurodevelopmental disorders, asthma, and allergic diseases later in life [2, 7, 8].

There is increasing evidence that children born to mothers with MS are more prone to neuro-psychiatric developmental disorders. For example, several studies have shown that children born to mothers with MS have higher rates of autism spectrum disorders and hospitalizations related to neuro-psychiatric disorders [57-59]. Additionally, these children had lower IQ scores and were more likely to suffer from attention deficit hyperactivity disorder [57-59]. Increased lipid peroxidation, microglial activation, and elevated expression of pro-inflammatory cytokines in children born to mothers with MS suggest that neuroinflammation and oxidative stress play an important role in the development of maladaptive processes in the brain [60].

Several studies have shown that children born to mothers with MS are at higher risk for allergic diseases, including atopic dermatitis and asthma [61-63]. Furthermore, a higher level of leptin in umbilical cord blood was directly proportional to the risk of asthma in 3-year-old children [64].

MS in mothers predisposes children to cardiometabolic diseases by altering the development of the cardiovascular system. In a study by Razaz N et al, it was found that children born to mothers with MS are at higher risk for developing cardiovascular diseases, excluding congenital heart defects [65]. Moreover, there was a positive correlation between maternal BMI before pregnancy and offspring blood pressure, independent of birth weight [66].

In addition to cardiovascular diseases, children born to mothers with MS are also at higher risk for obesity, insulin resistance, and ultimately type 2 diabetes [67].

Conclusion

As the prevalence of overweight, obesity, and metabolic syndrome continues to rise year on year, the associated health risks to pregnant women and their infants, as well as the costs of managing complicated pregnancies, become increasingly significant. Therefore, it is necessary to develop modern approaches to the management of such patients in order to reduce the risk of adverse outcomes of pregnancy and childbirth.

References

1. *Essays on endocrine gynecology / V. E. Radzinsky, O. A. Raevskaya, I. A. Ilovayskaya [and others]. – Moscow: Limited Liability Company “Media Bureau Status Present”, 2020. – 576 p. – ISBN 978-5-907218-05-5.*

2. *Obesity. Diabetes. Pregnancy. Versions and contraversions. Clinical practices. Prospects* / V. E. Radzinsky, T. L. Botasheva, O. V. Papyshcheva [and others]; edited by V. E. Radzinsky, T. L. Botasheva, G. A. Kotaish (responsible editor). - Moscow: GEOTAR-Media, 2020. - 528 p.

3. *Gestational diabetes mellitus - another mask of metabolic syndrome?* / O. V. Papyshcheva, G. A. Kotaish, O. B. Lukanovskaya [etc.] // *Obstetrics and gynecology. News. Opinions. Education.* – 2019. – T. 7, No. 3(25). – pp. 32-37. – DOI 10.24411/2303-9698-2019-13005. – EDN UYOOME.

4. Haddad H., Kyrtykov S.I., Orazmuradov A.A., Zokirova N.M., Bekbaeva I.V., Morozov S.G., Krylova Yu.V., Zulumyan T.N., Suleymanova Zh.Zh., Mukovnikova E.V., Orazmuradova A.A. *Clinical and anamnestic features of obese pregnant women* // *Obstetrics and gynecology: news, opinions, training.* 2022. T. 10, no. 3. pp. 16-20.

5. Zokirova N.M., Orazmuradov A.A., Bekbaeva I.V., Haddad H., Minaeva A.V., Kyrtykov S.I., Kotaish G.A. *The effectiveness of programmed childbirth in women with extragenital diseases* // *Obstetrics and gynecology: news, opinions, training.* 2021. Vol. 9, No. 3. Appendix. pp. 98-101.

6. Papyshcheva O.V., Kotaish G.A., Savenkova I.V., Arakelyan G.A., Lukanovskaya O.B., Damirova S.F. *The influence of pregestational obesity on perinatal outcomes in women with gestational diabetes mellitus* // *Obstetrics and gynecology: opinion news, training.* 2019. Vol. 7, No. 3. Appendix. pp. 25-30.

7. Loginova E.V., Arakelyan G.A., Savenkova I.V., Gagaev D.Ch., Orazmuradov A.A., Gagaev Ch.G. *Modern ideas about the health of children born to mothers with diabetes* // *Obstetrics and gynecology: news, opinions, training.* 2019. Vol. 7, No. 3. Appendix. pp. 56-62. doi: 10.24411/2303-9698-2019-13907

8. Arakelyan G.A., Orazmuradov A.A., Mayatskaya T.A., Bekbaeva I.V., Kotaish G.A. *Features of newborns from mothers with gestational diabetes mellitus and pregestational obesity* // *Obstetrics and gynecology: news, opinions, training.* 2020. Vol. 8, No. 3. Appendix. pp. 24-29. DOI: 10.24411/2303-9698-2020-13904

9. Orazmuradov A.A., Papyshcheva O.V., Kotaish G.A., Bekbaeva I.V., Akhmatova A.N., Islomov Sh.I., Arakelyan G.A. *Weight gain and features of gestational diabetes mellitus* // *Obstetrics and gynecology: news, opinions, training.* 2020. Vol. 8, No. 3. Appendix. pp. 19-23. DOI: 10.24411/2303-9698-2020-13903

10. *Assessment of risk factors for the development of maladjustment syndrome in newborns from mothers with obesity and overweight* / V. A. Prilutskaya, A. V. Sukalo, Yu. A. Shishko [etc.] // *Pediatrics. Eastern Europe.* – 2019. – T. 7, No. 3. – P. 445-452.

11. *The state of lipid and carbohydrate metabolism in children born to mothers with gestational diabetes mellitus* / O. V. Papyshcheva, L. A. Kharitonova, G. A. Kotaish, D. A. Shurygina // *Experimental and clinical gastroenterology.* – 2019. – No. 1(161). – pp. 137-144. – DOI 10.31146/1682-8658-ecg-161-1-137-144.

12. *Analysis of complications of pregnancy and childbirth in patients with metabolic syndrome* / I. P. Koval, N. A. Denisova, E. V. Kravchenko [etc.] // *New technologies in obstetrics and gynecology: Collection of scientific papers of the Far Eastern Regional Scientific and Practical conference, Khabarovsk, May 26–27, 2022* / Rep. editor T. Yu. Pestrikova. – Khabarovsk: Far Eastern State Medical University, 2022. – P. 52-59.

13. *Staged stratification of pregnant women according to the risk of preeclampsia* / Yu. V. Tezikov, I. S. Lipatov, A. R. Azamatov [etc.] // *Medical Council*. – 2021. – No. 4. – P. 174-184. – DOI 10.21518/2079-701X-2021-4-174-184.

14. Azamatov A.R., Tezikov Yu.V., Lipatov I.S. *Pathogenetic substantiation of early diagnostic criteria for severe preeclampsia*. *Russian Bulletin of Obstetrician-Gynecologist*. 2021;21(2):513.

15. Shaposhnikova E.V., Bazina M.I., Mentsik M.M., Shageeva E.V., Shageev T.A. *Features of the course of pregnancy and delivery in patients with carbohydrate metabolism disorders*. *RMJ. Mother and child*. 2020;3(3):163-168. DOI: 10.32364/2618-8430-2020-3-3-163-168.

16. Seregina Daria Sergeevna, Nikolaenkov Igor Pavlovich, Kuzminykh Tatyana Ulyanovna. *Obesity is the leading pathogenetic link in the pathological course of pregnancy and childbirth* // *Zh. obstetrics. and wives disease.*. 2020. No. 2.

17. Kuzina I.A., Goncharova E.V., Martirosyan N.S., Telnova M.E., Atamanova Yu.A., Yudina K.A., Petunina N.A. *The state of hemostasis in women with obesity and metabolic syndrome*. *RMJ. Medical Review*. 2021;5(9):598-604. DOI: 10.32364/2587-6821-2021-5-9-598-604.

18. Petrov, Yu. A. *Features of the course of pregnancy in women with metabolic syndrome complicated by thrombophilia* / Yu. A. Petrov, N. S. Kalinina // *Scientific review. Medical Sciences*. – 2020. – No. 1. – P. 25-29.

19. *“Pregnancy is a natural model of metabolic syndrome”: results of a dynamic study of physiological gestation* / I. S. Lipatov, Yu. V. Tezikov, R. G. Shmakov [etc.] // *Obstetrics and Gynecology*. – 2020. – No. 9. – P. 88-96. – DOI 10.18565/aig.2020.9.88-96.

20. Savina, A.K. *Analysis of complications of pregnancy and childbirth in patients with metabolic syndrome* / A.K. Savina // *Medicine of the future: collection of materials, Vladivostok, May 24–27, 2022* / Far Eastern Federal University, School of Medicine. – Vladivostok: Far Eastern Federal University, 2022. – P. 46-48.

21. Ugurchieva, Kh. M. *Clinical and pathogenetic features of early and late pregnancy with metabolic syndrome: connection with the formation of preeclampsia* / Kh. M. Ugurchieva // *New challenges - new research: Collection of articles of the International Scientific and Practical Conference, Petrozavodsk, September 13 2022*. – Petrozavodsk: International Center for Scientific Partnership “New Science” (IP Ivanovskaya I.I.), 2022. – P. 10-14.

22. *Commonality of clinical manifestations of preeclampsia and metabolic syndrome: search for justification / I. S. Lipatov, Yu. V. Tezikov, A. R. Azamatov, R. G. Shmakov // Obstetrics and Gynecology. – 2021. – No. 3. – P. 81-89. – DOI 10.18565/aig.2021.3.81-89.*

23. *State of hemostasis in women with obesity and metabolic syndrome / I. A. Kuzina, E. V. Goncharova, N. S. Martirosyan [etc.] // Breast cancer. Medical Review. – 2021. – T. 5, No. 9. – P. 598-604. – DOI 10.32364/2587-6821-2021-5-9-598-604.*

24. *Evsyukova, I. I. Molecular mechanisms of functioning of the “mother-placenta-fetus” system in obesity and gestational diabetes mellitus / I. I. Evsyukova // Molecular Medicine. – 2020. – T. 18, No. 1. – P. 11-15. – DOI 10.29296/24999490-2020-01-02.*

25. *Patent No. 2693412 C1 Russian Federation, IPC G01N 33/53. Method for predicting early and late preeclampsia: No. 2018140787: application. 11/20/2018: publ. 07/02/2019 / Yu. V. Tezikov, I. S. Lipatov, A. R. Azamatov, N. V. Martynova.*

26. *World Obesity Atlas, 2023*

27. *Langley-Evans SC, Pearce J, Ellis S. Overweight, obesity and excessive weight gain in pregnancy as risk factors for adverse pregnancy outcomes: A narrative review. J Hum Nutr Diet. 2022 Apr;35(2):250-264. doi: 10.1111/jhn.12999. Epub 2022 Mar 20. PMID: 35239212; PMCID: PMC9311414.*

28. *Relph S, Guo Y, Harvey ALJ, Vieira MC, Corsi DJ, Gaudet LM, Pasupathy D. Characteristics associated with uncomplicated pregnancies in women with obesity: a population-based cohort study. BMC Pregnancy Childbirth. 2021 Mar 5;21(1):182. doi: 10.1186/s12884-021-03663-2. PMID: 33673827; PMCID: PMC7934497.*

29. *Najafi F, Hasani J, Izadi N, Hashemi-Nazari SS, Namvar Z, Shamsi H, Erfanpoor S. Risk of gestational diabetes mellitus by pre-pregnancy body mass index: A systematic review and meta-analysis. Diabetes Metab Syndr. 2021 Jul-Aug;15(4):102181. doi: 10.1016/j.dsx.2021.06.018. Epub 2021 Jun 19. PMID: 34214900.*

30. *Yao D, Chang Q, Wu QJ, Gao SY, Zhao H, Liu YS, Jiang YT, Zhao YH. Relationship between Maternal Central Obesity and the Risk of Gestational Diabetes Mellitus: A Systematic Review and Meta-Analysis of Cohort Studies. J Diabetes Res. 2020 Apr 2;2020:6303820. doi: 10.1155/2020/6303820. PMID: 32337296; PMCID: PMC7157762.*

31. *Alwash SM, McIntyre HD, Mamun A. The association of general obesity, central obesity and visceral body fat with the risk of gestational diabetes mellitus: Evidence from a systematic review and meta-analysis. Obes Res Clin Pract. 2021 Sep-Oct;15(5):425-430. doi: 10.1016/j.orcp.2021.07.005. Epub 2021 Aug 11. PMID: 34391692.*

32. Kampmann U, Knorr S, Fuglsang J, Ovesen P. Determinants of Maternal Insulin Resistance during Pregnancy: An Updated Overview. *J Diabetes Res*. 2019 Nov 19;2019:5320156. doi: 10.1155/2019/5320156. PMID: 31828161; PMCID: PMC6885766.

33. Huang B, Huang C, Zhao H, Zhu W, Wang B, Wang H, Chen J, Xiao T, Niu J, Zhang J. Impact of GPR1 signaling on maternal high-fat feeding and placenta metabolism in mice. *Am J Physiol Endocrinol Metab*. 2019 Jun 1;316(6):E987-E997. doi: 10.1152/ajpendo.00437.2018. Epub 2019 Mar 5. PMID: 30835511.

34. Szlapinski SK, Hill DJ. Metabolic Adaptations to Pregnancy in Healthy and Gestational Diabetic Pregnancies: The Pancreas - Placenta Axis. *Curr Vasc Pharmacol*. 2021;19(2):141-153. doi: 10.2174/1570161118666200320111209. PMID: 32196450.

35. Arroyo-Jousse V, Jaramillo A, Castaño-Moreno E, Lépez M, Carrasco-Negüé K, Casanello P. Adipokines underlie the early origins of obesity and associated metabolic comorbidities in the offspring of women with pregestational obesity. *Biochim Biophys Acta Mol Basis Dis*. 2020 Feb 1;1866(2):165558. doi: 10.1016/j.bbadis.2019.165558. Epub 2019 Oct 23. PMID: 31654701.

36. Nguyen-Ngo C, Willcox JC, Lappas M. Anti-Diabetic, Anti-Inflammatory, and Anti-Oxidant Effects of Naringenin in an In Vitro Human Model and an In Vivo Murine Model of Gestational Diabetes Mellitus. *Mol Nutr Food Res*. 2019 Oct;63(19):e1900224. doi: 10.1002/mnfr.201900224. Epub 2019 Jul 31. PMID: 31343820.

37. Poornima IG, Indaram M, Ross JD, Agarwala A, Wild RA. Hyperlipidemia and risk for preeclampsia. *J Clin Lipidol*. 2022 May-Jun;16(3):253-260. doi: 10.1016/j.jacl.2022.02.005. Epub 2022 Feb 20. PMID: 35260347; PMCID: PMC10320742.

38. Wu LL, Chen YX, Guan XN, Tong JN, Wu XX, Niu JM. [Associations between pre-pregnancy body mass index and occurrence and clinical features of preeclampsia]. *Zhonghua Fu Chan Ke Za Zhi*. 2021 Feb 25;56(2):96-101. Chinese doi: 10.3760/cma.j.cn112141-20200904-00691. PMID: 33631880.

39. Bicocca MJ, Mendez-Figueroa H, Chauhan SP, Sibai BM. Maternal Obesity and the Risk of Early-Onset and Late-Onset Hypertensive Disorders of Pregnancy. *Obstet Gynecol*. 2020 Jul;136(1):118-127. doi: 10.1097/AOG.0000000000003901. PMID: 32541276.

40. Schenkelaars N, Rousian M, Hoek J, Schoenmakers S, Willemsen S, Steegers-Theunissen R. Preconceptional maternal weight loss and hypertensive disorders in pregnancy: a systematic review and meta-analysis. *Eur J Clin Nutr*. 2021 Dec;75(12):1684-1697. doi:10.1038/s41430-021-00902-9. Epub 2021 Apr 9. PMID: 33837274.

41. Easton ZJW, Regnault TRH. *The Impact of Maternal Body Composition and Dietary Fat Consumption upon Placental Lipid Processing and Offspring Metabolic Health*. *Nutrients*. 2020 Oct 3;12(10):3031. doi: 10.3390/nu12103031. PMID: 33022934; PMCID: PMC7601624.

42. Hu J, Liu Y, Wei X, Li L, Gao M, Liu Y, Ma Y, Wen D. *Association of gestational diabetes mellitus with offspring weight status across infancy: a prospective birth cohort study in China*. *BMC Pregnancy Childbirth*. 2021 Jan 6;21(1):21. doi: 10.1186/s12884-020-03494-7. PMID: 33407256; PMCID: PMC7789150.

43. Cozzolino M, García-Velasco JA, Meseguer M, Pellicer A, Bellver J. *Female obesity increases the risk of miscarriage of euploid embryos*. *Fertil Steril*. 2021 Jun;115(6):1495-1502. doi: 10.1016/j.fertnstert.2020.09.139. Epub 2020 Nov 30. PMID: 33267960.

44. Butwick AJ, Bentley J, Leonard SA et al. *Pregnancy maternal body mass index and venous thromboembolism: a population based cohort study*. *BJOG*. 2019;126(5):581-588. DOI: 10.1111/1471-0528.15567.

45. Dalbye R, Gunnes N, Blix E, Zhang J, Eggebø T, Nistov Tokheim L, Øian P, Bernitz S. *Maternal body mass index and risk of obstetric, maternal and neonatal outcomes: A cohort study of nulliparous women with spontaneous onset of labor*. *Acta Obstet Gynecol Scand*. 2021 Mar;100(3):521-530. doi: 10.1111/aogs.14017. Epub 2020 Nov 27. PMID: 3303156

46. Thies-Lagergren L, Kvist LJ, Gottvall K, Jangsten E. *A Swedish register-based study exploring primary postpartum hemorrhage in 405,936 full-term vaginal births between 2005 and 2015*. *Eur J Obstet Gynecol Reprod Biol*. 2021 Mar;258:184-188. doi: 10.1016/j.ejogrb.2020.12.018. Epub 2021 Jan 5.P

47. Mustafa HJ, Seif K, Javinani A, Aghajani F, Orlinsky R, Alvarez MV, Ryan A, Crimmins S. *Gestational weight gain below instead of within the guidelines per class of maternal obesity: a systematic review and meta-analysis of obstetrical and neonatal outcomes*. *Am J Obstet Gynecol MFM*. 2022 Sep;4(5):100682. doi: 10.1016/j.ajogmf.2022.100682. Epub 2022 Jun 18. PMID: 35728780.

48. Doi L, Williams AJ, Marryat L, Frank J. *Cohort study of high maternal body mass index and the risk of adverse pregnancy and delivery outcomes in Scotland*. *BMJ Open*. 2020 Feb 20;10(2):e026168. doi: 10.1136/bmjopen-2018-026168. PMID: 32086347; PMCID: PMC7045241.

49. Lauth C, Huet J, Dolley P, Thibon P, Dreyfus M. *Maternal obesity in prolonged pregnancy: Labor, mode of delivery, maternal and fetal outcomes*. *J Gynecol Obstet Hum Reprod*. 2021 Jan;50(1):101909. doi: 10.1016/j.jogoh.2020.101909. Epub 2020 Sep 12. PMID: 32927107.

50. Kerbage Y, Senat MV, Drumez E, Subtil D, Vayssiere C, Deruelle P. *Risk factors for failed induction of labor among pregnant women with Class III obesity*. *Acta Obstet Gynecol Scand*. 2020 May;99(5):637-643. doi: 10.1111/aogs.13794. Epub 2020 Jan 8. PMID: 31863451.

51. Drummond R, Patel M, Myers M, Ritter A, Hurvitz JA, Goetzinger KR, Crimmins SD. Class III obesity is an independent risk factor for unsuccessful induction of labor. *AJOG Globe Rep.* 2022 Sep 23;2(4):100109. doi: 10.1016/j.xagr.2022.100109. PMID: 36311296; PMCID: PMC9596871.

52. Hamm RF, Teefey CP, Dolin CD, Durnwald CP, Srinivas SK, Levine LD. Risk of Cesarean Delivery for Women with Obesity Using a Standardized Labor Induction Protocol. *Am J Perinatol.* 2021 Dec;38(14):1453-1458. doi: 10.1055/s-0041-1732459. Epub 2021 Jul 19. PMID: 34282575; PMCID: PMC9108751.

53. Volk HE, Park B, Hollingue C, Jones KL, Ashwood P, Windham GC, Lurman F, Alexeeff SE, Kharrazi M, Pearl M, Van de Water J, Croen LA. Maternal immune response and air pollution exposure during pregnancy: insights from the Early Markers for Autism (EMA) study. *J Neurodev Discord.* 2020 Dec 16;12(1):42. doi: 10.1186/s11689-020-09343-0. PMID: 33327930; PMCID: PMC7745402.

54. Rothers J, Stern DA, Lohman IC, Spangenberg A, Wright AL, DeVries A, Vercelli D, Halonen M. Maternal Cytokine Profiles during Pregnancy Predict Asthma in Children of Mothers without Asthma. *Am J Respir Cell Mol Biol.* 2018 Nov;59(5):592-600. doi: 10.1165/rcmb.2017-0410OC. PMID: 29863910; PMCID: PMC6236694.

55. Coo H, Fabrigar L, Davies G, Fitzpatrick R, Flavin M. Are observed associations between a high maternal pregnancy body mass index and offspring IQ likely to be causal? *J Epidemiol Community Health.* 2019 Oct;73(10):920-928. doi: 10.1136/jech-2019-212257. Epub 2019 Jul 29. PMID: 31358534.

56. Windham GC, Anderson M, Lyall K, Daniels JL, Kral TVE, Croen LA, Levy SE, Bradley CB, Cordero C, Young L, Schieve LA. Maternal Pre-pregnancy Body Mass Index and Gestational Weight Gain in Relation to Autism Spectrum Disorder and other Developmental Disorders in Offspring. *Autism Res.* 2019 Feb;12(2):316-327. doi: 10.1002/aur.2057. Epub 2018 Dec 21. PMID: 30575327; PMCID: PMC7778460.

57. Jenabi E, Bashirian S, Khazaei S, Basiri Z. The maternal prepregnancy body mass index and the risk of attention deficit hyperactivity disorder among children and adolescents: a systematic review and meta-analysis. *Korean J Pediatr.* 2019 Oct;62(10):374-379. doi: 10.3345/kjp.2019.00185. Epub 2019 Jun 14. PMID: 31208166; PMCID: PMC6801198.

58. Parker SE, Carlson JM, Kebede N, Werler MM, Janulewicz PA. Pre-pregnancy body mass index and parent and teacher-reported behavioral outcomes among offspring in childhood. *Neurotoxicol Teratol.* 2022 Jan-Feb;89:107049. doi: 10.1016/j.ntt.2021.107049. Epub 2021 Nov 12. PMID: 34780987; PMCID: PMC8819681.

59. Zhang J, Peng L, Chang Q, Xu R, Zhong N, Huang Q, Zhong M, Yu Y. Maternal obesity and risk of cerebral palsy in children: a systematic review and meta-analysis. *Dev Med Child Neurol.* 2019 Jan;61(1):31-38. doi: 10.1111/dmcn.13982. Epub 2018 Aug 7. PMID: 30084489.

60. Yoo HJ, Kwon MS. *Aged Microglia in Neurodegenerative Diseases: Microglia Lifespan and Culture Methods*. *Front Aging Neurosci*. 2022 Jan 5;13:766267. doi: 10.3389/fnagi.2021.766267. PMID: 35069173; PMCID: PMC8766407.

61. Drucker AM, Pope EI, Field AE, Qureshi AA, Dumas O, Camargo CA Jr. *Association Between Maternal Pre-Pregnancy Body Mass Index, Gestational Weight Gain, and Offspring Atopic Dermatitis: A Prospective Cohort Study*. *J Allergy Clin Immunol Pract*. 2019 Jan;7(1):96-102.e2. doi: 10.1016/j.jaip.2018.10.044. Epub 2018 Nov 8. PMID: 30414948; PMCID: PMC6312733.

62. Liu S, Zhou B, Wang Y, Wang K, Zhang Z, Niu W. *Pre-pregnancy Maternal Weight and Gestational Weight Gain Increase the Risk for Childhood Asthma and Wheeze: An Updated Meta-Analysis*. *Front Pediatr*. 2020 Apr 3;8:134. doi: 10.3389/fped.2020.00134. PMID: 32309270; PMCID: PMC7145976.

63. Wei X, Huang P, Gao C, Shen S, Tu S, Guo Y, Zhang L, Lu MS, Lu J, Wang CC, He JR, Qiu X. *Associations of maternal weight status with the risk of offspring atopic dermatitis and wheezing by 1 year of age*. *Pediatr Allergy Immunol*. 2022 Jan;33(1):e13703. doi: 10.1111/pai.13703. Epub 2021 Nov 28. PMID: 34806795.

64. Castro-Rodriguez JA, Forno E, Casanello P, Padilla O, Krause BJ, Uauy R. *Leptin in Cord Blood Associates with Asthma Risk at Age 3 in the Offspring of Women with Gestational Obesity*. *Ann Am Thorac Soc*. 2020 Dec;17(12):1583-1589. doi: 10.1513/AnnalsATS.202001-080OC. PMID: 32726560; PMCID: PMC7706596.

65. Razaz N, Villamor E, Muraca GM, Bonamy AE, Cnattingius S. *Maternal obesity and risk of cardiovascular diseases in offspring: a population-based cohort and sibling-controlled study*. *Lancet Diabetes Endocrinol*. 2020 Jul;8(7):572-581. doi: 10.1016/S2213-8587(20)30151-0. PMID: 32559473.

66. Eitmann S, Mátrai P, Németh D, Hegyi P, Lukács A, Bérczi B, Czumbel LM, Kiss I, Gyöngyi Z, Varga G, Balaskó M, Pétervári E. *Maternal overnutrition elevates offspring's blood pressure-A systematic review and meta-analysis*. *Paediatr Perinat Epidemiol*. 2022 Mar;36(2):276-287. doi: 10.1111/ppe.12859. Epub 2022 Jan 18. PMID: 35041216; PMCID: PMC9305555.

67. Voerman E, Santos S, Patro Golab B, Amiano P, Ballester F, Barros H, Bergström A, Charles MA, Chatzi L, Chevrier C. *Maternal body mass index, gestational weight gain, and the risk of overweight and obesity across childhood: An individual participant data meta-analysis*. *PLoS Med*. 2019 Feb 11;16(2):e1002744. doi: 10.1371/journal.pmed.1002744. PMID: 30742624; PMCID: PMC6370184.

68. Barseem NF, Khattab E, Dawood R, Mohamed S. *GST T1, M1, and IRS-1 G972R Genetic Variants Association to Gestational Diabetes Mellitus (GDM) in Egyptian Women: Linkage to Maternal Hyperglycemia*. *Curr Diabetes Rev*. 2022;18(2):e021921191604. doi: 10.2174/1573399817666210219124628. PMID: 33605864.

69. Górska A, Wolek M, Czerny B, Uzar I, Seremak-Mrozikiewicz A, Olbromski P, Baraniak J, Kania-Dobrowolska M, Sienko M, Bogacz A. Polymorphism analysis of the Gly972Arg IRS-1 and Gly1057Asp IRS-2 genes in obese pregnant women *Reprod Biol.* 2020 Sep;20(3):365-370. doi: 10.1016/j.repbio.2020.05.002. Epub 2020 Jun 12. PMID: 32540195.

70. Yaribeygi H, Farrokhi FR, Butler AE, Sahebkar A. Insulin resistance: Review of the underlying molecular mechanisms. *J Cell Physiol.* 2019 Jun;234(6):8152-8161. doi: 10.1002/jcp.27603. Epub 2018 Oct 14. PMID: 30317615.

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採用現代技術進行塑膠塗料的應用

THE USE OF MODERN TECHNOLOGIES FOR THE APPLICATION OF PLASTIC COATINGS

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註解。 本文介紹了用於腐蝕防護、透過噴塗汽車構造部件來平整表面不平整的主要塑膠粉末。 已經制定了使用氫氧氣體混合物火焰噴塗零件的建議。 給出了火焰噴塗用TPF-37和PFN-12粉末塑膠的化學成分和物理機械性能。

關鍵字： 塑膠粉末。 噴塗。 氫氧火焰。 電解水發生器。 粉末噴塗技術。

Annotation. *The paper presents the main plastic powders used for corrosion protection, for leveling surface irregularities by spraying car construction parts. Recommendations on flame spraying of parts using a hydrogen-oxygen gas mixture have been developed. The chemical composition and physico-mechanical properties of TPF-37 and PFN-12 powder plastics used for flame spraying are given.*

Keywords: *Plastic powders. Spraying. Hydrogen-oxygen flame. Electrolysis-water generators. Powder spraying technology.*

Introduction: During spraying, it becomes necessary to analyze the course of chemical reactions between the combustion products of the hydrogen-oxygen gas mixture and the materials of plastic powders, as well as between the components of the sprayed surfaces; to establish the influence of ongoing chemical reactions on the mechanical properties of the sprayed layer with the introduction of the above studies in improving the new powder spraying technology. Flame spraying

is used to protect against corrosion, to align the irregularities of the surfaces of car construction parts.

Materials and methods. Spraying of plastic powder is carried out on the pre-prepared surface of the part with compressed air through the flame of a special gas burner “ISKRA”. As a result of heating, plastic particles become plastic; under the action of compressed air, they hit a preheated metal surface and, being in a semi-liquid, plastic state, adhere to the surface and to each other, forming a durable coating [6].

A special universal surfacing burner “ISKRA” is used, which is shown in Figure 1, with which plastic powders can be applied to a metal surface in a molten state



Figure 1. Universal surfacing burner “ISKRA”

A feeding tank is installed on the burner (Figure 2), into which plastic powder is loaded.

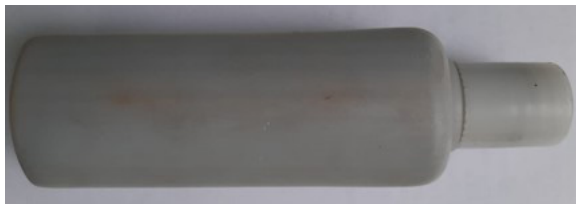


Figure 2. The nutrient tank.

Flame spraying. The technological process is as follows: an air jet with particles of powdered polymer suspended in it passes through a torch of a hydrogen-oxygen flame (temperature 650...700 ° C and above; the speed of passage of the polymer material is 20... 30 m/s), the particles soften to a plastic state and, upon impact on the prepared surface of the part, adhere to it, forming a continuous polymer coating[6]. The plastic coating, subject to the technological process, does not peel off during vibrations and protects the metal well from corrosion. Flame spraying of TPF-37 and PFN-12 pow-

der plastics is also used to align the surfaces of bodies, cabins and tail parts in order to remove traces of welding seams, dents, undulations, etc.

The coating is applied using an electrolysis-water generator (MBV-500 devices; Energia – 1.5 UHL – 4; “Moscow”), which has a spray gas burner “ISKRA” and a nutrient tank. These types of equipment solve the problem of safe performance of work, can be used indoors, in wells and tunnels, storage can also be carried out in all industrial buildings [2].

The technological process of spraying includes operations: cleaning of paint, dirt and oil from the cabin, body, tail parts with irregularities and dents no more than 5 mm deep. Damaged surfaces with dents and irregularities are straightened, and cracks and holes are brewed. The surface of the welds is cleaned with a grinding machine to remove sharp corners and edges with a radius of rounding less than 2 mm; drying of powder (PFN-12 or TPF-37) sifted through a sieve with a mesh of 0.16 ... 0.25 mm, at a temperature of 60 ° C for 5 ... 6 hours. The humidity of the powder should be no more than 2%.

The compressed air used in the technological process must be cleaned of excess moisture and oil contamination. The use of a round or flat nozzle depends on the width of the surface to which the coating is applied: with a cylindrical nozzle, the jet captures 15 in one pass...20 mm, with a flat one — 65...70 mm;

Coating application. The prepared surface is heated to 220 ... 230 ° C (the heating temperature is controlled by changing the color of the thermal pencil; overheating of the surface (to blue) is not allowed). Coating mode: the speed of movement of the burner is 1.2 ... 1.6 m / min; compressed air pressure is 0.3 ... 0.6 MPa; the distance between the mouthpiece and the heating surface is 100 ... 120 mm; the number of passes of the burner is 2 ... 3; rolling the applied layer with a roller moistened with cold water (the procedure is carried out 5 ... 8 seconds after coating). Before rolling, the roller should be in cold water, and when rolling, it should be periodically cooled with cold water; the second layer is applied after heating the coating with a burner flame for 5 ... 8 s. After 8 ... 10 s, the coating is rolled with a roller again, until the dent or unevenness is completely leveled. The coating must meet the technological requirements - it must be dense, without bubbles and irregularities.

After complete hardening of the coating (15... 20 min) it is subjected to machine grinding until a smooth transition from the metal surface to the coating surface is obtained. There should be no peeling of the applied coating from the metal surface. Polymer coatings are applied piecemeal to a significant surface area.

Instead of acetylene, it is more economical to use a hydrogen-oxygen gas mixture formed by electrolysis-water generators. Gorenje hydrogen-oxygen flame (a mixture of hydrogen-oxygen explosive gas with gasoline vapor) takes place in two stages without taking into account the oxygen of the surrounding air and with the addition of oxygen of the surrounding air [1]:

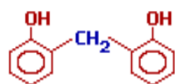
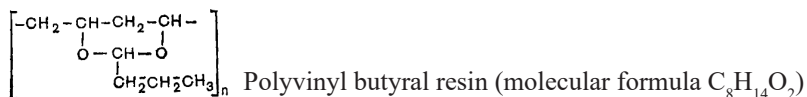
a) without the addition of O₂ air



b) when adding oxygen to the air (stage I)



For spraying, TPF-37 or PFN-12 plastic powder is used, which has the composition: polyvinyl butyral resin—54%; graphite—23%; iditol—21%; urotropin—2%.

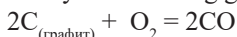


Iditol is a new resin (Phenol-formaldehyde). (molecular formula C₆H₁₄O₆)



urotropin (molecular formula C₆H₁₂N₄) [5]

Products formed under the action of elevated temperatures can act as reducing agents. The following reactions may occur during graphite combustion gorenje



Carbon (II) oxide has reducing properties.

Table 1.

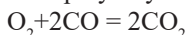
Thermodynamic characteristics for the graphite oxidation process at 3000C:

	$\Delta\text{H, kJ/mol}$	$\Delta\text{S, kJ/mol}$
C _(графит)	0	5,74
O _{2 (г)}	0	205,04
CO _(г)	-110,53	197,55
CO _{2(г)}	-393,51	213,66

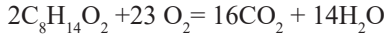
According to the equation for calculating the isobaric-isothermal potential $\Delta\text{G}=\Delta\text{H} - \text{T}^*\Delta\text{S}$.

$$\Delta\text{G x.p.} = 2*(-110,53) - 573*(2*0,19755 - 0,20504 - 2*0,00574) = 2*(-110,53) - 573*(-0,01897) = 118,13 \text{ kJ/mol}$$

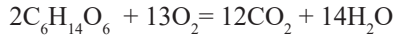
Heating at a temperature of 3000C (573K) in excess of oxygen leads to complete oxidation of carbon monoxide (II) to carbon monoxide (IV) and loss of reducing properties. Gorenje reactions: polyvinyl butyral resin



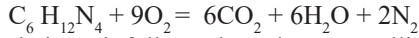
According to the calculation of the isobaric-isothermal potential



Iditol is a new resin (Phenol-formaldehyde).



Urotropin



Based on the calculations, it follows that when controlling the oxygen supply, compounds with reducing properties are formed, which prevents the oxidation of polymers.

Currently, the industry produces gas-welding electrolysis-water generators that produce a hydrogen-oxygen gas mixture [2]. These include portable electrolysis-water devices MBV-500, welding hydrogen-oxygen Energy – 1.5 UHL – 4 and electrolysis-water devices “Moscow”, shown in Figures 3-5.



Figure 4. Installation welding hydrogen-oxygen Energy-1.5 UHL – 4



Figure 4. Installation welding hydrogen-oxygen Energy-1.5 UHL – 4.



Figure 5. Electrolysis and water devices of the “Moscow” series

Conclusions

The plastic coating, subject to the technological process, does not peel off during vibrations and protects the metal well from corrosion. Flame spraying of powdered plastic TPF-37 and PFN-12 is used to align the surfaces of bodies, cabins and tail parts in order to remove traces of welding seams, dents, undulations, etc.

Electrolysis-water generators solve the problem of safe performance of work, can be used indoors, in wells and tunnels, storage can also be carried out in all industrial buildings.

Based on the calculations, it follows that when controlling the oxygen supply, compounds with reducing properties are formed, which prevents the oxidation of polymers.

List of literature

1. Korzh V.N., Tuzenko Yu.M., Matveev I.V. and others. *Welding of low carbon steel parts with hydrogen-oxygen flame. / Automatic welding, №11 (368), 1983.*

2. Semeshin, A.L. *Electron-water generators in repair production for soldering parts: a textbook /A.L. Semeshin, V.V. Goncharenko.- Orel GAU, 2013 - 268 p*

3. Khromov V.N., Semeshin A.L., Semeshin P.A. *The use of hydrogen-oxygen gas mixture in repair production for soldering parts: Monograph– Orel: publishing house Orel GAU, 2009 – 197c.*

4. *Technology of repair and restoration of products made of plastics and polymer composites Galimov E.R., Bobryshev A.A., Shafigullin L.N., Shafigullina A.N.*

Bulletin of Kazan State Technical University named after A.N. Tupolev. 2014. No. 2. pp. 84-88.

5. *A short reference book of physico-chemical quantities of some inorganic and organic compounds. Comp.: L. Y. Brusentseva, A.A. Kudryashova – Samara: NOU VPO media “REAVIZ”, 2011. – 68 p.*

6. *Polymer materials in cars and methods of their repair Vetrov A.M., Dick E.A., Solovyova E.N., Yushchenko N.I. In the collection: PROGRESSIVE TECHNOLOGIES AND PROCESSES. Collection of scientific articles of the 3rd International Youth Scientific and Practical Conference. Responsible editor Gorokhov A.A., 2016. pp. 52-56.*

7. *Restoration of automotive parts made of thermoplastics Yushchenko N.I., Dick E.A. Scientific thought. 2017. NO. 3. PP. 174-176.*

8. *REPAIR OF PLASTIC CAR PARTS Yudin A.I. In the collection: CARS, TRANSPORT SYSTEMS AND PROCESSES: PRESENT, PAST AND FUTURE. Collection of articles of the 2nd International Scientific and Technical Conference. Kursk, 2020. pp. 349-351.*

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烏茲別克採石場挖土機運作的創新方法：分析與前景
**INNOVATIVE APPROACHES TO THE OPERATION OF QUARRY
EXCAVATORS IN UZBEKISTAN: ANALYSIS AND PROSPECTS**

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註解。 本文對挖掘機運作過程中的影響因素進行了分析。 描述了烏茲別克共和國背景下這些因素的特殊性。 重點關注挖土機操作員的資格要求。 描述了作為影響運作效率的因素的維護和修理的特點，以及烏茲別克共和國適用的維護和修理規定。

關鍵字： 採石場挖土機、操作、影響因素、維護保養、效率。

Annotation. *The article presents an analysis of factors influencing excavators during their operation. A description of the peculiarities of these factors in the context of the Republic of Uzbekistan is provided. Emphasis is laid on the qualification requirements for excavator operators. The features of maintenance and repair, as factors influencing operational efficiency, are described, along with the maintenance and repair regulations applicable in the Republic of Uzbekistan.*

Keywords: *Quarry excavator, operation, influencing factors, maintenance and repair, efficiency.*

Uzbekistan possesses rich reserves of various minerals: gold, uranium, copper, silver, coal, lithium, tungsten, titanium, niobium, and tantalum, typically extracted through quarrying methods [1]. Leading mining enterprises include the Almalyk and Navoi Mining and Metallurgical Combines, as well as JSC «Uzbekcoal».

The primary equipment used for overburden removal and extraction work are quarry excavators. Currently, over 220 units of excavation-loading equipment are operated across these three MMCs, with bucket capacities ranging from 5 to 20 m³. The main technological fleet of excavators is represented by cable-operated machines: EKG-10, EKG-15, and EKG-20K, accounting for 62% of the fleet, followed by hydraulic excavators: Hitachi ZAXIS 670, Hitachi EX 3600, CAT-5230,

RH-170 (16%), and wheel loaders like WA900-3E0, HELI ZL30G, and CDM853 (22% of the fleet).

During operation, an excavator is influenced by numerous factors, both negative and positive. These factors are divided into several main groups:

- Geological and mining conditions.
- Quality of the face preparation and rock mass.
- Excavator operation.
- Technical maintenance of the excavator.
- Organization of mining operations.
- Climatic factors.
- Natural aging.

The positive or negative influence of these factors is determined in comparison with nominal corresponding values for normal operating conditions of the excavator. The group of geological conditions includes factors such as the physico-mechanical properties of the mineral and surrounding rocks. For example, when operating an excavator on soft rocks, the intensity of wear and tear on its elements and systems will be less than under normal conditions – semi-rocky rocks of the III category with preliminary loosening [2]. In Uzbekistan’s quarries, the rocks are soft, clayey. Preliminary loosening is carried out by blasting, making this factor positive.

One of the primary factors influencing the performance of quarry excavators is the qualification and experience of the operator. The effectiveness of the excavator’s work depends on the operator’s ability to adapt to varying conditions, understand the specific requirements of the job, and respond promptly to emerging challenges. In the Republic of Uzbekistan, the demand for highly qualified operators is steadily increasing, especially in light of the growing complexity of mining operations and the introduction of new, more sophisticated machinery.

To ensure high productivity and minimize equipment downtime, operators must be well-trained in both the technical aspects of the excavators they handle and the best practices for their operation under different conditions. This includes understanding the geological characteristics of the mining site, the optimal methods for rock extraction, and the efficient use of the excavator’s capabilities.

Maintenance and repair (M&R) activities are crucial for the uninterrupted operation of quarry excavators. Regular, well-planned M&R helps in maintaining the excavators in optimal working condition, thereby ensuring their long-term operational efficiency. In Uzbekistan’s mining industry, M&R practices are governed by specific regulations that dictate the frequency, scope, and methods of these activities.

The M&R activities are typically divided into several categories, including routine maintenance, scheduled repairs, and unscheduled or emergency repairs.

Routine maintenance involves regular inspections and minor adjustments to prevent potential malfunctions. Scheduled repairs are planned in advance and involve more extensive work, such as the replacement of worn-out parts or major overhauls. Unscheduled repairs occur in response to unexpected breakdowns and are critical for minimizing downtime.

The efficiency of M&R activities is influenced by several factors, such as the availability of spare parts, the skill level of the maintenance personnel, and the organization of the M&R processes. In the Republic of Uzbekistan, efforts are being made to improve the efficiency of these activities by enhancing the training of maintenance personnel, optimizing spare parts inventory management, and adopting advanced diagnostic and repair techniques.

Table 1

Maintenance and repair mode		EKG-12K	EKG-15M	EKG-20K/20KM
		Operating frequency, mln.m³		
Shift service	M _{sh}			
Shift service	M _m			
Seasonal service	M _s			
Current repairs first (quarterly)	CR1	0,625	1	1,5
Current repairs second (six-monthly)	CR2	1,3	2,0	3,0
Current repairs third (annual)	CR3	2,5	4	6
Overhaul	O	25	40	60
Overhaul of the electrical part	O _{ele}	9	9	9
		Frequency, h		
Shift service	M _{sh}			
Shift service	M _m	500÷600	500÷600	500÷600
Seasonal service	M _s	3000÷3600	3000÷3600	3000÷3600
Current repairs first (quarterly)	CR1	1500÷1800	1500÷1800	1500÷1800
Current repairs second (six-monthly)	CR2	3000÷3600	3000÷3600	3000÷3600
Current repairs third (annual)	CR3	6000÷7500	6000÷7500	6000÷7500
Overhaul	O	60000÷75000	60000÷75000	60000÷75000
Overhaul of the electrical part	O _{ele}	30000÷36000	30000÷36000	30000÷36000

The climatic conditions in Uzbekistan, characterized by hot summers and relatively cold winters, significantly affect the operation of quarry excavators. High

temperatures in summer can lead to overheating of engines and hydraulic systems, while cold temperatures in winter can cause difficulties in starting the engines and increase the viscosity of hydraulic fluids, affecting the excavator's performance.

To mitigate these climatic impacts, it is essential to adapt the operation and maintenance of excavators to the specific environmental conditions. This includes using appropriate lubricants and coolants, adjusting maintenance schedules according to seasonal changes, and providing additional protective measures for the equipment during extreme weather conditions.

Natural aging of quarry excavators is an inevitable process, influenced by both operational and environmental factors. Over time, components of the excavator, such as the engine, hydraulic system, and structural elements, undergo wear and tear, leading to a gradual decrease in performance and efficiency. In the Republic of Uzbekistan, the average service life of quarry excavators is affected by the intensity of their use, the nature of the extracted material, and the maintenance practices employed.

Proactive measures to combat natural aging include regular maintenance, timely replacement of worn-out parts, and adherence to operational guidelines that minimize unnecessary stress on the excavator's components. Additionally, modernization and retrofitting of older machines with updated technologies can extend their service life and improve their efficiency.

The operation of quarry excavators in the Republic of Uzbekistan is influenced by a variety of factors, including geological and mining conditions, the skill of operators, maintenance and repair practices, climatic factors, and natural aging. To optimize the performance and longevity of these machines, it is crucial to consider all these aspects in a comprehensive manner.

Effective training of operators, adherence to maintenance schedules, and adaptation to climatic conditions are key strategies for maximizing excavator efficiency. Furthermore, addressing the challenges posed by natural aging through proactive maintenance and modernization can significantly enhance the operational life and productivity of quarry excavators in Uzbekistan.

References

1. Shemetov, P.A. «Prospects for Sustainable Development of Gold Mining in the Central-Kyzylkum Mining Province.» *Mining Information-Analytical Bulletin*, no. 7/2012, pp. 115-125.
2. Chishegorov, D.A., Shibanov, D.A. «Analysis of the Impact of Various Factors on the Excavator's Resources.» *Innovations and Perspectives in Mining Machinery and Electromechanics: IPDME-2021: Proceedings of the VIII International Scientific and Practical Conference, Saint Petersburg, April 22-23, 2021. Saint Petersburg State Mining University, 2021, pp. 236-239.*

3. Baron, L.I. *«Lumpiness and Methods of Its Measurement.»* Moscow: Publishing House of the USSR Academy of Sciences, 1982, p. 121.
4. Repin, A.A., Matveev, A.V., Lobanova, O.O. *«Analysis of the Influence of the Lumpiness of Blasted Rock on the Productivity of Excavators.»* Science and Youth: Problems, Searches, Solutions: Proceedings of the All-Russian Scientific Conference of Students, Postgraduates and Young Scientists, Novokuznetsk, May 19-21, 2020, edited by Professor M.V. Temlyantsev. Volume Issue 24. Part VI. Novokuznetsk: Siberian State Industrial University, 2020, pp. 199-203.
5. Donskoy, V.M., Shipilin, V.A., Shibano, D.A., Melnikov, D.A. *«Crawler Quarry Excavator EKG-20K. Operation Manual. 3549.00.00.000 RE. Volume 1.»* Kolpino: LLC «IZ-KARTEX named after P.G. Korobkov», 2013, 113 pages.
6. Ivanov, S.L., Ivanova, P.V., Kuvshinkin, S.Yu., Shibano, D.A. *«Assessment of the Impact of Weather-Climate Factor on the Reliability of Equipment of the Mineral-Raw Complex.»* Resources of the European North. Technologies and Economics of Development, no. 04/2018, pp. 17-27.
7. Agagena, A., Mikhailov, A.V., Eliseev, A.S. *«Influence of Weather-Climatic, Mining-Geological and Organizational-Technical Factors on the Resource of a Quarry Excavator.»* Transportation, Mining and Construction Engineering: Science and Production, no. 17-2/2022, pp. 294-298.
8. Shadrin, A.I., Khramovskikh, V.A. *«Assessment of the Durability of Metal Structures of Quarry Excavators in Cold Climate Conditions.»* Mining Machines and Automation, no. 10/2003, pp. 34-38.
9. *«Resolution of the Cabinet of Ministers of the Republic of Uzbekistan ‘On Further Improvement of the Classifier of Main Positions of Employees and Professions of Workers’ No. 795 dated October 4, 2017.»*
10. *«Decree of the President of the Republic of Uzbekistan ‘On Additional Measures for Further Improvement of the System of Professional Education’ UP-5812 dated September 6, 2019.»*

研究低環境溫度下廢棄物密度對其微生物破壞強度的影響

INVESTIGATION OF THE EFFECT OF WASTE DENSITY ON THE INTENSITY OF ITS MICROBIOLOGICAL DESTRUCTION AT LOW AMBIENT TEMPERATURES

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抽象的。目前的問題是都市固體廢棄物的管理。為了減少進入垃圾掩埋場進行處置的廢棄物量，需要進行分類和壓制。在壓制過程中，廢棄物的物理和化學特性會發生變化，其微生物破壞的條件惡化。結果，廢物被緩慢回收，尤其是在低溫環境下。

關鍵字：都市固體垃圾、垃圾掩埋場、垃圾掩埋場復壘、氣候條件、垃圾掩埋場的負面影響、環境、垃圾分解過程。

Abstract. *The current issue is the management of solid municipal waste. To reduce the amount of waste that enters landfills for disposal, sorting and pressing are used. During pressing, the physical and chemical characteristics of the waste change and the conditions for its microbiological destruction deteriorate. As a result, waste is slowly recycled, especially in low-temperature environments.*

Keywords: *solid municipal waste, waste landfills, landfill reclamation, climatic conditions, negative impact of landfills, environment, waste decomposition processes.*

1. Overview

The result of the formation and intensive development of industrial society is the intensification of the process of production and consumption waste generation. The sources of formation and composition of municipal waste are very diverse. It were believed that in the Russian Federation as a whole more than 150 million cubic meters of them have been accumulated [1]. The main contribution to this

volume make by urban agglomerations. Predictive estimation models for the composition of newly generated waste often have significant errors. It is primarily due to the rapid development and widespread introduction of new technologies and materials as well as the level of development of the country (Table 1, Fig. 1).

Currently, from urbanized areas receive waste with a high content of organic components which share is approximately 50 - 60% of the total waste mass. It is mainly food waste, fallen leaves, paper, packaging materials, furniture made from wood products, rubber and plastic products, etc. In view of this diversity and, for the purpose, of predicting the assimilation of waste in the environment, the organic matter of these wastes divided into five main categories: biodegradable carbohydrates (cellulose, hemicellulose, starch, monosaccharides and oligosaccharides); proteins; fats; hardly degradable lignin; almost non-degradable plastics [2,3, 4].

Table 1.
Morphological composition of municipal waste in Russia.

Waste component	Content, % by weight	
	1989	2019
Paper	30	35
Food waste	30	41
Metals	4	4
Polymers	3	8
Tree	3	2
Textiles	5	4
Other	25	6

The quantitative content of each category of waste largely determines the overall intensity of microbiological processes at the burial sites and the achievement of a stable state of the waste.

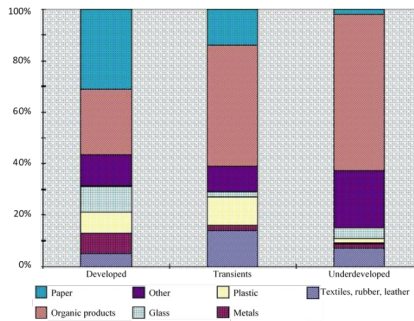


Figure 1. *Distribution of waste by category in different countries [5].*

The quantitative content of each category of waste largely determines the overall intensity of microbiological processes at the burial sites and the achievement of a stable state of the waste.

2. Materials, methods, results

2.1 Research methods

Analysis of the impact of municipal waste landfills on the environment on the basis of field and laboratory studies. Study of design and technological and reporting documentation of waste management. As well as measures for the reclamation of landfills with modeling of waste management processes and with using geoecological methods of research of municipal waste landfills.

2.2 Analysis of the results and its discussion

In order to improve the efficiency of waste disposal, it proposed to carry out its pre-sorting [6, 7, 8, 9, 10] as shown in Figure 2. This will allow even at the initial stage of waste management for each specific group justify and choose the most appropriate method of disposal and think through an effective system of collection, accumulation, transportation. High-quality waste logistics will ensure compliance with sanitary and hygienic requirements and create conditions for ensuring the continuity of the processing plants. The combination of these measures will make the process of recycling municipal waste environmentally appropriate and economically profitable or at least self-sufficient. For various reasons, it will not be possible to implement these processes quickly. For a long time, most of the municipal waste will received for disposal at special landfills. Any such polygon is an open, self-developing geoecological system, i.e. its components are in constant systemic material-energy connection both with each other and with the surrounding territories, geospheres of the Earth (Fig. 3).

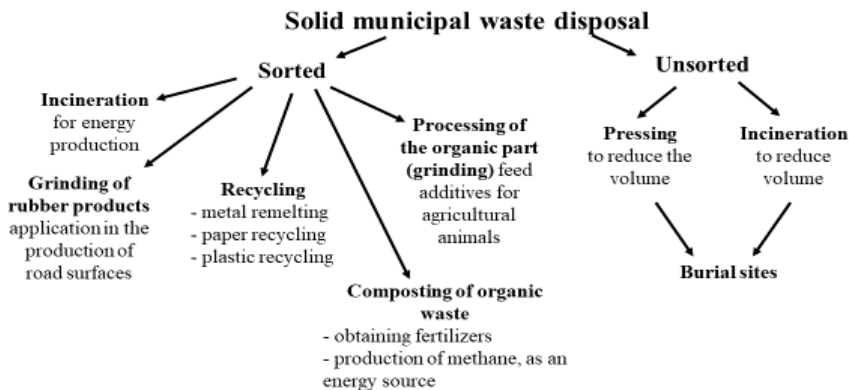


Figure 2. Solid municipal waste disposal technologies.

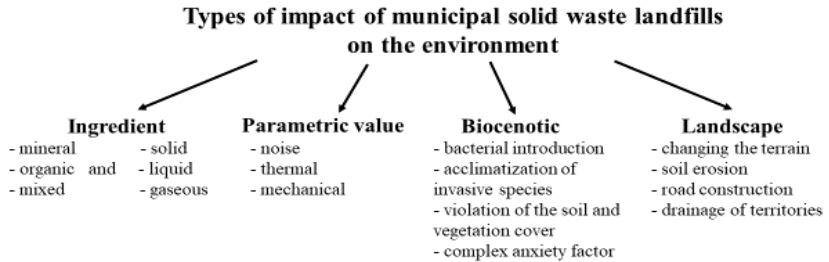


Figure 3. Environmental impact of municipal waste landfills.

One of the ways to reduce the negative impact of landfills on the environment is to reduce the volume of incoming waste. The process of its compaction with the help of special mechanisms (presses) allows reduce the volume of waste as much as possible. The conducted studies have shown that special efficiency, i.e. the maximum reduction in volume will be able to achieve when pressing precisely sorted waste. For example, if the waste has the following composition: waste paper, rags, textiles, leather, food waste, polymer products. Then if you unsorted it, pressing coefficient (compaction) for them will average 2.5 - 4. If you sort, then for the same mass of waste, the average pressing coefficient can be 7 - 11 (Table 2) and these are not the maximum values.

Table 2.
Volume of sorted and mixed waste before and after pressing.

Type of waste	Waste density, kg / m ³	Waste mass, kg	Waste volume, m ³		Pressing ratio
			before pressing	after pressing	
Waste paper	100	1000	10.0	1.4	7:1
Rags, textiles, leather	180	250	1.4	0.3	5:1
Food waste	370	1500	4.1	0.3	12:1
Polymer products	55	100	1.8	0.5	4:1
Total			17.3	2.5	7:1
Mixed household waste (all of the above)	176	2850	16.2	6.5	2.5:1

From a technical point of view, these values can be increased with helping of special equipment. Studies have shown that from a biological point of view, this is not desirable.

The porous state of the waste and the high content of organic substances in them, taking into account sufficient humidity, create prerequisites for the active

development of microbial processes in the layers of technogenic soil of the landfill. The various stages of decomposition of the organic matter of the waste accompanied by a consistent replacement of microbiological processes, together with qualitative and quantitative changes in filtrates and biogas. The content of organic substances in municipal waste ensures the implementation of aerobic microbial processes on the surface of the landfill. Due to anaerobic microorganisms and environmental waste, the formation of a methanogenic microbial community already occurs in landfill deposits. The result of its work is the complete destruction of buried organic substances. These processes lead to the formation of a wide range of gaseous compounds in landfills. The main one is biogas. Biogas from landfills on average has the following composition: methane – 40 - 60%, carbon dioxide – 30 - 45 %, nitrogen – a few percent. It also includes a large number of micro-impurities: ammonia, hydrogen sulfide, nitrogen oxides, organomineral complexes of heavy metals, etc [11].

Active gas formation in the waste usually begins several years after the closure of the landfill or part of it and remains particularly intense for the next 10 - 30 years. The process then gradually decays as the biodegradable organic matter is exhausted [12, 2, 13, 14]. The complete microbial decomposition of the waste organic matter continues in the landfill body for another 30 - 50 years. At the same time, the following indicators affect the duration of the processes:

- primary morphological and physico-chemical composition of waste;
- the primary degree of compaction and porosity of waste when placed in the landfill;
- average annual ambient temperature.

In the course of research, it were proved that the physical and chemical conditions for the development of microorganisms change greatly when burying tightly compressed waste (the coefficient of increase in the initial density for which is more than 20). The oxygen content and humidity decrease when these conditions change. As a result, there is a sharp decrease in biodiversity and the number of microorganisms. Its activity decreases. All this leads to the fact that the primary stage of decomposition of waste is slow and later comes anaerobic destruction. The process of polygon stabilization is greatly lengthening.

Determining the level of stability of the landfill, a complex of engineering and environmental surveys is performing. In methods for determining the standard physical and chemical parameters of waste and filtrate (organic matter content, pH, chemical oxygen consumption, biological oxygen consumption (5), ammonium nitrogen, etc.) are used aerobic and anaerobic biological tests for this purpose (GS21, RI4). Which allow us to determine the oxidation potential of the organic component and the biogas potential of waste [15]. All this allows you to predict and evaluate the state of the landfill in terms of determining the possible direction

of its reclamation (agricultural, forestry, recreational, construction) and the time it will take.

The degree of compaction of waste is of particular importance when it will be bury in areas with low ambient temperatures [16]. There are many days in the year with negative air temperatures in these areas. There is a strong and deep freezing of the ground, intensive leaching of the technogenic soil of the landfill by melt-water. Since the microorganisms themselves are adapted only to a rather narrow temperature range [17], the period of its activity on landfills in these places is very short. Taking into account the density of the disposed waste, the efficiency of destructive processes may also decrease. In the course of the conducted studies, it was found that the placement of tightly compressed waste at landfills in the Arctic and near-Arctic regions leads to a slowdown in the processes of its microbial destruction by about 3 times compared to similar processes at landfills in temperate climates. The annual production of biogas is reducing. The forecast estimate of the transition of waste to a stable state increases by 25 - 30%. A significant heterogeneity of the processes occurring both vertically (Fig. 4) and horizontally of the landfill body is visible.

The intensity of processing of organic matter in the technogenic soil of the landfill depends on a number of factors. Its diversity creates difficulties in developing a unified mathematical model for predicting the ecological state of any landfill. Therefore, the best results be able to obtain only in the course of time-consuming field studies.

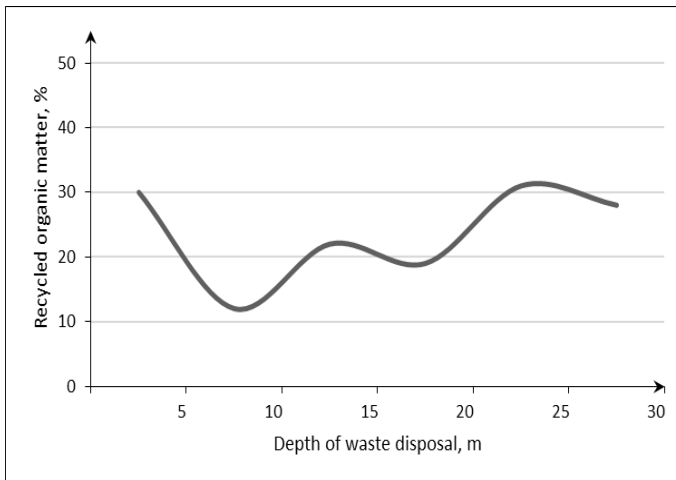


Figure 4. Dependence of the degree of decomposition of the organic part of the waste on the depth of disposal.

3. Conclusion

All these features of the intensity of the work of microorganisms in compressed waste in conditions of low annual ambient temperatures create the need for a more thorough study of the issue of municipal waste management for the Arctic and near-Arctic territories. A promising direction should be the issues of waste sorting, for the purpose, of its further processing, in order to reduce the volume of waste entering landfills for disposal. The issue of the permissible level of waste compaction also requires further study, which on the one hand will ensure a reduction in its volume and on the other hand will preserve favorable conditions for the development of microorganisms. Since only through its' activities is it possible to completely recycle waste and reduce the negative impact of decommissioned landfills of municipal waste on the environment. International experience shows that with an integrated approach to the issue of waste management, it is possible to achieve a significant reduction in the anthropogenic load on the environment from municipal waste. A great role here is played by a competent policy and the will of state structures, they must create conditions for the organization of new waste processing facilities, ensure the economic feasibility of separate waste collection and their maximum processing. High social responsibility also lies with ordinary citizens who carry out the very first stage of waste sorting; they should be interested in taking care of nature, saving its resources.

References

1. A.N. Mirny, V.E. Murashov, V.E. Koretsky *State waste management within the framework of the concept of sustainable development* / ed. by A.N. Mirny, (2012).
2. O.V. Gorbatyuk, O.I. Minko, A.B. Lifshits, *Fermenters of geological scale* (*Nature*, №9, 1989).
3. V.S. Lebedev, O.V. Gorbatyuk [et al.], *Biogeochemical processes of formation and oxidation of biogas in landfills of household waste* / (*Ecological Chemistry*, № 4, 1993).
4. M Pichler, I Kögel-Knabner, *Chemolytic analysis of organic matter during aerobic and anaerobic treatment of municipal solid waste*, (*Environ. Qual*, 2000).
5. *The problem of solid waste: its history and modern scales* [Electronic resource], (*Public ecological Internet-project EcoLife*)
6. N.G. Kovalev, I.N. Baranovsky, *Organic fertilizers in the XXI century. (Bioconversion of organic raw materials)*, (2006).
7. *Applied ecobiotechnology* / A.E. Kuznetsov, N.B. Gradova [et al.], (2012).
8. G.E. Merzlaya *Preparation and application of vermicompost*, (2001).

9. I.N. Titov *Earthworms. Guide to vermiculture. At 2 o'clock. Compost worms, 1* (2012).
10. K.F. Forster, D.A.J. Weiz (ed.) *Ecological biotechnology*, (1990).
11. *Biotech and microbiology of anaerobic processing of organic municipal waste: a collective monograph / general ed. and compiled by A. N. Nozhevnikova, A. Yu. Kallistov, Yu. V. Litt, M. V. Kevbrina*, (2016).
12. V.A. Vavilin, S.V. Kalyuzhny, A.N. Nozhevnikova, *Active biochemical environment in landfills of household garbage (Nature, № 5, 2003)*.
13. A. N. Nozhevnikova, *Garbage deposits – “methane bombs” of the planet (Nature, № 6, 1995)*.
14. *Microbiological process in landfills / A.N. Nozhevnikova, V.R. Nekrasova, V.S. Lebedev [et al.]*, (*Water Sci. Technol*, 1993).
15. A. Yu. Pukhnyuk, Yu. B. Matveev, M. Huber-Humer, *Application of spectral and thermal analysis methods for ecological and energy assessment of solid waste landfills (Energy Technologies and Resource Conservation, No. 4, 2012)*.
16. M.D. Maurichev, S.D. Mauricheva, T.S. Mauricheva, *Stages of formation of the system of household waste management, modern problems (Innovative technologies, economics and management in industry, 1, 2021)*.
17. A Schnurer, A Jarvis, *Microbiological handbook for biogas plants (Swedish Waste Management U2009:03, Swedish Gas Centre Report 207, 2010)*.

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